

**The SIGN**  
of Efficient  
Radio Service

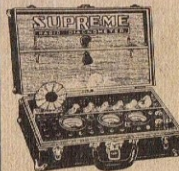
### SUPREME SERVICE.

Our RADIO EXPERTS are thoroughly skilled, and they are perfectly equipped with the most modern "SUPREME" precision instruments.

Thus they can test EVERY PART of your RADIO in a thoroughly scientific manner—absolutely no guess-work.

Service is not only expeditious, but results can be GUARANTEED.

Ring 45-274 for "SUPREME SERVICE."



See page 43 for this  
£60 RADIO TESTER.

Arthur Cheave and Co. Ltd., Printers, High Street, Auckland.

AUCKLAND'S OLDEST RADIO FIRM. ESTD. 1920.

# Radio-Electrical-Tools Cycles-Gramophones-Etc.



MAY 1931.

# Johns Ltd.

CHANCERY ST. AUCKLAND.

BOX: 471. G.P.O. AUCKLAND.

PHONES:— 45274, 40743.

TELEGRAMS:

"CLIVIC" AUCKLAND.



## EASY TERMS.

RADIO SETS, KITS, APPARATUS, CLOCKS, TOOLS, MOTORS, ETC., ETC.

Please Note.—If you are under 21 years of age, a guarantee of age must also sign the agreement on your behalf.

**DEPOSIT**—Usually 20 to 33 1/2 per cent, depending on the nature of the articles. Please suggest the deposit which suits your convenience—we cannot know this—and we will endeavour to meet your wishes.

**INSTALLMENTS**—Periodically, as arranged.

**INTEREST**—Twopence per £1 per month is added to invoice, covering interest.

**INSURANCE**—During currency of agreement, this is effected by us, and charged to customer's account.

All transactions kept strictly confidential.

## 12ZJ

The 12ZJ was heard for the first time last year, when we constructed a small power station, and began to operate it on a limited but regular schedule, as follows:

Tuesday, noon-2 p.m.

Wednesday, 7.30-9.30 p.m.

Thursday, noon-2 p.m.

Our object was to set a high standard for clarity of broadcast, coupled with a quiet dignity in connection with programmes.

We have frequently been told that 12ZJ is received with remarkable clarity, but our customers can judge this better for themselves.

Shortly after completing our own station, we received a contract to install a similar but more powerful plant for Messrs. Lewis Eady Ltd., 12IR. In three weeks, 12IR was quite ready to go on the air, and has maintained a very full schedule ever since.

Recently, Messrs. Lewis Eady decided to increase their power, and at the time of writing, we are enlarging their station for them, being responsible both for the design and construction.

## GUARANTEE.

WE HEREBY CERTIFY THAT, to the best of our expert knowledge, our RADIO SETS and APPARATUS are free from all defects, either of workmanship or material, when they are despatched from our factory.

**ANY PART** which proves defective within the guarantee period specified with it in our catalogue, must be returned to us, carriage paid, for inspection, and if the defect is not caused by accident, abuse, neglect or other extraordinary circumstances beyond our control, it will be repaired or replaced free, at our option. Our guarantee is limited to the repair or replacement of the actual part, and does not cover consequential damages of any kind. **Valves and batteries not guaranteed.**

This guarantee is voided if, without our permission being previously obtained, repairs or alterations are executed by any other person or firm.

We endeavour to sell only reliable apparatus, and invariably wish to be advised of any defect in any article at all. Usually, we can adjust the matter for you, but in any case, the matter will be taken up with the manufacturers.

## FOR HIRE.

POWERFUL PUBLIC ADDRESS SYSTEMS

are available for sports meetings, public addresses, political meetings, shows, etc., within reasonable reach of Auckland.

The cost is a matter of arrangement, as conditions vary extremely. Approximately, however, the most powerful outfit costs about 15 per day, including operator, plus transport charges, and plus charge for records, if music is also wanted.

**ORDER EARLY**—We have already had to supply three equipments in one day—ALL WE HAD at the time. Please advise whether A.C. current is available for the amplifiers.

**ELECTRIC GRAMOPHONES.** For dances, entertainments, very powerful gramophones can be hired, to work either from D.C. or A.C. Full particulars on application.

## TELEPHONE ENQUIRIES.

COMPLETE TELEPHONE ENQUIRIES.

Ring 45-274 or 46-743, and TO SAVE TIME, ask our Exchange Attendant for the Department you want—

1. DIRECTORS: Mr. V. R. Johns

Mr. A. C. Johns

2. MANAGER—WHOLESALE AND MAIL Order (Mr. Jarman)

3. ACCOUNTS AND OFFICE (Mr. Smith)

4. BROKERS (Mr. Muller)

5. SERVICE (Mr. Martell)

6. WHOLESALE

7. QUOTATIONS, STOCKS, ETC. (Mr. King)

8. RETAIL

Our Exchange Attendant will get you through much quicker to the department you want if you give the above information. If the person you want is using another phone or otherwise engaged, you will be advised.

## ENQUIRY AND QUOTATIONS.

In future, we hope to be able to answer all questions—RADIO and ELECTRICAL—referred to us, freely and without charge, but request the following instructions be followed:

1. Questions are numbered.

2. Questions are as definite as possible.

3. Full, essential details be given.

4. Stamped addressed envelope be enclosed.

And remember TWO THINGS—we appreciate your order just as much as you may appreciate our expert advice, AND we in turn will certainly appreciate your acknowledgment of our answer, with any comments you care to make on them. Others may have a similar problem, and it helps considerably to get various opinions.

**QUOTATIONS.** Similarly, we always like to get comments on any quotation we make you. If our price is right, or even if it is not, we shall be able to offer alternatives. These can usually not all be given in one letter, and frequently information shared from further correspondence enables us to supply just what is required.

# JOHNS LIMITED

JOHNS BUILDING, CHANCERY STREET, AUCKLAND.

(1½ minutes' walk from Queen Street, by concrete road. See Locality Chart on Back Cover)

## Retail Radio Dist.

PLEASE HAND THIS LIST TO A FRIEND IF IT DOES NOT INTEREST YOU.

### PAYMENT.

CASH WITH ORDER, UNLESS OTHERWISE PREVIOUSLY ARRANGED. Add exchange to cheques.

DEFERRED PAYMENT—See opposite page.

### BUSINESS HOURS.

Week Days: 8.30 a.m. to 5.30 p.m.

Fridays: 8.30 a.m. to 8.30 p.m.

Saturdays: 8.30 a.m. to 12.15 p.m.

### RETURNS.

NO RETURNS will be accepted after seven days. ACCUMULATORS, VALVES, BATTERIES, CRYSTALS, and similar goods, unless SPECIALLY GUARANTEED, are not returnable under any circumstances. PROCURED GOODS NOT RETURNABLE.

PACKAGES, returns or otherwise, MUST BE SENT correctly addressed "JOHNS LTD., AUCKLAND," with the NAME and FULL ADDRESS of SENDER on the package. A LETTER must be posted advising that the package has been sent, otherwise goods will be entirely at sender's risk.

### PRICE ALTERATIONS.

All prices are subject to alteration without notice. Illustrations in a few cases may differ from the actual articles, owing to changes, which we reserve the right to make as occasion demands.

### SATISFACTION.

It is our earnest endeavour that every customer should be perfectly satisfied with every transaction. If the subject is the subject of dissatisfaction, the DIRECTORS will regard it as a personal favour if you will write them—confidentially—giving full details. It will receive prompt attention.

### NEW APPARATUS.

New lines are continually being imported or made. An enquiry for any article not listed may bring you full details of the very thing you want.

### INCREASED EXCHANGE RATES.

Owing to the abnormally high EXCHANGE RATE existing at present, we may find it necessary to increase slightly some of our prices, until exchange rates become normal again.

Customers may rest assured, however, that such increases will be kept as low as possible, if they cannot be avoided, and that prices will revert to normal again at the very first opportunity.

We ask your co-operation in this matter, remembering that, even where such extra charges are passed on, we are absorbing a far larger proportion ourselves.

## OUR TENTH ANNIVERSARY.

OUR TENTH ANNIVERSARY was celebrated at the end of last year.

As business firms go, of course, ten years represents only a very brief span—but to have been associated with the RADIO TRADE for over ten years almost makes us feel hoary with RADIO AGE! We naturally feel very proud of the honour of being "AUCKLAND'S OLDEST RADIO FIRM."

Each year brings new problems for all of us—new joys, new sorrows, and new accomplishments. Most of us will remember last year as one of the least pleasant, but, nevertheless, we believe that the RADIO has done its share towards making things more cheerful, and in bringing added joy to thousands of homes.

Bad times must come, just as surely as the good times. The happiest times, in fact, come just after the bad, when, with the old confidence restored, everyone can look forward again to several years at least of renewed prosperity. And the corner HAS been turned—better and more cheerful years are ahead.

We wish each and everyone of our customers the best of luck in the future, and thank them for their support in the past—support which has been especially appreciated during last year.



# WELL-MAYDE.

IN FUTURE, THE RADIOS MANUFACTURED BY OUR FACTORY, WITH  
**OVER TEN YEARS' EXPERIENCE**

IN THE PRODUCTION OF

**SETS SPECIALLY SUITED TO NEW ZEALAND CONDITIONS**

WILL BEAR THE NAME

## Well-Mayde Radio.

Already, the high quality of WELL-MAYDE APPARATUS is well known throughout New Zealand. This standard of excellence will, of course, be fully maintained in the future.

### WELL-MAYDE MEANS:—

1. DESIGN to suit local New Zealand conditions.
2. High Quality, and Efficiency.
3. Prompt Factory Service.
4. The GUARANTEE that IS a guarantee.
5. Employment for fellow New Zealanders.

### MAKE YOUR SET THE NEW ZEALAND BUILT WELL-MAYDE.

ELECTRIC MODELS from £14/10/-. BATTERY MODELS from £13/10/-.

### RADIO INSTALLATION?

Probably the first bath invented was put in a corner of a room. Similarly, the first stove created a smoky nuisance in the kitchen, until steps were taken to have it "installed."

Fortunately, Radio does not create a nuisance, but one does not need to be a prophet to visualise Radio even five years hence.

So why not be ahead of the times, and consult us, not about a "RADIO SET," but about "RADIO INSTALLATION." You will at least find our information interesting.

And, if you adopt our advice, you will not get out of date. In other words, why not have "To-morrow's Radio To-day."

Your architect will make provision for the Radio Cabinet, just as he now does for your wardrobes. The Radio Chassis will be tucked away in this, while "Radio Points" will be distributed through the house, so that one or more speakers can be used just where they are wanted.

In many houses already built, such an "INSTALLATION" can be made, giving maximum convenience, and, far, far better value for money.

MASTS ERECTED CORRECTLY.

## WELL-MAYDE ELECTRIC RADIO.

PRICE VERSUS QUALITY.

WELL-MAYDE stands for QUALITY—real high quality. WELL-MAYDE must therefore be measured in terms of many years of service.

Let it be thought that such remarks are superfluous, may we refer to N.Z. RECORD HANDBOOK, 1931, page 24, where the following statement appears in an article dealing with imported Mantel Sets:

"Just whether they will last is another question. That their

POWER PACKS are most conservatively cut is no secret."

The POWER PACK is the very HEART of a Radio set.

WELL-MAYDE POWER PACKS are not stinted—they are substantially over-size, so that the above criticism could never be levelled at them.

YOU are SAFE with WELL-MAYDE.

Each WELL-MAYDE ELECTRIC CHASSIS, with valves and speaker, is a complete Radio Receiver, less cabinet. You can make your own cabinet, install it on a shelf, or use it without any cabinet at all.

Each WELL-MAYDE ELECTRIC CHASSIS is fitted with PICK-UP TERMINALS, enabling instant conversion to a RADIO-GRAMOPHONE.

### W-M CHASSIS MODEL 31.

As Used in the ACE ELECTRIC.

Three valves, with famous Westinghouse metal rectifier, instead of a fourth rectifier valve, SELECTRIX DEVICE now fitted prevents interference from stronger stations.

WELL-MAYDE reliability is built in—Model 31 is small, but is very robustly constructed.

#### RANGE.

MODEL 31 is meant chiefly as a local station receiver. More valves, higher first cost, greater running cost, are all necessary for really satisfactory long distance reception in all localities. Yet, the majority of ACE users do report reception from Australian stations quite regularly.

1/- WEEK MAINTENANCE—See next page.

Current cost is negligible—10 to 50 hours for 1d.!!

MODEL 31 is the best value for money in Radio.

W-M 31 CHASSIS, with valves and speaker £12/15/-.

### MODEL 81—ELECTRIC CHASSIS.

As used in ARIKI SETS.

Another entirely new chassis, embodying the now famous BAND PASS FILTER CIRCUIT.

The object of the band pass circuit is to give EXCEPTIONAL SELECTIVITY, and you retain the FULL RICH TONE such as is obtained by high-grade receivers. These two features, of course with extreme range, cannot yet be obtained without fairly complicated circuits, and expensive apparatus.

Therefore, the BAND PASS CHASSIS 81, designed and constructed as it is with the greatest possible care, must remain in a high-priced class. Even so, one does not buy RADIO every year, and you, in common with everyone who has a discriminating taste, will regret purchasing something less excellent.

Four screened grid valves are used, power detector, two stages of amplification, with push pull valves in the last. Its quality can be summed up very briefly—long range, selectivity, superb tone, simple power, extreme reliability. There is nothing else to add, except that the price is very low for such a high-grade machine.

W-M 81 CHASSIS, with valves and dynamic speaker £39

### W-M CHASSIS MODEL 61.

As Used in RANGATIRA SETS.

When we say this entirely new chassis is in many ways the best our factory has ever produced you will realise it is something exceptional.

It is rather larger than usual mantel size, since compactness, carried too far, means skimping of parts and efficiency loss.

It is considerably heavier, too, simply because it has an oversize power pack—capable of working continuously 24 hours per day, and yet keep cool. Long life can be secured only this way.

A SCREENED GRID SET may have only one SCREENED GRID valve, but MODEL 61 has FOUR, including that latest improvement, the SCREENED GRID POWER DETECTOR.

TONE—RANGE—SELECTIVITY.

Each of these qualities, as would naturally be expected, are exhibited in MODEL 61 to an extent that will literally amaze you, even though you are accustomed to sets with eight or more valves. It is, of course, futile to build a GOOD set, unless it has these features.

Even in the heart of Auckland, IYA does not interfere at all with reception from other stations, a degree of selectivity that can be surpassed only by much more expensive sets. Similarly, extra long range is secured by the four screened grid valves, each operating at maximum efficiency, owing to the careful selection of components and precision construction. As already mentioned, the tone of the dynamic speaker is really wonderful.

There is no cross-modulation—that is interference from another station when tuned low.

You are welcome to test the performance for yourself—a trial will convince you.

Then do not forget other WELL-MAYDE FEATURES.

- (a) General suitability for New Zealand.
- (b) Prompt factory service always available.
- (c) A GUARANTEE that IS a guarantee.
- (d) Robust construction, to give years of service.

All these are built into the MODEL 61 CHASSIS.

W-M 61 CHASSIS, with valves and dynamic speaker £24

## WELL-MAYDE CABINETS.

Experience has shown us that only by manufacturing our own cabinets were we able to secure consistent high quality. Modern precision woodworking machines are installed, and only thoroughly experienced artisans are employed. Thus WELL-MAYDE CABINETS will pass the closest inspection with flying colours.

In the final process, latest SPRAY MACHINES give the cabinets a hard hand-rubbed satin finish, which is permanently retained.

JENSEN DYNAMIC SPEAKERS, acclaimed everywhere by musical experts as being the "MOST FAITHFUL," are supplied with Chasses 61 and 81.



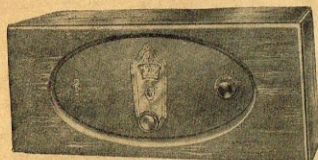
## ACE ELECTRIC—BEST VALUE FOR MONEY.

### W-M ACE, TABLE.

With Model 31 Chassis—See page 3.

The cabinet is very neat and highly polished. The speaker is separate, and the price includes either a horn or a cabinet speaker, the former usually giving better results on a small set.

Note our 1/- per week maintenance offer below.

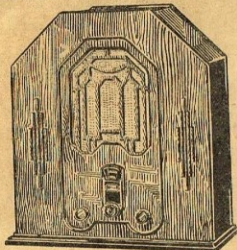


W-M ACE, Table Model, with speaker ... £14/10/-

### W-M ACE, MANTEL.

Chassis is again the MODEL 31, but a special magnetic speaker is included in the walnut mantel cabinet. You merely connect the set to aerial system and to the mains, and it operates without fuss or worry as long as you leave the switch turned on.

The tone is excellent, and we feel sure a trial will convince you that the ACE is the BEST RADIO VALUE.



W-M ACE, Mantel Model, complete ... £15/10/-  
Remember the wonderful ACE GUARANTEE.

### ONE SHILLING WEEKLY.

You cannot buy the ACE for this sum, BUT we will GUARANTEE, for 52/- per annum, paid in advance, to maintain your

### ACE TABLE OR MANTEL RADIO.

in first class working order. This sum to include new valves and all repairs, only provided such are rendered necessary by fair usage.

We believe this is the first time in the whole world that such an offer has been made—and we are prepared to make it year after year, because the ACE will NEVER wear out.

At 2d. per unit—far more than many pay for current in Auckland—the ACE costs only about 1d. for current for 10 to 15 hours' use.

YOU can now see WHY we claim ACE is the cheapest RADIO.

With ACE costing so little, either to buy or to run, you simply cannot afford to be without Radio.

WE WILL GIVE SIMILAR GUARANTEES with RANGATIRA and ARIKI, but not, of course, for 1/- per week.

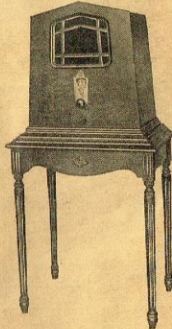
### W-M RANGATIRA, MANTEL.

(Rangatira—Maori Chief.)

The chassis used is MODEL 61, fully described on page 3, and including, of course, the selected DYNAMIC SPEAKER.

The WALNUT cabinet is highly polished, well proportioned, and of very pleasing appearance. The small TABLE is supplied where there is already no table or shelf for mantel set.

The RANGATIRA MANTEL will positively delight you, and it represents the very finest value Radio can possibly offer at this price.



Dynamic

Speaker—

Power

Detector

Four

Screen—

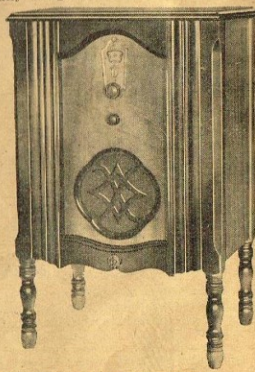
Grid

Valves

W-M RANGATIRA MANTEL (less table) ... £26/7/0  
Table as illustrated, extra 50/-.

### W-M RANGATIRA, CONSOLETTTE.

Similar construction to the Mantel, except that the Radio is fitted in a CONSOLETTTE CABINET, walnut, beautifully designed.



W-M RANGATIRA CONSOLETTTE ... £29/10/-  
FULLY GUARANTEED.

## EXPERT REPAIRS TO ALL SETS QUOTED FOR.

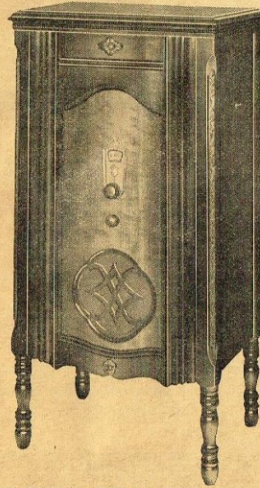
### W-M RANGATIRA COMBINATION

The COMBINATION, in addition to RADIO, affords the convenience of your own ELECTRIC GRAMOPHONE. The MODEL 61 chassis is, of course, used, and with it a high-class gramophone motor (electric) and PICK-UP.

Thus, you can always decide whether you will have broadcast entertainment or enjoy your own records.

The price sets a new record for a high quality, reliable combination RADIO-GRAMOPHONE.

For those who may wish to add the GRAMOPHONE SECTION later, the RADIO only will be supplied in cabinet as below. Motor and pick-up can then be added any time you wish.



W-M RANGATIRA COMBINATION ... £42/15/-  
W-M RANGATIRA COMBINATION, less motor and pick-up ... £31/15/-

### BRITISH OSRAM VALVES, A.C.

A satisfactory ENGLISH valve for use in the thousands of U.S.A. type RADIO SETS in New Zealand to-day has been long awaited, especially by those who prefer to BUY BRITISH where possible. We should perhaps say ENGLISH, as it is common knowledge that large quantities of apparatus produced by U.S.A. capital and actually to a great extent in U.S.A., comes to this country as CANADIAN, and therefore British. BRITISH is not necessarily ENGLISH, though undoubtedly this impression is generally meant to be conveyed.

England is easily the best customer for our primary products, on whose export the welfare of New Zealand depends absolutely. By buying OSRAM VALVES, you stimulate trade with England, to the ultimate advantage of every man and child in this country.

A N.Z. WELL-MAYDE RADIO and OSRAM VALVES make a very fine combination, in the purchase of which you assist both local and British trade.

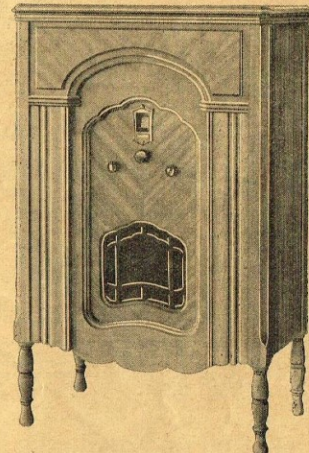
Osram valves are sold at standard prices (see page 56), and as distributors, we can give an excellent guarantee with OSRAM.

### W-M ARIKI CONSOLE.

Ariki—a Maori "Big Chief.")

In the ARIKI, our BAND PASS CHASSIS, Model 81, is installed in a very beautiful cabinet indeed. This is constructed as a combination cabinet, so that, if you now purchase your Radio, you can, just whenever you wish, have a motor and pick-up added. When this is done, you will have an extremely fine combination radio-gramophone.

We cannot really tell you much more about this wonderful Radio. It embodies the greatest experience and care, both in design and manufacture, and to prove that the best Radio CAN be built in New Zealand, you are welcome to a trial.



W-M ARIKI RADIO ... £52  
W-M ARIKI Radio-Gramo. Combination ... £65

### YOUR OWN RADIO CHOICE.

Although we always endeavour to offer a very complete range of RADIO of our own, we by no means confine our sales to these.

We can usually supply any make on the market, and it is possible, in fact probable, that you will get better service from us with any machine, simply because of the very excellent RADIO SERVICE DEPARTMENT maintained by our firm. Any defect will have prompt and experienced attention, and our long association with the trade ensures that we will be still in business when you want us.

### PHILIPS RADIO.

"PHILIPS" are made in Europe, and any type can be supplied.

Q.P. 3-valve electric, Baby Grand speaker ... £14 11 0  
RADIOPLAYER, Baby Grand speaker ... 24 0 0  
RADIOPLAYER, Victor Pan speaker ... 26 0 0  
RADIOPLAYER, Sevenette speaker ... 26 10 0

Radioplayers are four valve electric.  
PHILIPS CONSOLE, Dynamic speaker ... 59 10 0  
PHILIPS CONSOLE, Radio-gramophone ... 79 10 0  
PHILIPS CONSOLE "De Luxe" ... 89 5 0  
PHILIPS Portable Battery Set ... 32 10 0



## HAMMARLUND HI-Q ELECTRIC.

## THE ROLLS-ROYCE OF RADIO.

Hammarlund is to Radio what Rolls-Royce is to motor cars—a very superior apparatus, perfectly designed, perfectly engineered, and consequently, perfect in use.

Hammarlund pioneered the BAND PASS FILTER, which alone enables utmost selectivity to be obtained, WITHOUT SACRIFICING those superior tone qualities demanded of the high-grade Radio. So selective is the HI-Q, and also so sensitive, that the rital is turned, station AFTER station comes in with clarity, and without even the slightest trace of interference from one another. In other sets, the stations get mixed in most annoying manner.

Hammarlund supremacy does not stop at its marvelous range, its extraordinary selectivity, nor its superb tone. Every single item used in the construction is of the highest possible quality, and the possibility of any kind of breakdown is very remote indeed. These carefully selected parts are laboriously matched to suit one another. The coils, for instance, are fired one after another with the condenser with which they are eventually used, until they are matched with the utmost precision. This laborious work, if dispensed in each set being different, some few being perhaps good, but the majority very indifferent.

HAMMARLUND LABORATORY METHODS ensure that one HI-Q is as good as another—and both of them better than the rest.

If, therefore, you want the very best in RADIO, set as about HI-Q. We can supply the HI-Q as a chassis, or in a cabinet to your own special design, either as Radio alone, or as a Radio-Gramophone. The HI-Q, as just below, is fitted in a beautiful Walnut Combination Console Cabinet, similar to the ARKI. Thus, even if you purchase the RADIO, we can, at any price, supply it to a Radio-Gramophone for you, without the slightest difficulty.

**HAMMARLUND HI-Q, Radio, Console . . . £75**  
**HAMMARLUND HI-Q, Radio-Gramophone Console . . . £87**

**SPECIAL PRICES** will be quoted to any customer who places an order with us for a HI-Q or similar high-grade receiver, to be cabled direct to the factory. Delivery will be obtained in about ten weeks, and a substantial saving in cost effected. Thus, you can acquire the very best receiver at an extremely moderate price.

## ELECTRIC GRAMOPHONES.

These Electric Gramophones are more powerful than ordinary Radio combinations, and are used in the home, tea rooms, restaurants, dance halls, cabarets, hotels, skating rinks, etc.

Provision is made for attaching extra speakers, and also, if required, a microphone, converting the instrument into a Public Address System.

## WELL-MAYDE ALTONA.

A Loftin-White amplifier, fitted in a cabinet similar to the RANGATIRA combination (see page 5), powerful dynamic speaker, electric motor and B.T.H. pick-up. Full volume control. Very suitable for home use when tone quality is paramount.

**W-M ALTONA ELECTRIC GRAMOPHONE . . . £32**

## WELL-MAYDE "TRIUMPH."

A dual 250 Loftin-White amplifier fitted in cabinet similar to the ARKI combination (see page 5).

Best quality motor, pick-up and volume control. Concert large size dynamic speaker, with provision for operating four or five more if desired.

This is an extremely powerful machine of the finest tone—it is several times more powerful than the largest Radio-gramophone.

**W-M "TRIUMPH" ELECTRIC GRAMOPHONE . . . £65**

Automatic record changers fitted on either above machines. Approx. £25-£30 extra.

## HAMMARLUND-ROBERTS

(Well-Mayde).

The Hammarlund-Roberts (H-R) for short) four-valve battery Radio has a wonderful record to its credit. It has consistently, for five years, proved its superiority over other sets, even though the latter may have had two extra valves and have cost considerably more. This is no idle claim, for dealers and experts have been literally astonished by its tests, and freely admitted H-R superiority.

For five years the H-R has remained fundamentally unchanged, although each year those small refinements necessary to keep up with Radio progress, have been added. Other battery Radio circuits have been developed—the screened grid, for instance—but H-R is so excellent in EVERY FEATURE that counts for successful battery Radio that we believe that its superiority will be maintained for many years to come. In N.Z., where conditions are rather different from those existing in U.S.A. and Europe.

The following features, all possessed by the H-R, are essential for the successful battery Radio:

## 1—SIMPLICITY.

Battery sets are generally used where expert Radio mechanics are not easily available. The H-R is very simple indeed, and thus is very unlikely to give a moment's trouble. Operation is extremely simple.

## 2—DURABILITY.

While its simple construction naturally assists greatly in the long trouble free life of the H-R, the durability is still further augmented by the very careful choice of every part in its construction. Very rarely indeed is any repair or adjustment required.

That the H-R is held in very high esteem is amply proved by the fact that its construction is offered for sale, and when it is, it commands a higher price than any other battery set.

## 3—RANGE.

The H-R is regenerative, neutralised, and so combines exceptionally long range, with freedom from interference. It has full Government approval.

Some customers desire a set to receive a broad cast stations, including many in U.S.A., on their H-R—please note, no short wave stations are included.

Under normal conditions, the H-R readily gives you full speaker reception of the main New Zealand and Australian stations, with utmost clarity.

Except when within about 20 miles of a powerful broadcasting station, the selectivity of the H-R is excellent, and a simple device enables it to be increased still more.

We cannot too strongly recommend the H-R for country users.

## RADIO ECONOMY.

The successful DRY (OR AIR CELL) BATTERY RADIO must be absolutely efficient, in order that the results can be obtained from an absolute minimum of current. Even the slightest inefficiency means a continual wastage of expensive batteries and valves.

Although the H-R may cost a little more originally, we have known hundreds of instances where its running cost has been £4 or £5 per year LESS than on other sets. When you consider the extra cost of these sets over four years, you immediately realise how much it is to your advantage to invest in the H-R.

## BATTERIES FOR THE H-R.

Although the "A" battery for the H-R may be an accumulator, or a dry battery, the invention of the new AIR CELL makes the latter especially suited for the H-R. The AIR CELL is merely filled with water (any water will do), and will then last the H-R, equipped with the new valves, for nearly two years of ordinary use. No further attention is required by the battery, except perhaps the addition of a little water occasionally.

Hitherto, it has not been possible to get any "A" battery, either accumulator or dry, which would not need re-charging or replacing every few weeks. The first cost of the AIR CELL is naturally fairly high, but eventually it proves much cheaper than any other form of battery.

These batteries on the H-R also have a very long life, so the Radio may be expected to operate for months on end without any attention whatever, where the Air Cell is used.

## H-R CONQUEROR (Well-Mayde).

This inexpensive, high efficiency battery Radio has always proved to be our best seller in country districts, and not without excellent reason.

With only four valves, it has a range that many of your city cousins would envy with their costly electric sets, coupled with tone quality and a freedom from "noises" that is most pleasing. Each extra valve in a set increases renewal costs for both valves and batteries, so that the H-R is a "minimum maintenance" Radio, particularly when used with our SELECTED ACCESSORIES.



If your present battery set is unsatisfactory—if its upkeep is prohibitive—if it continually gives trouble—try the H-R. You will appreciate the wonderful difference in your enjoyment of Radio.

Three alternatives are given in accessories. The cheapest is (a), the most convenient is (b), and the most powerful (c).

## ACCESSORIES (A) (Set should have a meter).

Aerial A128, two 60 amp. batteries, Two Columbia 45 volt "B" batteries, Columbia "C" battery, Nand K Junior speaker, four 230 volt valves. Value £8 8s or if taken with set or kit set £7/10/-

ACCESSORIES (B) (Motor advised, but not essential).

As above, but with AIR CELL, instead of No. 6 batteries. Value, £12/1/6, or with set or kit set, £11.

## ACCESSORIES (C)

As A, but with 6 volt 30 amp. accumulator, and 221 valves. Value, £9/10/-, or with set or kit set, £9.

	Less	With
	Accessories	Accessories
W-M CONQUEROR, Air Cell model	£12	£23 (B)
W-M CONQUEROR, Accumulator	£12	£21 (C)
W-M CONQUEROR, Dry Battery	£12	£19/10 (A)

Motor, 15/- extra on all models.

## H-R ELITE (Well-Mayde)

The Elite is exactly the same as the CONQUEROR, except that it contains a much improved amplifier system, and this, together with a special power valve and extra batteries, considerably improves the tone, and enables you to use more volume. By using a gramophone motor and pick-up with it, it makes an excellent Radio-Gramophone. See next page ARKI and Conqueror.

It costs little more to run than the Conqueror.

## ACCESSORIES (D)

Aerial A128, three Columbia "A" battery, three Columbia Layerbilt batteries, Columbia "C" battery, Radiola speaker, three 230 and one 231 power valves. Value, £17/8/-, or if taken with set or kit set, £16

## ACCESSORIES (E)

As (D), but with 6 volt 80 amp. Young accumulator, three 221 and one 112 power valves. Value, £18/0/6, or if taken with set or kit set £16

	Less	With
	Accessories	Accessories
W-M ELITE	£14/4/10	£20
W-M ELITE, Radio-Gramophone	£32/10	£48

NOTE.—If you have your own electric light, or even an engine, give us full details, and we will gladly quote you for special apparatus to reduce your running costs. Any H-R Radio, for instance, can be readily built to work direct from 22-volt accumulator lighting system, thus eliminating a separate "A" battery entirely.

## H-R SUPERB (Well-Mayde).

A five-valve Hammarlund-Roberts, with powerful amplifier, employing push pull as in the largest electric sets. The tone is very fine indeed; in fact, it can scarcely be improved upon in a battery set suitable for home use. We advise an accumulator with it, but it could be supplied at same price with the AIR CELL. It will prove far more economical than many other sets now being used, and give much better results as well.

## ACCESSORIES (F).

Aerial A128, 6 volt 80 amp. Young accumulator, three Columbia Layerbilt batteries, Columbia "C" battery, inductor dynamic speaker in cabinet, three 221 and two 112 valves. Value, £23/2/6, or if taken with set or kit set £21

	Less	With
	Accessories	Accessories
W-M SUPERB	£18/10	£37/10
W-M SUPERB Radio-Gramophone	£32/10	£54

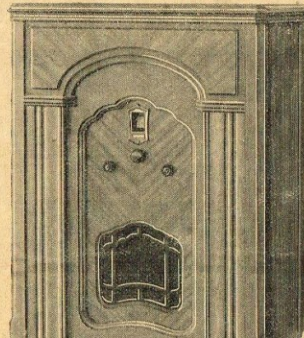
## H-R RADIO-GRAMOPHONES

When you have a GOOD Radio in the house, you should certainly make use of it in a gramophone, instead of using the old style gramophone. Any of the H-R sets may be thus used, since pick-up terminals can be fitted, so that the only extras required are a pick-up like the B.T.H., and if you have no gramophone already, a motor.

We will be glad to supply complete H-R Radio-Gramophones in the large CONSOLE CABINET, just as we use on our best electric sets. All batteries, etc., are self-contained, and the very best inductor dynamic speaker is fitted.

This instrument will then be a very fine acquisition to any home, since you may play your own records, or listen to broadcasting concerts from any of a large number of stations, just as you please.

Full details have already been given under the ELITE and SUPERB SETS.



**W-M ELITE RADIO-GRAMOPHONE, complete . . . £48**

**W-M SUPERB RADIO-GRAMOPHONE, complete . . . £54**

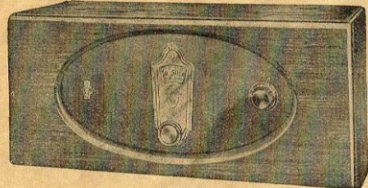


## W-M ACE BATTERY.

Still keeping in view the necessity for a cheap, but trouble free Radio, we have this year re-designed the ACE, bringing about a further reduction in price, but in no wise sacrificing reliability or efficiency.

The ACE is NOT as cheap as a set can be, but it is as cheap as a GOOD set can be. Similarly, accessories are practically the same as we use with the H-R, simply because experience has shown only too clearly that cheap sets and accessories literally "eat their heads" off, and are very expensive to run.

The appearance of the ACE is greatly enhanced by the new cabinet, which is beautifully designed, and handsomely polished.



## ACCESSORIES.

Aerial A133, two No. 6 Columbia batteries, two 45-volt Columbia "B" batteries, Columbia "C" battery, three 230 valves, N and K speaker. Value, £7/6, or if taken with set or kitset.

	Less Accessories	With Accessories
W-M ACE	£7	£13/10/-

NOTE the quality of the valves, batteries, etc.

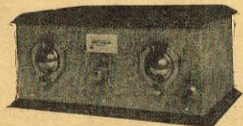
## W-M "WORLD" SCREENED GRID.

## ALL-WAVE, FOUR VALVE.

The interest in SHORT WAVE reception increases year by year, and the receiver which will receive SHORT WAVE STATIONS as well as ordinary broadcasting will appeal very strongly to large numbers of enthusiasts.

The "WORLD" "ALL-WAVE" is a SHORT WAVE or BROADCASTING SET at will—merely by changing two coils, the work of a moment.

Delighted customers have received on the speaker dozens of SHORT WAVE STATIONS from all parts of the world, hence its name "WORLD." On ordinary broadcasting, Australian stations come in with greatest clarity and ample volume.



For selected accessories, see page 13.

W-M "WORLD" SCREENED GRID, less accessories	£10 10 0
W-M "WORLD" SCREENED GRID, with accessories	£19 0 0

If supplied with AIR CELL, 12/12/6 extra.

## PORTABLE RADIO.

## COMFORT.

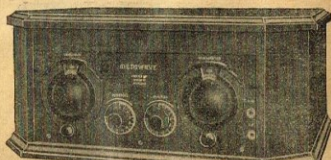
A screened grid portable Radio, British made, all contained in a neat carrying case, complete with batteries, valves, and aerial system. PRICE, £21. Further details on application.

## MENIWADE SETS and ADAPTORS.

The components used in the Meniwa are of very high quality throughout, as it is comparatively useless expecting world-wide results with cheap apparatus.

There seems to be an impression existing that Short Wave Sets can be operated only by a Radio expert. This is entirely incorrect—the expert is merely more than usually careful in tuning, and you must be careful too, if you wish results. That is all.

The Meniwa can be supplied EITHER as a special Short Wave set only, range 15-100 metres approx. OR as a combined Short Wave and Broadcasting Set, range 23-600 metres approx. Only best accessories supplied.



W-M MENIWADE	£10/10/-	Less accessories With accessories £19
W-M ADAPTOR, for working in conjunction with your present set, £3.		

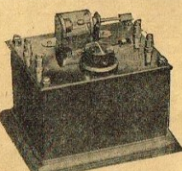
## CRYSTAL SETS.

Crystal sets will always be popular, because they are cheap and the quality of reception is so perfect.

The ordinary crystal set has a range of about 10 to 20 miles from a station like Auckland, but considerably more from Wellington.

Fixed detectors like the Red Diamond give good results at very short ranges, but HERTZITE is better for longer distances, owing to greater sensitivity.

The accessories required for a crystal set include merely an aerial outfit A133 (A137 would do), and one or more pairs of telephones, say, N and K.



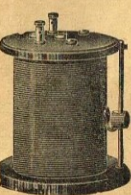
## W-M CRYSTAL SET.

A Well-Mayde product. Metal case, with Formica top panel, and Formica tuning knob.

Can be fitted with either a Hertzite detector, or a Red Diamond permanent detector, at the same price.

WELL-MAYDE CRYSTAL SET	£17 6
Complete with aerial and N and K phones	£47 6

## KNOCK-OUT CRYSTAL SET.



Very cheap, but made for continual use. Specially enclosed crystal detector, instantly detachable, and beautifully made and plated.

Knock-out crystal set, with detector	£12 6
Complete with aerial and "Knock-out" phones	£22 6

## LOFTIN-WHITE AMPLIFIERS.

Some little time ago, a special demonstration was held in U.S.A., and by means of very powerful amplifiers and a huge thronged speaker, carried by a plane, the human voice was made to cover an area 10 miles across!

AMPLIFIERS may be made to-day to give the increase demanded for practically any purpose. The talkies, of course, have been responsible for much of this development, and particularly for the clarity obtained by modern systems.

To-day, the LOFTIN-WHITE system will be found to possess overwhelming advantages for most amplifier purposes. Not only is it very simple and inexpensive in consequence, but it is less liable to get out of order, and accomplishes a given increase in volume with the fewest valves. In upmost cost, therefore, it is unique, since it involves smaller replacements of both apparatus and valves.

But this does not complete its virtues—it amplifies FAITHFULLY over the whole musical scale. Where other systems lose both or either upper or lower notes, Loftin-White reproduces them all.

It is true it has some disadvantages, perhaps the greatest being that, though it is so nearly perfect as a straight out amplifier, it is not altogether suitable for incorporating "under the tone" effects, and in a manner which immediately causes much of its advantage to be lost.

But, since it is to be regarded as an amplifier only, its comparative failure in this respect can be easily ignored. It might be mentioned, however, that older types of Electric Radio sets, with poor amplifiers, can be brought up to date by installing the Loftin-White, more easily than by any other plan.

Very high voltages are employed in Loftin-White, so careful workmanship is essential in the construction, pack, and in the correct selection of most of the parts.

All our L-W amplifiers are built on steel chassis, and are very well finished.

For kitsets—See Kitset Section.

## WELL-MAYDE LOFTIN-WHITES.

Our factory has designed a complete range of LOFTIN-WHITE AMPLIFIERS, and is ready at any time to add to this range, as it is essential to meet any requirements. Normally, a 224 A.C. screened grid valve is used, followed by one or two 245 or 250 valves, while the 224 A.C. is followed by the 224 is followed by a 50 watt transmitting valve has been supplied by us to special order.

## W-M LOFTIN-WHITE SINGLE 245.

The smallest A.C. L-W we make, using one 224, one 245, and one 280 rectifier valve. Very small, compact, and thoroughly shielded.

Transformer designed to supply filament and "B" current for four extra 224 or 227 valves.

It possesses the wonderful clarity and faithful reproduction already referred to as a characteristic of all Loftin-Whites. It is capable of power sufficient for a small dance hall, so will not fail to meet this requirement in any home.

It is fitted with field supply terminals for Jensen dynamic speaker. It can be used with cone or inductor speakers, but for these a speaker filter or transformer must be added.

Valves are included in the price, and in order to operate it as an electric gramophone, only a pick-up and motor are required—See under "Kits."

A235 W-M L-W single 245 amplifier	£12 10 0
A237 Jensen concert dynamic with amplifier	£7 12 6

The Jensen is fitted with Westinghouse 712 C.

## W-M LOFTIN-WHITE DUAL 245.

Constructed on similar lines to the single 245, but far more powerful. Uses one 224, two 245 and one 280 rectifier valve. Field supply for Jensen Concert dynamic fitter as above. Valves included.

A238 W-M L-W 245 amplifier	£18 0 0
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## W-M LOFTIN-WHITE DUAL 250.

We do not recommend a single 250—it has only the same power as the dual 245 and costs more. The dual 250, however, is far and away more powerful. In fact, we can thoroughly recommend it for talkie theatres up to about 800 seats, large dance halls and clubs, hotels, public address systems, etc. Valves: One 224, two 250 and two 281. Speakers recommended are Jensen Concert, Jensen Auditorium, or, best of all, Magneto Exponential with Mace dynamic unit. A235 W-M L-W dual 250, less valves

A240 W-M L-W dual 250, with valves	£27 0 0
Valves only	£40 0 0
	£13 19 6

## LOFTIN-WHITE FOR TALKIES (double channel).

Although the Loftin-White Dual 250 is already described, it is frequently used for talkies. It is customary to install rather differently in the better installations. The general construction, output, etc. is exactly the same, but motors are fitted to give instant indication of any defect.

Two amplifiers, too, are frequently fitted side by side, connected by switches, so that if trouble does occur the other amplifier can be immediately brought into action. This is called a double channel system.

Such double channel systems are constructed to special order, the cost being £85 to £90 as a general rule. IF YOU WANT STILL MORE POWER, WE CAN BUILD A L-W FOR YOU, AT A VERY LOW PRICE.

## L-W BATTERY AMPLIFIER.

The tone qualities are really excellent, especially as regards the upper notes, and are usually missed by other amplifiers. The volume is quite good, but it lacks a first class electric gramophone for home use. Where a record is not available, the tone is not so good.

A241 L-W battery amplifier	£8 10 0
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Accessories: Six 45 volt "B" batteries, two 2 volt accumulators, two valves, inductor speaker (£22 11s. 6d.). Special price, £30.

## POWER D.C. AMPLIFIERS.

Where A.C. is not available from power mains for amplifiers it can be generated by a ROTARY CONVERTER, which is driven from a large accumulator, or from a dynamo. A LOFTIN-WHITE AMPLIFIER can then be used.

In other cases, however, a DIRECT CURRENT AMPLIFIER is used, and its "B" supply obtained in one of the following ways—

## 1.—D.C. MAINS, 230 VOLT.

A special power pack is used, and a powerful amplifier can be supplied. It is suitable for dance halls, talkies, etc.

## 2.—MAGNETO "B" SUPPLY.

This is driven by an accumulator, 12 or 32 volt. For a truly portable unit, that is to say, irrespective of any power mains, we regard it as easily the best system. Magneto type "B" is usual, but type "F" operates a very large amplifier.

## 3.—ACCUMULATOR "B."

About 250 or 300 volt "B" accumulator is used, charged up afterwards by a suitable plant. A very satisfactory outfit, and unlikely to give any trouble, though rather bulky.

## 4.—DRY "B" BATTERIES.

While these CAN be used for power amplifiers, they cannot be recommended, unless the circumstances are VERY EXCEPTIONAL. They simply will not stand the heavy strain.

## D.C. AMPLIFIER.

Three stages, the last being push-pull. Only first-class material is used throughout, and the valves are specially chosen. The amplifier is mounted in a cabinet, but is meant to be incorporated in a cabinet, includes valves, and associated apparatus. Price includes valves, and associated apparatus. Price includes valves, and associated apparatus.

A246 D.C. amplifier	£15 0 0
A247 D.C. amplifier, with power pack for 230 D.C. mains	£25 0 0

To complete a Public Address System, the following are required for A246—Two six-volt accumulators, magneto type "B", battery, Jensen dynamic or exponential speaker, pick-up, gramophone, microphone and its battery and transformer.



## "HULLO" PUBLIC ADDRESS SYSTEMS.

(See also Under Kits.)

Public functions to-day, especially where large numbers of people are involved, are scarcely complete without a PUBLIC ADDRESS SYSTEM. Not only can the whole of the announcing or calling of competitors, declaration of winners, and any other information be given to the audience, even when scattered over large areas, but music can also be provided with a minimum of expense and maximum of convenience.

The ideal type of Public Address System, generally speaking, must be easily portable, easily connected up and operated, simple and reliable, cheap to run, and, of course, both **POWERFUL** and **CLEAR**.

The systems described here can be transported in an ordinary car, and cover all likely requirements, and if there are special circumstances, we will be only too glad to quote specially.

### MICROPHONES.

Where these are used they must not be in a position where they can be affected by the loud speakers. Otherwise, of course, they will merely cause intense howling, unless very special precautions are taken. Outdoors, a sedan chair can be conveniently used for the mike. None of this trouble is experienced when playing records.

### INDOOR SPEAKERS.

Exponential horns may also be used indoors with very fine results, although they are usually bulky. Jensen dynamic speakers will prove extremely satisfactory.

More than one can be used, in selected positions, thus giving even reproduction through the building.

### OUTDOOR SPEAKERS.

Exponential horns are the best for general outdoor work—they reproduce speech with greater clarity, and are excellent for music. Further, they will throw the sound in any given direction, and so cover a greater area than other speakers.

The ideal type of Public Address System, generally speaking, must be easily portable, easily connected up and operated, simple and reliable, cheap to run, and, of course, both **POWERFUL** and **CLEAR**.

## "HULLO" P/A SYSTEM No. 1—For A.C. Mains.

Consists of:

1 Cabinet (with handles), fitted with LOFTIN-WHITE DUAL 250 AMPLIFIER, valves, pick-up, electric gramophone motor, microphone, microphone transformer and connections for speaker.

2 Jensen Dynamic Concert speaker in strong cabinet, with 20 feet connection.

An accumulator, costing £3 3s. upwards, or a rectifier unit is required extra.

A242 "Hullo" P/A System No. 1 . . . . . £77 10 0

## "HULLO" P/A SYSTEM No. 2.

Exactly as No. 1, but with one 49-inch aluminium horn and Universal unit. No accumulator required.

A243 "Hullo" P/A System No. 2 . . . . . £90 0 0

## DEAF APPARATUS.

This can be made to order. Radio valves will amplify speech, etc. to any extent required, and so overcome even very obstinate cases of deafness.

## "HULLO" P/A SYSTEM No. 3—For D.C.

Consists of:

1 Cabinet (with handles), fitted with magneto "E" machine, D.C. amplifier to match, "C" battery, pick-up, gramophone motor. (Microphone and transformer, if desired, extra.)

2 Two separate six volt car type accumulators.

3 Jensen dynamic speaker in strong cabinet. This outfit suits admirably for country dance halls, where no electric supply is available. It will prove a money maker for its owner.

A244 "Hullo" P/A System No. 3 . . . . . £84 0 0

A245 "Hullo" P/A System No. 4 . . . . . £98 0 0

No. 4 is same as No. 3, but a 49-inch aluminium speaker replaces the Jensen. Recommended for outdoor work.

## TALKIE INSTALLATIONS.

In many of the smaller centres, the installation of a high-priced TALKIE PLANT is out of the question, on the score of the heavy expense involved.

Our firm has for some time been manufacturing amplifiers suitable for talkies, and also supplying the necessary speakers, faders, etc.

We have decided to manufacture, also, the sound head, so that in future we will be able to supply complete equipment to convert your silent machine to SOUND-ON-FILM.

It is, of course, most convenient and expensive. TALKIES from the 250 volt A.C. power mains, and in places where this is not available it is possible to supply plants worked by batteries. These are quite satisfactory and yet not too expensive.

Unfortunately, at the present moment, we are not in a position to give full quotations, though amplifiers, speakers, etc., are, of course, fully described in this list. We are endeavouring, however, to keep inside the £200 mark as far as possible.

### Macy Exponential Speaker.

In designing an inexpensive machine, it is not our intention to sacrifice durability and reliability, and will not sacrifice our good reputation in any item we sell.

In addition, we will always be ready to supply any part of the equipment to those who wish to build their own.

## BROADCASTING STATIONS.

We have already constructed our own station, 121, and Messrs. Lewis Radys 121, first on low power and later on much higher power.

There is no need here to comment on results—in this case every listener can very readily form his own conclusions.

Business firms, especially in the smaller centres, where there are now no broadcasting stations, should consider the installation of broadcasting plants as a means to furthering their position in their own district. Nothing else offers quite the same opportunity of doing this.

We can supply a small 10 watt station at a very low price, but for consistent results, 50 watts is necessary, and a complete station of this power would cost considerably less than £200.

We can also quote for larger stations of 250 watts or more. Owing to our manufacturing facilities, most of the apparatus is constructed in our own factory, enabling very prompt service to be always available.

## ELECTRO-MEDICAL APPARATUS.

INQUIRIES are invited from the medical profession for the above.

Our kind apparatus is so well equipped for manufacturing kindred apparatus that we can frequently quote for special machines of all kinds.

## KITSETS.

The faculty implanted in every boy to "make something," or to improve something already made, has been directly responsible for the enormous strides in scientific and mechanical inventions. The progress made in the last century is simply amazing, and to-day its rate is fully maintained.

Your boy may some day emulate Edison, James Watt or Marconi, all of whom started life far worse equipped for fame than most of the school boys of our time. They made good—and others will make good. The inventive genius displayed by so many boys should be encouraged in every way along practical lines. Not only will it keep a boy from mischief and bad company, but it will train him so that when the time comes to leave school he will be better able to secure employment. His self-training will have developed his mind, even though he may not actually become an engineer.

In any case, we are so surrounded by machines and electrical apparatus that scientific and experimental work are very desirable for every man. How frequently is a simple defect in a motor car, for instance, remedied in five minutes by a man with some amateur experience, when his less fortunate friend has to hold up hours, while he sends to the nearest garage for a mechanic, at great expense, considering the actual job.

## RADIO CIRCUITS.

No less than 99 per cent. of Radio sets marketed to-day employ one of four or five circuits, which time and experience have proved definitely to be more suitable than all others.

The countless different radio circuits described weekly in different Radio Journals, are, with very rare exceptions, all but failures. The circuit, differing mainly in design, and in some fancy touch which is merely a whim of the designer.

If in an English magazine, it is nearly certain that the circuit will be illegal in New Zealand, and if it were not, it may possibly be entirely unsuitable for the conditions of this country. It is, in fact, a fact that some articles describe sets which are hopeless in actual practice.

We lay no claim at all to any originality in any of the circuits used in our own sets or kits. We have merely taken those standard circuits which have proved their worth, and rather spent our time in making them efficient as possible by careful attention to details such as accurate matching of parts. When a new idea comes along which is worth adopting, it is adopted without further fuss. You have no ways up to date, without waste of money, time or effort.

We simply cannot sell kits which are not thoroughly good. We always make an open offer to build up our kits, should our customers fall short of anything. We make the same results as with the corresponding complete set which we sell. No unfulfilled promises, no speculation as to results, no worry that the design may not be correct! Our kits are not offered for sale UNTIL they are proved.

Radio provides one of the very best hobbies for a boy. He makes something that is very useful, and in the process obtains the education that would hardly be possible otherwise.

### SIMPLICITY.

ANYONE WHO CAN READ AND WHO HAS EVEN THE SLIGHTEST KNOWLEDGE OF ELECTRICITY CAN BUILD OUR KITSETS WITH PERFECT SUCCESS. We make a kit for every successful type of set which is within the scope of an amateur. If you are interested in a type not listed, you are welcome to ask us about it—you may save yourself much time and expense by so doing.

## CHOICE OF CIRCUIT.

The choice depends largely on price, which, of course, must be determined by the consumer. The following are the circuits:

1. REGENERATIVE (Ace and Menwave).
2. REGENERATIVE neutralised (Racetrack and Racetrack).
3. SCREENED GRID (World S.G.).
4. AMPLIFIERS (Loftin White).
5. SPECIAL KITS.

## HAMMARLUND-ROBERTS

### KITSETS.

For further details, see also description of the H-R RADIOS in the earlier pages of this list. Your own built set should give absolutely equal results and no previous Radio knowledge is necessary.

Soldering makes the most reliable job, but if you wish to avoid soldering, we can furnish all parts with terminals, etc., for a slight extra charge.

There is no need here to repeat the advantages of the H-R—they are already fully described earlier in the catalogue. But we would emphasise here that the H-R is very easy to build and operate, and therefore peculiarly suited for amateurs.

All parts of this kitset are correctly matched, while the design has been most carefully and accurately worked out, to ensure the best. No one need hesitate about building his own instructions are so ordinary simple and easy to follow. Every screw, every wire, every lug, is carefully and accurately referred to in a manner which makes mistakes impossible, even though you may know nothing at all of electricity or Radio.

Build it—and compare it with any other set you may ever see, of what kind or price. You will be delighted with the result.

YOU WILL NEVER REGRET PURCHASING A HAMMARLUND-ROBERTS.

## H-R COMPONENTS.

- 2 Condensers and coils.
- 1 Set H-R coils, with knob
- 1 Neutralising condenser.
- 1 Panel, drilled and engraved.
- 4 Valve holders.
- 1 Rheostat.
- 1 Switch.
- 1 Grid leak and condenser.
- 1 Bypass condenser.
- 15 100 ohm terminals, engraved.
- 1 Resistor and mount (Senior only)
- 1 Baseboard.
- 2 Transformers.
- 1 Battery cable.

Instructions and diagrams. Lugs, screws, tinned wire, etc.

### METER.

We can now supply a double reading small meter, with two pushes for reading both "A" and "B" batteries. This meter is strongly adapted for use with the H-R. Although not necessary for accumulation, the Air Coil sets, will be found very convenient with them.

### W-M H-R SENIOR.

This Well-Made H-R kit has extra quality components throughout, including Hi-Fix transformers. It meets the requirements of those amateurs who prefer to build the best while they are about it, and who take greatest pride in their work. H-R Level 5, 5-Valve Kit. Meter and pushes, extra . . . £18 16 0

### W-M H-R CONQUEROR.

This kit is very similar to the Conqueror, but, being of a more substantial construction, but several cheaper components are used. The result is not, of course, quite so good as with the Senior, but, nevertheless, you need not have the slightest fear that the Conqueror Kit will not render satisfaction—you have our assurance that it will certainly do so. No satisfactory results without the H-R Conqueror, 4-valve . . . £5 18 6 Meter and pushes, extra . . . 15 0

No need to build without Radio at this price.

### W-M H-R SUPERB.

There are many customers who can charge accumulators very readily from a private dynamo. In such cases we recommend the use of an "A" accumulator with every H-R set.

Particularly, however, where more than one volume is required, must an accumulator be used, together with power valves, dynamic speaker, and a set like the SUPERB.

The SUPERB KIT is a five valve, with best push pull transformers, which give much greater volume with perfect clarity to be obtained. But it must be remembered that such a set will cost two or three times as much as the result—batteries, valves and speaker must all be matched up, each to do its share. The result is a set that spoils the whole chain, and in power Radio, the chain embodies the above. H-R Superb, 5-Valve kit . . . £10 10 0 Meter and pushes, extra . . . 15 0

### H-R ACCESSORIES (all models).

Special prices as for complete sets.

ON DRY BATTERY SETS, FIT A METER. It saves trouble in the long run.







## OUR KITSETS ARE EASILY BUILT AND VERY EFFICIENT

### TRANSMITTER PARTS.

The range of these transmitters will vary with circumstances, even with a 20A valve and 90 volts B. Many have worked Australia on similar outfits.

The following parts will suit either for a 5 or a 10 watt valve. A power supply is also required, and alternatives for this are given separately.

1 5 watt valve	1 7 6
1 Valve socket	1 6
1 Rheostat	1 6
2 "Wide-Space" condensers, with dials	1 10 0
2 Helices, silver plated wire, assembled complete	1 15 0
2 Ebonite tubes, to mount helices and 4 screws	3 0
2 Pewee clips	4 0
1 Mica condenser .00025	2 0
1 Mica condenser .001	2 0
1 Formica panel, 3/16 (engraving extra if required)	11 0
1 Baseboard	2 0
10 Belling Lee terminals and terminal strip	7 6
1 10,000 resistor	5 0
1 R.F. choke	5 0
1 Telegraph key, heavy brass case holder, with bulbs	1 4 0
2 Miniature fuse holders with bulbs	4 0
2 Switches	5 0
1 Milliammeter (optional)	12 0
1 Tinned wire, spaghetti, lugs, etc., free.	£9 5 0

For telephony (with, of course, much restricted range) a microphone and extra helix leads will be required, costing from 20s. extra, according to quality of microphone.

## USED SETS, APPARATUS, MOTORS, TOOLS, ETC.

We generally have on hand an assortment of the above, which have been traded in by owners from his purchase, shop sold, etc.

Send us your enquiry and GET OUR BARGAIN PRICES. We believe in giving our customers a square deal on used goods, so our reputation for value is established.

The following are a few of our bargains—send for our complete and latest "USED" List.

### ELECTRIC SETS.

All guaranteed in good working order.

**HAMMARLUND H-Q, 8 Valve.**  
Cost £55, in perfectly good order, very slightly shop soiled. A "Rolls Royce" at a very low price. £59

**ZENITH, 8 Valve.**  
Returned from hire purchase. Automatic tuning, cost £73. Slightly soiled and guaranteed. A high quality Radio. £48 10 0

As above, but altered to RADIO GRAMOPHONE. A specially nice performer. Worth £60

**MONARCH, 8 Valve.**  
Also returned. Complete in console cabinet. Cost £50. A high quality Radio. £48 10 0

**MONARCH CHASSIS**, with Jensen speaker and valves. Cost £37 10s. £22 15 0

**REMLER, 6 Valve.**  
Small console, dynamic speaker; new. Cost £35. £22 10 0

**ACE 3 ELECTRIC.**  
Our own make, returned from hire purchase. Same guarantee as with new set. Only £12

The above outfit would also suit a 10 watt valve, costing £28, instead of 27s. 6d. Of course, for the 10 watt valve, extra power would be required.

### POWER SUPPLY—5 Watt.

For those unable to work from the power mains, batteries will prove very convenient for the five watt outfit. The following would be required:

4-7 Layerbills, 45v., each	£1 12 0
1 10 watt accumulator, 30 amp.	1 16 0
On this outfit, no extra batteries are required for telephony.	
If other sources of current supply are available, no doubt the 10 watt transmitting valve will be used.	

### POWER SUPPLY—10 Watt.

Those who have A.C. current supply will probably prefer to use the 10 watt valve in which case the power equipment is:

1 Transformer with secondary ratio to give 10 watt transmitter and modulator valves, etc.	
Details as follows:	
High voltage 500-0-500, 50 mva., low voltage 250-0-250, 2 amp.	
280 valve, low voltage 3.75-0-3.75, 5 amps.	
For use with modulator valves	£3 15 0
2 Chokes I.L.T.	3 0 0
1 Condenser, Hydra, 1000 test 2 m.f.	8 6
2 Condensers, Hydra, 1000 test 4 m.f.	1 10 0
2 .001 condensers	3 0 0
1 UX289 valve and holder	18 0

When this outfit is used for telephony as well as Morse, the Heising system of modulation is much better than that already suggested for the battery supply. Extras for telephony with Heising system are:

1 10 watt valve with socket	2 6 6
1 Transformer, input	1 5 0
1 615 valve and socket	15 0
1 Rheostat	1 6
1 Speech choke	1 10 0
1 Microphone transformer	1 15 0
1 4-7 volt battery	2 6 6
1 Microphone battery switch	
1 Microphone, piece according to quality.	

If A.C. is not available, but six-volt accumulators can be readily charged, then the magneto "B" will prove the most successful method of obtaining high tension current. Cost as follows:

2 6-volt accumulators	£9 10 0
Magneto "B" type F (600 volt 100 mva.)	16 0 0
Or Type F (1000 volt 100 mva.)	22 10 0
For phone, this would be necessary on above magneto supplies—See page 20.	

### AERIAL EQUIPMENT.

Aerial and counterpoise are necessary for transmitting, material as follows:

150ft. 14g. enam. aerial wire	7 6
4 Pyrex insulators	7 0
2 12 x 3/16 in. lead-in tubes	19 0 0

**SPECIAL TERMS TO AMATEUR TRANSMITTERS**—Write for details.

## BATTERY SETS.

**ALTONA GRAND, 5 Valve.**

Highest quality, good for 20 years yet. With accessories—everything guaranteed. £15 10 0

**HAMMARLUND-ROBERTS, 4 Valve.**

Also highest quality, never wear out. Complete with accessories, every-thing guaranteed. £13 10 0

**SILVER-SIMPLEX, 5 Valve.**

Lowest price, complete £8 10 0

**GREBE, 5 Valve.**

Lowest price, complete £8 10 0

**REMLER-TULLY, 5 Valve.**

Lowest price, complete £8 10 0

**PRIZE SETS.**

Two sets, used to cost over £30, less accessories. They contain good parts, and the very finest cabinets. The prices are reduced from £2 10s. to £5, according to condition of cabinet. Buy one, and then build your own set from our parts.

## AMPLIFIERS—A.C.

**PAM, 3 Stage, Dual 250.**

Very powerful, three-stage amplifier, complete with rotary converter, for use on D.C. in Auckland City. Suitable for cabarets, dance halls, etc. Valves included. Cost over £30.

**VIM, Two-stage, Dual 245.**

A powerful amplifier, for small dance halls, guaranteed. £12 10 0

**WEBSTER, Two-stage, Dual 171.**

Another good amplifier, would make a first-class electric gramophone. Cost with valves over £24.

**SPRINGS.**

All kinds, all prices, including dynamos. From 15s. to £1 upwards.

**MOTORS.**

4 inch English screw, cutting, 3ft. between centres, 24 change wheels, 8 inch 4 jaw independent chuck, treadle, overhead gear. £24

**MOTORS, 415 Volt, Three Phase, New 1 h.p. 15; 1 h.p. 15 10s; 2 h.p. 16 10s.**

**MOTORS, 230 Volt, D.C., 1/6 h.p. 10; 1/6 h.p. 10 0 0**

## ACCUMULATORS.

All our ACCUMULATOR PARTS are in ACTUAL AMPS. Thus our 20 amp. size is equivalent to 40 amps. (ignition rating) in many tests.

### ACCUMULATOR HINTS.

1. Do not exceed maker's charging rates. Many garages are not equipped for charging smaller Radio batteries, and if charged with car batteries, they will be quickly ruined.

2. Never leave an accumulator if run down—get it charged immediately.

3. Never run an accumulator tight out.

4. Keep terminals, especially the positive, cleaned and greased.

5. Add acid only when some is split. Otherwise only distilled water is added to compensate for evaporation.

6. A hydrometer will show how fully charged an accumulator is. Get used to the readings of your hydrometer and accumulator. Even though your accumulator is fully charged, it may not show quite the correct hydrometer reading, it may be quite all right.

7. The simplest test in charging is to observe when bubbles are freely given off. Normally, when this occurs, the accumulator will be nearly charged.

8. Remove stoppers when charging.

9. Keep naked lights at least six feet away from accumulators during charging.

10. Never short circuit or spark an accumulator to test it. Such a test is almost useless and harms the accumulator. Never test with an ammeter—it will ruin the meter.

11. If an accumulator is to be stored longer than two or three months, charge it fully, empty acid, and fill with distilled water. Otherwise, the accumulator should be charged every three weeks, or if thick plates, every two weeks.

## CHARGING.

### DIRECT CURRENT MAINS.

Both "A" and "B" accumulators (especially the latter) can readily be charged from D.C. mains, and quotations will be gladly given on receipt of details of the batteries, and of the current cost, per unit.

### ALTERNATING CURRENT MAINS.

Accumulators are very easily charged from the A.C. power supply of the Westinghouse in New Zealand. A transformer is used to change the voltage from 230 supplied to that of the accumulator. BUT A RECTIFIER MUST ALSO BE USED. The transformer alone will not charge accumulators.

A charger like the WELL-MAYDE will charge your accumulator at practically no cost.

### WESTINGHOUSE RECTIFIER.

Fully described elsewhere in this issue (see rectifier). The Westinghouse dry metal rectifier is easily the best both for home and garage.

**MOTORS, 230 Volt, D.C., 1/6 h.p. 10; 1/6 h.p. 10 0 0**

### BULB RECTIFIER.

Often used, and until displaced by the Westinghouse, a clear leader in the field. Less efficient, less reliable, and less durable than Westinghouse. The best-known bulb is the Tungar, which is used in the ACE CHARGER.

### ROTARY CONVERTERS.

These convert an electric motor, driving a dynamo. Used only for larger installations, and never in the home.

### PRIVATE ELECTRIC SUPPLY.

If you have a private supply, you should certainly make use of it to run your Radio. Tell us the voltage, etc., and our advice is freely available.

### MILKING OR SIMILAR ENGINES.

Farmers, particularly those who run their milking machines by engines, will find that the installation of a small dynamo is very useful indeed. This will charge the Radio "A" battery, either in the shed, or in the house, by running two lights in the shed, who runs two lights in his shed as well as charging his "A" battery, claims that the small cells will work while the lights alone. The outfit is very simply installed, and can be used for anyone practically without attention.

A larger dynamo could be installed in the shed, two wires run to the house, where a set of motor car accumulators would provide electric light, and house and car current for the Radio set. The cost of running would be very small—certainly far less than the cost of dry "B" batteries, only when the engine was running for milking.

The actual cost of dynamos would be from about 45s. up to £15. See our range of dynamos in this list, we usually stock various sizes.

If you have no engine, we can supply a small and cheap one, suitable for dynamo driving.

We are also experimenting with dynamos driven by the wind, and will give details to anyone interested.

**CHOOSING ACCUMULATORS.**

The size of accumulator depends on the number and kind of valves in your set, and whether you can charge at home or must send the accumulator to a charging station.

If you tell us the above details, we will advise you of a large and more expensive accumulator does not always give any better results at all, any more than a 400-gallon radiator on your car would.

(a) Speaking generally, for large sets, where the accumulator is sent away to be charged, a large 80 amp. accumulator gives best results.

(b) For large sets, in a home where the accumulator is charged, a 30 or 40 amp. accumulator, used in conjunction with a WELL-MAYDE, will give the best results.

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### SPARTA S.W.G.

Glass cells, in two volt units, with 8 or 16 cells, spaced round the plates for acid, and ample space at bottom of cell. In a test tubular set 8 p.p.a. at 0.8.

Moulded covers, with large stoppers, and a rod grease cap terminals. A very fine battery.

**SPARTA S.D.G.**

Glass cells, with thick plates, which hold their charge for many weeks, and so are used for clocks, bells, etc., and for radios.

Capacity is 123 amps, actual (ignition rating would be 25 amps), so it is appreciably larger than the ordinary small accumulator.

Suitable for small Radios, bells, clocks, etc. The maximum charge rate is 5 amp. and discharge rate 25 amp.

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### YOUNG—NON-SULPHATING, ENGLISH MADE.

Sulphating, shown by the whitening of accumulator plates, is the worst "disease" of an accumulator. Hitherto, it would attack any ordinary accumulator if it were run down too far, and let it stand in condition. If it occurred only slightly, it might be removed by consecutive charging and discharging, under close inspection. Once bad sulphating took place, the accumulator became worthless.

When we heard of a new battery which would not sulphate, we merely laughed rather scornfully—as was perhaps only to be expected from English shippers, who are nothing if not careful, assured us that the NEW YOUNG ACCUMULATORS would not sulphate. Then came the news that the YOUNG accumulator was standard equipment on BENTLEY CAIRS, a very high priced car, reputed to be the fastest stock car in the world, and costing a mere \$3000 or so. It did not seem likely such a car would adopt an inferior accumulator. Naturally, we were rather impressed.

Then, when we were informed that YOUNG had secured a large contract from the Canadian Steamship Company, followed by another from the French Government for the hard service on railways, we decided there might be something in it.

Samples were ordered, and duly arrived. We ourselves charged up a sample 20 amp. Radio battery, in glass case. It was run down at a couple of amperes in the ordinary way, and THEN SHORT CIRCUITED WITH 110. COPPER WIRE FOR SIX DAYS. Not a sign of sulphating. The test was repeated with the same results. Not until then were we fully convinced.

A report from the National Physical Laboratory, whose tests are accepted throughout the world as the most accurate that can be obtained, no one would ever dream of doubting a N.P.L. test. It is clear that YOUNG accumulators would stand—apparently without damage—abuse which would put the ordinary battery quickly out of action entirely.

The newly invented Wilderman porous rubber separator, which is so porous that cigarette smoke can be blown through it, is now used.

### YOUNG RADIO ACCUMULATORS.

Glass cells, two volts each. For four volts use two cells, and for six volts three cells.

A221 20 amp. actual	15 0
A222 30 amp. actual	18 0
A223 40 amp. actual	21 0
A224 60 amp. actual	27 0

It is impossible to judge an accumulator by its appearance, actual test by experience over at least four years being the only reliable guide. A shilling or two saved in first cost proves expensive if the accumulator lasts only six months—and a troublesome six months—whereas a reliable one would have given good service for several years.

### HOUSE LIGHTING.

Special price quoted for YOUNG ACCUMULATOR, also for engine and dynamo to make a complete installation.

CHARGING—See Charging Table.

### YOUNG 6-VOLT ACCUMULATORS.

YOUNG are especially reliable for car use, where accumulators usually have a very short life, particularly those which are purchased at low prices. Make your next battery a YOUNG, whether for car or radio.



Volts	Amps.	Charged	Uncharged
A226	6	30	5 7 6
A227	6	105	8 10 6
A228	6	135	8 2 6
A229	12	60	8 7 6
A231	12	75	9 12 6

You PAY LESS for YOUNG when you PAY MORE for it.

### UNFILLABLE ACCUMULATORS.

There is only one really unfillable accumulator—that which is filled with a jelly-like electrolyte. Young have developed this to a stage where even motor car accumulators can use it.

For portable Radio receivers, this is ideal, as no leakage takes place, regardless of the position of the portable.

### YOUNG JELLY ACCUMULATORS.

Made in two volts only. Celluloid case.

A224	10 amps. actual	15 0
A225	20 amps. actual	31 0
A236	30 amps. actual	37 0

### RELIANCE ACCUMULATORS.

Reliance accumulators are really made, from the purest materials, and are fully guaranteed. The following sizes are the commonest used, but others can be supplied promptly when desired.



A217	80 amp. special	3 15 0
A218	92 amp.	5 0 0
A219	110 amp.	5 17 6

### RELIANCE RADIO.

The plates of this accumulator make it more suitable for Radio purposes than a car accumulator, except the Young.

A158 6 volt 80 amp actual 4 10 0  
A159 6 volt, 100 amp. actual 5 10 0  
First charge, free.

"A" ELIMINATORS—See page 30.

### CHARGERS.

#### WELL-MAYDE CHARGES—A.C.

Fully guaranteed for one year.

These are manufactured in Auckland, under Patent License, incorporating the WESTINGHOUSE METAL RECTIFIER, which is British-made. A full description of these famous rectifiers is given under RECTIFIERS, in this Catalogue.

Notice particularly that the Westinghouse rectifier, besides being far more durable than the Tungar or other bulb rectifier, actually wastes far less current when charging. Thus it is far cheaper to run.

WELL-MAYDE CHARGERS are extraordinarily convenient and simple. They can be permanently wired to your battery, so that charging is done merely by turning on a switch. NONE OF THE WIRES NEED EVER BE DISCONNECTED.

Running costs are so low as to be negligible—you would not notice any difference in your electricity bill.

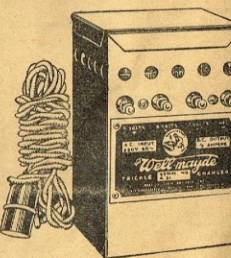
Besides paying for itself in a short time, your battery need never run down. You need not take away for a day or two at a time for recharging. The WELL-MAYDE is always ready for action. Inadequate, your battery lasts much longer if you carried about too much.

Let Your Charging Pay for Itself. Use our installment system.

#### WELL-MAYDE—TYPE A.

Charges "A" batteries of 2, 4 or 6 volts, at 1 amp.  
Supplies full current for a Jensen dynamic speaker or any other using up to 5 amps.

With a choke and condenser, furnishes "A" current for 4 volt valves, thus eliminating the "A" battery altogether.



For 110 volt supply, 10s. extra, except Type A, 5s.

A198 ..... 2 15 0  
Easy terms, 10s. cash, and five monthly payments of 10s. each.

ACE 2 AMP. CHARGERS can be converted to one or two amp. Westinghouse chargers. No more bulb replacements.

The cost of conversion to a 1 amp. charger will be £2; and to a 2 amp. charger, £3; but, when converted "B" batteries cannot be charged.

## CHARGE YOUR BATTERIES WITH A "WELL-MAYDE."

### CHARGERS—Continued.

#### WELL-MAYDE—TYPE A3.

Charges 6 volt batteries at 1 amp. Two and four volt batteries can be charged, with extra resistance.

Supplies 2 amp. current for Jensen, Magnavox or other dynamic speakers taking up to 1 amp.

With choke and condenser, etc., makes a really fine "A" eliminator, enabling the "A" battery to be entirely dispensed with.

A206 ..... 3 10 0

#### WELL-MAYDE—TYPE A4.

Nine volt two amp. size, doing just what the A3 will do, except that it supplies 2 amps. instead of 1.

A207 ..... 5 0 0

#### WELL-MAYDE—TYPE B.

Charges "B" batteries 80-180 volts, at up to 50 milliamperes.

A205 ..... 4 4 0

#### "AB" CHARGERS.

In the combined "A" and "B" accumulator chargers, both batteries can be charged at the same time, if desired. In every case, the "B" charger will charge 80 to 180 volts IN SERIES, the charging rate being up to about 50 milliamperes. This is the first charger to be offered in New Zealand that will charge such high voltages in series.

#### WELL-MAYDE—TYPE AB.

A208 6 v., 5 amp. "A" & "B" £5 15 0

#### WELL-MAYDE—TYPE A3B.

A209 6 v., 1 amp. "A" & "B" £6 6 0

#### WELL-MAYDE—TYPE A4B.

A210 6 v., 2 amp. "A" & "B" £7 15 0

All "AB" chargers charge both batteries simultaneously.

### Guarantee

#### WELL-MAYDE CHARGERS.

Any WELL-MAYDE CHARGER which our factory inspection proves to have become defective through ordinary fair use within twelve months from date of sale by us, will be repaired or replaced free. This guarantee applies whether the charger is used 1 or 24 hours per day.

#### TUNGAR BULBS.

TUNGAR BULBS are sold entirely without guarantee, though we usually replace defective 2 amp. bulbs, used only in GENUINE ACE or TUNGAR CHARGERS, within six months from date of sale, charging 3s. per month for use of bulb up to time claim is made.

#### ACE CHARGER, 5 AMP.

"(A)" and "(B)" chargers. It is made with the same care, and the same guarantee as the 2 amp. Ace charger. "B" battery lamp is extra.

A190 Ace 5 amp. charger ..... 7 10 0  
A195 Tungar bulb, 5 amp. .... 2 6  
A161 Lamp for "B" batteries 2 3

WRITE FOR WESTINGHOUSE BOOKLET. Post free, 3d.

### GARAGE CHARGERS.

WESTINGHOUSE RECTIFIERS are now available in large sizes, and the following chargers must appeal to all garage proprietors, simply because they are wired to both batteries on the Tungar bulb type. The advantages are—

1. For greater durability, with practical immunity from breakdown. No need to carry spare bulbs, which add to the cost of the charger.

2. Telephone exchanges have adopted large numbers of Westinghouse type chargers. This is proof of the best recommendation obtainable for their reliability and efficiency.

3. No extra expense, for there are no bulbs requiring replacement—rectifier is everlasting.

4. Simpler construction, so that even much less current, so that current bill, which steadily mounts up with other chargers, is greatly reduced with WESTINGHOUSE.

5. No cut-outs, etc., required—If power goes off, charging ceases but resumes immediately when the Power Board remedies the defect.

6. Silent.

7. Less current waste means far cooler running.

On the larger outfits, a single battery charger will be practically full profit. No other charger offers this advantage—in most of them, a single battery shows actual loss.

WELL-MAYDE GARAGE CHARGERS.

Like the smaller home chargers, these are made in our own factory using Westinghouse rectifiers. They are fully guaranteed. We know that cheaper chargers can be purchased, but they are not cheaper to operate because:

1. They use more current, and even 3d. per day saved for current means a saving of £4 10s. per year. Even one charger can be charged at almost full profit.

2. Extra bulbs must be carried in stock in case of failure, and this increases the first cost.

3. Annoyance and inconvenience is caused by breakdown, avoided in the Well-Mayde.

WELL-MAYDE CHARGERS will charge any number of batteries from one up to the number listed. The chargers are made to order.

Volts Amps Batteries (6 volt)

A235	12	3	1 to 2	10 10 0
A232	36	3	1 to 6	22 10 0
A232	36	1	1 to 6	30 0 0
A233	48	6	1 to 6	42 10 0

Other sizes or types built to order.

#### SPECIAL PRICE TO GARAGES.

BALKITE CHARGERS.

Balkite electrolyte chargers are well known everywhere. Never before has a similar charger been offered at such an astounding price. Balkite will charge 2, 4 or 6 volt batteries at 5 amp. from your 220 or 110 volt mains (state which).

Originally priced at 65s., the present price is absolutely low. Buy now as stocks are limited.

A220 Balkite charger ..... 25 6

TERMS: 10 days, 5s. monthly.

Take advantage of this exceptional offer while you may. Stocks are limited. You must save money.

#### ACE CHARGER, 2 AMP.

Charges six-volt "A" accumulator at 2 amps, and 90-volt "B" accumulator, though not simultaneously.

Price includes the RECTIFIER BULB, all that is necessary for charging "A" accumulators. For charging "B" accumulators, a lamp is required, costing 2/3 extra.

1. For greater durability, with practical immunity from breakdown. No need to carry spare bulbs, which add to the cost of the charger.

2. Telephone exchanges have adopted large numbers of Westinghouse type chargers. This is proof of the best recommendation obtainable for their reliability and efficiency.

3. No extra expense, for there are no bulbs requiring replacement—rectifier is everlasting.

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#### SPECIAL PRICE TO GARAGES.

BALKITE CHARGERS.

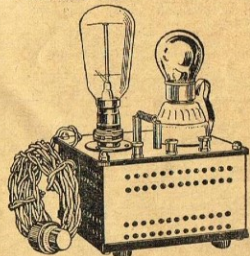
Balkite electrolyte chargers are well known everywhere. Never before has a similar charger been offered at such an astounding price. Balkite will charge 2, 4 or 6 volt batteries at 5 amp. from your 220 or 110 volt mains (state which).

Originally priced at 65s., the present price is absolutely low. Buy now as stocks are limited.

A220 Balkite charger ..... 25 6

TERMS: 10 days, 5s. monthly.

Take advantage of this exceptional offer while you may. Stocks are limited. You must save money.



For 110 volt mains, 5s. extra.

A160 Ace Charger, with bulb 4 15 0  
A161 Lamp, for B batteries 2 3  
A123 Tungar Bulb, for Ace or Tungar Chargers ..... 1 0 0

### AERIAL OUTFITS.

For convenience, the following aerial outfit is made complete. The aerial wire in each instance is 100 feet long. Enough to make the earth connection from the set should be cut off, and the remainder used for the aerial.

Neither the aerial nor earth wire need be insulated, if properly fitted. Enamel wire is better solely because it prevents corrosion.

#### AERIAL OUTFIT NO. 1.

Comprises the choice of aerial material—100 feet 7/22 enameled wire, two Pyrex insulators, two nine-inch lead-in tubes, with wing nuts, Little Joe arrester, Clampine earth clamp.

A229 Aerial outfit (best) ..... 17 0

#### AERIAL OUTFIT NO. 2.

A cheaper outfit, but fulfilling insurance requirements. 100 feet 14s. wire, two large porcelain insulators, nine-inch lead-in tube, Homeguard arrester, earth clamp.

A138 ..... 9 0

#### AERIAL OUTFIT NO. 3.

Although this aerial does not satisfy the insurance requirements, it is quite efficient for Radio reception. It is suitable for camping, temporary aerials, and for 100 foot 15s. wire, two porcelain insulators, porcelain lead-in tube, earth clamp.

A137 ..... 4 6



## ALUMINIUM.

See INDEX—Shields, Chassis.

ALUMINIUM is now much in demand for Radio purposes, being used for panels, chassis, shields and cabinets.

Aluminium is only kept and cut at our factory, hence a few hours delay is necessary in filling orders, which have to be cut to size. If in town, phone your order in the morning, making sure to give correct sizes.

For panels, chassis and better grade shields 14g is usual. Shields can, however, be made from any thickness.

For 14 gauge shields and cabinets, aluminium corner rod, grooved to fit closely on the 14g, aluminium can be supplied (see A201). For lighter shields and cabinets, aluminium angle can be used for the joints, fastened to the panel with small screws and nuts.

## ALUMINIUM SHEET (English).

Full-size sheets are 6 x 3 feet or 18 sq. ft. and, prices are for delivery at our factory, packing extra.

A full sheet can be supplied out to your own sizes at 3d. per piece extra—thus 6d. extra charged if cut in half, 18. 6d. extra if cut in six pieces, etc. Slight allowance necessary for wastage, especially for the thicker gauges, which are cut on a saw about 1/16 in. thick.

S.W.G.	Thick	Sq. ft.	Full sheet
14	.08	4 1/2	51/-
16	.064	4 1/2	29/-
18	.048	3 1/2	33/-
20	.036	2 1/2	24/-
22	.028	2 1/2	19/6

## ALUMINIUM PANELS.

These can be supplied either crystal enamelled or ducoed. Write for prices. Special prices for quantities.

## ALUMINIUM CORNER ROD.

This rod has grooves in it, to take 14g. aluminium sheet. The ends can be tapped for screws, which pass through the top and bottom panels, thus holding the whole assembly together.

A200 Corner rod	.. per ft.	1 0
If cut accurately to length, drilled and tapped at both ends, complete with screws, per P.I.C.E. extra	6d.	
A201 Partition rod	.. per ft.	6

## ALUMINIUM ANGLE.

For making lighter aluminium shields, aluminium angle can be used at the corners, the panels being riveted or screwed on. We can supply suitable angle aluminium, in lengths up to two feet.

1/2 x 3/4 inch	.. per ft.	9d.
3/4 x 3/4 inch	.. per ft.	6d.

## POWER AMPLIFIERS.

SEE INDEX "AMPLIFIERS."

WE CAN SUPPLY OR MAKE AMPLIFIERS FOR ALL PURPOSES.

## AMPLIFIERS.

MULTI-VALVE sets always contain an AMPLIFIER but amplifiers are used as separate units for:

1. Working a loud speaker from a crystal set. (This can only be done by using valves and batteries.)

2. Working a loud speaker from a single valve set.

3. An electric gramophone consists merely of an amplifier, pick-up and gramophone motor, mounted in suitable casing, making sure to give correct amplifier is very suitable for the purpose.

4. For enabling deaf people to hear ordinary speech in a room.

5. For TALKIES.

6. For public address systems, political meetings, announcing at sports, controlling events at shows, etc.

**LARGE AMPLIFIERS FOR TALKIES, RESTAURANTS, ADDRESS SYSTEMS, CABARETS, etc.** are given elsewhere in this list—see index.

**DE JURE RESISTANCE COUPLED AMPLIFIER.** A beautifully moulded three-stage amplifier, mounted in a very compact space. It contains the necessary valve holders, resistors, condensers, and is fitted with terminals so that it can be connected up in a few minutes.

R209 £1 4 0  
So clear is the reproduction of this amplifier that it is used as the pre-amplifier in TALKIES (film). Such an amplifier must be very clear and free from all distortion.

Two high impedance valves are used, with a power valve in the last stage. 135 volt "B" at least are required. In talkies, this is usually a dry "B."

**BEE AMPLIFIER.** A two-stage transformer amplifier, assembled ready for use, and fitted with transformers, valve holders, terminals, etc. Price is very low for an article which is really reliable.

Ready for connecting to crystal set, batteries, speaker, etc.

A202 BEE Amplifier .. 1 10 0  
Or with two 45 volt Columbia "B" batteries, Columbia "C" battery, two valves, Fuller accumulator, and N. and K. special speaker, giving a full output to work with your crystal set, £7 15s.

**BUY THE DE JURE or BEE AMPLIFIER AND ENJOY YOUR SPEAKER RADIO.**

## ARRESTERS—LIGHTNING.

Many arresters on the market are NOT APPROVED by the N.Z. FIRE AND MARINE WRITERS, although they may be approved in other countries.

In case of fire, a policy might be voided if the arrester is not an approved type.

**ALL ARRESTERS LISTED HERE ARE APPROVED FOR USE THROUGHOUT NEW ZEALAND.**

A properly erected aerial is actually a lightning protection against lightning. The arrester should be fitted outside, and wires should be kept as straight as possible.

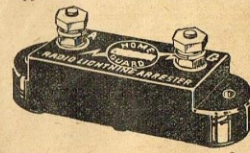
## LITTLE JOE.

A neat and effective brown porcelain arrester, complete with screws for attaching to wall. Approved in New Zealand.

A176 .. 5 0

## HOMEGUARD.

The cheapest reliable arrester procurable. Porcelain, with screws. Approved in New Zealand.



A177 .. 3 9

## "B" SUPPLY.

The "B" or high tension current may be derived from several sources, as follows:—

**DRY BATTERIES**, used where other alternatives not available.

**"B" ACCUMULATORS** used where current is available at the house for charging, and capable of giving the very best results, owing to absolute uniformity and freedom from noise. Also used for public address systems.

**"B" ELIMINATORS** used where current from power lines (chiefly A.C.) is available at the house. (Every electric set contains a "B" eliminator, usually called power pack.)

**MAGNETO "B" SUPPLY** used where 6 volt accumulators are not easily and cheaply charged. The best source of power for public address systems, which have been operated where there are no power lines.

**BURGESS BATTERIES, 45 VOLT.**  
B111 Flat (2106) .. 1 10 0  
B152 Vert. (2108) .. 1 10 0  
B154 Vert. (2138) Super 1 12 6  
B148 4.5 volt C (2376) .. 2 9  
B149 7.5 volt C (5540) .. 0

## "B" BATTERIES.

"B" or high tension, batteries, supply the current that actually operates the speaker, the current they give out being controlled by the incoming size of the valves. They have a high voltage, but the current (amperes) they supply is very minute. Thus "B" batteries consist of a large number of comparatively small cells, since no dry cell can give more than 1 1/2 volts.

Small "B" batteries have a very short life, especially those used with portable sets. It is in this connection, largely, that the self-contained portable set gives indifferent results in actual use. The small batteries are nearly run down even before they reach New Zealand.

For a set of four or more valves, it is best to purchase the largest and best "B" batteries possible—and in this connection we strongly advise the larger LAYERBILT. For two-valve sets, it is possible that best economy will be obtained from the ordinary size 45-volt battery.

Avoid cheap or unknown "B" batteries. You will never regret it. The cleverest expert cannot judge a battery from its carton. We will list cheaper batteries as soon as they prove reliable.

When purchasing a car, you pay considerable attention to its fuel consumption. You should pay equal attention to the "B" consumption of a battery radio for your car. It costs as much for "B" batteries as others—and with no corresponding advantage. Our own Radios are designed with special attention to this point, and are the most economical on the market.

The Hammarlund-Roberts Radio is famous for its economy in "B" batteries.

Different valves may affect "B" consumption very considerably. This is especially the case with many well advertised valves, which have very low "A" consumption. These lose on "B" far more than they save on "A" batteries.

This will make you realise the absolute necessity of knowing how economical your Radio is to be. Do not blame batteries for running down quickly when the fault is in the design of your set, and in no way whatever due to the battery. Many poorly designed Radios cost at least £4 extra per year for "B" batteries alone.

"B" batteries require no switch. When the "A" battery is switched off, the "B" is also effectively switched off as well.

Accumulator "B" batteries, where a charger is installed in the house, will be found more satisfactory, and very much cheaper in maintenance.

## YOUNG "B" ACCUMULATORS

10 Volt, 6000 Milliamps.  
Made in one piece with the same quality plates as in the YOUNG BATTERIES already described in this list. Although small in size, the rating is 6000 milliamps; they will stand a heavy charge and discharge rate. Glass cells.  
B235 6 amps. uncharged .. 12 0  
90 volts, in wooden crate, charged .. 6 0 0

"B" CHARGERS—See index.

## COLUMBIA "B" BATTERIES.

Columbia "B" batteries are undoubtedly the best dry batteries on the market to-day. Unlike other brands, they have been consistently reliable since the inception of Radio.

For heavy service on multi-valve sets, the Columbia Layerbilt commands first choice.

We ourselves have selected Columbia batteries as standard equipment on all sets supplied by us.

Since we have regular monthly supplies of Columbia batteries arriving direct from the factory, customers can be certain of always obtaining fresh stock. Only our large turnover makes this possible. A word of caution is necessary in regard to batteries offered by some dealers at a shilling or two less.

This is a well recognised dodge of disposing of old or defective stock. It usually passes so long as the initial test seems right. Work it out—half the life, and only a shilling or two saved. Your reputation is valuable—use only fresh stocks at the lowest price that can be fairly charged for them.

## LAYERBILT "B" BATTERIES.

The Layerbilt battery is undoubtedly the finest "B" battery in the world. Like the good meat, it is "meat." It is made in two sizes, both of which have a 22 1/2 volt tapping.



B102 Layerbilt Super (4408) 1 12 0  
B207 Layerbilt Med. (4485) 1 4 0

## COLUMBIA 45 VOLT.



B101 Flat, taps 16 1/2-22 (4767) 21 0  
B152 Vertical, tap 22 (4772) 21 0

## COLUMBIA, FLAT, 22 1/2 VOLT.

B100 Tapped 16 1/2-22 (4766) 13 6

## COLUMBIA, FLAT, 90 VOLT.

A small battery, necessary for portables, but not advised in New Zealand for other purposes.  
B237 90 volt (4755) .. 30 0

## B ACCUMULATORS.

It is apparent that not every accumulator manufacturer can make a reliable "B" accumulator. To this fact is due the impression in some quarters that "B" battery accumulators are not as successful as they might be.

If this is a rule, then Fuller's must be the happy exception, for we have sold hundreds, and complaints have been less than one per cent. This shows the necessity of a careful choice. Buy FULLER and forget your battery troubles.

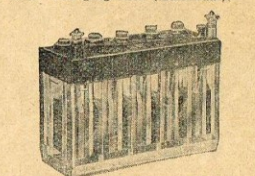


Fuller "B" batteries are now made in 10-volt monobloc units. This not only reduces considerably the size, but gives a much more substantial battery.

All sizes have the same quality of plate-selection depends rather on the work they do. The ordinary Ray Radio is quite happy with the smallest size. On our Broadcasting Station, 122, we use 1000 volts of a medium size. The remarkable purity of reproduction is largely due to the use of "B" accumulators. The largest size provides a battery of exceptional merit and performance, even for heavy work.

## FULLER "SPARTA" MEG 10 VOLT.

3500 milliamp. capacity. Best quality plates. Battery troubles practically unknown with this battery. Charging rate (maximum).



B208 10-volt unit (uncharged) 8 6

"Nine units (90 volts) will be supplied in special wooden crate, charged ready for use for £4.

## FULLER "SPARTA" D.M.H.G. 10 V.

6500 milliamp. A large "B" accumulator at small extra cost. Very suitable for powerful Radios, electric gramophones in districts without power supply. Size 7 x 2 1/2 x 1 1/2 in. high.

B234 10-volt unit (uncharged) 12 0  
90 volts, in wooden crate, charged, 5s.

## FULLER "SPARTA" QMG 10 V.

10,000 milliamps. The largest "B" accumulator now known. Heavy duty work, transmitting plants, etc.

B234 10-volt unit (uncharged) 18 0



## MAGNETO "B" SUPPLY.

In England these are known as Anode converters, but we have adopted the above name as more in keeping with the terms used in N.Z.

The MAGNETO "B" SUPPLY consists of a combined motor and generator, very carefully built to consume an absolute minimum of current, since it is usually driven by an accumulator. For economy a strong permanent magnet is used—all current generated can be then put to useful work.

The machine is enclosed in a small and neat case, with provision for oil every two or three months. No other attention is necessary.

If you can easily charge your own 6 volt accumulator, or if you have a home lighting plant of 32, 110, 230 or any other voltage, your Radio can be operated very cheaply, and with full power from a magneto "B."

### AMPLIFIERS, ELECTRIC GRAMOPHONES AND PUBLIC ADDRESS SYSTEMS.

For the above purposes, where the apparatus may or may not be always wanted in one place, the MAGNETO "B" is easily the finest current supply available. Using a 12 volt magneto "B" it only requires two six volt accumulators of 80 amp. size or upwards to supply "A" current. "B" current, "C" supply can also be obtained, though in many cases it is more advisable to use a dry "C" battery, which for such purposes is an inexpensive item.

Some ready means for re-charging the 6 volt batteries must, of course, be available.

For this class of work, two 80 amp. 6 volt batteries should operate type C at full power for about 20 to 25 hours.

Type B would operate about half this time, but it should be remembered that type E, operating on a suitable amplifier, is extremely powerful—sufficient to run quite a large talkie plant or to cover a large area of ground for a public address system.

The E type weighs only 31 lbs., and is only about eight inches high. It is thus very readily portable in a car.

We ourselves use an outfit like the above for all our public address work, even where power supply current may be available. This will show that the magneto "B" outfit is NOT a substitute for a powerful A.C. outfit, but the equivalent.

In ordinary times, an outfit like the above could be hired out by its owner for dances, political meetings, special meetings, races, shows, and numerous other public events. The remuneration obtained is a very fair one. During the present year political meetings will call for dozens of such outfits throughout the year, but they will not be obtainable at a moment's notice just when the election campaign starts.

For other details concerning public address systems, electric gramophones, etc. see index.

### MAGNETO "B."

MAGNETO "B" SUPPLY is offered in special metal boxes, complete with filter system for use with Radio or amplifier, or without filter.

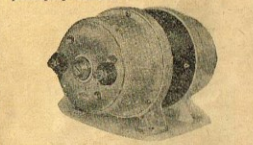
It can also be supplied without filter, but in such cases a filter must be added for satisfactory working. Very frequently it suits to incorporate the filter as part of the amplifier itself. A better filter is required for Radio purposes than for amplifier work only.

Where intermediate voltages are required—and they usually are—we can supply a suitable resistance system for from 15s. It is necessary to tell us what valves are used, and whether the "C" supply is to be drawn from the magneto as well as "B."

Finally, let us emphasise the reliability of this machine. It is made by magneto experts, is thoroughly British, and is a field where Britain is a clear leader.

### STOCKS.

It is impossible on such a highly specialised apparatus to carry large stocks, but we always endeavour to have on hand machines with 12 volts and also 32 volts, in types C, E, and B. For other wise orders can be promptly called.



In the list below, any input or output given can be obtained from the factory at 15s. but we normally do not stock those in brackets.

**TYPE B.** Input, 6 volts. Output, 150 volts, 15 milliamperes.  
B225 With filter . . . . . 13 10 0  
B226 Less filter . . . . . 7 15 0

**TYPE C.** Input, 12 or 32 volts (50, 100 or 230 volts).  
Output, 300 volts, 50 milliamperes (or 400v. 40ma.; 500v., 20ma.).  
B227 With filter . . . . . 15 10 0

**TYPE E.** Input, 12 or 32 volts (50, 100 or 230 volts).  
Output, 300 volts, 120 milliamperes (or 400v. 160ma.; 600v. 100ma.; 1000v. 50ma.).  
B229 With filter . . . . . 22 10 0  
B230 Less filter . . . . . 16 0 0

**TYPE F.** Input 12 or 32 volts (50, 100 or 230 volts).  
Output, 400 volts, 250 milliamperes (or 600v. 160ma.; 1000v. 100ma.).  
B232 With filter . . . . . 43 0 0  
B233 Less filter . . . . . 22 10 0

LET US SOLVE YOUR  
**POWER PROBLEMS—**  
RADIO AND AMPLIFIER.

### MAGNETO RESISTANCE SYSTEMS

For use with Radio sets, or with address systems and amplifiers, a resistance system is used with the magneto "B." These are quoted to suit individual jobs, the cost being usually about 1s. to 2s. In ordering, please advise us the valves used in the amplifier, and the "B" voltages.

### M-L AEROPLANE GENERATORS.

M-L manufacture a hand generator similar to their magneto "B," but giving 800 volts, 30 milliamperes, and 6 volts 2.6 amps. Had Kingsford Smith one of these when he was lost in Australia, communication would have been easy. The M-L is essentially, of course, an emergency apparatus.

The price of this aeroplane generator is 15s.

### DYNAMOTOR.

A used generator, working on 27 volts input, and giving 400 volts 100 ma. output, as used in U.S.A. Army. Price 25. Guaranteed good condition.

## CHARGING "B" ACCUMULATORS.

First Extra  
10 volt 10 volt  
Recharging . . . . . 1 0 0  
1 0 0

Although we recharge "B" accumulators, we do not recommend them when they cannot be recharged at home, except in special cases.

### COLUMBIA "C" BATTERIES.



B112 4 1/2 volt, tapped at 3 . . . . . 4 0  
B231 9 volt, tapped every 1.5 4 0

### COLUMBIA No. 6.

This battery has no rival for "A" batteries of Radio sets (where accumulators cannot be used), for telephones, bells, buzzers, etc.

Thousands of these batteries are used annually by the New Zealand Government, having been selected after searching test.

B113 1 1/2 volt . . . . . 2 6

**WARNING.**—Beware of No. 6 at cut prices—almost invariably they have been many months in stock, and already considerably worn down. The same applies to dry "B" and "C" batteries.

### COLUMBIA AIR-CELL.

A battery that would give an absolutely constant current for a very long period has always been the dream of scientists. That dream has now been realised, for after an enormous amount of research and experimenting, the Columbia factory has evolved the AIR-CELL.

This battery depends for its uniform supply on air. It has been developed mainly for RADIO and goes hand in hand with the new volt .06 valves now obtainable—the 1X23.

The AIR-CELL is really a double battery in one case, which is similar to a car accumulator. On test it has operated a 6 or 7 valve set for over 1000 hours, without any noticeable drop in voltage. The ordinary dry battery, of course, drops in voltage immediately, and this drop continues.

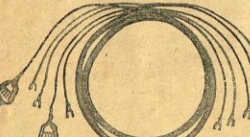
On a set like the Hammarlund-Roberts—still, we believe, the best Radio for New Zealand conditions where no current is supplied to the house—one AIR-CELL should last about the same part of two years. This once removes the main objection to Radio, as with the AIR-CELL, the trouble due to the "A" battery simply vanish. We predict the AIR-CELL will oust the "A" accumulator as a very great extent.

B235 Columbia Air-cell . . . 3 18 0

## BATTERY CABLES

### A.CE.

Battery cables consist of wires of different colours, braided together to secure neatness, and to avoid troubles with straggling wires from battery to set. Can be supplied in lengths, or finished ready for use with lugs fitted.



Cable, with Lugs and Clips.

### A.CE CABLES (With Lugs, all 5ft. Long).

B175 5 wire . . . . . 2 6  
B178 6 wire . . . . . 3 0  
B179 7 wire . . . . . 3 6  
B214 9 wire . . . . . 4 6  
"A" battery clips extra, per pr . . . 1 6

### A.CE CABLES (Ont to Length).

Per ft. 5d. 20.0  
B173 5 wire . . . . . 5d. 20.0  
B176 6 wire . . . . . 6d. 24.0  
B215 7 wire . . . . . 7d. 28.0  
B218 9 wire . . . . . 9d. 32.0

### FLEXO CABLES.

A very high grade cable for those who insist on real quality. These cables are specially treated and so rendered acid proof. They are all five feet long, and have lugs fitted.  
B188 5 wire . . . . . 1 6  
"A" battery clips extra, per pr . . . 1 6

### MULTI-PLUG CABLES

Four or five wire cables fitted to valve bases. With these, batteries can be connected or disconnected immediately. Indispensable for changing from short to long wave sets. Save time and accidents.

The seven wire cable has special plug, and its price includes socket.



C113 4-way plug cable . . . 4 6  
C114 5-way plug cable . . . 5 0  
C509 7-way plug cable & socket 7 6

## BATTERY LEAD TAGS

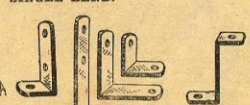
Small circular "name plates" instantaneously clipped on to your battery wires. Prevent confusion and accidents by identifying through strong connections to batteries.

In complete sets, only: A—A, B—B, C—C, D—D, E—E, F—F, G—G, H—H, I—I, J—J, K—K, L—L, M—M, N—N, O—O, P—P, Q—Q, R—R, S—S, T—T, U—U, V—V, W—W, X—X, Y—Y, Z—Z.  
B194 Set of eight; per set . . . 6

## BRACKETS.

Made of brass, finely nickel plated, and drilled to take 5/32 U.S.A. screws or 3 A. Especially useful in all kinds of ways in Radio building, and for many other purposes.

### SINGLE BEND.



L shape. Z shape.

Width Length arms ea. 4d.  
B131 1in. 1in. 2d. 1 3  
B132 1in. 1in. 2d. 1 3  
B134 1in. 1in. 2d. 1 3  
B135 1in. 1in. 2d. 1 3  
B137 1in. 1in. 4d. 3 0  
B138 1in. 12in. 4d. 0  
B138 has four holes.

B196 1in. 1in. 4d. 3 0

### L SHAPE.

Width Length arms ea. 4d.  
B136 1in. 1in. 2d. 1 3  
B139 1in. 1in. 2d. 1 3  
B139 1in. 1in. 2d. 1 3

### Z SHAPE.

Width Height ea. 4d.  
B133 1in. 1in. 3d. 2 6  
B134 1in. 1in. 4d. 3 6  
B135 1in. 1in. 4d. 3 6  
B142 1in. 2in. 6d. 5 0



B140 Straight 3in. x 1in. 5d. 4 0

## BOOKS AND PERIODICALS.

**RADIO NEWS.**  
Postage 2d. extra; per copy 1 6  
Postage 2s. extra; per annum 16 0  
Yearly subscriptions must be paid in advance.  
Q.S.T. same price as Radio News.

## BRASS RODS, ETC.

**BRASS RODS, ROUND.**  
1/8, 5/32 or 3/16 inch diam. ft. 3d.  
7/32, 1/2, 5/8, 3/4, 7/8, 1 inch 6d.  
5/16 3d.  
B.A. 0 6d.  
1, 2, 3, 4, 5, 6, 7 4d.  
3d.

**BRASS RODS, SQUARE.**

This is the size used for slider bars. See under Sliders for 1in. square brass rod, plated and drilled.  
1 inch . . . . . ft. 6  
5in. 4

### BRASS TUBES.

Best brass, solid drawn. Per ft.  
3/16 inside diam, 1/16 wall . . . 1 0  
1/8 inside diam, 1/16 wall . . . 1 3  
5/16 inside diam, 3/32 wall . . . 2 0

### BRASS STRIP.

1in. wide, 1/16in. thick, ft. 4  
1in. wide, 3/32in. thick, ft. 7  
1in. wide, 1/16in. thick, ft. 7

### THREADED ROD (See SCREWS).

### BUZZERS.

Sounders and Bells—See index.

A JAX BUZZERS have been designed on a new base and plated over. The note is very high pitched, making the buzzer very suitable for Morse code practice, or for testing crystals.

B141 Buzzer only . . . . . 6 6

B144 Key and buzzer (see keys) 16 0

See also under BELLS.

## CABINETS.

Having an up-to-date cabinet-makers' plant at our factory, we are able to make any style cabinet, from the simplest to the most elaborate.

QUOTATIONS GLADLY SUBMITTED.

### CABINET COVERS.

A real boon to dealers. Protects cabinets during transport. Its cost in a month by preventing scratches.

For full size Radio consoles.

M243 . . . . . £2 18 0



## CABINET FITTINGS.

## BALL CATCHERS.

These small catches are used on the doors of cabinets of all kinds. They are most convenient to operate, and hold the doors quite securely enough for all ordinary purposes.

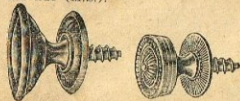
With lock plates. All nickel plated.



C483 1/4 in. diameter	per set	5
C484 5/16 in. diam.	per set	6
C485 3/8 in. diameter	per set	8
C486 1/2 in. diameter	per set	9

## CABINET KNOBS.

Used for small cabinets of Radio sets, gramophones and similar purposes. They are supplied either nickel plated (N.P.), or bronzed (B.), and with wood (W.S.) or metal screw and nut (M.S.).



C487-C488 C489-C491

C487 1/4 in. plain, N.P.	W.S.	ca.	dz.
C488 3/8 in. plain, N.P.	W.S.	3d.	2 6
C489 1/2 in. fancy, N.P.	W.S.	3d.	2 6
C490 3/8 in. fancy, N.P.	W.S.	3d.	2 6
C491 1/2 in. fancy, B.	M.S.	3d.	2 6

## RUBBER FEET.

Deaden noise and prevent furniture scratches.

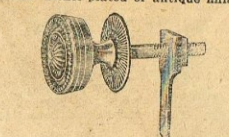


C.151-152 C149-150

G151 Screw type, No. 3	6d.	5
G152 Screw type No. 4	9d.	6
G149 Pin type No. 1	9d.	6
G150 Pin type No. 2	9d.	6

## CUPBOARD LOCKS.

These are supplied in two sizes, either nickel plated or antique finish.



C492 1 1/2 in. diam., plated	1s. 11	0
C493 1 1/2 in. diam., antique	1s. 11	0
C494 1 in. diam., plated	9d.	6
C495 1 in. diam., antique	9d.	6

## DEEP HANDLES.

Small drop handles for small cabinet drawers, either plated or antique.

C502 Plated .. 9d.  
C503 Antique .. 9d.



## LID SUPPORTS.

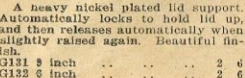
Lid supports hold the lid up while adjusting valves, etc. Brass, either nickel or gold plated. Five inches long.



C410 Nickel plated	1 5
C411 Gold plated	1 5
C452 Folding pattern, N.P.	1 0

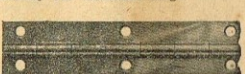
## LID SUPPORTS—AUTOMATIC.

A heavy nickel plated lid support. Automatically locks to hold lid up, and then releases automatically when slightly raised again. Beautiful finish.



## HINGES—PIANO.

Radio cabinets should have long hinges fitted in the same manner as in pianos. The hinges listed here are best English, brass, and either nickel or gold plated. The width given is for the open hinge. The price of these hinges is now so low that no builder need use the clumsy old fashioned hinge.



C407 21 x 1 1/2 in., nickel plated	3 0
C408 21 x 1 1/2 in., gold plated	4 6
C409 18 x 3/4 in., nickel plated	2 6

## CELLULOID SHEET.

Transparent, white, grained or black. This celluloid, unlike most motor car celluloid, cements very readily. Full sheets are 50 in. x 20 in. 10/1000 is usual for coil winding.

C164 10/1000 thick, sq. ft.	1 0
Full sheet, sq. ft.	9
C401 5/1000 thick, sq. ft.	10
Full sheet, sq. ft.	8
C453 50/1000 thick, sq. ft.	3 0
Full sheet, sq. ft.	3 0

We can also supply 50/1000 thick in black, and in white (ivory), at the same price as transparent. Can be used for engraved name plates. See "CELLULAC" CEMENT for celluloid—under INSULATORS.

## CHASSIS—WELL-MAYDE.

Building a chassis at home is difficult, as expensive tools are involved. Well-Mayde chassis are steel, silvered finish, and include special valve holders already mounted—state if other than those specified are desired.

Multiple condensers mentioned are used by ourselves, and match the chassis perfectly. Other items are: shielded R.F. matched transformers, four-valve shield S221, power transformer T345 or T347, choke C505 and 1500 condenser.

No. 1 chassis is 15 x 10 1/2 x 3 and has four UY and two XU holders. For Hammarlund condenser (4 gang). No. 2 is 22 x 12 1/2 x 3, and has five UY and three XU holders. For De Jur five-gang condenser.

C115 No. 1 chassis	1 15	0
C116 No. 2 chassis	2 2	0

## CLIPS—BATTERY

(CADMIUM PLATED)

The popular type for "B" Batteries and general testing.



C107 The popular	ea.	dz.	gr.
size, 1 1/2 in.	6d.	5	0 48 0

## (LEAD COATED)

Used everywhere for charging accumulators, and also on the ends of battery cables on a Radio set. Make instant and certainly contact on the accumulator. Corrosion resisting.



C110 25 amp. 2 1/2 in.	ea.	dz.	gr.
C111 50 amp. 3 1/2 in.	1 1	11	20 0
	1 3	14	0 15 0

## CLIPS—SCREENED GRID.

Made to connect to the top terminal of the 224 screened grid valves.

C571 S.G. clips, ea.	4d
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WELL-MAYDE  
SPACED COILS.

(New Zealand Patent No. 53830.)

The spaced turns on WELL-MAYDE COILS are firmly held together by strong, yet thin, dielectric material, selected for its great efficiency. Each turn is rigidly anchored in its correct position, thus rendering short circuit impossible.

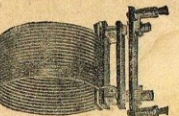
For both sensitivity and activity it is essential that capacity and resistance losses be reduced to an absolute minimum. Both these features are amply demonstrated in WELL-MAYDE COILS.

Being made on accurate machines, the method of manufacture ensures that the coils are very uniform in electrical characteristics.

The finish is up to the usual WELL-MAYDE standard—a standard which is already famous throughout New Zealand.

## WELL-MAYDE COIL.

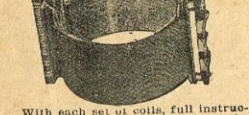
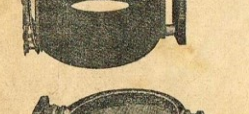
Showing method of mounting.



Diarm	Turns per in.	per in.	per ft.
1 1/2	10, 20, 30, 40	1 6	16 6
2	10, 20, 30, 40	1 6	16 6
2 1/2	10, 20, 30, 40	1 6	16 6
3	10, 20, 30, 40	1 6	16 6

## WELL-MAYDE HAMMARLUND-ROBERTS COILS.

The Hammarlund-Roberts receiver contains two coils, which are the heart of this popular set. Since the set itself is fully described in this list, little more need be said here, except to point out that there are no better coils available than the WELL-MAYDE.



With each set of coils, full instructions and diagrams for building the Hammarlund-Roberts set are included. These are very simply arranged, and even if you intend rebuilding your old receiver, using the good parts from it, you should have no difficulty in following them.

C446 Set of two coils	1 14	6
C450 Pointer knob to suit	2	0

## VALVO COIL FORMERS.

A bakelite tube, with thin walls, attached to a four-pin UX valve base. Can be plugged into a valve holder. Gives small size, concentrated field, readily changeable coils.



C524	each	1 6
------	------	-----

Bakelite tube only, as above, three inches long, out dead true each end. Accurately fits UX valve base.

C525 S.W. bakelite tube	each	8
Six for		3 6

## WELL-MAYDE COILS.

## "ALL WAVE."

These are the coils chosen for our famous MENTIVAVE SETS, fully described in an earlier part of the catalogue.

A full set of coils comprises the PRIMARY, mounted on a Formica base, and capable of adjustment. The base is fitted with four sockets, into which interchangeable coils can be plugged. The PRIMARY COIL, being adjustable, suits all the other coils.

The four interchangeable coils cover a wave length range from about 25-650 metres, when used with good quality apparatus, including particularly a first-class .00025 condenser. The regenerative condenser (not necessarily of best grade) should be .0005. The tickler coil is matched in each case, and wound close to the secondary.

Banana plugs and sockets are used throughout, as these make smooth but perfect contact, without sticking.

## WELL-MAYDE COILS.

Showing PRIMARY COIL and BASE, with TWO EXTRA INTER-CHANGEABLE COILS.

## PRIMARY COIL, with Base.

C331 Each	11	0
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## INTERCHANGEABLE COILS.

C426 A, range 240-450	7	0
C427 B, range 103-283	7	0
C428 C, range 18-132	7	0
C429 D, range 23-60	7	0

## FULL SET—"ALL WAVE."

This comprises No. C331, with four coils, B, C, D, and MENTIVAVE KIT SET INSTRUCTIONS and DIAGRAMS.



C460	1 16	0
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## WELL-MAYDE "SHORT WAVE" COILS.

In connection these are similar to the "ALL-WAVE" COILS, but they are designed to work with a double spaced condenser of .0001 capacity. It is only by securing a condenser of very low minimum capacitance that the range can be brought really low.

## PRIMARY COIL, with Base.

C331 Each	11	0
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## INTERCHANGEABLE COILS.

C430 range 55-97	7	0
C431 K, range 34-60	7	0
C432 L, range 23-35	7	0
C433 M, range 15-25	7	0

## FULL SET, "SHORT WAVE."

Comprising C331, with four coils J, K, L, M, with MENTIVAVE KIT SET INSTRUCTIONS and DIAGRAMS.

C431	1 16	0
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THESE SHORT WAVE COILS are those actually used by the oldest Radio transmitters in Auckland, and are of the HARMER type (see index) they form the main part of the receiver we recommend.

## WELL-MAYDE "WORLD" S-G COILS.

As used in the "WORLD" screened grid kit set. Two coil bases are fitted in the set, and the coils can be plugged into these, a pair of coils being required at one time. Actually designed for use with De Jur 5000 set, but suitable for other good condensers.

C519 Coil bases	pair	6 0
C520 Broadcast coils	pair	14 0
C521 Short wave coils, 30-36	pair	14 0
C522 Short wave coils, 15-50	pair	14 0
C523 complete set 3 pair coils	pair	45 0



## COILS.

## ACE COIL.

The range of this coil is approximately 200-600 metres, with .00035 condenser. It consists of a bakelized tube, wound with primary, secondary, and tickler, all correctly spaced. Brackets are fitted for baseboard mounting.

The circuit employs a condenser for regeneration control this principle being widely used. ACE SETS, as well as many New Zealand RADIO circuits, are of this type.



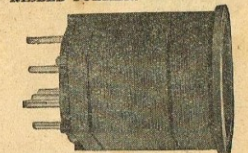
Full instructions for assembling ACE KIT SET included with each coil. C434

C434	10	0
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## COIL FORMS—

TUNWELL FORMERS are moulded from bakelite, the pins being also moulded accurately in place. They are ribbed, and the amount of bakelite is the least possible consistent with strength. Standard English six pin moulding.

## RIBBED FORMER.



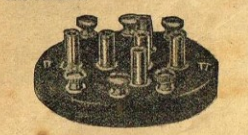
C499 Ribbed former	2	0
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See R.F. TRANSFORMERS also—they are used instead of coils for modern circuits employing 224 valves.



## COIL BASE.

Six pin coil bases, moulded from bakelite, to fit the TUNEWELL FORMERS, or any standard English coil formers.



C501 . . . . . 2 6

## R.F. CHOKES.

## HAMMARLUND R.F. CHOKES.

The Hammarlund chokes are enclosed in beautiful bakelite cases, instructional diagrams being included. They carry 60 millihenries, have a very low capacity, while the effective resistance is such as to eliminate resonance bands.

## HAMMARLUND 85.

85 millihenries, capacity 3 mfd., resistance 240 ohms.

C143 Each 10 0

## HAMMARLUND 250.

250 millihenries, capacity 2 mfd., resistance 240 ohms.

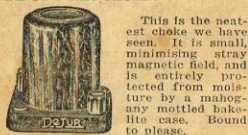
C344 Each . . . . . 11 6

## WELL-MAYDE R.F. CHOKES.

Carefully designed and accurately constructed to suit both regenerative and screened grid sets. Very efficient. Completely with bakelite base, and plated clips.

C419 Each . . . . . 5 0

## DE JUR R.F. CHOKES.



C462 De Jur R.F. choke . . . 6 3

## HONEYCOMB COILS.

Honeycomb coils, in various sizes from 38. to 78. 6d., make excellent chokes, while lengths of WELL-MAYDE COIL, 11 inch diameter will also suit splendidly. These could be readily adjusted to exact requirements.

## POLARISED R.F. CHOKES.

Used in high gain screened grid circuits. Thoroughly shielded, minimum external field, permitting close mounting and compactness. Undesirable feed back or instability avoided.

Low distributed capacity, and no natural resonance over the whole broadcast range

C557 W-M polarised choke . . . 7 6

## R.F. CHOKES FORMER.

Moulded with grooves and slots. Easily mounted. Enables first class chokes to be readily made at low cost.



C570 Choke formers . . . . . 1 6

## CHOKE COILS.

Well-Mayde chokes are ruggedly built to stand continuous full loads. The finish is the same as in Well-Mayde transformers, and you should read remarks on construction under that heading. W-M stands for quality. Note particularly the low resistance.

- CHOKES built to order, on receipt of:
1. Milliamper or amp. to be carried.
  2. Inductance in henries.
  3. Purpose for which choke is required.



## WELL-MAYDE CHOKES A3.

A low resistance choke, for use with the type A3 charger (or the A3 rectifier and transformer) and an electrolytic condenser, to make an "A" eliminator, with output of 6 volts 1 amp. maximum, for the valves. Could also be used with the type A4 1 amp. charger, giving 6 volts 5 amp. for the valves.

C507 W-M choke A3 . . . 1 10 0

## WELL-MAYDE CHOKES A4.

Similar to the A3, for 2 amp. output.

C550 W-M choke A4 . . . . . 40 0

## WELL-MAYDE DUPLEX CHOKES.

Consists of two filter chokes in one unit so joined as to give better filtering than two separate chokes. Current 60 milliamper. D.C. resistance per section 400 ohms.

C549 W-M duplex choke . . . 40 0

## 30 HENRY, 50 MILLIAMPER (H.T.A.).

Suitable for small eliminators and power packs. Used in H.T.3 and H.T.4 eliminator kits.

C548 W-M 30h. 50ma. choke 27 0

## 30 HENRY, 125 MILLIAMPER (H.T.1).

General purpose choke of generous dimensions, designed for modern power packs. Used in H.T.1 eliminator kit. D.C. resistance 210 ohms.

C508 W-M 30h. 125ma. choke 33 0

## 30 HENRY 300 MILLIAMPER.

Special attention to insulation in this choke makes it very suitable for transmitters and heavy duty speech amplifiers. D.C. resistance 155 ohms.

C102 W-M 30h. 300ma. choke 65 0

## 30 HENRY, 500 MILLIAMPER.

An extra large choke for broadcast transmitters, etc., where the voltage from choke to earth does not exceed 3000 volts. Very conservatively rated. D.C. resistance 100 ohms.

C103 W-M 30h. 500ma. choke E8 10 0

## CONDENSERS.



Hammarlund condensers, although expensive, have the highest quality materials in U.S.A. They reduce hum, yet occupy less than any 32 volt house lighting set, as well, of course, as from 110 or 230 volt installations.

The condenser is then attached to the chassis in much the same way as a valve is put in its holder. The 2 mfd. is only 1 1/2 inch diam. by 1 1/2 inch high.

The peak load (working) of higher voltages, condensers may be used in series. They can, for instance, be used on transmitters up to 4000 volts.

C558 8 mfd. . . . . 12 0  
C559 Dual 8 mfd. . . . . 25 0  
C558 Dual 8 and 16 mfd. . . . . 25 0  
C559 12 mfd. . . . . 16 0

T.C.C. ELECTROLYTIC.

Electrolytic condensers to-day have about the test of time. In a small space undreamt of a few years ago, they have a capacity of thousands of microfarads.

These condensers are used chiefly for making "A" eliminators, and also for eliminating hum in A.C. dynamos with low resistance fields.

Care must be taken to see that they are not used on a voltage over 12 maximum, and that they are connected right way round.

Otherwise they will be spoiled.

KATO KONVERTERS are recommended with every confidence.

The T.C.C. is oblong, the Magnafarad being small, round, in aluminium case.

C514 2000mf. T.C.C. . . . . 11 0 0  
C512 400mf. T.C.C. . . . . 1 15 0  
C551 3000mf. Magnafarad . . . 1 5 0

WELL-MAYDE CHOKES, J. K. L. M., are specially made to match this condenser.

C242 . . . . . 1 5 0

## ELECTROLYTIC CONDENSERS.

The capacity in microfarads of a condenser depends on three things: the size of plates used, the closeness of the plates, and the material between the plates.

Of recent years, electrolytic condensers have been developed in which the main object has been to separate the plates, or the equivalent, by a very thin film caused by electrolytic means.

The result is a very thin film that the capacity of the condenser is increased enormously.

In a condenser like the SPRAGUE, should the film break down—an unlikely contingency—it heals itself with a few hours' rest!

That these condensers are reliable is proved by their wholesale acceptance by the highest quality manufacturers in U.S.A. They reduce hum, yet occupy less than any 32 volt house lighting set, as well, of course, as from 110 or 230 volt installations.

The condenser is then attached to the chassis in much the same way as a valve is put in its holder. The 2 mfd. is only 1 1/2 inch diam. by 1 1/2 inch high.

The peak load (working) of higher voltages, condensers may be used in series. They can, for instance, be used on transmitters up to 4000 volts.

C558 8 mfd. . . . . 12 0  
C559 Dual 8 mfd. . . . . 25 0  
C558 Dual 8 and 16 mfd. . . . . 25 0  
C559 12 mfd. . . . . 16 0

## T.C.C. ELECTROLYTIC.

Electrolytic condensers to-day have about the test of time. In a small space undreamt of a few years ago, they have a capacity of thousands of microfarads.

These condensers are used chiefly for making "A" eliminators, and also for eliminating hum in A.C. dynamos with low resistance fields.

Care must be taken to see that they are not used on a voltage over 12 maximum, and that they are connected right way round.

Otherwise they will be spoiled.

KATO KONVERTERS are recommended with every confidence.

The T.C.C. is oblong, the Magnafarad being small, round, in aluminium case.

C514 2000mf. T.C.C. . . . . 11 0 0  
C512 400mf. T.C.C. . . . . 1 15 0  
C551 3000mf. Magnafarad . . . 1 5 0

WELL-MAYDE CHOKES, J. K. L. M., are specially made to match this condenser.

C242 . . . . . 1 5 0

## CONVERTERS (ROTARY).

## FOR RADIO, NEON SIGNS, ETC.

Fortunately, only in a few places in New Zealand is direct current supplied. In these places, however, Radio presents difficulties, which some prefer to surmount by installing a converter, which changes D.C. to A.C.

The converter consists really of an electric motor, combined with a generator. It is the only efficient method of changing D.C. to A.C.

Neon signs require A.C. to operate them, and converters must be used for this purpose.

Converters may be used with an electric transformer without any filter system. But for Radio use, a filter system must be included, since otherwise a loud hum will develop in the speaker. It is advisable even then to keep the converter a little distance away from the Radio set.

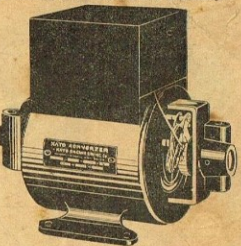
## KATO KONVERTERS.

KATO KONVERTERS can be supplied to work from any 22 volt house lighting set, as well, of course, as from 110 or 230 volt installations.

They are connected to the mains, just as used on the power mains, to be operated from the private house lighting system.

Not only can we supply both set and converter but we are always able to give expert advice on suitable combinations.

The KATO 157 watt converter, used in conjunction with a LOFTIN-WHITE DUAL 250 AMPER and five motor car accumulators, furnishes an extremely powerful outfit, which, while not so portable as magnetos "B" outfits, can, nevertheless, be transported with little difficulty.



We understand the KATO KONVERTER has been adopted in U.S.A. by such well-known manufacturers as DELCO and PHILCO for use with their electric plants.

KATO KONVERTERS are made in 50, 117, 157, 200, 350 and 500 watt sizes. Input current can be 32, 110 or 230 volts. Output is 110 or 230 volt, 50-60 cycle (suitable for use anywhere in New Zealand).

C572 157 watts, with filter 225 0 0  
C574 157 watts, no filter 21 0 0  
C575 350 watts, with filter 33 0 0  
Other sizes on application.

## M-L MAGNETO CONVERTERS.

These are British made by the manufacturers of the magnetos "B"—see index.

They are very economical, partly because permanent magnet fields are used, and partly because of the precision of manufacture.

They are wound for 12, 32, 50, 100 or 230 volt input, and have an output of 230 volts 50 cycles A.C.

The WIRELESS WORLD (England) tested these machines, and reported consumption at 200 volt input, on a load of about 80 watts, as 8 amps. This would correspond on 12 volts to 1.4 amps., and on 32 volts to .5 amp. With filter, there was no interference with the Radio set.

## M-L 40 WATT CONVERTER.

For small three or four valve electric sets.

C555 With filter . . . . . 18 0 0

## M-L 85 WATT CONVERTER.

For electric sets up to six or seven valves.

C556 With filter . . . . . 22 10 0

## CRYSTALS.

RED DIAMOND (PERMANENT). The RED DIAMOND is made from selected materials throughout, the crystal being sensitive practically all over. It can, however, be adjusted if found necessary.



C526 Red Diamond permanent 2 6

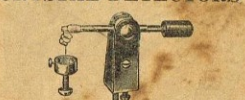
## HERTZITE-RUSSELL'S.

Although there are very many "brands" of crystals on the market, most of them are merely galena, either in its natural state or treated chemically to make it more sensitive. HERTZITE is a treated galena, and takes its place as the best known crystal in the world.



C529 HERTZITE-BLUE . . . . . 1 0

## CRYSTAL DETECTORS

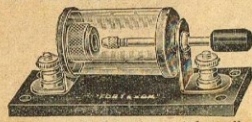


A well made set of parts for making your own detector. Screws, also steel cup, 600 H. 1/2 inch—If so, Nickel wire will get hot, and possible burn out.

C400 . . . . .



## ACE DETECTORS.



It is supplied in three styles, all glass enclosed, as follows:

C446 MOUNTED, with crystal	2 0
C182 " " without crystal	2 0
C181 PARTS, on card	2 0

## DIALS.



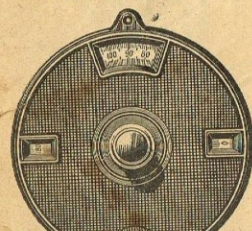
The illustration hardly does justice to this handsome dial. Ratio of vernier movement 14:1. Easily fitted, and adjustable to read right or left hand. Highly finished bakelite. Simple, yet very reliable.

The walnut dial is wonderfully beautiful, and matches Formica walnut panel perfectly.

D124 4in. black	6 6
D135 4in. walnut	6 6
D136 3in. black	5 4
D137 3in. walnut	6 0

## ACE VERNIER.

Artistically designed Vernier dial at a price well within the means of any set builder. It has a high ratio, which ensures easy tuning. It is made to read in either direction. The friction drive is sure. Black only. Scale 100-0-100.



MAY also suit splendidly. These readily adjusted to exact requirements.

## POSITIF DIAL.

Diameter of scale 3 1/2 in. knob and dial centres 2 1/2 in. apart. T.H. drive, by flat metal belt, is very smooth and positive. This dial will drive the modern multiple condensers, as used in the largest Radios. Pilot light fitted if desired. Knob and D165 escutcheon included. For 4in. or 3 1/2 in. shaft.

D162 POSITIF DIAL	10 0
D163 POSITIF DIAL, illuminated	13 6

## SIMPLEX DIAL.

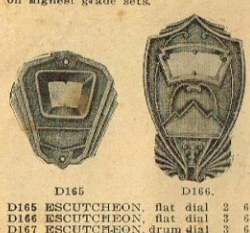
The kind used on midget sets. Diam. 3 1/2 in. It fits on the shaft of the condenser, and includes escutcheon D165 and knob.



D164 SIMPLEX DIAL	6 0
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## ESCUTCHEONS.

Beautiful bronze finished, as used on highest grade sets.



D165 ESCUTCHEON, flat dial	2 6
D166 ESCUTCHEON, flat dial	3 6
D167 ESCUTCHEON, drum dial	3 6

## PILOT ILLUMINATED DIAL.

Complete with small light.

D154 Pilot dial	11 3
D155 Pilot dial, less light	11 6

## MMCO VERNIER.

A standard bakelite dial, made in either black or mahogany. State whether wanted with dial marked on left (anti) or on right (clockwise).

D137 Black bakelite: each	6 6
D138 Mahogany	6 6
D144 MMCO VELMO DIAL 5	6 0
D146 MMCO BARY VELMO 4	6 0

## HAMMARLUND SINGLE DRUM.

An illuminated drum dial, turned by a single knob, arranged so that the latter can be placed in any position on the panel. The scale is translucent, illuminated by a small electric light placed behind it. The bronze escutcheon plate, embossed and oxidized, gives an air of distinction to any Radio set. The driving mechanism has absolutely no backlash, and simply cannot slip. Can be supplied with black or walnut knob. Escutcheon as with D163.



D147 Hammarlund single drum dial	19 6
----------------------------------	------

## DRUM DIALS.

Drum dial, although popular, have hitherto been rather expensive. The Remler was secured at a very low price, and is offered to our customers at a great saving. For 4in. shaft.

It is complete with escutcheon plate, knob and dial light.

D168 Remler drum dial	14 6
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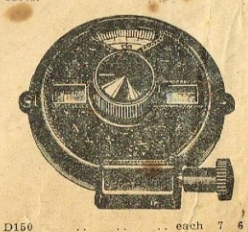
## HIGH RATIO DIALS.

For SHORT WAVE SETS, it is highly desirable to have a dial with a high ratio, as the tuning must be done very exactly. Yet it is also desirable to be able to turn the knob with approximate positiveness.

Both these features are secured in the dials offered.

## PRECISE.

A small dial with worm gearing. Small knob can be instantly moved to leave the dial free to turn exactly as an ordinary dial. Ratio about 235:1.



## DUPLEX.

A large size dial, ratio about 160:1. Worm and bevel gear, instantly disconnected by tilting knob.



D151	each 9 0
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## K-K BAKELITE (ORDINARY).

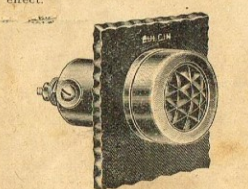
The finest dials procurable. Beautifully moulded and accurately made.



D164 4in.	3 0
D115 Black, moulded, 4in.	1 2
D163 Black, 3in. rheostat	1 0
Magnus, 3 inch	9d.
Herules, 2 1/2 inch	6d.
Herules, 2 inch rheostat	6d.

## PANEL OR DIAL LIGHTS.

Special signal lights, showing whether current is turned on or off. Especially suitable for auto, electric gramophones, etc. Uses a .06 bulb, so there is little current waste. Ruby glass cut to give sparkling effect.



D169 PANEL LIGHT	4 6
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## DIAL MARKERS.

Nickel plated pointers, fitted with screw.

D112	6d.
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## PILOT DIAL LIGHTS.

Red jewelled, without bulb, but any flashlight bulb can be used.

D158 Dial light	2 5
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## DYNAMOS.

There are many places in New Zealand where an engine is available for driving a dynamo, or where water power is easily harnessed. Most farmers, for instance, who use milking engines, can drive a dynamo while the engine is running for milking, and thus generate electricity AT PRACTICALLY NO COST.

This current can be used for charging batteries in the shed, or, if the house is not too far away, two wires can be run to the house, and the batteries charged there, without the trouble of removing them. The dynamo must be chosen to suit.

A small dynamo will charge the "A" battery quite easily, and also give enough current to run small casual lights in the house.

A larger dynamo, with a few motor car accumulators in the house could amply current to light the house, and also to charge BOTH "A" and "B" ACCUMULATORS for your wireless set. There is then no need to worry in the slightest about current consumption of the set, and powerful valves and speaker can be used.

Actually, the cost of such an installation would be saved in a few years by entirely cutting out the cost of dry batteries for your Radio. And in addition, the benefits of electric light are secured.

Advice on such installation can be furnished—tell us the revolutions per minute of your engine, the diameter of the large flywheel, and the distance from the shed to your house.

## SIMPLICITY.

You already have an accumulator and dynamo in your car. Do they give you any trouble? There is practically no more knowledge needed to run a plant like the above.



## ENGLISH MAKES.

Stocks held to-day are—

Volts	Amps.	Rev.	Pulleys	Price
12	8	2500	V3in.	4 15 0
20	15	1500	V3in.	6 15 0
20	15	1500	R2 1/2	10 0 0
50	8	2500	R2 1/2	13 10 0
100	30	1250	Flat 4	20 0 0
100	1 1/2	2500	R2 1/2	6 0 0
100	3 5	2400	R2 1/2	7 10 0
180	25			5 0 0

Pulleys, where fitted are for small round belt (R), or for motor cycle V type (V). Sizes are diameters.

## VOLTAGE.

The voltage generated by a dynamo depends entirely on the speed. A 12 volt dynamo, if driven fast enough, and would stand the strain, would generate 20 volts. If driven slower, it would generate anything up to 12 volts with perfect safety.

In the above generators, therefore, the voltage given may be taken as the maximum, and ANY VOLTAGE up to that figure obtained merely by reducing speed. If the amps. were slightly reduced, the voltage could be increased to a certain extent.

The amps. drawn from a dynamo should not be much exceeded—if so, the dynamo will get hot, and possibly burn out.

A very powerful Radio gramophone, a magneto "B" supply to run from the large accumulators would enable you to do without "B" batteries entirely.

## WATER POWER.

We receive large numbers of questions on water power. For convenient harnessing, there must be a fall of water over at least five or six feet, or a small fall over a much higher distance. In the former case, a wooden wheel with buckets is usual, and in the latter a turbine or water wheel.

Horse power derived from water is calculated by dividing 3300 by the product of the number of gallons flowing per minute and the number of feet the water falls. Thus, 100 gallons per minute falling vertically 33 feet produces one horse-power. In small plants, probably half of this would be wasted in the wheel.

## WIND POWER.

We are carrying out tests to ascertain if a satisfactory wind-driven dynamo can be constructed at reasonable cost. You are invited to write for results. Such plants should cost about £16 to £25, but if successful would prove a tremendous boon to those who have no engines or water power.

## DYNAMOS.

There is a difficulty in obtaining supplies of good dynamos at competitive prices. By keeping a close watch on the markets, however, and particularly on the disposal stocks of Government departments in England, we are generally able to offer first-class dynamos at very attractive prices. In some cases these are entirely new and unused. In other cases they have been used, but all are guaranteed in perfect condition.

As an example of value, the Crompton dynamo listed below actually cost the Government in England over £20. It is a particularly fine job, and obviously as good as new.

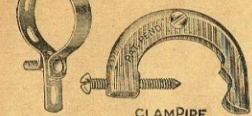


## EARTH CLAMPS.

For connecting earth wires from the Radio set to the water pipe.

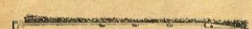
## CLAMPIPE.

A sure and quick grip on your water pipe. Three points "dig into" the pipe to make clean contact.



C227

C227 ClamPipe . . . each 1 0  
Lighter clamp, also adjustable  
C237 Light clamp, adjustable . . . 1d



E225 Earth pipes

## EBONITE

**PANELS.**  
Ebonite for panels has been entirely superseded by Exelon and Formica.

**TUBES.**  
Inside diameter or bore is given, the wall being 1/16 in. thick in every case.

Bore 1/16 5/16 3/8 1/2 5/8 3/4  
Per ft. 1/10 1/10 1/7 1/3 1/8 1/9 2/1

**ROD.**  
Diam 1/16 5/16 3/8 1/2 5/8 3/4  
Per ft. 1/4 1/4 1/4 1/4 1/4 1/4 2/3

Larger tubes and rods are frequently available.

## SPEED TUBE.

Flared tube is used for low loss only. It is sold in six inch lengths only, the diameter given being the inside diameter over the ribs.

1 1/2 in. diam., 6 in. long . . . 3 0  
E137 1 1/2 in. diam., 6 in. long . . . 1 0

**ELIMINATORS.**

The "A," "B," and "C" batteries of a Radio may be replaced by eliminators, thus enabling all current to be drawn direct from the mains, without batteries at all.

Every A.C. (electric) Radio contains a "B" eliminator, though it is usually referred to as a power pack.

In an eliminator, a transformer first gives a suitable A.C. current, which is passed through a rectifier to change it to direct current. Condensers and chokes then "smooth"

the uneven D.C. current, and resistances control the output voltages. Westinghouse are easily the best rectifiers, and can be used in most cases. Though their first cost is higher, they are permanent. Valves are more common, simply because they are less costly.

If your Radio is now operating on batteries, and is giving good results, there is no need to discard it, for by the addition of suitable eliminators it will continue to give excellent service. This assumes, of course, that the eliminators chosen are really high grade.

In ordering an eliminator, be certain to tell us exactly what valves are being used in your set. The eliminator will then be matched to suit your particular set.

**WELL-MAYDE ELIMINATORS.**

We have already installed a large number of WELL-MAYDE ELIMINATORS, fitted with the famous Westinghouse rectifiers units, which are everlasting. Customers everywhere have expressed their huge delight with the results obtained. Operation is so smooth as to be indistinguishable from batteries at general rule, but a very marked increase in "pep" is noticeable.

In WELL-MAYDE ELIMINATORS there is nothing to wear out, so they last for years without renewals of any kind. Enormous saving of light with the results obtained. Operation is so smooth as to be indistinguishable from batteries at general rule, but a very marked increase in "pep" is noticeable.

Special eliminators can be built to order, and quotations will be gladly given on receipt of full particulars, which include number of valves used, and the type of valve in each stage.

**WELL-MAYDE "HALF AMP."**

Maximum output 6 volts, 1 amp. Suitable for four or five 1 amp. or eight 1/2 amp. valves, including the new Radiotron 231. Fitted with rheostat and voltmeter. Metal case. State voltage of valves to be used.

E167 . . . . . 8 5 0

**WELL-MAYDE "ONE AMP."**

Maximum output 6 volts 1 amp. Suitable for working several valves, and also for supplying a dynamic speaker with smooth current, thus eliminating hum. Fitted with voltmeter and rheostat. Metal case. State voltage of valves to be used.

E168 . . . . . 9 15 0

**WELL-MAYDE "TWO-AMP."**

Maximum output 6 volts 2 amps. Very powerful. Details as for one amp type.

E169 . . . . . 12 10 0

**"A" ELIMINATORS.**

**WELL-MAYDE "SOVEREIGN."**

Rectifier Output 180 volts, 100 mls. Suitable for powerful Radios and also for the Altona "B" and "C" equivalent in the last stage, push pull. One hundred mls is ample current for all requirements.

Tappings for detector, R.F., first audio.

Handsomely finished metal case. A little higher price and well worth it.

E166 . . . . . 13 0 0

**ALTONA ELIMINATORS.**

A sturdy "B" eliminator, using a 280 valve, same as in electric sets. Ample power over 200 volts at 60 mls. Just the thing for high power work, yet the price is very low indeed for an eliminator of WELL-MAYDE manufacture. Built included.

E253 Altona eliminator . . . . . 15 10 0

**"ABC" ELIMINATORS.**

**IN ORDERING ELIMINATORS STATE—**

(1) Make of set.

(2) Number and type of valves.

If you cannot use the combination of valves mentioned below, or valves similar in characteristics, we will be very glad to make "ABC" eliminators specially for you. Our advice on the matter is always freely available.

**"B" ELIMINATORS.**

"B" ELIMINATORS are used to replace "B" batteries on Radios, where A.C. current is available. They cost practically nothing at all for current, and if fitted with WEST-MAYDE RECTIFIERS, they should require no renewals of any sort. If they embody valves, these must be renewed from time to time.

When purchasing, always get a powerful eliminator. More and more power is being asked for every day, and the biggest eliminator of a couple of years ago, is comparatively weak to-day. This advice applies particularly where dynamic speakers, or combination sets, etc. are used, or likely to be used.

Short Wave Radios will probably not operate on eliminators, but the difficulty is surmounted by using a small 22 1/2 volt "B" battery for the detector valve only, deriving the anode current from the "B" eliminator.

**"A" SUPPLY.**

6 volts, 5 amps.

**"B" SUPPLY.**

150 volts, 50 mls, tapped for detector, R.F., and first audio.

**"C" SUPPLY.**

4-5 and 9 volts, or to suit. Suitable for screened grid Radios, at slight extra charge.

In handsome metal cabinet.

E174 Monarch "ABC" eliminator . . . . . 17 10 0

**PRESIDENT "ABC" ELIMINATOR.**

Similar in every way to the MONARCH, but with a 5 volt 1 amp. "A" supply. This gives far more latitude of choice for valves, owing to extra filament current, which is available, but if a suitable dynamic speaker is chosen, it may be worked on the "A" supply, and 5 volt 1 amp. valves. The Jensen six-volt dynamic speaker is an excellent choice, since it operates on only 4 amp., leaving 5 amp. available for the valve filaments.

E175 President "ABC" eliminator . . . . . 20 0 0

**ELIMINATOR KITS.**

Easily and quickly assembled and wired from circuits supplied. Westinghouse Booklet "All Metal" Free with each kit, containing Westinghouse unit.

All our kits are perfectly suited to Radio as used in New Zealand—repeated tests prove this.

**FOR DETAILS, SEE CORRESPONDING COMPLETE ELIMINATOR.**

**"A" ELIMINATOR KITS**

Details of outputs are the same as for the corresponding WELL-MAYDE "A" kits, and in ordering, please state if voltmeter is wanted, and also what voltage valves are to be used, so that the correct rheostat can be sent. The voltmeter is advisable, but in many cases the rheostats on the set itself will do, provided the meter is wired up to the filament terminals of the valve holders.

(METERS EXTRA).

**6 VOLT, 5 AMP., "A" KIT (E170).**

Well-Mayde 1 amp. charger 2 15 0  
2000 m.f. electrolytic condenser . . . 1 0 0  
Well-Mayde A3 choke . . . 1 10 0  
Rheostat, baseboard, wire . . . 4 6

Meter extra . . . . . E5 9 0

## MONARCH "ABC" ELIMINATOR.

Designed normally for our Hammarlund-Roberts sets, using three 221 Radiotron valves, and one 112A; or for the Altona Neutrodyne, using four 221 Radiotrons, and one 112A; or for any other set in which similar combinations of valves can be used, such as Browning Drake, and any five valve Neutrodyne.

Do not attempt to use the eliminators with valves whose total filament consumption is more than 5 amps.

**"A" SUPPLY.**

6 volts, 5 amps.

**"B" SUPPLY.**

150 volts, 50 mls, tapped for detector, R.F., and first audio.

**"C" SUPPLY.**

4-5 and 9 volts, or to suit. Suitable for screened grid Radios, at slight extra charge.

In handsome metal cabinet.

E174 Monarch "ABC" eliminator . . . . . 17 10 0

**PRESIDENT "ABC" ELIMINATOR.**

Similar in every way to the MONARCH, but with a 5 volt 1 amp. "A" supply. This gives far more latitude of choice for valves, owing to extra filament current, which is available, but if a suitable dynamic speaker is chosen, it may be worked on the "A" supply, and 5 volt 1 amp. valves. The Jensen six-volt dynamic speaker is an excellent choice, since it operates on only 4 amp., leaving 5 amp. available for the valve filaments.

E175 President "ABC" eliminator . . . . . 20 0 0

**ELIMINATOR KITS.**

Easily and quickly assembled and wired from circuits supplied. Westinghouse Booklet "All Metal" Free with each kit, containing Westinghouse unit.

All our kits are perfectly suited to Radio as used in New Zealand—repeated tests prove this.

**FOR DETAILS, SEE CORRESPONDING COMPLETE ELIMINATOR.**

**"A" ELIMINATOR KITS**

Details of outputs are the same as for the corresponding WELL-MAYDE "A" kits, and in ordering, please state if voltmeter is wanted, and also what voltage valves are to be used, so that the correct rheostat can be sent. The voltmeter is advisable, but in many cases the rheostats on the set itself will do, provided the meter is wired up to the filament terminals of the valve holders.

(METERS EXTRA).

**6 VOLT, 5 AMP., "A" KIT (E170).**

Well-Mayde 1 amp. charger 2 15 0  
2000 m.f. electrolytic condenser . . . 1 0 0  
Well-Mayde A3 choke . . . 1 10 0  
Rheostat, baseboard, wire . . . 4 6

Meter extra . . . . . E5 9 0

## 6 VOLT, 1 AMP., "A" KIT (E171).

As above, but supplying 6 volts at 1 amp, thus being suitable for up to 10.1 amp 6 volt valves.

Well-Mayde A3 transformer 1 10 0  
Westinghouse A3 rectifier . . . 1 8 0  
Two 2000 m.f. condensers . . . 2 0 0  
Well-Mayde A3 choke . . . 1 10 0  
Rheostat, baseboard, wire . . . 4 6

Meter extra . . . . . E6 12 6

**6 VOLT, 2 AMP., "A" KIT (E172).**

Well-Mayde A4 transformer 2 6 0  
Westinghouse A4 rectifier . . . 2 8 0  
Two 2000 m.f. condensers . . . 2 0 0  
Well-Mayde A4 choke . . . 2 0 0  
Rheostat, baseboard, etc. . . 7 0

Meter extra . . . . . E8 15 0

**METERS.**—Although not essential, it is advisable to fit these. A cheap one can be supplied at 3/6, and a Creescent moving coil (recommended) at 30/-. Details are same as for E173, except that a special transformer and choke combined is used, costing 75s., rectifier valve 280 and base costing 18s., and extra resistance.

E237 280 "B" and "C" kit, with valve . . . . . E16 16 6

**"B" ELIMINATOR KITS**

**H.T.3 (E176).**

Output 120 volts, 30 mls. Suitable for Muller Radio, but it would probably be better to choose the next larger size, which costs little more, but is far more powerful. Nevertheless, on Radios up to three valves, this eliminator will give ample output.

Well-Mayde transformer HT4 . . . . . 1 10 0  
Rectifier HT3 . . . . . 1 8 0  
Well-Mayde choke HT4 . . . 1 7 0  
2 Hydra 4 m.f. 500 volt condensers . . . 15 0  
3 Hydra 2 m.f. 500 volt condensers . . . 12 0  
Well-Mayde resistance, mounted . . . 13 6  
Baseboard, wire, terminals, etc. . . 3 0  
E176 . . . . . E6 8 6

**H.T.4 (E177).**

Output 150 volts, 50 mls. Quite a powerful eliminator, especially as it can be relied on to be working at full strength. Through the peculiar circuit used, a transformer giving only 135 volts enables a considerably higher output voltage to be obtained.

It is easy to adapt this to give "C" supply as well.

Well-Mayde transformer HT4 . . . . . 1 10 0  
Rectifier HT4 . . . . . 2 8 0  
Well-Mayde choke HT4 . . . 1 7 0  
2 Hydra 4 m.f. 500 volt condensers . . . 1 2 6  
3 Hydra 2 m.f. 500 volt condensers . . . 12 0  
Well-Mayde resistance, mounted . . . 13 6  
Baseboard, wire, terminals, etc. . . 3 0  
E177 . . . . . E7 16 0

**Guaranteed POWER PACKS.**

Any size built to order.

## H.T.1 (E178).

Output 180 volts, 100 mls. Very powerful, and suitable for two 171A valves in push pull in final stage. These give ample undistorted volume for any house, or for a small hall.

Well-Mayde transformer HT1 . . . . . 1 15 0  
Rectifier HT1 . . . . . 4 10 0  
Well-Mayde choke HT1 . . . 1 13 6  
2 Hydra 4 m.f. 750 volt condensers . . . 16 0  
3 Hydra 2 m.f. 500 volt condensers . . . 12 0  
Well-Mayde resistance, mounted . . . 13 6  
Baseboard, wire, terminals, etc. . . 3 0  
E178 . . . . . E10 1 6

**280 VALVE KIT "B" AND "C."**

Very powerful eliminator at very reasonable price. Output 230 volts 60 mls, allowing for full 180 volts "B" supply and 40 volts "C". Details are same as for E173, except that a special transformer and choke combined is used, costing 75s., rectifier valve 280 and base costing 18s., and extra resistance.

E237 280 "B" and "C" kit, with valve . . . . . E16 16 6

**"ABC" KITS.**

Details of these are hardly necessary, as they combine the apparatus used in the "B" and "C" kits, with the addition of one or two extra resistance strips for the "C" supply. Circuit diagram supplied, which can be readily followed.

**RAYTHEON B.H. VALVES.**

Most eliminators use this type. It is a heavy duty tube, rectified output being up to 300 volts, 125 milliamperes.

**EXELON**

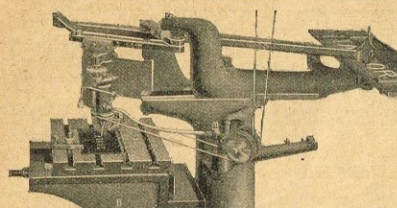
Exelon is a bakelite material, similar to Formica, but not such a good insulator. It is, however, superior to the usual bakelite sheets sold.

It is very highly polished, and can be used in black or walnut grain.

Any size panel can be cut, but 3d. extra is added for panels below 2 1/2" thick.

3/4" 3/16" 1 1/2" 1 3/4" 2 1/4" 2 3/4" 3 1/4" 3 3/4" 4 1/4" 4 3/4" 5 1/4" 5 3/4" 6 1/4" 6 3/4" 7 1/4" 7 3/4" 8 1/4" 8 3/4" 9 1/4" 9 3/4" 10 1/4" 10 3/4" 11 1/4" 11 3/4" 12 1/4" 12 3/4" 13 1/4" 13 3/4" 14 1/4" 14 3/4" 15 1/4" 15 3/4" 16 1/4" 16 3/4" 17 1/4" 17 3/4" 18 1/4" 18 3/4" 19 1/4" 19 3/4" 20 1/4" 20 3/4" 21 1/4" 21 3/4" 22 1/4" 22 3/4" 23 1/4" 23 3/4" 24 1/4" 24 3/4" 25 1/4" 25 3/4" 26 1/4" 26 3/4" 27 1/4" 27 3/4" 28 1/4" 28 3/4" 29 1/4" 29 3/4" 30 1/4" 30 3/4" 31 1/4" 31 3/4" 32 1/4" 32 3/4" 33 1/4" 33 3/4" 34 1/4" 34 3/4" 35 1/4" 35 3/4" 36 1/4" 36 3/4" 37 1/4" 37 3/4" 38 1/4" 38 3/4" 39 1/4" 39 3/4" 40 1/4" 40 3/4" 41 1/4" 41 3/4" 42 1/4" 42 3/4" 43 1/4" 43 3/4" 44 1/4" 44 3/4" 45 1/4" 45 3/4" 46 1/4" 46 3/4" 47 1/4" 47 3/4" 48 1/4" 48 3/4" 49 1/4" 49 3/4" 50 1/4" 50 3/4" 51 1/4" 51 3/4" 52 1/4" 52 3/4" 53 1/4" 53 3/4" 54 1/4" 54 3/4" 55 1/4" 55 3/4" 56 1/4" 56 3/4" 57 1/4" 57 3/4" 58 1/4" 58 3/4" 59 1/4" 59 3/4" 60 1/4" 60 3/4" 61 1/4" 61 3/4" 62 1/4" 62 3/4" 63 1/4" 63 3/4" 64 1/4" 64 3/4" 65 1/4" 65 3/4" 66 1/4" 66 3/4" 67 1/4" 67 3/4" 68 1/4" 68 3/4" 69 1/4" 69 3/4" 70 1/4" 70 3/4" 71 1/4" 71 3/4" 72 1/4" 72 3/4" 73 1/4" 73 3/4" 74 1/4" 74 3/4" 75 1/4" 75 3/4" 76 1/4" 76 3/4" 77 1/4" 77 3/4" 78 1/4" 78 3/4" 79 1/4" 79 3/4" 80 1/4" 80 3/4" 81 1/4" 81 3/4" 82 1/4" 82 3/4" 83 1/4" 83 3/4" 84 1/4" 84 3/4" 85 1/4" 85 3/4" 86 1/4" 86 3/4" 87 1/4" 87 3/4" 88 1/4" 88 3/4" 89 1/4" 89 3/4" 90 1/4" 90 3/4" 91 1/4" 91 3/4" 92 1/4" 92 3/4" 93 1/4" 93 3/4" 94 1/4" 94 3/4" 95 1/4" 95 3/4" 96 1/4" 96 3/4" 97 1/4" 97 3/4" 98 1/4" 98 3/4" 99 1/4" 99 3/4" 100 1/4" 100 3/4" 101 1/4" 101 3/4" 102 1/4" 102 3/4" 103 1/4" 103 3/4" 104 1/4" 104 3/4" 105 1/4" 105 3/4" 106 1/4" 106 3/4" 107 1/4" 107 3/4" 108 1/4" 108 3/4" 109 1/4" 109 3/4" 110 1/4" 110 3/4" 111 1/4" 111 3/4" 112 1/4" 112 3/4" 113 1/4" 113 3/4" 114 1/4" 114 3/4" 115 1/4" 115 3/4" 116 1/4" 116 3/4" 117 1/4" 117 3/4" 118 1/4" 118 3/4" 119 1/4" 119 3/4" 120 1/4" 120 3/4" 121 1/4" 121 3/4" 122 1/4" 122 3/4" 123 1/4" 123 3/4" 124 1/4" 124 3/4" 125 1/4" 125 3/4" 126 1/4" 126 3/4" 127 1/4" 127 3/4" 128 1/4" 128 3/4" 129 1/4" 129 3/4" 130 1/4" 130 3/4" 131 1/4" 131 3/4" 132 1/4" 132 3/4" 133 1/4" 133 3/4" 134 1/4" 134 3/4" 135 1/4" 135 3/4" 136 1/4" 136 3/4" 137 1/4" 137 3/4" 138 1/4" 138 3/4" 139 1/4" 139 3/4" 140 1/4" 140 3/4" 141 1/4" 141 3/4" 142 1/4" 142 3/4" 143 1/4" 143 3/4" 144 1/4" 144 3/4" 145 1/4" 145 3/4" 146 1/4" 146 3/4" 147 1/4" 147 3/4" 148 1/4" 148 3/4" 149 1/4" 149 3/4" 150 1/4" 150 3/4" 151 1/4" 151 3/4" 152 1/4" 152 3/4" 153 1/4" 153 3/4" 154 1/4" 154 3/4" 155 1/4" 155 3/4" 156 1/4" 156 3/4" 157 1/4" 157 3/4" 158 1/4" 158 3/4" 159 1/4" 159 3/4" 160 1/4" 160 3/4" 161 1/4" 161 3/4" 162 1/4" 162 3/4" 163 1/4" 163 3/4" 164 1/4" 164 3/4" 165 1/4" 165 3/4" 166 1/4" 166 3/4" 167 1/4" 167 3/4" 168 1/4" 168 3/4" 169 1/4" 169 3/4" 170 1/4" 170 3/4" 171 1/4" 171 3/4" 172 1/4" 172 3/4" 173 1/4" 173 3/4" 174 1/4" 174 3/4" 175 1/4" 175 3/4" 176 1/4" 176 3/4" 177 1/4" 177 3/4" 178 1/4" 178 3/4" 179 1/4" 179 3/4" 180 1/4" 180 3/4" 181 1/4" 181 3/4" 182 1/4" 182 3/4" 183 1/4" 183 3/4" 184 1/4" 184 3/4" 185 1/4" 185 3/4" 186 1/4" 186 3/4" 187 1/4" 187 3/4" 188 1/4" 188 3/4" 189 1/4" 189 3/4" 190 1/4" 190 3/4" 191 1/4" 191 3/4" 192 1/4" 192 3/4" 193 1/4" 193 3/4" 194 1/4" 194 3/4" 195 1/4" 195 3





ENGRAVING MACHINE.

## ERINOID.

Erinoid is a comparatively new material, of peculiar interest to us in New Zealand, as it is a casain product. It is made in rods, in a large variety of beautiful colors.

It can be easily turned, cut, and polished. It is already used very widely in electrical work (small knobs, etc.). Unexcelled for special knobs.

Diam.  $\frac{3}{16}$   $\frac{1}{2}$   $\frac{3}{4}$   $1$   $1\frac{1}{2}$   $2$   $2\frac{1}{2}$   $3$   $4$   $5$   $6$   $8$   $10$   $12$   $14$   $16$   $18$   $20$   $22$   $24$   $26$   $28$   $30$   $32$   $34$   $36$   $38$   $40$   $42$   $44$   $46$   $48$   $50$   $52$   $54$   $56$   $58$   $60$   $62$   $64$   $66$   $68$   $70$   $72$   $74$   $76$   $78$   $80$   $82$   $84$   $86$   $88$   $90$   $92$   $94$   $96$   $98$   $100$   $102$   $104$   $106$   $108$   $110$   $112$   $114$   $116$   $118$   $120$   $122$   $124$   $126$   $128$   $130$   $132$   $134$   $136$   $138$   $140$   $142$   $144$   $146$   $148$   $150$   $152$   $154$   $156$   $158$   $160$   $162$   $164$   $166$   $168$   $170$   $172$   $174$   $176$   $178$   $180$   $182$   $184$   $186$   $188$   $190$   $192$   $194$   $196$   $198$   $200$   $202$   $204$   $206$   $208$   $210$   $212$   $214$   $216$   $218$   $220$   $222$   $224$   $226$   $228$   $230$   $232$   $234$   $236$   $238$   $240$   $242$   $244$   $246$   $248$   $250$   $252$   $254$   $256$   $258$   $260$   $262$   $264$   $266$   $268$   $270$   $272$   $274$   $276$   $278$   $280$   $282$   $284$   $286$   $288$   $290$   $292$   $294$   $296$   $298$   $300$   $302$   $304$   $306$   $308$   $310$   $312$   $314$   $316$   $318$   $320$   $322$   $324$   $326$   $328$   $330$   $332$   $334$   $336$   $338$   $340$   $342$   $344$   $346$   $348$   $350$   $352$   $354$   $356$   $358$   $360$   $362$   $364$   $366$   $368$   $370$   $372$   $374$   $376$   $378$   $380$   $382$   $384$   $386$   $388$   $390$   $392$   $394$   $396$   $398$   $400$   $402$   $404$   $406$   $408$   $410$   $412$   $414$   $416$   $418$   $420$   $422$   $424$   $426$   $428$   $430$   $432$   $434$   $436$   $438$   $440$   $442$   $444$   $446$   $448$   $450$   $452$   $454$   $456$   $458$   $460$   $462$   $464$   $466$   $468$   $470$   $472$   $474$   $476$   $478$   $480$   $482$   $484$   $486$   $488$   $490$   $492$   $494$   $496$   $498$   $500$   $502$   $504$   $506$   $508$   $510$   $512$   $514$   $516$   $518$   $520$   $522$   $524$   $526$   $528$   $530$   $532$   $534$   $536$   $538$   $540$   $542$   $544$   $546$   $548$   $550$   $552$   $554$   $556$   $558$   $560$   $562$   $564$   $566$   $568$   $570$   $572$   $574$   $576$   $578$   $580$   $582$   $584$   $586$   $588$   $590$   $592$   $594$   $596$   $598$   $600$   $602$   $604$   $606$   $608$   $610$   $612$   $614$   $616$   $618$   $620$   $622$   $624$   $626$   $628$   $630$   $632$   $634$   $636$   $638$   $640$   $642$   $644$   $646$   $648$   $650$   $652$   $654$   $656$   $658$   $660$   $662$   $664$   $666$   $668$   $670$   $672$   $674$   $676$   $678$   $680$   $682$   $684$   $686$   $688$   $690$   $692$   $694$   $696$   $698$   $700$   $702$   $704$   $706$   $708$   $710$   $712$   $714$   $716$   $718$   $720$   $722$   $724$   $726$   $728$   $730$   $732$   $734$   $736$   $738$   $740$   $742$   $744$   $746$   $748$   $750$   $752$   $754$   $756$   $758$   $760$   $762$   $764$   $766$   $768$   $770$   $772$   $774$   $776$   $778$   $780$   $782$   $784$   $786$   $788$   $790$   $792$   $794$   $796$   $798$   $800$   $802$   $804$   $806$   $808$   $810$   $812$   $814$   $816$   $818$   $820$   $822$   $824$   $826$   $828$   $830$   $832$   $834$   $836$   $838$   $840$   $842$   $844$   $846$   $848$   $850$   $852$   $854$   $856$   $858$   $860$   $862$   $864$   $866$   $868$   $870$   $872$   $874$   $876$   $878$   $880$   $882$   $884$   $886$   $888$   $890$   $892$   $894$   $896$   $898$   $900$   $902$   $904$   $906$   $908$   $910$   $912$   $914$   $916$   $918$   $920$   $922$   $924$   $926$   $928$   $930$   $932$   $934$   $936$   $938$   $940$   $942$   $944$   $946$   $948$   $950$   $952$   $954$   $956$   $958$   $960$   $962$   $964$   $966$   $968$   $970$   $972$   $974$   $976$   $978$   $980$   $982$   $984$   $986$   $988$   $990$   $992$   $994$   $996$   $998$   $1000$   $1002$   $1004$   $1006$   $1008$   $1010$   $1012$   $1014$   $1016$   $1018$   $1020$   $1022$   $1024$   $1026$   $1028$   $1030$   $1032$   $1034$   $1036$   $1038$   $1040$   $1042$   $1044$   $1046$   $1048$   $1050$   $1052$   $1054$   $1056$   $1058$   $1060$   $1062$   $1064$   $1066$   $1068$   $1070$   $1072$   $1074$   $1076$   $1078$   $1080$   $1082$   $1084$   $1086$   $1088$   $1090$   $1092$   $1094$   $1096$   $1098$   $1100$   $1102$   $1104$   $1106$   $1108$   $1110$   $1112$   $1114$   $1116$   $1118$   $1120$   $1122$   $1124$   $1126$   $1128$   $1130$   $1132$   $1134$   $1136$   $1138$   $1140$   $1142$   $1144$   $1146$   $1148$   $1150$   $1152$   $1154$   $1156$   $1158$   $1160$   $1162$   $1164$   $1166$   $1168$   $1170$   $1172$   $1174$   $1176$   $1178$   $1180$   $1182$   $1184$   $1186$   $1188$   $1190$   $1192$   $1194$   $1196$   $1198$   $1200$   $1202$   $1204$   $1206$   $1208$   $1210$   $1212$   $1214$   $1216$   $1218$   $1220$   $1222$   $1224$   $1226$   $1228$   $1230$   $1232$   $1234$   $1236$   $1238$   $1240$   $1242$   $1244$   $1246$   $1248$   $1250$   $1252$   $1254$   $1256$   $1258$   $1260$   $1262$   $1264$   $1266$   $1268$   $1270$   $1272$   $1274$   $1276$   $1278$   $1280$   $1282$   $1284$   $1286$   $1288$   $1290$   $1292$   $1294$   $1296$   $1298$   $1300$   $1302$   $1304$   $1306$   $1308$   $1310$   $1312$   $1314$   $1316$   $1318$   $1320$   $1322$   $1324$   $1326$   $1328$   $1330$   $1332$   $1334$   $1336$   $1338$   $1340$   $1342$   $1344$   $1346$   $1348$   $1350$   $1352$   $1354$   $1356$   $1358$   $1360$   $1362$   $1364$   $1366$   $1368$   $1370$   $1372$   $1374$   $1376$   $1378$   $1380$   $1382$   $1384$   $1386$   $1388$   $1390$   $1392$   $1394$   $1396$   $1398$   $1400$   $1402$   $1404$   $1406$   $1408$   $1410$   $1412$   $1414$   $1416$   $1418$   $1420$   $1422$   $1424$   $1426$   $1428$   $1430$   $1432$   $1434$   $1436$   $1438$   $1440$   $1442$   $1444$   $1446$   $1448$   $1450$   $1452$   $1454$   $1456$   $1458$   $1460$   $1462$   $1464$   $1466$   $1468$   $1470$   $1472$   $1474$   $1476$   $1478$   $1480$   $1482$   $1484$   $1486$   $1488$   $1490$   $1492$   $1494$   $1496$   $1498$   $1500$   $1502$   $1504$   $1506$   $1508$   $1510$   $1512$   $1514$   $1516$   $1518$   $1520$   $1522$   $1524$   $1526$   $1528$   $1530$   $1532$   $1534$   $1536$   $1538$   $1540$   $1542$   $1544$   $1546$   $1548$   $1550$   $1552$   $1554$   $1556$   $1558$   $1560$   $1562$   $1564$   $1566$   $1568$   $1570$   $1572$   $1574$   $1576$   $1578$   $1580$   $1582$   $1584$   $1586$   $1588$   $1590$   $1592$   $1594$   $1596$   $1598$   $1600$   $1602$   $1604$   $1606$   $1608$   $1610$   $1612$   $1614$   $1616$   $1618$   $1620$   $1622$   $1624$   $1626$   $1628$   $1630$   $1632$   $1634$   $1636$   $1638$   $1640$   $1642$   $1644$   $1646$   $1648$   $1650$   $1652$   $1654$   $1656$   $1658$   $1660$   $1662$   $1664$   $1666$   $1668$   $1670$   $1672$   $1674$   $1676$   $1678$   $1680$   $1682$   $1684$   $1686$   $1688$   $1690$   $1692$   $1694$   $1696$   $1698$   $1700$   $1702$   $1704$   $1706$   $1708$   $1710$   $1712$   $1714$   $1716$   $1718$   $1720$   $1722$   $1724$   $1726$   $1728$   $1730$   $1732$   $1734$   $1736$   $1738$   $1740$   $1742$   $1744$   $1746$   $1748$   $1750$   $1752$   $1754$   $1756$   $1758$   $1760$   $1762$   $1764$   $1766$   $1768$   $1770$   $1772$   $1774$   $1776$   $1778$   $1780$   $1782$   $1784$   $1786$   $1788$   $1790$   $1792$   $1794$   $1796$   $1798$   $1800$   $1802$   $1804$   $1806$   $1808$   $1810$   $1812$   $1814$   $1816$   $1818$   $1820$   $1822$   $1824$   $1826$   $1828$   $1830$   $1832$   $1834$   $1836$   $1838$   $1840$   $1842$   $1844$   $1846$   $1848$   $1850$   $1852$   $1854$   $1856$   $1858$   $1860$   $1862$   $1864$   $1866$   $1868$   $1870$   $1872$   $1874$   $1876$   $1878$   $1880$   $1882$   $1884$   $1886$   $1888$   $1890$   $1892$   $1894$   $1896$   $1898$   $1900$   $1902$   $1904$   $1906$   $1908$   $1910$   $1912$   $1914$   $1916$   $1918$   $1920$   $1922$   $1924$   $1926$   $1928$   $1930$   $1932$   $1934$   $1936$   $1938$   $1940$   $1942$   $1944$   $1946$   $1948$   $1950$   $1952$   $1954$   $1956$   $1958$   $1960$   $1962$   $1964$   $1966$   $1968$   $1970$   $1972$   $1974$   $1976$   $1978$   $1980$   $1982$   $1984$   $1986$   $1988$   $1990$   $1992$   $1994$   $1996$   $1998$   $2000$   $2002$   $2004$   $2006$   $2008$   $2010$   $2012$   $2014$   $2016$   $2018$   $2020$   $2022$   $2024$   $2026$   $2028$   $2030$   $2032$   $2034$   $2036$   $2038$   $2040$   $2042$   $2044$   $2046$   $2048$   $2050$   $2052$   $2054$   $2056$   $2058$   $2060$   $2062$   $2064$   $2066$   $2068$   $2070$   $2072$   $2074$   $2076$   $2078$   $2080$   $2082$   $2084$   $2086$   $2088$   $2090$   $2092$   $2094$   $2096$   $2098$   $2100$   $2102$   $2104$   $2106$   $2108$   $2110$   $2112$   $2114$   $2116$   $2118$   $2120$   $2122$   $2124$   $2126$   $2128$   $2130$   $2132$   $2134$   $2136$   $2138$   $2140$   $2142$   $2144$   $2146$   $2148$   $2150$   $2152$   $2154$   $2156$   $2158$   $2160$   $2162$   $2164$   $2166$   $2168$   $2170$   $2172$   $2174$   $2176$   $2178$   $2180$   $2182$   $2184$   $2186$   $2188$   $2190$   $2192$   $2194$   $2196$   $2198$   $2200$   $2202$   $2204$   $2206$   $2208$   $2210$   $2212$   $2214$   $2216$   $2218$   $2220$   $2222$   $2224$   $2226$   $2228$   $2230$   $2232$   $2234$   $2236$   $2238$   $2240$   $2242$   $2244$   $2246$   $2248$   $2250$   $2252$   $2254$   $2256$   $2258$   $2260$   $2262$   $2264$   $2266$   $2268$   $2270$   $2272$   $2274$   $2276$   $2278$   $2280$   $2282$   $2284$   $2286$   $2288$   $2290$   $2292$   $2294$   $2296$   $2298$   $2300$   $2302$   $2304$   $2306$   $2308$   $2310$   $2312$   $2314$   $2316$   $2318$   $2320$   $2322$   $2324$   $2326$   $2328$   $2330$   $2332$   $2334$   $2336$   $2338$   $2340$   $2342$   $2344$   $2346$   $2348$   $2350$   $2352$   $2354$   $2356$   $2358$   $2360$   $2362$   $2364$   $2366$   $2368$   $2370$   $2372$   $2374$   $2376$   $2378$   $2380$   $2382$   $2384$   $2386$   $2388$   $2390$   $2392$   $2394$   $2396$   $2398$   $2400$   $2402$   $2404$   $2406$   $2408$   $2410$   $2412$   $2414$   $2416$   $2418$   $2420$   $2422$   $2424$   $2426$   $2428$   $2430$   $2432$   $2434$   $2436$   $2438$   $2440$   $2442$   $2444$   $2446$   $2448$   $2450$   $2452$   $2454$   $2456$   $2458$   $2460$   $2462$   $2464$   $2466$   $2468$   $2470$   $2472$   $2474$   $2476$   $2478$   $2480$   $2482$   $2484$   $2486$   $2488$   $2490$   $2492$   $2494$   $2496$   $2498$



## INSULATORS.



## PYREX.

Pyrex glass insulators cost a little more, but they are less affected by moisture and dirt. Used in our best aerial outfit.

J115 Pyrex	1	9
J144 Ordinary glass	1	0

## AERIAL—SHELL AND EGG.

Made of best porcelain, these are the most popular insulator on the market. The shell type has a longer resistance path than the egg type, and so is actually better in use. Sold in three sizes.



	ea.	ds.	gr.
J105-125-104			
J105 Small	2	3	24
J125 Medium	3	3	30
J104 Large	6	0	50
J107 Small egg	3	1	20
J128 Medium	4	3	30
J109 Large	6	0	50

**ROBBIN & BUTTON INSULATORS.**  
Small porcelain insulators, used for telephone wires, distance pieces, etc.



Diam.	Height.	Hole	ea.	ds.	gr.
J174 1/2 in.	3/16	1/16	14	164	
J175 1 in.	3/16	1/16	24	184	
In J175, groove is near top.					
J181 1 1/2 in.	3/16 in.	1/16	14	84	
J182 1 in.	3/16 in.	1/16	14	84	
J183 2 in.	3/16 in.	1/16	34	2/3	
J180 4 in.	1 in.	5/16 in.	24	1/3	

## CLEATS.



For leading wires around walls, or along any woodwork.

	ea.	ds.	gr.
J110 Set of 2	3d.	2	6

## IRON (PERFORATED).

Perforated iron, in various patterns, for covering switchboards, transformers and other electrical apparatus, is now stocked.

Price on application.

## LEAD-IN TUBES.

When fitting an aerial, it is best to bring the down lead to a lead-in tube, put through a hole in the wall. This makes the neatest job, and enables ordinary insulated wire to be connected from the lead-in tube to the aerial terminal. In some cases another lead-in tube is used for the earth connection.

Only good ebentite is used for the lead-in tubes, and the nuts are plated.



J122-124 J113-109-112

## SIX TUBE, KNURLED TUBES.

	ea.	ds.	gr.
J122 6 in.	2	3	6
J122 9 in. (usual size)	1	0	11
J124 12 in.	1	3	13

## SIX TUBE, WING TUBES.

	ea.	ds.	gr.
J113 6 in.	1	0	11
J109 9 in. (usual size)	1	3	14
J112 12 in.	1	6	17

## FLEXIBLE LEAD-INS.

Very useful for temporary aerials, or where holes cannot be bored in the wall. They fit over a window or door.



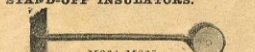
J536	J114	1	0
J114 50K, insulated; each			
J536 Mueller, rubber covered			1

## PORCELAIN LEAD-IN.

A 6 x 2 in. porcelain tube. Suitable either for aerial or earth lead.

J129			3
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## STAND-OFF INSULATORS.



M264-M265.

For keeping aerials away from spouting masts, etc. If the aerial is too close to the building, much efficiency is lost.

M264 20 inch	3	0
M265 20 inch	3	0

## INSULATED HOES.

	ea.	ds.	gr.
J127 1 1/2 in.	3d.	2	22
J184 2 in.	3d.	2	24
J185 2 1/2 in.	3d.	2	27
J186 3 in.	4d.	3	33
J187 4 in.	6d.	4	48
J186 7 1/2 in.	9d.	8	96

## INSULATED STAPLES.

Ordinary staples cut the insulation of wires when stapling the latter to the wall, but with these the wire is protected by the fibre.

	ea.	ds.	gr.
J146 1 in.	2	4	2
J147 3/2 in.	2	4	2

## JACKS.

Only best quality jacks are listed. Well nickel plated, with good screw threads and best springs, accurately adjusted. C.C. stands for closed circuit; O.C. for open circuit; F.C. for filament control; S for single; and D for double.

J501 S.O.C. 1 spring	2	0
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J502 S.C.C. 2 springs	2	3
J503 D.C.C. 4 springs	2	3



J504 S.O.C. F.C. 3 springs	4	0
J505 S.C.C. F.C. 5 springs	4	0
J500 D.C.C. F.C. 7 springs	6	0

## CORD TIP JACKS.

Cord tip jacks enable the 'phone tips to be directly connected to the set, without using an ordinary plug.



J521 Cord tip jacks, per pair	1	0
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## TWIN JACKS.

Bakelite mouldings, with two-cord tips jacks permanently fixed in place. Marked "SILENT KITT," "PHONE," or "FIELD"—state which.



J535 Twin jacks	1	0
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## WALL JACKS.

Wall jacks can be fitted in every room, connected by thin permanently concealed wires to the Radio A speaker can then be operated in any room by plugging in the jack.

Even if you have a console set, an extra speaker can be used, either by itself, or in conjunction with the main speaker in the set.

## WELL-WAYDE WALL JACKS.

These have a beautiful brown bakelite cover, and are fitted with a best grade plated jack. Two screws are supplied, requiring only very small holes to be bored in the wall.



J522 Single open circuit	3	6
J523 Single circuit	4	6
J524 Single circuit F.C.	4	6

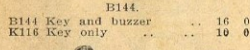
## KEYS (Telegraph).

The Ajax is a light, cheap key, which is very satisfactory for Morse Code practice. It is fully adjustable, and the bearing spindle is long, fitted with pointed bearings.

The buzzer is the well-known Ajax.



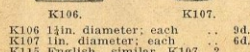
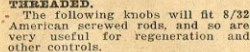
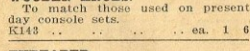
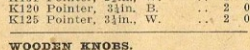
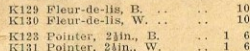
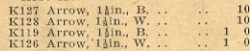
B144 Key and buzzer	16	0
K116 Key only	10	0



K140 Heavy brass transmitting	24	0
K141 Heavy brass receiving	24	0
K142 Light brass	15	0
S190 Heavy brass sounders	30	0
S191 Light brass sounders	22	6

## KNOBS.

Highly polished Bakelite, K.K. brand. Black (B.) or walnut (W.)



K106 1 in. diameter; each	9d.
K107 1 1/2 in. diameter; each	6d.
K115 English, similar K107, 2 B.A. thread; each	6d.

## LEARN MORSE CODE.

## LOUD SPEAKERS.

Three common types are met with to-day, all being so familiar as to require little description.

The DYNAMIC or MOVING COIL SPEAKER is undoubtedly the most popular, even though it is usually the most expensive for home use.

The new INDUCTOR DYNAMIC SPEAKER comes next best. Its power is only little less than the ordinary dynamic, and it requires no extra field current. Thus it is far more convenient.

CONE SPEAKERS have been continually improved, and to-day the best makes as listed here are really excellent, and quite suitable for medium power sets.

HORN SPEAKERS are still the best for smaller RADIOS, because, being more sensitive, they enable the receiver to bring in weak stations at better volume. For speech, they usually excel all other speakers.

It is worth noting that for best talkie work, horn speakers are invariably used. It is true that special construction is employed both for horn and unit, but it goes to show that horn speakers still possess inherent advantages.

## CHOICE OF SPEAKERS.

For small Radios, up to, say, four valves, a horn speaker is probably best.

For rather larger sets, a cone speaker or inductor dynamic.

For largest sets, especially all electric, dynamic.

For cabaret and general indoor work, chiefly for music, dynamic.

For indoor work, with speech, exponential horns.

For outdoor music, speech, address systems, large straight exponential horns.

This speaker is very well known in England, and our stock, which is very limited, was taken over from liquidated stocks in this country. The usual price is 75s, but we have reduced it appreciably.

The Orphean is rather larger than the N. and K. Senior, and is constructed largely of Bakelite.

L312 Orphean speaker (horn) 63 0

We frequently can supply odd speakers at exceptionally good prices—samples, shop soiled or trade-ins. Thus at time of going to press, we have available N. and K. Junior at 21s, a Baby Brown at 15s, A.J.S. Senior at 45s, Claritone at 40s, Brown Sovereign at 75s, and various other makes.

If you want a cheap speaker, write for our list. We will guarantee that speakers are in good order when sold.

## HORN SPEAKER UNITS.

(See under Exponential Horns.)

## PHILIPS SPEAKERS.

L326 New Baby Grand	£3	15	0
L327 Peter Pan	6	10	0
L328 Sevenette	7	0	0

## N. AND K. HORN SPEAKERS.

These are recommended for smaller sets, as they give the maximum results for long distance.

They are made in three sizes, but all are equally reliable, and differ mainly in the type of horn used. It is indeed a phenomenon for an N. and K. speaker to burn out—we give a guarantee for twelve months with each speaker, regardless of size and price.

The tone and volume of N. and K. speakers is exceptionally good.

## N. AND K. JUNIOR.

An all metal speaker, of medium size. Extraordinary value at the low price.

L311 N. and K. Junior	36	0
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## N. AND K. SENIOR.

A compact speaker with a large horn. Very solidly constructed, and besides adding miles to the range of your set, has very fine tone. A speaker that has always proved very popular.

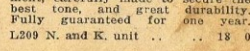
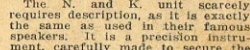
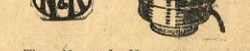
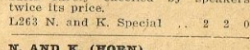
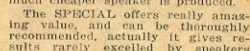
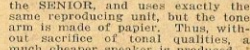
L210 N. and K. Senior	3	3	0
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## N. AND K. SPECIAL.

The SPECIAL is the same size as the SENIOR, and uses exactly the same reproducing unit, but the tone arm is made of paper. Thus, without sacrifice of tonal qualities, a much cheaper speaker is produced.

The SPECIAL offers really amazing value, and can be thoroughly recommended, actually it gives results rarely excelled by speakers twice its price.

L263 N. and K. Special	2	2	0
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L209 N. and K. unit	18	0
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## CONE SPEAKERS.

## WELL-MAYDE "SUPERR."

This speaker is locally assembled with a full knowledge of what our New Zealand customers require. Unit and chassis are the very best obtainable, while the cabinet work is of the finest. Top is flat, not curved.

Beautiful as a speaker may be, however, it is by its reproductive qualities that it must be judged. The superiority of the Well-Mayde is so marked that we welcome any comparison with any other speaker in its own price class.

The Well-Mayde brings out the bass notes that other speakers (excluding dynamics) usually suppress, but without the unpleasant exaggeration which causes the higher notes to be lost. In fact, it reproduces with a delightful balance over a wide scale range.

Guaranteed, of course.

L286 W-M Superr ... 6 0 0

## WELL-MAYDE "VERATONE."

A full-sized speaker, in cabinet similar to the Superr, but fitted with a popular priced full-sized unit. L287 W-M Veratone speaker 3 17 6

## RADIOLA CONE.

These Radiolas were sold here until recently at about £9, and our stocks are all brand new and guaranteed in perfect condition. You can get the saving for yourself. You will find the Radiola one of the very best reproducers of good music you have ever heard—if yours does not come up more than fully to your expectations, return it to us, and we will refund every penny you have paid us for it.

L293 Radiola cone ... 4 10 0

## ORPHEAN CONE.

A British speaker, complete in cabinet. L295 Orphean cabinet speaker 2 18 0

## "PLAQUE" SPEAKERS.

By mounting the speaker movement on a plaque, the tone results are scarcely impaired, and a handsome speaker can be supplied at very low cost.

The plaque supplied with these speakers is of imported heavy walnut plywood, of pleasing design and beautifully finished.

It is offered with a choice of three speaker movements, each of which is listed elsewhere, and is otherwise ordered. L314 is supplied.

L313 With Little Beauty ... 40 0  
L314 With Ormond unit ... 48 0  
L315 With Blue Spot 66K unit ... 70 0

CONE SPEAKER  
UNITS.

By using one of these units, you can build a very efficient speaker at home, or if you wish, incorporate it in your console cabinet.

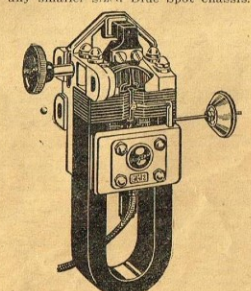
## BLUE SPOT UNITS.

These famous units are in future being made in England. There is little need to comment on their efficiency—everyone already is acquainted with them. We might add only that they are practically trouble free.

## BLUE SPOT UNIT 66R.

The latest Blue Spot unit, of large size, and made to operate a cone about 4 1/2 inch diameter, as sold with the 66R chassis. A really powerful unit, covering very fully the whole musical scale.

66R can, of course, be used with any smaller sized Blue Spot chassis.



L296 Blue Spot unit, 66R ... 40 0

## BLUE SPOT UNIT 66K.

A smaller, but probably more popular unit. This is the old favourite, adjustable and suitable for any of the Blue Spot chassis, though usually used with either of the smaller sizes.

L296 Blue Spot unit 66K ... 30 0

Remember, you buy a very fine outfit in the BLUE SPOT.

## LITTLE BEAUTY—UNIT AND CHASSIS.

A small speaker unit and chassis combined, ready for installing in cabinet. Although cheap, it is capable of really good performance, the unit itself being especially powerful. L310 Little Beauty ... 25 0

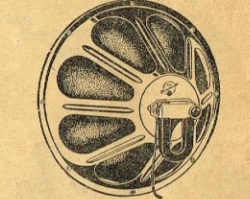
## ORMOND CONE UNIT.

A British unit, adjustable, which can be bought with its own cone and chassis. Will make an excellent speaker.

L288 Ormond unit only ... 18 0  
L290 Ormond chassis (with cone) ... 12 0  
L291 Ormond unit and chassis ... 30 0

## BLUE SPOT CHASSIS (No unit).

This consists of a cone ready mounted in a metal frame, to which the Blue Spot can be screwed in a minute or two. A very fine speaker is the result, which can be used as it is, mounted in a special cabinet, or in the Radio console cabinet.



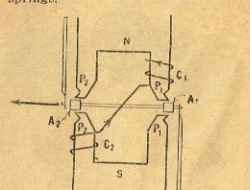
L297 14in. ... 25 0  
L298 12in. ... 19 0

Illustration shows unit and chassis.

## INDUCTOR DYNAMIC.

## HOW IT WORKS.

A double magnet system N. and S. is used, with poles P1, P2 and P3, P4. Iron pieces A1 and A2 are connected by a rod, the arrow end of which is connected to the speaker diaphragm. The rod is held at both ends by light springs.



Normally the two iron pieces A1, A2 are both pulled inward by the magnets, so are in a state of equilibrium. Current from the set is fed round the poles as shown, strengthening the inward pull at A1, and weakening it at A2. The iron pieces therefore move to the left. Reversed current produces movement to the right.

Every Radio enthusiast has heard of the INDUCTOR DYNAMIC SPEAKER. The principle is quite new, and like the dynamic, the action permits of unrestricted movement of the armature, without possibility of touching the magnets. This makes the response to the music more direct.

Since permanent magnets are used there is no need for any extra current to energise the magnets.

Even for small dance hall and restaurant use, the inductor proves quite satisfactory, especially where it is impossible to operate dynamics conveniently.

Inductors have already proved very popular in New Zealand, and with the present decreased cost will prove more so.

## INDUCTOR DYNAMIC—Continued.

A baffle or suitable cabinet is required, just as for a dynamic. Suitable cabinets are priced in this Catalogue.

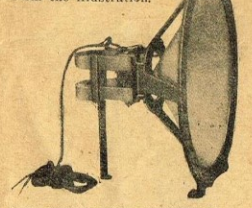
## BRIEF SUMMARY OF INDUCTOR FEATURES.

1. Faithful reproduction, particularly on low notes.
2. Freedom from blasting.
3. Light weight.
4. No extra current required, since the magnets are permanent.
5. Speaker cannot cause any hum in itself.
6. Lower cost, since the unit itself requires no outside apparatus like batteries or rectifiers to operate it.

## HOMELAND INDUCTOR DYNAMIC

Inductor speaker patents are held in America, and well-known manufacturers are being licensed to make them in different countries. Hitherto, in New Zealand, only foreign inductors have been available, but the HOMELAND is made by the largest electrical manufacturer in England, and its quality is really outstanding. It is a real pleasure for us to recommend this British speaker of this nature, since it is common knowledge that practically all the dynamic speakers in New Zealand are of foreign origin.

The magnets in the HOMELAND are connected differently from the illustration.



L316 HOMELAND INDUCTOR UNIT ... 5 5 0

L317 HOMELAND INDUCTOR SPEAKER, in cabinet 8 8 0

L294 N. and K. inductor unit £6 10 0

L295 U.S.A. inductor unit £6 17 6

MOVING COIL  
SPEAKERS.

MOVING COIL or DYNAMIC SPEAKERS are now familiar to everyone who has heard a high power Radio, and it is almost superfluous to remark that they give a remarkable response to ALL the musical notes from the lowest to the highest. Partly for this reason and partly because their construction enables them to give enormous volume without blasting, they have become standard on most good sets.

Their main objections are two—they are not quite so sensitive to weak signals as some other speakers (though they are by no means insensitive), and they require extra current for their powerful electro-magnets.

The latter objection makes dynamics impracticable in places where there is no current supply, or where a steady current is not readily obtained. In such cases, the inductor dynamic should be used.

## CURRENT SUPPLY.

The magnet current supply for a dynamic can be obtained—

1. From a six volt accumulator.
2. From a transformer using ONLY 4 AMPS, this being the lowest consumption speakers yet made. Thus, Jensen's speakers are carried out of their economy, where other speakers would be too extravagant on current.
3. From the 32 volt lighting system. A special speaker is, of course, required for this.
4. From the direct current mains, in the rare case where customers have direct current in their homes.
5. From the A.C. power supply. In this case, it is usual to attach a rectifier system to the six volt speaker, the rectifier supplying the necessary current. In some cases, with this system, there may be some hum, but this is cured by adding an electrolytic condenser of 2000 mfd.

Our Jensen A.C. speakers are fitted by us with the BRITISH WESTINGHOUSE RECTIFIERS, which ensures, of course, freedom from trouble with the rectifier.

If you already have a six volt dynamic speaker, a suitable Well-Mayde charger will immediately turn it into an A.C. speaker. For Jensen, use the 5 amp. charger, for Magnavox the 1 amp. charger.

5. From the power on an A.C. set. This is the method used in all A.C. Radios, but cannot be used otherwise unless the set itself is specially designed for it.

## HOW IT WORKS.

Accurately fitting between the poles of the field magnet, is a light coil, of a few turns of wire (or even one turn) connected indirectly through a transformer included with the speaker, to the speaker terminals or jack of the set.

This coil moves in sympathy with the broadcast music or voice, yet with a very powerful vibration up to 20,000 cycles per second. The coil can move for 1/4 in. or more without touching anything, hence the moving coil speaker will not blast. This freedom of movement is the secret of the success of the speaker.

The coil is in turn attached to a cone, whose edges are held in place by rubber or thin leather. It is, of course, the cone which actually imparts the vibrations to the air, and reproduces the music.

## MOVING COIL BAFFLES.

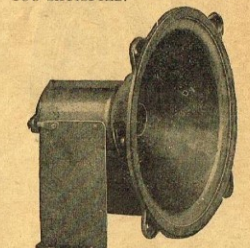
The working part is sold without cabinet, and so the purchaser may fit it into the cabinet of his own set, or perhaps, better still, position it on the wall of the room. This would give the best results of all.

Otherwise the unit may be housed in a strong box, or on a large piece (say, 3ft. x 3ft. at least) of thick plywood. It is necessary to make the speaker within 18 in. of the wall. Speakers can, of course, be supplied complete in handsome cabinets.

JENSEN NU-CORE  
DYNAMIC SPEAKERS.

JENSEN DYNAMICS are now recognised as the BEST DYNAMIC, simply because the music you hear from a Jensen is so perfectly true to the original. The low notes are not too strong in the usual dynamic. Unfortunately, many who first hear a dynamic after being used to the ordinary speaker, are carried away by the excessive bass, only to find it annoying after a short time.

This is just where the Jensen excels—satisfies you, and KEEPS YOU SATISFIED.



## JENSEN NU-CORE.

It is well known that special alloys are more magnetic than others. Thus STALLOX, universally used for transformer cores, has been specially made for the purpose, because a core made from it can be rendered more highly magnetic than other materials.

The special NU-CORE used in the Jensen speaker, definitely places it ahead of its competitors. You have merely to hear its performance, and compare it with other dynamics to prove it to yourself. But further proof is available—Jensen six volt speakers USE ONLY 4 AMPS FOR THE FIELD COIL, whereas others use 7 amps, or more. Economy is gained, with better actual performance.

But, if further proof is necessary, BUY JENSEN, and TRY IT. WE will refund your purchase price if you are not satisfied.

All Jensen speakers are now fitted with a push-pull transformer, which can, however, be used also as an ordinary transformer.

This saves an extra transformer in your set.

## AUDITORIUM JENSEN.

Theatres, dance halls, restaurants, hotels, etc. demand special dynamics, and for this purpose the Jensen large AUDITORIUM UNIT, with full size 12 inch cone.

It is particularly suitable for the TALKIES. Where used on A.C. current, the necessary field current is supplied through a 283 rectifier valve.

L331 Senior, A.C. ... 25 0  
L332 Senior, 2500 ohms D.C. ... 25 0  
L333 Junior, A.C. ... 19 0  
L334 Junior, 2500 ohms D.C. ... 19 0

Price includes valve.







## LUGS—Continued.

## PLATED



	L202	L194-L201	L203
L191 Fork, 1/4 in., 5/32 hole	6 5 0		
L192 Loop	6 5 0		
L193 Fork, 3/16 in.	8 7 0		
L194 Loop	8 7 0		
L195 Fork, 1/4 in., 1/8 hole	10 9 0		
L196 Loop	10 9 0		

## HEAVY COPPER (Plated).

	L202	L194-L201	L203
L191 Fork, 1/4 in., 1/8 hole	8 7 0		
L192 Loop	8 7 0		
L193 Fork, 3/16 in.	8 7 0		
L194 Loop	8 7 0		
L195 Fork, 1/4 in., 1/8 hole	10 9 0		
L196 Loop	10 9 0		

## PINTERS—FORKTERMS.

Well nickel plated lugs with saw tooth edges. Easily fitted on braided wires with ordinary pliers. Loop makes wire connection certain without soldering.

	dz.	gr.
L202 Pintners	6	5 6
L203 Forkterms	6	5 6

## RADIO OR DRAWING PINS.

These pins are invaluable for attaching flexible or single wire to the wall for speakers, etc. Inserted immediately with fingers only, yet rigid fixing. Different colours



R304	Each 2d., doz.	1 9
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## MASTS AND FITTINGS

In the past we have offered cheap Radio masts very reluctantly, simply because they did not seem substantial enough for long use.

The HOMELAND masts are made from much heavier piping, however, and so we offer them with the greatest confidence. They are complete, and easily erected.

## HOMELAND MASTS.

Complete, ready to erect. Heavy and durable—no fear of these crashing in a gale after a couple of years.

M152 25ft.	Complete	24 0
M153 30ft.	Complete	30 0
M154 34ft.	Complete	37 6

Prices for one mast only.

## MAST CLEATS

M164 Cleats galvanised 6d

## GALVANISED MASTS.

HEIGHTS given are approximate, depending on the lengths of pipes available.

NOTE.—These masts are supplied complete, with costly cable for hauling aerial into place, as well as the usual fittings, such as base, strong galvanised stays, mast bands, pulley, and cleat.

PRICES for single masts, not #A115.

M160 30ft. high, 2 sets guys	3 5 0
M161 40ft. high, 2 sets guys	4 5 0
M162 50ft. high, 2 sets guys	6 0 0

## MAST BANDS—GALVANISED.

Made with three eyes.	
M130 1 1/2 in. hole	1 6
M133 2 in. hole	2 0
M134 2 1/2 in. hole	2 6
M135 3 in. hole	3 0

## GUY WIRE—See under WIRE.

## MAST CABLE.

Cable for hauling aerial into place may be rope, but this will probably rot in a year or two, and then it is necessary to lower the mast to replace it. The galvanised cable listed here runs readily even over a small pulley, and will last many years.

It is formed of 49 very thin steel strands, enabling it to run freely over the smallest pulley.

Although rather expensive, its advantages must be obvious to anyone. Any length can be cut to order, as it is too valuable to sell in standard lengths, with resultant waste.

W115 Steel cable, per 100ft.	12 0
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## PULLEYS.



M102 Pulleys, galvanised	10
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## STRAINERS—SOCKETS (Galv.).

STRAINERS are used to adjust the tension on guy wires, and are required for each wire. The illustration shows the usual galvanised strainer, but we can also supply aero plane strainers, machined from solid bar steel. Although not galvanised, they make very strong strainers, either for Radio work or in aero plane building.

M100 Strainer, galvanised	1 9
M301 Strainer, small galv.	1 0
M121 Aero 2 in. ext. 15cwt.	5 6
M132 Aero 3 in. ext. 45cwt.	4 0

## SOCKETS (Galvanised).

These are screwed to the outer wall, and hold a wood rod to which the down lead can be attached to keep it clear of the eaves, spouting, etc.

M104 For 1/2 in. rod	4 6
M163 For 1 in. rod	5 6

## STAND-UP INSULATORS.

See under INSULATORS.

M264 20 inch	3 0
M265 30 inch	4 0

## METERS (Electrical).

For accurate measurements, moving coil or other high-priced meters are essential. For many purposes, however, where exactness is of no great consequence, moving iron meters will serve admirably.

We have in our LABORATORY, an extremely fine selection of accurate meters, including a MICROAMMETER, which measures millionths of an amp. We are ready to quote for testing and calibrating your instruments. Cost will depend on the accuracy which is desired.

## MOVING COIL METERS (D.C. only).

Where accuracy in electrical measurements is desired, or where volt-meters with a small current consumption are necessary, MOVING COIL meters are the usual type. A Such meters must be carefully made, and until recently it has not been possible to sell them at attractive prices.

In CRESCENT MOVING COIL METERS, however, a high degree of accuracy is attained, together with a fine appearance, while the price is much lower than has previously been possible in a high-class meter.

## CRESCENT METERS (M.C.).

The body fits a 1 1/2 in. hole in the panel, and is nickel plated, and highly polished. Easy fitting clamps are included. The pointer has a knife-edge for accurate reading. A precision instrument, comparing very favourably with the best known makes, costing far more.



M181 0-5 milliamps.	30 0
M182 0-25 milliamps.	30 0
M183 0-50 milliamps.	30 0
M184 0-100 milliamps.	30 0
M244 0-200 milliamps.	30 0
M186 0-1.5 amps.	30 0
M187 0-6 volts	30 0
M189 0-7/150 volts (double range)	30 0

## FERRANTI METERS.

All high-grade, moving coil instruments of unchallenged precision. Either flush or projecting.

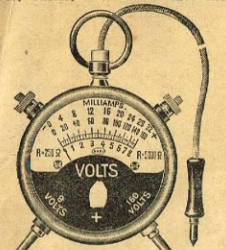
M230 15, 50, 150 milliamps, 1.5, 10 amps ..	each	£2 5 0
M231 7.5, 150 volts ..	each	2 5 0
M232 250 volts (1000 ohms per volt) ..	each	3 18 0
M233 1 milliamps ..	each	3 5 0
M234 Spare fuses for milli- ammeters ..	each	1 0 0

## WESTON METERS.

State your requirements—we will supply or procure.

## POCKET METERS.

Useful for checking "B" batteries, "B" consumption, mains, current, etc. Every battery user should have one.



M248	
M249 6-6/120 volts D.C.	9 6
M250 6-150 volts D.C.	10 6
M245 0-12/240 volts (double)	12 0
M259 0-250 volts, A.C. or D.C.	15 0

## TRIPLEX METER.

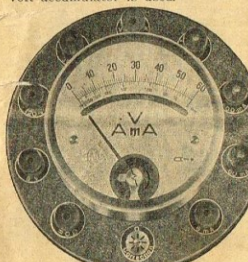
A pocket meter, with three very useful readings, 3 volts and 150 volts for batteries, and 32 milliamps for finding the actual consumption of "B" batteries. This meter will be found of the greatest use to dealer and user alike, especially as it costs so little.

M248 Triplex meter, D.C.	15 0
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## THE UNIVERSAL METER.

A combination outfit, in which the meter itself measures 34 inches in diameter, has a 60-line mirror scale, and dead-beat knife pointer. It is highly accurate, and the dead-beat scale makes the pointer stop immediately without swinging.

It measures VOLTS, AMPS, and RESISTANCE (in ohms). Diagrams for each reading are attached to bottom of meter. Switches are provided for each millamp reading. For resistance measurements, a two-volt accumulator is used.



Readings are:	
2 millivolts, 6, 120, 300 volts.	
6, 60, 600 milliamps, 6 amps.	
Thus a single instrument gives a wonderfully wide range of readings.	
M247 Universal meter	44 10 0

## MOVING IRON METERS.

For the majority of ordinary purposes, moving iron meters will prove perfectly satisfactory. They are not so accurate as moving coil meters, but frequently great accuracy of measurement is by no means essential.

## MARVEL METERS (Moving Iron).

Moving iron meters, overall diameter of flange three inches and of body two inches. Available in a large range.

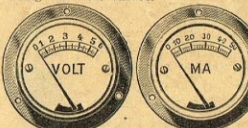
Panel meters, of small size, nickel plated, and very neat.

The motor car types read both charge and discharge.	
M252 Volts, 6, 10, 20, 120	12 6
M253 Amps, 5, 6, 10, 20, 120	12 6
M254 Milliamps, 20, 50, 100, 500	12 6
M214 0-7/150 volts (double)	15 0
M215 0-1/2/240 volts (double)	15 0
M212 8-0.8 amps.	12 6
M213 20-0.20 amps.	12 6
M246 30-0.30 amps.	12 6
M255 8-50 milliammeter. Scale without numbers. For making high range volt and ammeters	12 6

## MIDGET METERS.

These tiny meters, only 1 1/4 inch diameter, will be found very useful for many purposes where fairly accurate readings are required. In spite of their small size, they are sufficiently accurate for most purposes, very neat indeed, and made in a large variety of ranges.

The three and four volt meters are very useful for dry battery sets using two volt valves.



M249 Volts 3, 4, 6, 12	5 0
M250 Amps 1, 3, 6, 10 or 20	12 0
M251 Milliamps 10, 15, 20, 30, 50, 100, 500	10 0

## A.C. METERS.

## ALTERNAX METERS.

A.C. meters are of the moving iron type. Those listed below are suitable either for A.C. or D.C., and are air damped. Overall size 3 1/2 inches, the meters being made for fitting to panels. The lowest reading possible on meters of this kind is about one-fifth of the highest reading.

The meter for volt size is used particularly for checking filament voltages in A.C. sets, and the 250 volt for checking power line voltage. Adapters could be fitted to the voltmeters for these purposes.

## A.C. VOLTMETERS.

M255 5, 10, 20, 50 volts	33 0
M256 130, 250 volts	36 0

## A.C. AMMETERS.

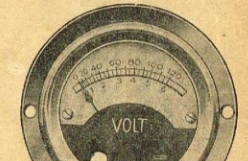
M257 5, 10, amps.	33 0
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## PANEL DUO-METERS, A.C. or D.C.

A plated panel meter, about 2 1/2 inches diameter.

These meters will read either D.C. or A.C., and being very cheap, will enable everyone to purchase enough for their usual requirements. The 250 voltmeters, with a piece of flex and bayonet holder attached, can be used for promptly measuring the house voltage, which varies considerably as a rule. The adaptor is simply plugged into a lamp holder, instead of the lamp.

Do not try this experiment with an ammeter.



M260 4, 6, 12, 20 volts	15 0
M261 40 or 250 volts	18 0
M262 1, 3, 5, 10 or 20 amps	15 0

## POCKET DUO-METER, A.C. or D.C.

M259 0-250 volts, pocket type	15 0
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## MICROPHONES.

Microphones are used in broadcast and amateur transmitting stations, for public address systems, and for announcing records as played in a gramophone shop, advertising in talkie theatres, for deaf outfits, etc.

## STUDIO MICROPHONE.

Two button carbon granule type stretched duriumium diaphragm, with gold contact surfaces. Has a flat curve from 30 to 10,000 cycles, and is excellent for broadcast station work.

M266 Microphone, studio	22 0 0
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## "MULTIPLE" TYPE.

A very neat "mike" with separate carbon buttons, arranged in a small bakelite frame, for desk use. Clear reproduction, great sensitivity.



M217 Multiple Mike	5 5 0
M218 Transformer for above	2 0 0



## HANDIMIKE.

For public address work, announcing and similar purposes. Double button, reciprocating type. Switch in handle, and complete with triple cord, plug and jack. Uses push-pull type of microphone transformer. A very fine "mike."



M208 Handimike . . . £9 0 0  
M266 Transformer . . . 2 0 0

## FROST MICROPHONES.

Three styles—DESK (as illustrated), HAND and WALL. Good quality, at reasonable price.

## DESK TYPE.

M204 Desk type £2 5 0  
M203 Wall type £1 5 0  
M205 Hand type £1 12 0

M267 Transformer . . . £1 10 0

## UNIVERSAL MICROPHONES (CONDENSER).

(These expensive microphones are of the type universally used for broadcasting studios, and for making talkie films, etc. Definite price quoted on application, being approximately £60.

## NAME PLATES.

We can engrave any name on Formica, celluloid, xylonite to your special order. Send for quotations.

TAKE ADVANTAGE  
OF OUR  
EASY TERMS  
On All Apparatus.

## PHONE PLUGS.



## WESTON.

WESTON has always been considered the best plug obtainable. It has quick grip and release that never fails, and grips so that it is impossible to pull the cords out. Yet by pressing the small projections, the cords fall out readily.

P108 Weston plug . . . 3 6

## BUFFALO.

This small plug is astonishingly popular. It is moulded, with plated barrel. The tips are instantaneously inserted or removed. The best value ever offered in plugs.

P133 . . . 1 0

## H. AND H.

A full-size plug of really good quality, but medium price. Cord tips are held in place by a screw.

P155 H. and H. phone plug . . . 2 6

## PLUGS.

See also VALVE PINS and SOCKETS, which are largely used as small plugs and sockets.

## BANANA.

Banana plugs are so called from the resemblance of their contact springs to bananas. They slide very easily into the sockets, yet perfect contact is secured at four points at least. They will be appreciated very much after other plugs, which are either difficult to insert or make bad contact. Red or black. Sockets are brass, plated, fitted with two nuts.



P131 Plug only . . . 3d. 2 6  
P131-Socket only . . . 3d. 2 6

For short wave coils, a banana plug can be supplied without coloured top, but with a screw to fix them to the coil mounting. These are used on MENIWAIVE SHORT WAVE COILS and were specially made for us (P137).

P137 Banana coil plug . . . 3d. 2 6

## WANDER PLUGS (Red or Black).



Boiling-Lee, type P143, have spring contact pins, while both wire and brading are securely gripped, combining definite contact with a freedom from frayed ends. Both types fit English valve sockets.

P143 Ordinary . . . each 3d.  
P143 Side cord . . . each 5d.  
P143 plugs can be supplied engraved HT-1, HT-2, HT-4, HT-4.2, HT-4.3, HT-4.4, GRID-1, GRID-2, GRID-3, GRID-4, GRID-5, GRID-6, GRID-7, GRID-8, GRID-9, GRID-10, GRID-11, GRID-12, GRID-13, GRID-14, GRID-15, GRID-16, GRID-17, GRID-18, GRID-19, GRID-20, GRID-21, GRID-22, GRID-23, GRID-24, GRID-25, GRID-26, GRID-27, GRID-28, GRID-29, GRID-30, GRID-31, GRID-32, GRID-33, GRID-34, GRID-35, GRID-36, GRID-37, GRID-38, GRID-39, GRID-40, GRID-41, GRID-42, GRID-43, GRID-44, GRID-45, GRID-46, GRID-47, GRID-48, GRID-49, GRID-50, GRID-51, GRID-52, GRID-53, GRID-54, GRID-55, GRID-56, GRID-57, GRID-58, GRID-59, GRID-60, GRID-61, GRID-62, GRID-63, GRID-64, GRID-65, GRID-66, GRID-67, GRID-68, GRID-69, GRID-70, GRID-71, GRID-72, GRID-73, GRID-74, GRID-75, GRID-76, GRID-77, GRID-78, GRID-79, GRID-80, GRID-81, GRID-82, GRID-83, GRID-84, GRID-85, GRID-86, GRID-87, GRID-88, GRID-89, GRID-90, GRID-91, GRID-92, GRID-93, GRID-94, GRID-95, GRID-96, GRID-97, GRID-98, GRID-99, GRID-100.

## ARROW CONNECTORS (230v. 3a.).

The finest little plug and socket we have ever seen. Small, neat, strong, simple, reliable, efficient. For making connections, speakers, batteries, etc.

The following series will be found eminently useful. They really consist of four parts: a nickel-plated shell fitting a one-inch hole, two bakelite plugs, one fitted with projecting, and the other with internal contacts, but otherwise identical, and a bakelite cap. The plugs can be screwed either into the shell or cap, so that it is possible always to have the projecting plug contacts immune from shock.

Order a sample—you may return it if you like—but you won't.

E217 Plug, internal contacts 1 6  
E218 Plug, projecting contacts 1 6  
E219 Socket, internal contacts 1 6  
E220 Socket, projecting contacts, with ends flush with surface of shell . . . 1 6  
E221 Socket and plug, can be arranged any of above ways . . . 3 0  
E222 Pair of plugs (E217, E218), making very fine cord connectors . . . 3 0

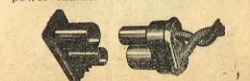
## RADIO DUPLEX PLUG.

Bakelite, with polarised plugs, allowing connection only one way. Very useful for speaker and battery connection, rectify. If he does not use the SUPREME, insist that he gets one or try another dealer.

P174 Radio duplex plug . . . 1 6

## TWIN PLUG AND SOCKET.

Polarised connector, with metal parts completely insulated. For power mains.



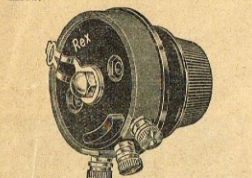
P146 Twin plug and socket . . . 2 0

## POTENTIOMETERS.

Potentiometers are really rheostats wound with fine wire, and having a high resistance, with a terminal at both ends of the resistance as well as on the arm.

By using the central and one outside terminal, a potentiometer becomes a rheostat.

Rex potentiometers are made of bakelite, and are complete with knob.



P152 200, 400 or 600 ohms . . . 4 6  
P172 1600 ohms . . . 6 0  
P173 2000 ohms . . . 7 6

SUPREME  
Testing Instruments  
"SUPREME BY COMPARISON"

The modern RADIO receiver is more or less intricate, and should it fail, it is a waste of time and money to attempt to locate the trouble by hit and miss principles. Even the most skilful expert is seriously handicapped without a good RADIO TESTER.

There are, of course, many types of Radio testers on the market, from those performing one or two tests, to those which will, in turn, make every test possible right throughout the set, and, relentlessly track down each and every fault. All these are done in a comparatively short time.

In addition, a tester like the SUPREME DIAGNOMETER will tell if your valves are working exactly as they should—if the valves are matched—if the condensers are properly adjusted—and other tests not possible with cheaper testers. It has been adopted by the largest concerns in U.S.A. for servicing their sets.

You should make a point of ascertaining whether your DEALER uses the SUPREME DIAGNOMETER. If he does, you should get your defects remedied promptly and correctly. If he does not use the SUPREME, insist that he gets one or try another dealer.

REMEMBER, IF YOUR DEALER DOES NOT SAY FOR HIS SUPREME, YOU MOST CERTAINLY WILL, as you will be charged for TIME HE WASTES with inefficient testing gear.

## DIAGNOMETER METERS.

We can supply METERS and SPECIAL SWITCHES for making YOUR OWN RADIO TESTERS.

We do not propose here to attempt to describe ALL that a SUPREME

will do. The prices are given briefly here, and further literature will be gladly sent to anyone interested.

OUR OWN EXPERTS are all equipped with SUPREME DIAGNOMETERS, which accompany them on all SERVICE JOBS. This accounts largely for the satisfactory repair service maintained by our firm—every job undertaken is thoroughly tested. Quite frequently other faults than those for which we are called are discovered, and being rectified in time, prevent further damage and expense later on. Thus, correction in valve voltages might prolong the life of the valves very considerably, yet this defect would not be noticed normally.

## SUPREME DIAGNOMETER.

230 Volt A.C.



P152 200, 400 or 600 ohms . . . 4 6  
P172 1600 ohms . . . 6 0  
P173 2000 ohms . . . 7 6

SUPREME  
Testing Instruments  
"SUPREME BY COMPARISON"

The best tester ever made. Tells you everything you could want to know about the operation of every component in your set, including the valves. Such is its versatility that, in addition to the more ordinary tests, it will show unbalanced transformers, unmatched condensers, incorrect neutralising, and even a badly soldered joint, which is just not perfect.

M237 Supreme Diagonometer . . . £60

## SUPREME SET ANALYSER.

This contains a single meter, but it becomes a literal "jack of all trades", and, what is vastly more important, master of each of the 25 tests it performs. It performs for the rest of the set what the TUBE TESTER does for the valves.

M240 Supreme analyser . . . £32 0 6

## SUPREME TESTER, 230 Volt A.C.

The next best to the Diagonometer, giving a thorough analysis of every type of valve used. Does not, however, test the remainder of the set. Especially valuable for matching valves.

M239 Supreme tube tester . . . £40

## SUPREME TUBE CHECKER.

This is the cheapest tester of SUPREME, and is designed mainly for giving an initial test to new sets, or to use as a transformer work. It instantly tests all American type valves.

M241 Supreme tube checker £12 0 0

## SUPERHETERODYNE TESTER

TO ARRIVE

## ELECTRIFY YOUR RADIO.

By fitting an "A" ELIMINATOR to your RADIO, together with a "B" ELIMINATOR, you will derive the working current from the mains, dispensing with batteries. In many ways the RADIO will then be superior to the A.C. models on the market, especially on the score of expense in running, for the valves are fewer, much cheaper and have a much longer life.

## WESTINGHOUSE RECTIFIERS.

In our 1929 catalogue we expressed the opinion that WESTINGHOUSE RECTIFIERS would play a very important part in the electric Radios of the future. This prediction has been more than amply fulfilled.

The principle is known, but not explained. Electric current passes to pure copper than vice versa.

A similar effect is noticed and used in other metal rectifiers, but in the latter, a chemical action goes on continuously, so that the rectifiers themselves quickly wear out. The Westinghouse effect is called electronic, not chemical, and no deterioration takes place. Thus the units are practically everlasting.

Westinghouse rectifiers not only waste far less current than a rectifier valve, but they last much longer life. They are better in every way.

No wonder therefore that for rectifying, Westinghouse is rapidly replacing valves, even though the latter cost much less initially.

OUR EXTENSIVE EXPERIENCE WITH WESTINGHOUSE RECTIFIERS HAS PROVED CONCLUSIVELY THAT THEIR RELIABILITY IS TRULY MARVELOUS. We hardly know of any other Radio apparatus that approaches Westinghouse reliability—and all readers know we have sold the best Radio apparatus obtainable since 1920.



## SUMMARY OF ADVANTAGES.

1. No liquids, construction being entirely metallic.
2. High efficiency, so small current wastes.
3. Permanence.
4. Minimum reliability.
5. Very robust—no delicate parts to break.
6. Absolute silence in operation.
7. Easy to use as a transformer voltages not critical.
8. Only a simple secondary necessary for "B" eliminators.

## PULLEYS.

(See under MASTS.)



## WELL-MAYDE USBS.

1. Charging "A" accumulators.
2. Charging "B" accumulators.
3. "A" eliminators.
4. "B" eliminators.
5. "C" eliminators.
6. Dynamic speakers.

Several of the above features may be combined in one apparatus and other uses for the rectifiers are constantly being devised. For instance, D.C. motors fitted with Westinghouse rectifiers are now regularly used for measuring A.C. currents. The rectifiers are used for running small D.C. motors, etc.

From the above, it can be seen that it is possible to electrify battery Radios, as well as to manufacture up-to-date electric Radios, with WESTINGHOUSE RECTIFIERS. Maximum efficiency will be assured.

See "A" and "B" eliminators and chargers.

## RECTIFIER CHOKES AND TRANSFORMERS.

There is a WELL-MAYDE TRANSFORMER and CHOKES for each WESTINGHOUSE RECTIFIER.

The well-known WELL-MAYDE transformers and chokes are manufactured in Auckland, are fully guaranteed, and are supplied in metal cases, beautifully crystal enamelled.

WRITE FOR WESTINGHOUSE BOOKLET. Post free, 3d. Contains full particulars, data, circuit diagrams, etc.

If you wish to discard batteries electrify your Radio with Westinghouse Metal Rectifiers.

Ask our advice.

## RESISTORS.

Resistance is the "friction of electricity." Usually, therefore, it is undesirable, since it means wastage. But just as friction is necessary to "brake" a vehicle and therefore to control it, so is resistance absolutely essential to electrical control.

Some resistances are fixed, others variable. Resistance is measured in ohms, and in Radio the values may be from less than one to 10 million or more, according to the work it is called upon to do. This large variation accounts for the different names, i.e., usually a rheostat is a variable resistor from 6 to 30 ohms, a grid leak is a fixed resistor from 1 to 10 megohms (million ohms), and so on.

This renders complete classification somewhat difficult, but information on this point is always available on enquiry.

## RESISTORS—DE JUR.

These resistors are the result of much investigation and secure uniformity, combined with absolute freedom from temperature or moisture changes, in the form of a colloidal film.

Mfrs. No.	Volts.	Amps.
R248	6	1 1/2
R249	10	1 1/2
R250	A3	1 1/8
R250	A4	2 2/8
Volts, m/amps.		
R252	G.B.1	40 50
R251	H.T.3	120 20 1 80
R252	H.T.4	180 20 2 80
R250	H.T.1	200 100 10
R251	H.T.2	350 100 9 00
R254	H.T.5	120 20 1 10
R255	H.T.6	170 25 1 40
R256	H.T.7	200 28 1 80

INPUT VOLTAGES—See index for Transformers—A3 transformer suits A3 rectifier, and so on.

## NOTES.

1. The 6 and 9 volts rectifiers are for "A" chargers, "A" eliminators and dynamic speakers. For "A" eliminators, allow a third of the voltage for loss in the choke.

2. G.B.1 is for "C" eliminators.

3. H.T.s. are all for "B" or combined "B" and "C" eliminators.

4. H.T.4 is used with a 135 volt transformer, through a peculiar circuit, the output being 80 volts.

5. H.T.1 and H.T.4 can be connected direct to 230 volt A.C. mains and used for accumulator charging under conditions explained in WESTINGHOUSE BOOKLET. Post free, 3d.

6. In "B" eliminators, allow about 10 per cent. voltage drop in the chokes.

## POWER RESISTORS.

POWER RESISTANCES are essential to all Radio sets which derive any current direct from the mains. Particularly are they a component of "B" ELIMINATORS for A.C. mains.

## DE JUR.

DE JUR VITREOUS ENAMELED RESISTORS are designed to satisfy fully the requirements of modern Radio apparatus. The resistance wire is the highest grade, is wound on a porcelain refractory tube, firmly connected to lugs which cannot work loose.

Each resistance is calibrated to ensure accuracy. Then after a final test, the whole resistance is covered with a vitreous enamel and baked at a high temperature to harden the enamel.



## DE JUR—20 WATTS.

R218	500, 750, 1000, 1500, 2000,	
	2500, 3000 ohms ..	3 9
R219	500, 750, 1000, 1500,	
	2500, 3000 ohms ..	6 0
R220	20,000, 25,000 ohms ..	6 2
R221	50,000 ohms ..	7 2

## DE JUR—40 WATTS.

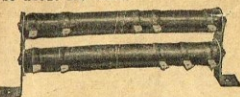
R222	500, 750, 1000, 1500, 2000,	
	2500, 3000 ohms ..	6 3
R223	3000, 5000, 7500, 10,000,	
	15,000, 20,000 ohms ..	7 6
R224	C5000 ohms ..	7 6
R225	50,000 ohms ..	10 0

## WARD LEONARD.

Ward Leonard have been the most famous of resistor specialists in U.S.A. for very many years.

## WARD LEONARD 507-70.

For Raytheon 350 milliamper A. B. C. valve. Secures Intermediate B voltage of 22, 45, 67, 135 and 180, also C negative bias of 40. Direct current of the rectifier is as long as the load should be about 220 volts.



Resistances are 865, 5,490, 2,600, 2,025 on one arm, and 57, 450, 304, 225, 45, 67, 90, 135, 180 volts B. Resistances are 70, 4160, 54, 18, 18, 4000 on one arm, and 40, 80, 130, 600, 100, 100, 30 on other. Either arm can be supplied separately at 22s. 6d each.

R176 Each .. .. . 45 0

## WARD LEONARD 507-62.

For 400 m.a. ABC supply. Voltages are 4.5, 9, 20, 40C A.-J. and 22, 45, 67, 90, 135, 180 volts B. Resistances are 70, 4160, 54, 18, 18, 4000 on one arm, and 40, 80, 130, 600, 100, 100, 30 on other. Either arm alone, 22s. 6d. Price, 45s.

## WARD LEONARD 507-6, 200 Watts.

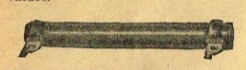
For intermediate voltages of 45, 67, 90, 135 and 400 in a current supply of 450 volts under load. Total resistance 41,000 ohms. Maximum current 70 milliamps.

Resistances are 8,000, 7,000 and 5000 on one arm, and 6,000, 2,700, 2,300, 2,000, 8000 on the other. Either arm can be purchased separately at 25s. 6d each.

R172 Each .. .. . 40 0

## WARD LEONARD 507-24 to 67.

Type S are rated 44 watts in free air. Obtained in a wide range of values.



R177	750, 1,500, 2,000, 2,250	
	2,500, 3,000 each ..	6 0
R178	3,500, each ..	7 6
R179	4,000, each ..	9 0
R180	5,000, each ..	10 6
R181	10,000, each ..	13 6
R182	15,000, each ..	16 6
R183	25,000, each ..	16 6
R184	50,000, each ..	19 6
R185	100,000, each ..	31 6

## FIXED ADJUSTABLE RESISTANCES.

It is rather difficult to find a name for these resistances. They are not variable in the sense that they have a knob attached to them for continual changing. Actually, they are meant to be placed in the set, adjusted to suit, and then left indefinitely.

Can be supplied plain or with clamp and connector, as shown below.



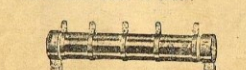
The resistances serve many purposes, the main being the control of filament current, and the control of static being entirely discarded. The resistance is installed in the set, adjusted, and then left as long as the same values are used.

R226	2, 6, 10, 15, 30, 50 ohms	1 3
R227	100, 200 ohms ..	1 6
R228	400, 500, 600, 1000, 1500	
	ohms ..	1 9
R229	2000 ohms ..	2 6

## ACE RESISTANCES—50 watt.

Wound with special wire on a smooth porcelain tube, about 7 inch long and 1 1/2 inch diameter. Plated mounting clips and resistance to baseboard, while there are five adjustable contact bands. A very fine resistance.

Other sizes made to order.



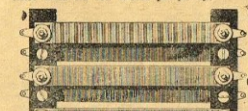
R231	AC 10,000 ohms ..	9 0
R232	AC 15,000 ohms ..	10 6
R233	AC 20,000 ohms ..	12 0

## WELL-MAYDE RESISTANCES.

We faced the demand for different types of resistances so varied as to be very unsatisfactory. It was impossible to keep an adequate stock available in all lines, simply because many of them were wanted to-day, and then forgotten.

The factory therefore investigated the problem, and after much experimenting, have produced a very complete range of wire wound resistors, in standard types, all of one type being wound on the same size strip, so as to be interchangeable.

The strip used is Formica, of a special grade. The wire is the best nichrome. Accurate winding machines ensure neat and close, but spaced windings. The result is a resistor that will do its work properly.



For "B" eliminators, where a number of resistances are used, a special mounting frame is supplied. This comprises two vertical strips of Formica, with plated brackets at the base for secure mounting. At intervals, thin rods are held in place by plated brass screws. The resistances can then be attached to the vertical strips with extra nuts, good contact being certain.

WELL-MAYDE "SOVEREIGN"  
Strip is 1 inch wide, the end eyes being spaced 4 1/2 inches apart, and suitable for 6/32 screws.  
R270 1000, 1500, 2000, 2500, 3000, 3500, 4000 ohms .. 2 6  
R271 5000, 6000 ohms .. 3 6  
R272 7000, 8000 ohms .. 4 0

WELL-MAYDE "MONARCH"  
Strip is 1 inch wide, end eyes 4 1/2 inches apart, therefore, fitting same mounting as the SOVEREIGN.  
R273 1000, 1500, 2000, 2500, 3000, 3500, 4000 ohms each 2 0

WELL-MAYDE "PRINCE"  
Strip is 1 inch wide, eyelets being 18 inches apart. For grid bias, etc.  
R274 750, 1000, 1500, 2000 ohms 2 0

WELL-MAYDE RESISTANCE MOUNT.  
A pair of mounting brackets, to take up of 6 Well-Mayde resistances. Nickel-plated brackets, with Formica strips, ready drilled and counter-bored. Screws, nuts and lugs included.

This mount, and WELL-MAYDE RESISTANCES will solve most, if not all, of the resistance problems for eliminators, etc.

R275 Well-Mayde mounts pair 1 6

## RESISTORS.

Compressed carbon resistors are now standard on practically all American sets, a number being used in each set.

RESISTORS are actually used by a large number of manufacturers in U.S.A. and you will probably find them already in your own set.

Resistors are made to various degrees of accuracy, but RESISTORS are accurate to within 10 per cent, the limit used by only the best manufacturers. Each has two 1/16 in. wide leads.

They can be used for various purposes, such as meter resistances, and if extreme accuracy is required, a lower resistance can be filed down.

RESISTORS have three colour markings, indicating different resistance. Send us your old resistor and we will match it. Made in following resistances:

100, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1500, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10,000, 15,000, 20,000, 25,000, 30,000, 40,000, 50,000, 60,000, 75,000, 100,000, 250,000, 500,000 ohms, and 1, 2, 3, 4, 5, 6 megohms.

## DEALERS' RESISTOR KIT.

Contains 24 assorted resistances most in demand together with full list of identifying colours. Enable prompt and accurate resistor replacement.



R297 1 watt ..	2/-	42/-
R298 3 watt ..	3/-	65/-
R299 5 watt ..	4/-	87/-

## SILICARBO RESISTORS.

Silicarbo is a solid substance made by the fusion of selected compounds in the presence of the electric furnace, in the same manner as carbon-undum.

Silicarbo is used as the heating element in high grade radio sets. It cannot burn out in a Radio set. It is used as comparatively thick rod, it is not delicate.

The sizes given below enable any resistor value to be made, merely by adjusting the length. Intermediate tapping clips will give as many taps as desired. This feature makes it especially useful for "B" eliminators.



Silicarbo is stocked in various resistances, 10m (10-1000), 25m, 50m, 100m, 150m, 200m ohms.

Size	Ohms	Price
R305 6 x 3/16	10m-50m	7 6
R306 4 x 3/16	10m-25m	5 0

Mounting end clips included with each resistor. Tapping clips, either size 6d, each extra.

## RADIATOR ELEMENTS.

R307	4 x 1/2 3/16in. Silicarbo ..	7 0
R308	8 x 3/5in. Silicarbo ..	10 0



**NICORDO.**

Very fine nichrome wire, wound on a special cord-like core, the whole being less than 1 inch thick. Nicordo can be cut to lengths, covered with spaghetti, and fitted with two lugs (say, L127 or L129). This gives an excellent wire wound resistance, which can be folded or coiled as desired.



	Ohms per ft.	milliamps	per ft.
R300 10,000	10	10	2 3
R301 25,000	10	10	2 1/2
R302 50,000	10	10	3
R303 100,000	10	10	4 1/2

**PORCELAIN RESISTANCE TUBES.**

For winding resistances, such as the ACE. Cross hole at each end for convenient mounting. Other tubes, including spiral grooved tubes also stocked. Tapping clips, 6d. ea.



R237 4in. x .4in. outside diam.	2 0
R238 6in. x .6in.	2 3
R239 8in. x .75in.	2 6
R239 8in. x 1.12in.	3 0

**RHEOSTATS.****DE JUR SUPER**

A genuine moulded bakelite rheostat, with very smooth action. Very high quality. Bakelite knob included. 2, 6, 10, 20, 30 50 ohms.  
R205 Each 4 6

**DE JUR BUFFALO**

A moulded bakelite rheostat, complete with bakelite knob. Suitable for all high grade receivers. 2, 2 1/2, 3, 4, 5, 6, 7, 10, 20, 30, 50 ohms.  
R206 Each 3 6

**CONTINENTAL.**

A moulded rheostat about 15 ohms, and suitable for the average set. Complete with knob, on which an arrow is moulded. The cheapest rheostat on the market.

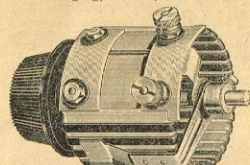
R205 15 ohms 1 0

**FROST HUM BALANCER.**

A 20 ohm potentiometer, to centre tap filament in A.C. Radios, thus eliminating hum.  
R263 6 0

**POWERHOBS—50 watts.**

Many uses are found for these rheostats, which are much larger than usual, and will carry very heavy currents. Controls accumulator charging, motors, etc.



Ohms	1	2.5	5	10	20	30	50
Amps.	7	4.5	3.2	2.2	1.6	1.3	1
R296 Powerhobs	12	0					

**AUTOMATIC FILAMENT RESISTORS.**

Known as amperites when first marketed, these resistors automatically adjust the filament current, enabling rheostats to be dispensed with.

**LYNCH EQUALIZER.**  
The best quality obtainable, made by a firm specializing in resistors.



R234 Lynch equalizer, with mount, all sizes	5 0
R236 Amperites	4 6

**VARIABLE RESISTORS**

Recent improvements in the continuously variable type of resistor make it possible for these to be used in many places where previously it was inadvisable to do so, owing to lack of durability.

**EMMCOSTADS.**

R237 No. 1	25-100 ohms	7 6
No. 1A	0-2,000 ohms	7 6
No. 2	250-25,000 ohms	7 6
No. 3	2,500-500,000 ohms	7 6
No. 4	4,500-500,000 ohms	7 6
No. 6	25-10 megohms	7 6

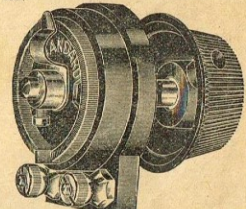
**VOLUME CONTROL—TABLE TYPE**

Similar to R203, mounted in a container, and fitted with long cords and connector, so that the set can be controlled from some distance. Range 10-500,000 ohms.

R242 Table volume control 13 6

**ROYALTY (POTENTIOMETER).**

The resistance is wire wound or protected by a wire winding which by its peculiar method of fitting, merely acts as a set of switch studs, thus protecting the element from wear. In appearance, it is exactly like a rheostat, and can be used either rheostat or potentiometer fashion.



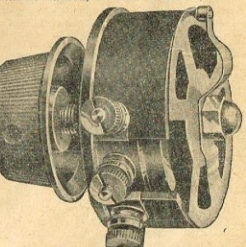
Note—All ROYALTY RESISTANCES are fitted with THREE TERMINALS.

Lowest resistance is about 10 per cent. of the total. About 50 per cent. margin in current (milliamps) is advisable.

	Range	Current	
	Ohms.	Milliamps	s. d.
R198 F	2,000	23.0	7 6
R202 K	5,000	20.0	7 6
R199 G	10,000	16.5	7 6
R200 H	25,000	10.5	7 6
R254 C	50,000	7.5	7 6
R255 B	100,000	5.0	7 6
R201 J	200,000	4.0	7 6
R203 L	500,000	2.5	7 6
R196 D	700,000	2.0	7 6
R256 A	7 megohms	—	7 6

**ROYAL GIANT.**

A heavy duty high resistance potentiometer. Note special contact, both smooth and non-wearing. For talkie faders, volume controls, etc.



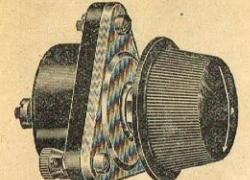
	Ohms.	milliamps.	
R291	5,000	28	13 6
R292	10,000	20	13 6
R293	25,000	12	13 6
R294	50,000	9	13 6
R295	100,000	6	13 6

**EMMCO POWERSTADS.**

R238 No. 1	0-100 ohms	12 6
No. 2	0-1,000 ohms	12 6
No. 3	200-100,000 ohms	12 6

**ROYALTY HEAVY DUTY.**

An 8-watt variable resistance similar to the Clarostat. Range from 5000 to 10 megohms, over several turns of the knob. Powerful enough for eliminator control.



R257 10 6

**CLAROSTATS.**

Clarostats are continuously variable resistances made in U.S.A.

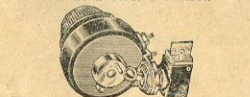
R169 0-5 megohms, 20 watts 12 6

1500 ohms, infinity 20 watts 12 6

R239 200-100,000 ohms 40 watts 19 6

**FROST WITH SWITCH.**

A 2000 ohm variable resistance, fitted either with battery or A.C. switch. It switches the set on and then acts as a volume control.



R246 With battery switch 10 6

R247 With A.C. switch 12 0

**SHAKEPROOF LOCK WASHERS.**

Shakeproof washers, with twisted steel teeth, do not tangle, but they firmly grip at a number of points. Try them on the number plate of your car, or any place subject to great vibration—you will be astonished.

U.S.A. screw sizes in brackets.

	3/32 (5/32in)	10/32 (3/16in)
3/8	4d. 3/9	6d. 5/6
1/2	5d. 4/6	8d. 7/7
5/8	6d. 5/6	12d. 10/6
1 1/8	7d. 6/6	16d. 15/6
1 1/2	8d. 8/6	20d. 15/6
1 3/4	10d. 11/6	24d. 11/6
2in.	12d. 11/6	30d. 11/6
NUTS	4d. 3/6	4d. 3/6

**INTERNAL OR EXTERNAL TEETH, SAME PRICE.**

Bolt thickness.	per dz.	per gr.
1/10 (4/36)	3d.	2/6
1/8 (6/32)	3d.	2/6
5/32 (8/32)	3d.	2/6
3/16 (10/32)	3d.	2/6
1/4	3d.	2/6
5/16	3d.	2/6
3/8	3d.	2/6
7/16	5d.	4/6
9/16	6d.	5/6
1 1/8	7d.	6/6
1 1/4	11/6	11/6
1 1/2	15/6	15/6
1 3/4	21/6	21/6
2in.	26/6	26/6

**SCREWS, NUTS,**

Without question, our range of these is the largest in the country. In fact, it is equally beyond dispute that our range of RADIO APPARATUS is not only the largest, but EASILY SO.

**U.S.A. SCREWS AND NUTS.**

For ordinary purposes, U.S.A. screws are recommended, because a range of only four sizes will cover practically every requirement in Radio. In fact, the two sizes (6/32 and 8/32) would almost do so.

All U.S.A. screws and nuts are brass, nickel plated, and the nuts are guaranteed to fit the screws properly. The nuts are hexagon, double chamfered, to give neat appearance.

The first number in the U.S.A. sizes denotes the gauge thickness of the screw, and the approximate equivalent in inches is given alongside. The second number (32 or 36) denotes the threads per inch.

Either ROUND HEAD (R/H) or COUNTERSUNK (C/S) screws can be supplied at the same price. Nuts are extra in every case.

Length.	2/56 (1/12in)	3/48 (1/10in)
dz. gr.	dz. gr.	dz. gr.
1/8 or 3/8	3d. 2/6	3d. 2/6
NUTS	6d. 5/6	6d. 5/6

Length.	4/36 (3/32in)	6/32 (1/8in)
dz. gr.	dz. gr.	dz. gr.
1/4	4d. 3/6	4d. 3/6
1/2	4d. 3/6	5d. 4/6
5/8	6d. 5/6	6d. 5/6
1 1/8	7d. 6/6	8d. 7/6
1 1/2	12d. 11/6	12d. 11/6
NUTS	4d. 3/6	4d. 3/6

Length.	8/32 (5/32in)	10/32 (3/16in)
dz. gr.	dz. gr.	dz. gr.
3/4	4d. 3/9	6d. 5/6
1 1/8	5d. 4/6	8d. 7/7
1 1/2	6d. 5/6	12d. 10/6
1 3/4	7d. 6/6	16d. 15/6
NUTS	5d. 4/6	6d. 5/6

8/32 screws fit Moccana.

**NUTS—CAP, WING, KNURLED.**

Brass, plated. Cap nuts fit neatly over the end of screw. All nuts stocked in U.S.A. sizes 4/32, 6/32, 8/32, 10/32, and cap nuts in 2 and 4 B.A. also.



	sa.	dz.
S143 Cap nuts, all sizes	2d.	1 6
S167 Wing nuts, all sizes	2d.	1 9
S170 Knurled, all sizes	2d.	1 9

**B.A. SCREWS AND NUTS.**

B.A. is the standard for all British electrical apparatus. Sizes 1 to 6 B.A. are listed, but other sizes from 0-10 are sometimes available.

THE SCREWS are brass, nickel plated, either round head or countersunk.

The hexagon nuts are also brass, nickel plated.

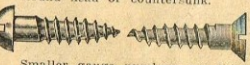
Length.	1 B.A.	2 B.A.
dz. gr.	dz. gr.	dz. gr.
1/8	6d. 5/6	4d. 3/6
1/4	8d. 7/6	5d. 4/6
1/2	8d. 7/6	6d. 5/6
NUTS	6d. 5/6	4d. 3/6
3/8	4d. 3/6	4d. 3/6
1/2	4d. 3/6	4d. 3/6
5/8	4d. 3/6	4d. 3/6
NUTS	4d. 3/6	4d. 3/6
1 1/8	3d. 2/6	3d. 2/3
1 1/2	3d. 2/6	3d. 2/3
NUTS	3d. 2/6	3d. 2/3

**SCREWED ROD (BRASS).**

U.S.A. sizes, 6/32, 8/32, per ft.	
1/2	1 0
B.A. sizes, 0 to 10	1 0

**WOOD SCREWS—BRASS PLATED.**

Round head or countersunk.



Smaller gauge nuts are thinner. Usual sizes mentioned first.

Length	Gauges	dz.
1in.	3, 1.	5d. 4/6
1 1/8	4, 2.	5d. 4/6
1 1/2	5, 3.	6d. 5/6
1 3/4	7, 4.	9d. 8/6
1 1/2	8, 5.	10d. 9/6
1 3/4	10, 6.	12d. 11/6

**WASHERS.**

These washers are BRASS, cleanly cut, and nickel plated. The data given are O.D. (outside diameter), I.D. (diameter of hole). U.S.A. screw that the washer will fit.

O.D. I.D. Screws dz. gr.	
S145 9/32in .125in	3/48 2d 1/6
S147 1/2in .150in	3/32 3d 2/3
S148 5/8in .170in	8/32 3d 2/3
S149 7/16in .170in	8/32 3d 2/3
S150 7/16in .170in	8/32 3d 2/3
S151 1in .195in	10/32 4d 5/6
S152 1 1/16in .200in	1in 6d 5/6

**SPRING WASHERS.**

Spring washers consisting of a couple of turns of flat phosphor bronze strip. Nickel plated. Two sizes, 5/32, and 3/16in.

	dz.	gr.
S180	5d.	5/6



## SHIELDS.

Most modern Radio sets are shielded by enclosing all or part of the apparatus in aluminum boxes. These are most effective when they are made of thick aluminum, but, nevertheless, the lighter shields are very effective indeed.

Special sizes can always be made to order, but are more costly.

## VALVE SHIELDS.

Hammarlund valve shields are spun from a single piece of heavy aluminum, specially coned at the top, and bottom fits inside the can, with neat effect.

A rubber grommet in the top insulates the screen clips from the shield. Other shields are not insulated, and frequently shorting takes place. There can be no shorting with the Hammarlund shield.

S213 Hammarlund shield, ea.	3 3
S222 Alum. shield, 5 x 3	2 2
S223 Alum. shield, 5 x 3	2 2
S224 Alum. shield, 4 x 2 1/2	2 2
S225 Alum. shield, 4 x 2	2 2

## SHIELD—WELL-MAYDE 4 VALVE.

For S.G. valves. Silver finish, heavy metal, to screw to chassis. Single lid, well fitting, no shorting.

S221 W-M 4 Valve shield	8 0
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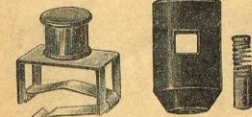
## ACE SHIELD.

A rigid shield, designed for easy assembly and efficient working. Size 9 x 6 x 1/2 in.

S183	9 0
------	-----

## SLIDERS.

Sliders are made to fit 1/4 in. square brass rod. Rods can be purchased either in plain brass or ready drilled and plated.



S104. S102.	
S104 Plated, coloured knob	6d.
S102 Black, with spring plunger	4d.

## SLIDER ROD—PLATED.

Plated and drilled, 1/4 in. square. S177 Length 6 in. S178 Length 8 in. Plain rod, see under BRASS.

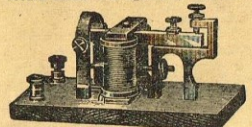
## SOLDER—RESIN-KOR.

A high-grade solder, made in England, and used locally by responsible authorities. Better than all others. S187 1 lb. (approx. 35ft.) S188 8 ft. length

(See under Tools.)

## SOUNDERS.

The heavy type are Government stock, not quite new, but in first class condition—if not, by all means return them. The lighter type is new.



S190 Heavy type	£1 10 0
S191 Light type	1 2 6

## SWITCHES.

## RADIO POWER SWITCH.

For the new A.C. sets, switches must be entirely different from the older push pull type. Tumbler switches could be used, but are much too clumsy. This switch can be mounted on a panel, has a quick make and break, and is very suitable for A.C. sets, electric gramophones, etc. Plate, engraved "on-off" included. Plated or bronze finish.

S181 One way	2 6
S192 Two way (no plate)	3 6

## RADIO INSULATED SWITCH.

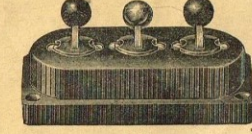
Similar movement to S181, but with rotary motion. Perfect insulation provided by knob.

S219 With black knob	3 0
S220 With walnut knob	3 3

## TROJAN SWITCHES.

Small switches, for low voltages. Useful on motor cars, launches, Radio batteries, accumulators, lighting, etc. Easily fitted. Made in several varieties, all having good rubbing contacts and capable of carrying up to 15 amps.

S197 Black moulded, single	2 0
S200 Nickel plated, single	4 0
S198 Black moulded, double	4 0



S199 Black moulded, triple	6 0
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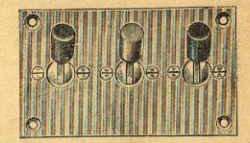
## SWITCH-PUSHES.

Small pushes, made like above switches.

S204 Black	2 0
S205 Nickel plated	2 0

## PLATE SWITCHES.

Similar movement to Trojan, but with nickel-plated plates; 15 amp. capacity.



S201 Nickel plated, single	2 0
S202 Nickel plated, double	4 0
S203 Nickel plated, triple	6 0

## TROJAN TWO-WAY SWITCHES.

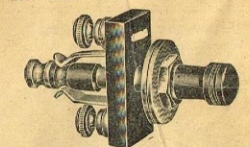
Key has three positions, the central position being neutral.



S206 Similar to S197	3 6
S207 Plate pattern	2 9
S208 Plate pattern, double	4 6

## WELL-MAYDE "A" BATTERY.

A simple, efficient and durable switch, mounted on Porcelain base, all brass parts being nickel plated. The springs are hard and springy, making the switch very free from trouble. Working parts can be inspected—a decided advantage. Single hole mounting.



S118 Well-Mayde switch	1 6
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## PORCELAIN BASE.

Useful for aerial-earth switches, for launches and other low voltage circuits. Plated.

S111 Single pole, double throw, each	1 6
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S113 Double pole, double throw, each	2 6
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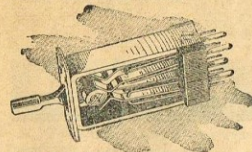
Aerial switch, with spark gap, similar to S111

S114 Single pole, double throw, each	1 6
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## DEWAR SWITCHES.

All Dewar switches have three positions, and they combine in a very small space the necessary means of obtaining complicated switching that otherwise would require very bulky and clumsy switches. They are very neat, and work extremely smoothly.

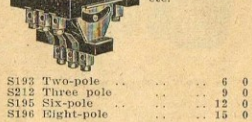
The smallest type can be used for switching from Radio to electric gramophone working, and for operating two pick-ups on a gramophone fitted with two turntables.



S169 24 contacts	15 0
S185 12 contacts	10 0
S186 6 contacts	9 0

## ANTI-CAPACITY SWITCHES.

One hole mounting, with three positions. For Radios, Radio-gramophones, accumulators, etc.



S192 Two-pole	6 0
S212 Three pole	9 0
S195 Six-pole	12 0
S196 Eight-pole	15 0

## RADIO OWL.

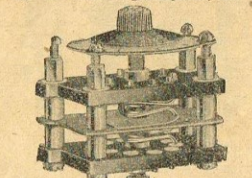
Something every Radio user wants. Before you go to bed, adjust the RADIO OWL any time up to two hours ahead. He watches till the time is up, and then switches off your set automatically. Very useful and also quite ornamental. Simple clockwork, and will operate any electric or battery set. BUT NOT a set using "A" batteries and "B" eliminators—two would be required for this purpose.

Order one immediately—you will be more than delighted.

S189 Radio Owl	30 0
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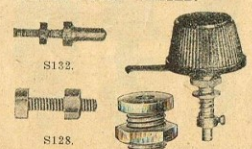
## SWITCHES—PERRANTI.

Small compact switches especially for making multi-meters from milli-amperes, but also useful in switching from Radio to gramophone, etc.



S214 Single pole, 3 way	3 9
S215 Double pole, 3 way	4 6
S216 Double pole, 5 way	6 6
S217 Single pole, 10 way	7 6
S218 Double pole, 10 way	8 6

## SWITCH PARTS—PLATED.

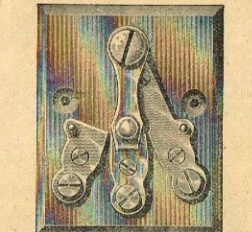


S122 Switch arm adj. 1 1/2 in.	ea. 1 0
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S123 SWITCH POINTS 1 1/2 in.	gr. 11 0
S122 SWITCH STOPS 1 1/2 in.	gr. 11 0
S123 Bearing 3/16 in. hole	ea. 6d.
S124 Bearing 1/4 in. hole	each 6d.

## BELL SWITCHES.

These can be supplied complete, or metal parts only for making your own plate.



S209 Handle and arm	9d.
S210 Contacts	2d.
S211 Complete switches made up, with bakelite base, and any number of contacts, for cost of parts plus	1 0

## TELEPHONES.

Telephones find many uses other than the usual one with crystal sets. For long distance and short wave work, they are almost essential.

Those who are, unfortunately, deaf can almost hear quite well through a pair of phones connected to the Radio. We can always arrange in such cases, that others in the house can use the speaker at the same time.

Further, we can supply apparatus which enables deaf persons to take part in the ordinary conversation in a room. The cost is really very small for the benefits obtained.

In times of sickness, telephones can be connected from any room to the Radio by a long cord. Many weary hours are thus made infinitely more pleasant.

## N. AND K. SENIOR.

The outward finish of N. and K. 'phones is very attractive indeed, the nickel plating being absolutely superb. But not until the smoothly polished earcap is removed does the fact that the apparatus inside is made with the precision of a watch become very evident.

A trial will convince you that the N. and K. has no equal—they are in a class by themselves. Experts are agreed on this.

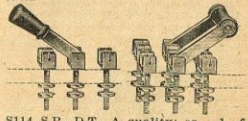
So confident are we of N. and K. quality, that not only do we give our own personal guarantee with every pair for twelve months, but if you find they are not as represented, DO NOT HESITATE TO RETURN THEM—your purchase price will be refunded in full.



T229 N. and K. SENIOR	22 6
T230 Earcap, Senior	2 6
T243 Diaphragm, Senior	5 6
T244 Diaphragm, Junior	5 6
T245 Earcap, Junior	2 6

## SWITCHES, MINIATURE—PARTS.

These switches are very useful for Radio and other purposes where a small switch is required. Two grades are supplied, both being plated. A template for easy marking of the panel is included with each.



S114 S.P., D.T., A quality; ea.	1 6
S115 S.P., D.T., B quality; ea.	1 6
S116 D.P., D.T., A quality; ea.	2 0
S117 D.P., D.T., B quality; ea.	1 0



## TELEPHONES—Contd.

We have gone to a great deal of trouble in selecting cheaper 'phones for our list. A cheap 'phone that will not work, or that works only for a short time, is useless.

After testing a large number from various manufacturers, we have chosen the following both for their efficiency and durability. They will compare very favourably with the No. 8 and K Junior kitsets offered, but now unfortunately withdrawn by the makers.

## TELAKU MAHAGANY.

A special 'phone, finished in brown bakelite and wound to 4000 ohms instead of the usual 2000. Double headbands, leather covered. Light in weight and very comfortable.

T352 Telaku Mahogany . . . 12 6

## TELAKU SABLE.

Similar to Telaku mahogany, but not so light. Brass earcap shells. Double headband. Very reliable, and excellent value at the low price charged.

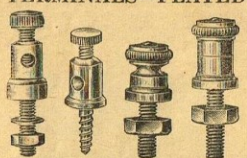
T353 Telaku Sable . . . 9 6

## JOHN'S KNOCK-OUT.

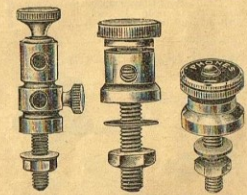
A really wonderful 'phone considering its low price. Single headband, light weight, yet very sensitive. Worth far more than many others costing 50 per cent. extra. A 'phone you can buy with confidence.

T354 Knock-out . . . 7 6

## TERMINALS—PLATED



T102 Small	ea.	d.	gr.
T103 Wood screw	3d.	2 3	24 0
T184	3d.	2 3	24 0
T186 Small	3d.	1 9	20 0
T187 Medium	3d.	3 6	39 0



T119	ea.	d.	gr.
T183	3d.	5 6	60 0

## BINDOTERMS.

Double purpose terminals, gripping a wire under the screw top, or through the hole. The top screw is bored to take a wander plug also.

T183	ea.	d.	gr.
	3d.	3 9	44 0

## PLATED.

Brass plated terminals, with names engraved on red and black insets. Two sizes, with all names as per special list.

T206 Medium	ea.	d.	gr.
T220 Small	3d.	5 9	65 0

## PHONE CUSHIONS.

Sponge rubber cushions fit over the earpieces of your 'phones, and make them feel very pleasant and comfortable. They also exclude external noises, making weak signals much more plain.



T234 Per pair	ea.	d.	gr.
	3d.	1 9	20 0

## PHONE DIAPHRAGMS.

Stallion is recognised as the best diaphragm material and is used in all well-known phones and speakers. All sizes from 1 1/2 up to over 3 inch.

T131 Bach	ea.	d.	gr.
	3d.	5 4	59 0

## ENGRAVED TERMINALS.

The following list shows the engravings obtainable on Bell-Lee terminals and plated terminals T206-T220.

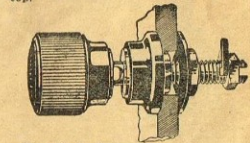
## STOCK LIST TERMINAL NAMES.

AERIAL PHONES	
A BATT. +	B BATT. - DET.
A BATT. -	B BATT. + R.P.
C BATT. +	B BATT. - A.P.
C BATT. -	B BATT. + P.W.R.
C BATT. - P.W.R.	

## BELL-LEE TERMINALS

## TYPE B—ENGRAVED.

These terminals are of substantial size, and being of finely moulded bakelite, have a superb appearance. The engraved top does not rotate, so that once the terminals are fixed, the readings always line up. 1 inch diameter, height 1 inch above panel. End is slotted to grip wire firmly without soldering. Non-removable top.

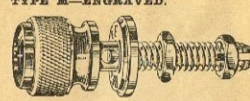


See stock list of names.

T189 Engraved	ea.	d.	gr.
T188 Not engraved	3d.	8 9	

Any name engraved to order

## TYPE M—ENGRAVED.

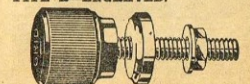


A very neat and effective plated brass terminal, with non-rotating name and other features as in Type B. A good solid terminal that can be thoroughly recommended for the best class of set.

See stock list of names.

T225 Engraved	ea.	d.	gr.
	3d.	6 0	

## TYPE R—ENGRAVED.



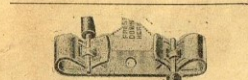
A small black terminal, non-removable top. Brass parts nickel plated. See special list of names.

T226	ea.	d.	gr.
	3d.	5 4	59 0

## FARNSTOCK TERMINALS.

These handy terminals are made from spring brass, and are plated. Vibration cannot shake them loose, and they make a better connection than most ordinary screw terminals. They can also be connected and disconnected instantly.

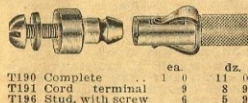
T108 Small	ea.	d.	gr.
T109 Medium	3d.	1 6	15 0
T110 Large	3d.	2 0	21 0



T113 Double, 2 1/16 in	3 6	36 0
T114 Double, 1 1/2 inch	3 0	33 0

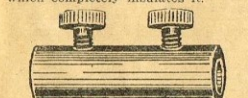
## RAJAH.

Very strong spring snap terminals. Brass plated. Make a reliable connector for heavy current.



## CONNECTORS.

Brass connectors, nickel plated, with two knurled head screws. T257 is enclosed in Erioloid block, which completely insulates it.



T256 CONNECTORS	ea.	d.	gr.
T257	3d.	2 6	

## TERMINAL STRIPS.

Formica strips, fitted with small plated terminals, engraved. The illustration is not accurate.



T256 With 9 terminals

Extra terminals, 3d. each.

## TERMINAL STRIPS.

Terminal strips are made of Formica, about one inch wide, any length up to three feet. Any special size can be made to order.

FORMICA STRIP, about 1 in. wide; per inch 1d.

## TRANSFORMERS.

## WELL-MAYDE RADIO FREQUENCY TRANSFORMERS.

The modern A.C. Radio requires for its success, accurately matched condensers and Radio frequency transformers for coupling the Radio valves together.

Unless all sections of the condenser are matched, and also all the R.F. transformers, the selectivity and range, two of the vital features of Radio, will be very poor indeed.

WELL-MAYDE R.F. transformers are designed only for use with 224 type screened grid valves. Each is completely shielded in a copper can, copper being the most efficient metal for the purpose. After the transformers are matched in our laboratory, the tops of the cans are soldered to prevent tampering.

We list these with necessary polarising shielded coils (C157), fitted inside for convenience, though they could be used equally well outside.

These transformers are of the very latest type, designed for equal amplification over the whole broadcast band, and are to be found only in the highest quality receivers. They can, of course, be supplied matched ONLY IN COMPLETE SETS.

T235 Set of 3, less chokes £3 0 0  
T236 Set of 3, with chokes £3 15 0  
T237 Set of 4, less chokes £4 0 0  
T238 Set of 4, with chokes £5 2 6

These transformers are made for any multiple .00035 to .00037 condensers, or our factors of Hammarlund or De Jur (see index).

## TRANSFORMER REPAIRS.

Although we now have an expensive winding machine, capable of re-winding transformers, we find by experience that it takes far too long to set the machine for a single coil. Consequently, it is cheaper to purchase a new transformer than to re-wind the old one, unless there are some special circumstances.

GUARANTEE.—In asking for replacements, it is essential to give the date of purchase, otherwise the claim will be entirely ignored.

## ACME TRANSFORMERS.

We can still supply these transformers, which have proved so popular in the past.

T133 Acme MA2	ea.	d.	gr.
T134 Acme A2	3d.	1 7	0
T235 New A2 coil, fitted	3d.	19	0

## TERMINAL MOUNT.

A bakelite moulding for aerial-earth, speaker, pick-up, etc. Terminals not included.

T233 Bakelite terminal mount 1 3

## TIN-FOIL.

Packets containing about 50 sheets, 5 x 2 1/2 in.

T115 Packet	ea.	d.	gr.
	3d.	6	

## AUDIO FREQUENCY TRANSFORMERS.

On the choice of audio transformers depends to a very large extent the tone of a set. Usually a transformer can be judged by its weight, for a good transformer MUST have a fair amount of iron core and copper wire in it. But weight alone does not make a transformer, for the experience and skill of the manufacturer are all important.

Transformers stocked by us have been selected for their durability, as well as, of course, as for their undistorted tone qualities. All are guaranteed, and, though modern manufacturing methods have largely overcome transformer troubles, we promptly replace or repair any transformer coming within the scope of this guarantee.

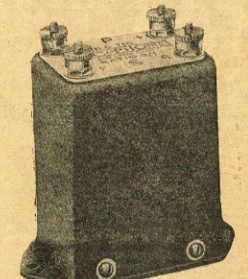
Even the cheapest transformer listed—the "BEE"—has proved wonderfully popular. Although low in price, its tone is really remarkable, while the windings seem to last indefinitely.

We will willingly procure any other transformer not listed, but cannot always extend the same guarantee as we do with those shown here.

## B.G.E. HI-FLUX TRANSFORMERS.

We have made hundreds of B.G.E. transformers, and say without hesitation that they have given unequalled service. They not only equal in tone far more expensive transformers, but we do not have to replace one in a hundred owing to defects arising. Their durability is simply astounding. You may pay more, but you cannot get better. Core is the new special alloy.

Guaranteed 12 months



T234 Hi-FLUX transformer, 3:1 25 0

## PHILIPS-RATIO, 3:1.

T270 £1 0





## BEE.

A really wonderful transformer, considering its low price. Fully shielded, ratio 5:1 or 3:1. Realizing the need for a durable, efficient and cheap condenser, we had this made to our special order.

At the price, one could hardly expect a guarantee, but out of hundreds sold, less than 1 per cent. have given trouble, so we are only too happy to give a full six months' guarantee with every "BEE" we sell.

Try a "BEE" against some of the expensive transformers, and you will realise that tone has not been sacrificed for durability. In many cases its tone and volume surpass that of transformers costing twice as much.

Usual ratio is 3:1.



T326 3:1 ratio . . . \$ 0  
T327 5:1 ratio . . . \$ 0

## STAL TRANSFORMER.

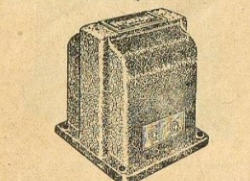
So great has been the success of the Bee transformer that we have now procured supplies of an exactly similar transformer, but much larger in size. If you want a really good transformer at a reasonable price, try one of these. Guaranteed 1 year.

T342 Stal transformer . . . 14 0

## NICKIRON.

Transformers with cores of nickel-iron (Nickiron) alloy are much smaller because of the special virtues of the alloy.

The STAL NICKIRON transformer is the cheapest of its kind offered today. Its small size, high quality and low price make it especially valuable as a replacement transformer in limited spaces.



T342 Nickiron transformer . . . 18 6

## PILOT PUSH FULL.

T307 Giant input, No. 408 . . . 33 0  
T308 Giant output, No. 409 . . . 33 0

## TRANSFORMER WIRE.

Soft iron wire is used for the cores of induction coils, small transformers, etc.

W112 26, 28 or 30g.; per lb. 2 3

## POWER TRANSFORMERS.

Transformers can be used on alternating current only. They are connected to the mains, and either a higher or lower voltage obtained, according to the ratio. There are no moving parts, and if well made and insulated, a transformer should be practically everlasting. It must not be unduly overloaded, however, nor must the secondary be shorted.

Unfortunately, transformers also cannot be used for battery charging, though they are used in conjunction with a rectifier in most cases.

We believe that our facilities are unique as far as New Zealand is concerned for the manufacture of transformers. Not only have we installed expensive winding machines, which wind the wire perfectly evenly, and place pieces of paper between the layers, but we fit the transformers into a very neat metal case, and insulate the whole with proper transformer wax where conditions make this advisable.

The cases can be crystalline enamelled, or ducoed, special plant being installed for both processes.

We claim that our transformers are better wound, more carefully made, and better finished than any imported article. Further, they cost less as a rule, than similar imported articles, and are guaranteed.

Let us solve your transformer problems—we know we can satisfy you.

## QUOTATIONS.

In asking for a quotation for a transformer, we must have the following details—

1. Mains or input or primary voltage, and cycles (nearly everywhere in New Zealand this is 230 volts 50 cycles).

2. VOLTAGE AND AMPERAGE OF EACH secondary winding.

3. Where tapplings, if wanted, are to be placed.

4. The purpose for which it is required—for instance, if for a "B" eliminator, or amplifier, or valves in each stage, etc. This enables us to check your figures to a great extent, but not essential, provided you KNOW EXACTLY WHAT YOU WANT.

WE CANNOT QUOTE WITHOUT AT LEAST ALL THE INFORMATION in 1 and 2 above.

## FERRANTI TRANSFORMERS.

Ferranti transformers are a well-known English production, famed for high quality. Although the price is rather more than usual. From the large Ferranti range, the following have been selected, but any other Ferranti product will be supplied when ordered.

T364 Andio A.F. 3 . . . 2 0 0  
T365 Andio A.F. 3 . . . 1 2 6

T366 Andio A.F. 3 . . . 112 6  
T367 Push pull A.F. 3c . . . 118 0

T368 Push pull A.F. 4c . . . 1 7 6  
T369 Push pull A.F. 5c . . . 1 6 0

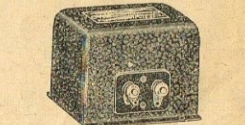
T370 Push pull output, G.P. 3c, 1/1 . . . 115 0

T371 Push pull output, O.P. 4c, 25/1 . . . 115 0

## WELL-MAYDE TRANSFORMERS.

Manufactured in Auckland under expert supervision, and with the most modern winding machines, which not only wind the wire evenly, but count each turn, and insert a layer of paper between the layers of wire. The precision winding ensures the greatest durability in the windings, especially when only the highest grade of wire is used.

STALLOY is used for the cores, because losses are lower, and heating consequently much less. After completion, careful tests are made which reveal the slightest defect, which might exist.



Sealing is done with best imported transformer compound.

Metal cases are finished with best DUOCO, or crystalline enamel, and in neatness and finish are actually superior to imported transformers.

ALL WELL-MAYDE TRANSFORMERS ARE GUARANTEED.

WE MAKE A SPECIALITY OF MAKING ANY TRANSFORMER TO ORDER, the following range representing a few only of the many kinds already manufactured.

## WESTINGHOUSE RECTIFIERS.

Five transformers listed below are specially designed for WESTINGHOUSE RECTIFIERS of corresponding numbers.

WELL-MAYDE TRANSFORMER A2.

Delivers about 14 volts 1 amp. which with the A2 rectifier produces 9 volts 1 amp D.C. Lower D.C. voltages are obtained by a resistance in the D.C. leads. Fitted with bayonet adaptor, and 8ft. turn flex.

T280 W-M transformer A2 1 10 0

WELL-MAYDE TRANSFORMER A4.

Details as A2, but output 2 amps.

T313 W-M transformer A4 2 0 0

## W-M TRANSFORMER H.T.I.

230 volts, 100 milliamperes output. Used with the H.T.I. rectifier, giving unfiltered output of 300 volts 100 milliamperes, which can be used either for a powerful "B" eliminator or charging of accumulators up to 180 volts. Could also be used for other eliminators.

T290 W-M transformer HT1 1 15 0

## W-M TRANSFORMER H.T.4.

Output 135 volts, 50 milliamperes, and suitable for either HT3 or HT4 "B" eliminator rectifiers.

T327 W-M transformer HT4 1 10 0

## W-M TRANSFORMER "ABC."

Gives combined outputs as for A3 and HT4 and is suitable for use as A3.

T328 W-M transformer ABC 2 5 6

## W-M TRANSFORMERS—Continued.

230/110 or 110/230 V.M.TS.

Change 230 volts A.C. to 110, or vice versa. Enable standard American 110 volt Radios and other apparatus to be used in N.Z. 230 volts A.C. can be changed to 110 by the size of transformer used, it is always safe to use one that is more powerful than required, but our advice is always available, on receipt of full particulars of the purpose for which the transformer is required.

To compensate for variations of line voltage, etc., these transformers are made with a tapped secondary, giving 120, 110 and 100 volts under full load, with 230 volt mains.

To obtain approximate output in amps., divide the watts by 110. All these transformers are entirely enclosed in Ducoed metal cases, sealed where necessary, with best transformer compound.

T309 50 watts . . . 2 0 0  
T310 100 watts . . . 2 15 0

T311 150 watts . . . 2 15 0  
T312 250 watts . . . 4 4 0

T313 500 watts . . . 7 15 0

Larger sizes on application.

## RECIPIER TRANSFORMERS.

Best quality material and manufacture, capable of continuous cool operation. Suitable for use with two pin input plug and engraved terminals, or less case and terminals, but mounted on rubber feet. Primary 230 volts (other voltages if required). Outputs accurate—no burnt out valves.

RECEPTOR

Volts Amps Valves

2.5 2 280  
2.5 12 245

2.5 12 7234 or 227  
300-6300 volts, 100 milliamperes.

T345 W-M Receptor, in case £3 15 0  
T346 W-M Receptor, no case 3 0 0

W-M LOFTWITE TRANSFORMER.

Suitable for Loftin White amplifiers using one 254 and one 245 valve. Output with A.C. rectifier and W-M amplifier combined, four 224 and one 245

Volts Amps Valves

2.5 1.5 424 or 227  
450-450 volts, 50 milliamperes

T347 W-M Loftwite, in case £3 5 0  
T348 W-M Loftwite, no case 2 11 0

W-M LOFTWITE-TALKIE.

An oversize transformer, suitable for largest amplifiers and especially for Loftin White 15 watt output, with two 250 valves in last stage. Suitable for powerful table equipment. Note two separate 7.5 volt filament windings.

T290 W-M transformer HT1 1 15 0

7.5 2.5 2281  
7.5 1.25 1250

2.5 1.25 1250  
2.5 7 4224 or 227

750-500-600-750 volts, 150 ma.

T350 Loftwite talkie, no case 5 0 0  
T350 Loftwite talkie, no case 5 0 0

TRANSFORMER FOR MECANO.

High grade transformer, suitable for driving the Meccano motor. Much cheaper than the imported article, but of the very highest quality.

T322 Transformer for Meccano 2 6

## W-M TRANSFORMER UX280.

For powerful eliminator using 280 rectifier valve. Correctly designed to give RECTIFIER FILTERED output of 230 volts 60 mls, and incorporating 0.022 mfd. as well. Filament winding included.

T351 W-M transformer UX280 75 0

## TRANSMITTING TRANSFORMERS.

We can make any type of transmitting transformer to order. These can be furnished to any power, with as many windings for high tension output, filament currents, etc. as may be desired. Each is guaranteed for twelve months when used for the purpose for which it was designed.

## JEFFERSON TOY TRANSFORMERS.

Jefferson transformers are made for home experimental purposes, and for ringing bells, driving toy trains or other small toys, etc. They are quite as safe as electric irons, rasters, etc.

Every boy with A.C. current in his home will want one of these instructive toys. The transformer gives the range of voltages obtainable on a switch. The tapplings show what intermediate voltages are obtainable.

Watts Range Tap every Price

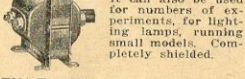
T197 50 54-103 1 volt 1 1 0  
T198 75 75-138 1 1/2 2 1/4

T199 100 51-23 3 3/4 2 1/4  
T200 150 12-30 1 1/5 2 10 0

WIZARD BELL TRANSFORMERS.

Bell transformers should always be used where A.C. current is available, as the former will operate bells or bell-batteries can. Transformers are always "the job" and need no attention whatever.

The Jefferson Wizard transformer will operate any ordinary toy bell. It can also be used for small model experiments, for lighting lamps, running small motors, etc., completely shielded.



T201 For 230 volts A.C. . . 8 6

## TAL-VOLT TRANSFORMER.

A more substantial transformer than the Wizard. Rated at 25 watts, 18 volts, with taps at 6 and 12 volts. Very useful for model experiments.

T302 Tri-volt transformer . . . 12 6

## RECORD.

THE RECORD BELL TRANSFORMER is fully enclosed, and gives 8 volts 1 amp. It is tapped so that either 3 or 5 volts can be obtained, thus giving greater flexibility of use.

T272 For 230 volts A.C. . . 8 6

## MEDICO TRANSFORMERS.

A small transformer made especially for lighting the small electric bulbs used by the medical profession. Replaces the expensive and expensive batteries for most purposes. Very convenient.

T353 Medico transformers . . . 32 6

## HEAVIDUTI TRANSFORMER.

Given 4, 8 or 12 volts, 2 amps. Much larger than the ordinary bell transformer. Will be found to have a variety of uses.

T357 Heaviduti transformer . . . 15 0

## STALLOY.

Stalloy, the highest grade of transformer steel, is used alike for the best quality jobs from the smallest to the very largest, weighing many tons, and used in the large power schemes.

Its permeability is 60,000 lines per square inch (working). Electrical losses, and therefore its heating, are an absolute minimum. Our stalloy is insulated 50% no varnishing or other treatment is necessary before using.

Thickness of steel is .014 inches, but 64 pieces are approximately 1 inch thick. Strips are 36in. long, 270 inches wide, 1 lb. approx.

Full sheet, 8 x 30, 5 lb. approx.

T215 36 x 11in. dz. strips 1 0  
T216 36 x 11in. dz. strips 2 6

T217 36 x 11in. dz. strips 1 0  
T218 36 x 11in. dz. strips 3 0

T219 36 x 11in. dz. strips 3 0  
Packing, etc. 6 x 3ft. 10 6

Special quotations for stalloy in strips or sheets, any quantity.

STALLOY PRICES (per gross piece).

Intermediate size same price as next larger. Larger sizes 21in. 22in.

1 2/6 2 2/6 2 1/6 1 1/6 2 1/4

2 2/6 3 2/6 3 1/6 2 1/6 4 1/6

3 2/6 4 2/6 4 1/6 3 1/6 5 1/6

4 2/6 5 2/6 5 1/6 4 1/6 6 1/6

5 2/6 6 2/6 6 1/6 5 1/6 7 1/6

6 2/6 7 2/6 7 1/6 6 1/6 8 1/6

7 2/6 8 2/6 8 1/6 7 1/6 9 1/6

8 2/6 9 2/6 9 1/6 8 1/6 10 1/6

Minimum value supplied, 2/6.

## CUTTING AND PUNCHING.

Stalloy is very difficult to cut and punch properly, even with special tools. It is always better to buy it cut ready for use. Otherwise it cut badly with ordinary tin snips the pieces will not pack closely, will require more wire, and will hum badly.

Rolls can be punched in one end of each piece, each being 24 dozen pieces, 15. 6d. gross. Minimum charge 2s.

## TRANSFORMER DATA.

The following tables are based on the use of Stalloy cores. If ordinary iron or other material is used, the tables will not apply.

Where enamelled wire is used, the layers should be separated by a thin layer of paper or silk.

Where D.C. wire is used, each layer during winding should be freely doped with AMBERLAC VARNISH. This will dry in air, but the process will be by dipping the finished coil in a warm oven of



To ascertain the number of turns on any transformer winding, either primary or secondary, merely multiply the turns per volt (T.P.V.) of the core chosen, by voltage desired.

As primaries in New Zealand will almost invariably be for 230 volts, the primary winding will be the turns per volt multiplied by 230. Thus for a 100 watt transformer, the primary turns will be 320. The turns for any secondary voltage are obtained in exactly the same way.

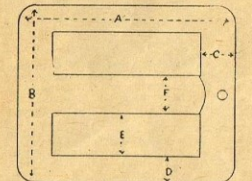
The core sizes given in inches are for ordinary step down transformers. Step up transformers may require a rather larger core.

The prices quoted are for cores, cut accurately to size, ready for assembling.

Any other sizes can be supplied to order.

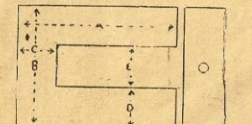
#### TRANSFORMER STAMPINGS.

See data below.



T316 No. 39	per 100	12 0
T317 No. 1	per 100	15 0
T321 Cases for No. 39 per set		2 0
T318 Cases for No. 1 per set		1 6

#### CHOKE STAMPINGS.



T319 No. 22, per 100		6 0
T320 No. 477, per 100		20 0

#### STAMPINGS—DATA.

All sizes in inches.				
A	T316	T317	T319	T320
B	3 1/8	3 1/16	2 5/16	3 5/16
C	2 3/16	2 1/4	2 1/4	2 15/16
D	1 1/2	1 1/2	9/16	15/16
E	3/8	1/2	9/16	1
F	5/8	1 1/8	5/8	1
G	9/16	1 3/16	5/8	1
Thick	1/60	1/50	1/50	1/75

#### TUBES.

See also EBONITE, EKEON, CARDBOARD (Six Inch Lengths).

Spiral wound cardboard tubes, accurately made, and perfect roundness.

T325 2in.	ca. dz.	3 9
T326 2 1/2in.	ca. dz.	3 9
T327 3in.	ca. dz.	5 9

RIBBED TUBING (See Ebonite).

#### TRANSFORMER DATA.

List No.	T322	T323	T324	T325	T326
WATTS	0-25	25-50	50-90	100-150	150-250
Core section, in.	1 1/8 x 1 1/8	1 3/8 x 1 3/8	1 1/2 x 1 1/2	1 3/4 x 1 3/4	2 x 2
Pieces, each size	160	192	192	256	320
Size (large)	3 x 1	3 1/4 x 3	4 x 1	4 1/4 x 1	5 1/4 x 1
Size (small)	1 1/8 x 1 1/8	1 3/8 x 1 3/8	1 1/2 x 1 1/2	1 3/4 x 1 3/4	2 x 2
Turns per volt	9	7.5	5.5	4	2.7
Primary wire, SWG	11b 32	11b 28	11b 24	11b 22	11b 20
Price, core only	5/-	6/6	7/6	8/6	9/6
Primary coil, only	7/6	10/-	12/-	15/-	20/-
Metal case, only	7/6	10/-	12/-	15/-	20/-

1. We used may be D.C.C. enamelled or D.S.C. enamelled.

2. Price of core includes requisite number of stallo pieces, accurately cut, sizes being given above in inches. Holes are not punched, clamps being intended. These will be quoted when wanted.

3. Primary coil, for attaching to 230 volts (or any other) is quoted, ready wound, and taped ready to place on core.

4. Metal cases are smoothly finished and duced. When used, transformer compound is finally melted in.

#### VALVES.

U.S.A. styles, 4 pin (UX), 5 pin (UY) are by far the most common in New Zealand. English bases, 4 or 5 pin, are used practically only in English sets.

#### BATTERY VALVES.

NO SPECIAL ADVICE is necessary to those battery Radio users who have "A" charger and "B" eliminator, or "B" accumulator. But to those who have to send accumulators away to be charged and who also have to buy dry "B" batteries regularly, the choice of valves, and indeed of the set itself, is vitally important.

If the "A" accumulator can be easily charged, and the battery valves for 120 to 150 hours—a 2 volt 20 amp. accumulator 30 to 50 hours—and the AIR CELL about 1500 hours.

2. The valve itself is wonderfully efficient and sensitive, and gives results comparable to six volt valves.

3. Efficient, dry battery valves have been fragile and short lived. The 230 is very robust, and will last very much longer.

For country users who have difficulty with "A" batteries, we predict that the 230 valve, together with the Columbia AIR CELL will prove the most valuable development for many years. Together, they will make Radio more reliable and popular, especially when used with the WELL-MAYDE Hammarlund-Roberts sets, which suit the valves peculiarly well.

Where 230 valves are used with two Columbia No. 5 batteries, a meter should be fitted to the set, and the valves run at two volts.

Where the AIR CELL is used, no meter and no rheostat are necessary.

231 is a power valve which can be used with the 230, while 232 is a screened grid valve of similar characteristics.

UX230 2 volt .06 amp. . . 18 0

UX231 2 volt 15 amp. . . 18 0

UX232 2 volt .06 amp. . . 26 6

The 201A valve uses more "A" battery current than most other valves to-day, but against this, it uses much less "B" than most.

The extra cost of "A" is therefore generally MORE than offset by saving in "B." Low consumption valves freely advertised are almost always low in "A" only.

Further, the 201A valve is very uniform in quality, and is far more durable, according to our long experience, than any other valve.

Do not replace your 201A valve except with another 201A.

201A 6 volt 25 amp. . . 9 0

SCREENED GRID VALVES.

Screened grid battery valves have advantages and disadvantages. At present, for battery sets, we regard the ordinary valves as being, in general, better for New Zealand conditions.

#### THE 230 VALVE.

Until recently, the UX199 valve was the best for dry battery sets. The new 230 valve, however, entirely supercedes it.

The 230 valve has three very definite advantages.

1. It takes only 2 volts, .06 amps. "A" supply.

Two No. 4 Columbia batteries will supply four valve set with these valves for 120 to 150 hours—a 2 volt 20 amp. accumulator 30 to 50 hours—and the AIR CELL about 1500 hours.

2. The valve itself is wonderfully efficient and sensitive, and gives results comparable to six volt valves.

3. Efficient, dry battery valves have been fragile and short lived. The 230 is very robust, and will last very much longer.

For country users who have difficulty with "A" batteries, we predict that the 230 valve, together with the Columbia AIR CELL will prove the most valuable development for many years. Together, they will make Radio more reliable and popular, especially when used with the WELL-MAYDE Hammarlund-Roberts sets, which suit the valves peculiarly well.

Where 230 valves are used with two Columbia No. 5 batteries, a meter should be fitted to the set, and the valves run at two volts.

Where the AIR CELL is used, no meter and no rheostat are necessary.

231 is a power valve which can be used with the 230, while 232 is a screened grid valve of similar characteristics.

UX230 2 volt .06 amp. . . 18 0

UX231 2 volt 15 amp. . . 18 0

UX232 2 volt .06 amp. . . 26 6

The 201A valve uses more "A" battery current than most other valves to-day, but against this, it uses much less "B" than most.

The extra cost of "A" is therefore generally MORE than offset by saving in "B." Low consumption valves freely advertised are almost always low in "A" only.

Further, the 201A valve is very uniform in quality, and is far more durable, according to our long experience, than any other valve.

Do not replace your 201A valve except with another 201A.

201A 6 volt 25 amp. . . 9 0

SCREENED GRID VALVES.

Screened grid battery valves have advantages and disadvantages. At present, for battery sets, we regard the ordinary valves as being, in general, better for New Zealand conditions.

A power valve installed in your present set instead of an ordinary valve MAY NOT GIVE MORE VOLUME—it will probably give much less. But it WILL give much better tone, batteries being altered to suit.

PENTODE.

Pentodes have three grids, but they are not generally of much advantage in New Zealand.

## VALVES! ANY TYPE ON THE N.Z. MARKET NOT LISTED GLADLY PROCURED.

The FILAMENT of every VALVE is tested before despatch or sale, and no claims for valves returned with defective filaments CAN BE ENTERTAINED.

UNDER NO CIRCUMSTANCES are valves sent out on trial or approval. We cannot offer subsequent customers second hand valves. We supply only RELIABLE BRANDS, BRAND NEW.

## ALL VALVES SUPPLIED AT STANDARD RULING PRICES AND GUARANTEES.

## VALVES!

Type.	Purpose.	A BATTERY	B BATTERY	C Batt.	Ampfn.	Impedance	Price
		Kind	Volts	Volts	Factor		
U.S.A. VALVES—U.K. BASE ONLY.							
UX-199	DAR	Dry	4.5	30	22-45	90	4.5
UX-120	DAR	Dry	4.5	30	22-45	135	22.5
UX-221	DAR	Dry	4.5	30	20-50	90-180	2.3
UX-201A	DAR	Acc.	6	35	22-45	90-180	4.5-10.5
UX-112A	DP	Acc./A.C.	6	35	22-45	90-180	4.5-9
UX-171A	P	Acc./A.C.	6	35	22-45	90-180	4.5-10.5
UX-230	DAR	Dry	3	66	30	45	16.5-40.5
UX-231	S.A.	Dry	3	15	30	135	2.5
UX-232	S.G.	Dry	3	15	30	135	2.5
UX-232 (S.G.)	Acc.	3	135	15	45	135	300

#### PHILIPS VALVES—U.K. OR ENGLISH BASE.

B406	DA	P	Acc.	4.	1	36	20-45	45-150					
B405	DA	P	Acc.	4.	1	36	20-45	45-150	5.	1,300	13	6	
B409	DA	P	Acc.	4.	15	30		150	5.	2,500	15	0	
B403	AP	P	Acc.	4.	15	30		150	5.	4,500	15	0	
A415	D	P	Acc.	4.	0.8	20	20-45	50-150	15-24	15	7,500	13	6
A409	DAR	P	Acc.	4.	0.8	20	20-45	50-150	15-24	15	7,500	13	6
A609	DAR	P	Acc.	6.	0.6	30	10-45	60-120	1.5-9	9	6,000	12	6
B605	DA	P	Acc.	6.	0.6	30	20-45	60-150	1.5-9	9	6,000	12	6
A610	DRC	P	Acc.	6.	1	30	20-45	60-150	4.5-18	9	6,000	12	6
G603	P	P	Acc.	6.	0.6	30	20-45	60-150	1.5-9	9	6,000	12	6
A515	D	P	Acc.	6.	0.6	30	20-45	60-150	1.5-9	9	6,000	12	6
A442	(S.G.)	P	Acc.	4.	0.6	20	20-45	50-150	1.5-9	9	6,000	12	6

#### OSRAM OR MARCONI (both are identical) U.K. or English Base.

DEL230	DAR	Acc.	2	10	6	40-80	70-150	3-73	11	12,000	13	6
DEL231	AP	Acc.	2	15	6	40-80	70-150	43-12	7	5,000	13	6
DEL240	P	Acc.	4	10	6	40-80	70-150	12-24	4	2,500	15	0
DEL410	DAR	Acc.	4	10	6	40-80	70-150	15-18	15	3,500	13	6
P225	P	Acc.	4	25	6	40-80	75-150	43-103	7.5	5,000	15	0
DEL410	DAR	Acc.	6	10	10	40-80	90-150	73-163	4.5	2,300	15	6
DEL610	P	Acc.	6	10	10	40-80	50-150	13-18	8	3,500	13	6
S215	R	Acc.	2	15	6	60-90	90-100	41-9	5	170	200,000	25 0
S410	R	Acc.	4	1	6	60-90	100-150	0-1.5	180	200,000	25 0	
S610	R	Acc.	6	1	6	60-90	100-150	0-1.5	210	200,000	25 0	

#### MULLARD VALVES—U.K. AND ENGLISH BASE.

PM1HF	DR	Acc.	2	1	6	30-100	50-125	1-9	18	22,500	13 6
PM1LF	DR	Acc.	2	1	6	30-100	50-125	1-9	18	22,500	13 6
PM2	AP	Acc.	2	15	6	30-100	50-125	1-9	18	22,500	13 6
PM3	DAR	Dry	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM4	D	Acc.	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM5	DAR	Dry	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM6	D	Acc.	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM7	DAR	Dry	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM8	D	Acc.	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM9	DAR	Dry	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM10	D	Acc.	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM11	DAR	Dry	4	1	6	30-100	50-125	1-9	18	22,500	13 6
PM12	(S.G.)	Acc.	2	15	6	60-90	100-150	0.1-5	170	200,000	25 0
PM13	(S.G.)	Acc.	4	1	6	60-90	100-150	0.1-5	180	200,000	25 0
PM14	(S.G.)	Acc.	6	1	6	60-90	100-150	0.1-5	210	200,000	25 0

ALWAYS STATE ENGLISH OR U.S.A. BASE, otherwise, where possible, the U.S.A. base is supplied. WHEN CHOICE OF VALVE IS DOUBTFUL, ASK OUR ADVICE.

The following explains the second column abbreviations: D, detector; R, Radio amplifier; A, audio amplifier; C, resistance coupled amplifier; S.G., screened grid; Pen, Pentode; P, super power amplifier.

The third column in the valve table gives the voltage of the battery to be used—usually rather higher than the actual voltage of the valve. Where three volts is mentioned, the new Air Cell 2.5 volts will suit perfectly, without ever rheostat.

In the "B" battery column, for screen grid valves, the screen voltage is given in the detector column.



## A.C. VALVES.

Not much need be said here about A.C. valves, chiefly because BLECTRIC RADIOS are designed for one particular type of valve, chosen by the manufacturers, and it is necessary to replace always with the same type of valve.

## U.S.A. TYPE VALVES.

ALL U.S.A. MANUFACTURERS adopt the same number (or one so similar as to be easily recognised) for the same type of valve. Therefore, valves similarly numbered are always interchangeable.

See valve table for Radiotron battery valves—these apply also to other U.S.A. makes. We supply Radiotron and other well-known U.S.A. valves, Philips, Mullard and Osram equivalents given.

U.S.A. Phils. Mu'd. Osram	Price
U235 TB04/10	60 0
X226 P109A AC3	12 0
X245 P203 PM245	17 6
X250 P704	75 0
X280 1560 PM280	16 6
X281 1562	16 6
Y224 P242 PM234	27 0
Y227 P209A 102T	MY227 18 0

## OSRAM.

## BATTERY VALVES (See Table).

First figure gives valve voltage.

DRH210 12/6	HL210 13/6	P625 20/-
DEH410 13/6	HL410 13/6	PK4 28/6
DEH610 13/6	HL610 13/6	PK4 28/6
P643A 20/-	P7235 25/-	
P7425 25/-	P7625 32/6	

## A.C. AND RECTIFIERS.

LS8A 35/-	LS8 35/-	MS4 32/6
LS8A 50/-	ML4 30/-	ML4 27/6
DA60 192/-	U9 25/-	GU150/-
MLH4 27/6	U9 25/-	GU150/-

## MULLARD.

<b>BATTERY VALVES (See Table).</b>		
PM1A 13/6	PM252 15/-	PM2DX 13/6
PM3A 13/6	PM254 15/-	PM5B 13/6
PM256 15/-	PM24A 30/-	

A.C. VALVES.					
AC4	20/-	35AV	30/-	16AV	30/-
10AV	27/6	S4V	40/-	S4VA	40/-
PM21	37/6	DU2	27/6	DU10	17/6

## PHILIPS.

In Philips valve names, the letters denote filament current (A is .05 or .08 amp.—B is 1 amp.—C is .25 or .3 amp.). The first figure is the filament voltage, and the last two figures the amplification factor.

A309 12/6	A141 20/-	A209 13/6
A225 12/6	B203 15/-	B205 13/6
B242 25/-	C243 25/-	A409 13/6
A414 17/6	A415 13/6	A425 13/6
A435 13/6	A441 20/-	A442 25/-
B405 15/-	B405 15/-	B406 13/6
B409 15/-	B423 25/-	A609 13/6
A615 12/6	A630 13/6	A635 13/6
A642 25/-	B605 13/6	C605 15/-

## PHILIPS A.C. VALVES.

C442 29/-	C643 30/-	D404 28/6
D443 30/-	E406 35/-	D440 29/-
E409 27/6	E414 25/-	E415 27/6
E424 27/6	E438 30/-	P442 29/6
E442 48/-	B4428 32/6	

## RECTIFIERS.

For electric sets, eliminators and power packs, P denotes fuel valve, H half-wave.

Type	Volts	Mils.	Price
UX280 P	F. 200	125	15 6
UX280 P	F. 500	125	30 0
Haythorn, P. 300V.	125 m/a		30 0

## VALVE HOLDERS.

The UX or American valve holder is the standard in New Zealand, over 90 per cent. of sets being so fitted.

## SURE-GRIP U.S.A. AND ENGLISH.

These are used in the majority of U.S.A. receivers to-day, fitted, of course, to the metal chassis, in which a 1 1/2 in. hole is punched. Two screws or rivets hold them securely in place, and a very rigid holder results.

The contacts are brass, but the springs are of steel, specially rust-proofed. The spring steel ensures perfect contact always. Sure-grip valve holders do not cause cracking. The holders can be engraved with the number of the valve at slight extra cost.

Special quantity quotations. Sub-panels with holders already riveted in also quoted.

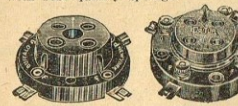


U.S.A. Phils. Mu'd. Osram	Price
U235 TB04/10	60 0
X226 P109A AC3	12 0
X245 P203 PM245	17 6
X250 P704	75 0
X280 1560 PM280	16 6
X281 1562	16 6
Y224 P242 PM234	27 0
Y227 P209A 102T	MY227 18 0

**SURE-GRIP holders, with screws and standard places for wood base-boards, 64, each extra. No more contact troubles.**

## DE JUR BUFFALO UX-4 PIN.

All De Jur holders are bakelite, with best quality springs.



U.S.A. Phils. Mu'd. Osram	Price
U235 TB04/10	60 0
X226 P109A AC3	12 0
X245 P203 PM245	17 6
X250 P704	75 0
X280 1560 PM280	16 6
X281 1562	16 6
Y224 P242 PM234	27 0
Y227 P209A 102T	MY227 18 0

## DE JUR UX-5 PIN.

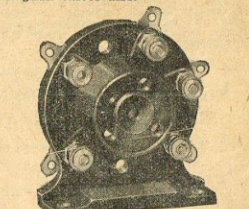


U.S.A. Phils. Mu'd. Osram	Price
U235 TB04/10	60 0
X226 P109A AC3	12 0
X245 P203 PM245	17 6
X250 P704	75 0
X280 1560 PM280	16 6
X281 1562	16 6
Y224 P242 PM234	27 0
Y227 P209A 102T	MY227 18 0

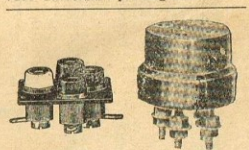
## ENGLISH.

In two types, ordinary for base mounting, and Universal for base or panel mounting.

NOTE.—This holder fits four-pin English valves also.



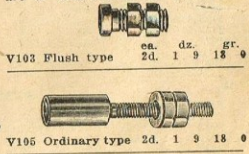
V163 Ordinary 5-pin Eng. holder 1 9  
V164 Universal 5-pin Eng. holder 1 9



V140. V101.  
V140 English, flush assem-  
bly, each ... 1 0  
V101 English, each ... 9  
V100 English, flange type ... 6

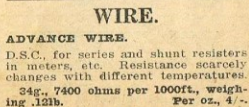
## VALVE LEGS AND SOCKETS.

These find many uses, especially for mounting coils. (Banana plugs—see under Plugs—are usually better for this purpose). Legs and sockets are of best brass well plated.



V150. V159.  
V150 With terminals ... each 2 6  
V159 UX spring ... each 2 0

## DE JUR UX-5 PIN.



V160. V161.  
V160 UX spring ... each 2 6  
V161 UX spring ... each 3 6

## WIRE.

## ADVANCE WIRE.

D.S.C. for series and shunt resistors in meters, etc. Resistance scarcely changes with different temperatures.

24g., 7400 ohms per 1000ft., weighing .12lb. Per oz., 4/-.

Other sizes stocked or prepared to order.

## INSTRUMENT WIRES.

DOUBLE COTTON.			
SWG.	Yds.	Turns	
per lb.	in.	lb.	lb.
14	17	10	1/2
16	28	13	1/2
18	46	17	1/4
20	78	22	1/6
22	128	25	1/6
24	202	30	2/3
26	293	36	2/3
28	422	39	2/6
30	570	44	2/3
32	721	50	3/4
34	940	54	3/4
36	1273	63	4/6

DOUBLE SILK—GREEN.			
SWG.	Yds.	Turns	
per lb.	in.	lb.	lb.
16	29	14	1/2
18	43	19	2/3
20	84	25	2/3
22	138	32	2/3
24	222	39	2/3
26	329	47	3/6
28	474	56	4/6
30	604	65	4/6
32	886	75	5/6
34	1200	85	5/6
36	1727	102	7/6
38	2090	121	10/6
40	4000	142	12/6
42	5491	167	15/6
44	8103	192	21/6

## RESISTANCE WIRES.

NICHROME WIRE.			
B. & S.	Lbs.	Ohms	Amps.
Diam (in)			
10	1.000ft.	1000ft.	10
12	1.000ft.	1000ft.	12
14	1.000ft.	1000ft.	14
16	1.000ft.	1000ft.	16
18	1.000ft.	1000ft.	18
20	1.000ft.	1000ft.	20
22	1.000ft.	1000ft.	22
24	1.000ft.	1000ft.	24
26	1.000ft.	1000ft.	26
28	1.000ft.	1000ft.	28
30	1.000ft.	1000ft.	30
32	1.000ft.	1000ft.	32
34	1.000ft.	1000ft.	34
36	1.000ft.	1000ft.	36
38	1.000ft.	1000ft.	38
40	1.000ft.	1000ft.	40
42	1.000ft.	1000ft.	42
44	1.000ft.	1000ft.	44
46	1.000ft.	1000ft.	46

## ENAMELLED.

S.W.G. Turns			
per in.	lb.	lb.	lb.
14	16	15	1/2
16	25	19	1/2
18	40	25	1/2
20	63	33	1/4
22	88	42	1/6
24	122	51	1/6
26	165	61	1/6
28	210	71	1/6
30	265	81	1/6
32	330	91	1/6
34	400	101	1/6
36	480	111	1/6
38	570	121	1/6
40	670	131	1/6
42	780	141	1/6
44	900	151	1/6
46	1030	161	1/6

## AERIAL WIRE.

Copper is invariably used—substitutes are now entirely of the market. Tinned wire is theoretically very inefficient for aerials, but will be supplied when ordered.

7/25. Enamelled wire is usually employed for aerials where quality is of prime importance, but (bare) on cheaper installations.

Wire	100ft. coil	100ft. coil	100ft. coil
W100 16g.	100ft. coil	100ft. coil	100ft. coil
W102 14g.	100ft. coil	100ft. coil	100ft. coil
W103 12g.	100ft. coil	100ft. coil	100ft. coil
W109 7/25, 100ft.	100ft. coil	100ft. coil	100ft. coil
W120 7/22, 100ft.	100ft. coil	100ft. coil	100ft. coil

## RADIO TWIN FLEX.

Light 14/36 red and black twin flex, suitable for many Radio purposes.

W127 14/36 ... yd. 4d., 72yds. 18 0

## WIRE TABLES.

B. & S. Diam (in)			
Gauge	S.W.G. DATA	Lbs. per 1000yds	Ohms per 1000yds
10	1212	1.481	13.87
12	104	58.24	2.831
14	8080	58.13	4.784
16	6583	37.36	2.478
18	54030	20.93	13.28
20	43196	11.77	23.62
22	35347	7.150	39.05
24	29347	4.392	64.78
26	24594	2.642	106.48
28	20548	1.589	189.8
30	17305	1.059	282.5
32	14602	0.678	448.1
34	12200	0.425	718.5
36	10050	0.265	1150.0
38	8144	0.165	1810.0
40	6620	0.102	2880.0
42	5310	0.063	4510.0
44	4210	0.039	7180.0
46	3310	0.024	11510.0

## POWER CABLES.

## PARALLEL FLEX.

Parallel wires, not twisted, heavily insulated, braid together. Various very attractive colours available. Best for reading lamps, radios, etc.

W130 Parallel flex yd 3d., 25ft. 52 6

## PARALLEL ASBESTOS FLEX.

For toasters, irons, radiators, etc. the regulations require the wire to be asbestos covered as a protection against heat.

W131 Per yard 1s., 25ft. coil 66 0

## TWIN FLEX.

For chargers, lamp lamps, etc. at ordinary temperatures. At 222 degrees Centigrade the resistance increases 10 per cent. at 500 degrees 20 per cent., and at 1000 degrees 33 per cent., approximately.

The current carried is at ordinary temperatures. At 300 degrees the amps are multiplied by 2, at 500 degrees by 3, and at 776 degrees by 6, approximately.

## GLAZITE.

Glazite is tinned copper wire, with thin braided, available in red, blue, yellow or black. The covering is easily removed at the ends, and it solders very readily. Ten feet coils. Larger coils also stocked.

W109 is a single wire, suitable for most purposes, but we now supply also a thin stranded GLAZITE, which is much in demand for wiring where metal chases are used, as it bends very readily.

W109 SINGLE GLAZITE, 10ft. 9  
W132 STRANDED, 10ft. 1 6

## TINNED.

Well tinned and very soft. To straighten, stretch slightly. Solders very easily.

Wire	100ft. coil	100ft. coil	100ft. coil
W107 16g.	100ft. coil	100ft. coil	100ft. coil
W108 14g.	100ft. coil	100ft. coil	100ft. coil
W124 18g.	100ft. coil	100ft. coil	100ft. coil
W125 20g.	100ft. coil	100ft. coil	100ft. coil
W126 22g.	100ft. coil	100ft. coil	100ft. coil
W127 24g.	100ft. coil	100ft. coil	100ft. coil

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W109 SINGLE GLAZITE, 10ft. 9  
W132 STRANDED, 10ft. 1 6

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Well tinned and very soft. To straighten, stretch slightly. Solders very easily.

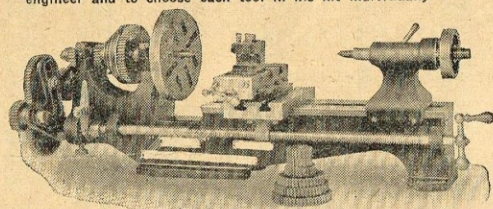
Wire	100ft. coil	100ft. coil
------	-------------	-------------



## EASY TERMS ON LARGER TOOLS.

The following tools have been selected not only for their quality, but also for their suitability for engineers, carpenters, farmers, and especially, amateurs.

Each tool is listed separately since it is always preferable for the amateur to follow the engineer and to choose each tool in his kit individually.



### "ALTONA" BACK-GEARED LATHE, 3in.

This remarkable new British lathe is thoroughly well designed, and built with a sturdy precision that enables it to do with accuracy any job within its scope.

The illustration shows the heavy vee bed, carefully machined. The headstock has adjustable bronze bearings, 1 inch hollow mandrel, ball thrust, and three speed pulley for round belt. The back gear ratio is 6:3, and the mandrel nose screwed 1 inch Whitworth.

The tailstock has square barrel thread, operated by a hand wheel, with locking screw. It has a 1 inch hole through its spindle. It is locked to the bed by a lever clamp.

The slide rest has vee slides, adjustable, and can be swivelled for taper turning. T slots provided on carriage and top slide.

The screw cutting gear is fitted with tumbler reverse, the lead screw being 8 threads per inch, enabling practically all threads to be cut with the 10 machined change wheels included.

The lathe can be easily driven by a 1 h.p. motor.  
Price includes faceplate and centres, as illustrated.

#### SCREW CUTTING TABLE.

Threads	8	9	10	11	12	14	16	18	20	22	24	25	27	28	30	32	36	40	48	50
First stud	40	40	40	40	20	30	20	20	20	20	20	20	25	20	20	20	20	20	20	20
Second stud													25	30	35	30	40	40	40	40
													20	20	20	20	25	20	20	20
Lead screw	40	45	50	55	30	35	40	45	50	55	60	50	40	45	50	55	60	65	70	75

The third stud is used for self-acting feed of 118.8, the coars being in turn 20—45, 25—55, 30—60.

#### LATHE TOOLS.

Agrippa lathe tools are drop forged, and we know of none other so good. Small high speed cutters are used, and these can be ground to suit any particular work.

#### AGRIPIA TURNING TOOLS.

These are made straight, right or left—state which in ordering. The



X311.

ENGLISH PATTERNS suits all lathes, but especially English lathes with high slide rests. One cutter with each tool.



X312.

X311 ENGLISH PATTERN ... 16 6  
X312 ORDINARY PATTERN ... 16 6  
X313 Extra cutters ... 9

#### AGRIPIA BORING TOOLS.

These also use high speed steel cutters, of which one is included.



X314 BORING TOOL ... 30 0  
X315 Extra cutters ... 9

#### AGRIPIA CUTTING OFF TOOLS.

Designed for cutting through bars. The cutter is as thin as possible, to avoid waste.



X316 CUTTING OFF TOOL ... 17 6  
X317 Extra cutters ... 4 0

#### EXPANSION BITS.

Two cutters, 1/2 to 1, and 1/2 to 1 1/2.



X223 ... 7 6

## LATHES.

The lathe is the king of tools. In New Zealand amateurs do not yet seem to realise how infinitely interesting lathe work is, even with a small lathe such as the above. Ability to use a lathe is necessary in all mechanical and engineering trades.

With a lathe of this size not only turning, but drilling and countless other small jobs can be done both accurately and quickly.

#### CHUCKS.

Prices are given further on in list. If desired, we can fit sets for ALTONA LATHE for 12s. 6d. each extra. We have a special mandrel for this purpose, and so do not require actually to have the lathe itself. X223 chuck fits either head or tailstock.

#### DIMENSIONS

Length between centres	... 12in.
Height from gran	... 31in.
Height from saddle	... 21in.
Hole through mandrel	... 1in.
Hole through tailstock	... 1in.
Centres, Morse taper	... No. 1
Change wheels	... 10

Price, £12 10s.

Freight extra. Packing free.

EASY TERMS FROM 25 DEPOSIT.

#### SMALL LATHES.

Particulars have just arrived of a 3-inch centre lathe, similar to the Altona, but without some of the latter's refinements, whose price will be about £10 10s.; screw cutting. Also of a 2 1/2-inch centre lathe, not screw cutting, at about £4.

LARGER LATHES QUOTED ON INDENT.

#### LATHE DOGS.

High class tools which grip securely and last for years.



X354 Lathe dog ... 6 0

#### BALANCES—Spring Pocket.

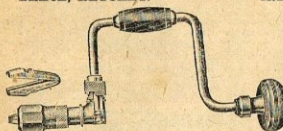
Brass face, galvanised hook.



X255 25lbs. ... Price 9

## EVERY HOME REQUIRES A KIT OF TOOLS.

#### BRACE, RATCHET.



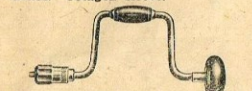
A beautifully plated brace, with solid forged steel jaws, and ball-bearing head. Suitable for the tool kit of any tradesman.

For use where a complete revolution is not possible.

X200 ... Price 9 6

#### BRACE.

With adjustable chuck. Sweep 9 inches. Octagon sleeve.



X199 ... 3 0

#### CALIPERS—Inside.

Bright steel.



X230 6-inch ... Price 1 6

#### CALIPERS—Outside.

Bright steel.



X229 6-inch ... Price 1 6

## CHUCKS.

#### CHUCKS—CUSHMAN PATTERN.



Three jaw chucks, supplied with two sets of jaws, and key. Self-centring.

Back plate castings are included. In the rough, since chucks must always be fitted to the lathe on which they are used. We believe we are the only firm who include these castings in the price of the chuck.

X258 3 1/2 in. diam. ... 2 0 0

X259 4 5/16 in. diam. ... 2 10 0

X260 5 1/2 in. diam. ... 2 0 0

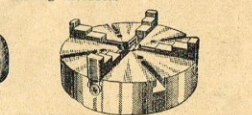
X261 6 1/2 in. diam. ... 3 15 0

Extra keys in stock.

Back plate castings included.

#### INDEPENDENT.

The jaws of which there are four, can be moved one at a time only. Jaws are reversible. Back plate casting included.



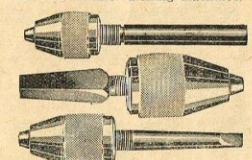
X263 4 1/2 in. diam. ... 2 10 0

X270 6 in. diam. ... 4 10 0

X271 8 in. diam. ... 5 10 0

#### DRILL CHUCKS—Three Jaws.

These chucks will hold round drills from 1/2 in. down to the smallest size. The 1/2 in. parallel shank will fit the ordinary drill, while the No. 1 Morse taper shank will fit lathe head stocks, and some smaller drilling machines.



X227 Parallel shank, 1/2 in. ... 6 0

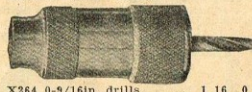
X228 No. 1 Morse shank ... 6 6

X263 Square shank ... 7 6

X262 1/2 in. round shank, chuck holds wood bits ... 2 9

#### CHUCKS—DRILL.

This chuck will save its cost in a very short time, where drills have to be frequently changed. The locking mechanism runs on ball-bearings, and so a firm grip can be obtained by hand pressure alone—no need to look for the key at each change. When the drill is adjusted, the harder the pressure the tighter the grip. Yet the chucks will readily unscrew when desired.

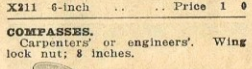


X367 Black ... 15 0

X358 Nickel, with point and rubber wheel ... 18 6

#### COLD CHISEL.

High-grade tool steel, correctly hardened.



X364 0-9/16 in. drills ... 1 16 0

X211 6-inch ... Price 1 0

X213 ... Price 4 0

#### SPLIT CUTTER PINS.

Well known for all classes of machinery. Best English quality. T279 Gross box, assorted ... 1 2

#### MACHINE COUNTERS.

Counters are used for a large number of purposes; in fact, most machines to-day should be fitted with them, in order to check production. The following counters have been selected for a wide range of requirements, and will be found to give every satisfaction.

All counters are somewhat similar in appearance, the large illustration showing the GIANT, while the small illustration shows a wheel fitted to a counter, to measure, in feet, materials such as cloth, ribbon, timber, wire, etc.

All counters can be instantaneously set back to 0.

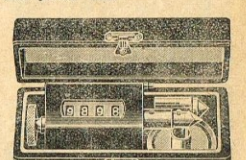
#### HAND COUNTER.

Counts to 1000. Adds one each time small lever is pressed. No larger than a medium-sized watch. Nice & 1 plated.

X356 Hand counter ... 12 6

#### POCKET TYPE.

Counts revolutions to 10,000. Two spindles, with rubber and metal points. Instantaneous zero set. In neat pocket case.

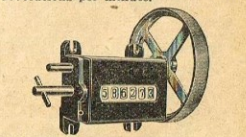


X357 Black ... 15 0

X358 Nickel, with point and rubber wheel ... 18 6

#### PROGRESS.

Shaft extended on both sides. Counts forwards only, irrespective of direction of spindle. Can be fitted with wheel to read up to 1000 revolutions per minute.



X318 5 figure, less wheel ... 35 0

X319 5 figure, ratchet movement ... 35 0

X320 6 figure, with wheel ... 60 0



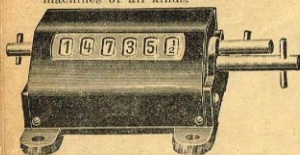
**REVERSO.**

Similar to Progress, but counts forwards and backwards. Fine for wire winding machines to speeds of 2000 revs.

X321 4 figure . . . . . 42 0

**GIANT.**

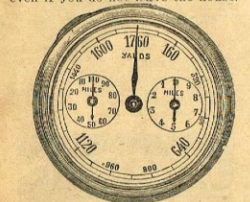
A robust, heavy duty counter, counting forwards and backwards, and at speeds to 5000 revs. per minute. Just the counter for factory machines of all kinds.



X322 6 figure . . . . . 65 0

**PEDOMETER.**

A little instrument, like a watch, which measures how far you walk. You will be astonished at the distance you actually do walk each day, even if you do not leave the house.



X323 Pedometer . . . . . 27 0

**COUNTERSINK.**

Cuts metal, formica, ebonite, etc. Short round shank, small enough to fit hand drill.

X105 . . . . . 2 0

**COUNTERSINKS.**

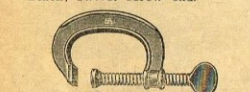
Rose head, for metal or hard wood.



X224 . . . . . Price 1

**CRAMPS—Malleable Iron.**

Black; swivel screw end.



X240 4 inch . . . . . 2 0

X241 6 inch . . . . . 3 0

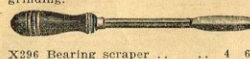
**CRESCENT TOOLS.**

We are listing the CRESCENT TOOLS all together, thus upsetting somewhat the alphabetical order of the catalogue. This is because CRESCENT make a very complete range of pliers, cutters, etc. of really first class quality, and the full range stocked will thus appear all together.

Crescent tools are first grade—we cannot too strongly emphasise this. As authorised CRESCENT DEALERS, we are empowered to replace or refund on any CRESCENT TOOL, which does not give satisfaction—the CUSTOMER to be the JUDGE. The Crescent Company also control S. and H. Co. so that the latter trade mark is also used for Crescent tools.

**BEARING SCRAPER.**

For finishing bearings of cars, etc. This tool is something better than the usual, as it is designed for easy grinding.



X296 Bearing scraper . . . . . 4 6

**CHISELS—WOOD.**

Made of steel throughout, no wooden handle to break. Invaluable for electricians, farmers, carpenters.



X325 Chisel, wood, 1 1/2 in. . . . . 4 3

X326 Chisel, wood, 1 in. . . . . 4 9

X327 Chisel, wood, 1 1/2 in. . . . . 5 6

**STAR DRILLS.**

Best quality, for stone, brick or concrete. Fast cutting.



X304 Star drill, 8 in. . . . . 2 3

X305 Star drill, 1 in. . . . . 3 6

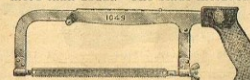
X306 Star drill, 8 in. . . . . 3 0

X307 Star drill, 3 in. . . . . 2 6

X308 Star drill, 1 in. . . . . 4 6

**HACKSAW.**

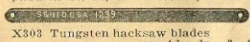
A heavy saw, adjustable 8 to 12 in. and 3 in. depth of cut, being more than usual. One blade included.



X302 Hacksaw, 8-12 inch . . . . . 7 9

**HACKSAW BLADES.**

Tungsten alloy steel, properly hardened and very durable. Length is eight inches, and blades are supplied in 18, 24, or 32 teeth per inch.



X303 Tungsten hacksaw blades . . . . . 3 9

**CENTRE PUNCHES.**

A quality job for real mechanics.

X309 Centre punch, 5/16 in. . . . . 1 3

**NAIL PULLERS—ECLIPSE.**

Do not waste your time with inferior grade nail pullers—in business, time is money. Cheap low grade pullers simply cannot work well over a long period.

**NAIL PULLERS—GIANT.**

A very robust puller, with box chisel and strap cutter.



X310 Giant puller . . . . . 15 0

**NAIL PULLERS—ECLIPSE.**

Forged steel jaws that do not break or chip.



X309 Eclipse puller . . . . . 8 6

**ACCUMULATOR PLIERS.**

For battery service stations and motorist's kits. Bent nose quickly shifts the most stubborn nuts.



X278 6 in. accumulator pliers, plated . . . . . 6 0

X289 As X278, lighter, for nuts, etc. . . . . 4 0

**THIN NOSE PLIERS.**

Thin blades, for bearing adjustment, etc. Slip joint, plated.



X282 Thin nose pliers, 6 in. . . . . 3 0

X283 Thin nose pliers, 6 in. . . . . 3 2

X290 As X283, with cutters . . . . . 4 6

**CEE TEE CO. PLIERS.**

Heavy duty pliers, for hard all round work.



X286 Cee Tee Co. pliers, 5 in. . . . . 1 9

X287 Cee Tee Co. pliers, 6 in. . . . . 2 0

X288 Cee Tee Co. pliers, 8 in. . . . . 2 9

**MOTOR CAR PLIERS.**

Should be in every motor kit. Heavy pattern, forged steel, with slip joint and wire cutter. Plated.



X284 Motor pliers, 5 in. . . . . 2 9

X285 Motor pliers, 6 in. . . . . 3 0

**UNIVERSAL PLIERS.**

Pliers, pipe tongs, side and double wire cutters, ramer and screwdriver.



X295 Universal pliers, 6 in. . . . . 4 6

**CARPENTERS' PINCERS.**

The old familiar, with tack puller on one handle and screwdriver and reamer on the other. Very strong.



X293 Carpenters' pincers, 6 in. 3 6

X294 Carpenters' pincers, 8 in. 4 3

**LONG NOSE PLIERS.**

For wire bending, confined space working, etc. Fitted with cutter.



X281 Long nose pliers, 6 in. . . . . 4 9

**DIAGONAL CUTTING PLIERS.**

Strong cutters that last and whose cutting convenience is well recognised.



X279 Diagonal cutters, 4 in. . . . . 8 0

X280 Diagonal cutters, 6 in. . . . . 9 0

**END CUTTING NIPPERS.**

Powerful leverage, keen edges, hammer head. A useful tool for continual use on the firm and in the home.



X291 End cutting nippers, 6 in. 6 0

**STAPLE PULLER.**

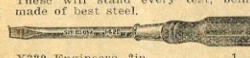
Wire stretcher, two wire cutters, two hammer heads, pipe grip and pincers, and double staple puller. The de luxe fencing tool.



X292 Staple puller, 10 in. . . . . 9 9

**SCREWDRIVERS—ENGINEERS.**

A good screwdriver, though a humble tool, is appreciated by GOOD ENGINEERS and MECHANICS. These will stand every test, being made of best steel.



X299 Engineers, 2 in. . . . . 1 9

X300 Engineers, 4 in. . . . . 2 0

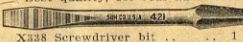
X301 Engineers, 5 in. . . . . 2 9

X302 Engineers, 6 in. . . . . 3 3

X303 Engineers, 8 in. . . . . 4 3

**SCREWDRIVER BIT.**

Best quality, for real hard work.



X304 Screwdriver bit . . . . . 1 0

**TINSMIPS.**

Specially forged and ground steel blades which retain their keen cutting edge. Powerful leverage, and scissors handle—why has the latter not been adopted before?

These snips are a wonderful tool around the house. They will cut almost anything from hedge to paper. In fact, they surpass ordinary scissors frequently where many thicknesses of paper or cloth are to be cut.



X276 7 in., cut 1 1/2 in. . . . . 4 6

X277 9 in., cut 2 in. . . . . 5 6

**CIRCULAR CUTTING SNIPS.**

For cutting intricate patterns and curves, smoothly and without bending the metal.



X274 7 inch, cut 1 1/2 in. . . . . 6 0

X275 12 inch, cut 3 in. . . . . 9 0

**WIRE CUTTING PLIERS.**

For cutting wires, round cases, aerial wire, wire netting, etc. Cheap, but very powerful.



X297 Wire cutters, 6 in. . . . . 2 3

**ADJUSTABLE WRENCH.**

Forged from special wrench steel, hardened and tempered.



X298 Crescent wrench, 6 in. to 8 in. . . . . 4 9

X299 Crescent wrench, 8 in. to 15/16 in. . . . . 6 0

**AUTO WRENCH.**

Made from the finest forged steel, to give lasting service. This spanner will not ruin your nuts—or your temper.



X301 Auto wrench, 9 in. to 3 in. 5 0

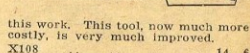
**CROID.**

A liquid glue of unrivalled tenacity. Used for sticking and repairing all kinds of material, and always ready for instant use from the collapsible tube.

Per tube 4d. and 6d.

**CUTTER—CIRCULAR.**

Adjustable, cutting all size holes from 1/4 in. to 6 in., for meters, etc. This tool is practically essential for

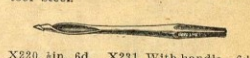


this work. This tool, now much more costly, is very much improved.

X108 . . . . . 14 6

**GMLET BITS.**

Cobra twist; screw point. Tough tool steel.



X220 1/2 in. 6d . . . . . 6d

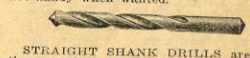
X221 3/16 in. 6d . . . . . 6d

X222 1/4 in. 6d . . . . . 6d

X223 With handle 8d

**TWIST DRILLS.**

Everyone who uses tools of any description should possess a hand and a breast drill, together with at least a dozen twist drills. These drills will bore through wood, iron and other metals and materials, and there is no substitute for them if not handy when wanted.



STRAIGHT SHANK DRILLS are the same thickness throughout. They fit hand or breast drills having three jaws, and also all engineer's drill chucks.

The wire gauge drills have much smaller differences between consecutive sizes than the English sizes.

The A grade drills listed below are of the highest grade manufacture, but to satisfy the demand for a good quality drill at a cheap rate, the B grade are included.

THE HIGH SPEED DRILLS, while quite expensive, are used where continuous work at a quick rate must be done.

**ENGLISH SIZES.**

A grade drills are stocked in all sizes from 1/32 in. to 1 in. by 1/64 in.

B grade and HIGH SPEED are stocked in 1/16 in. sizes only.

Price of any drill not actually mentioned will be that of the next larger size. Thus a 2 3/64 drill would cost the same as a 3/16 drill.

**A Grade B Grade High Speed**

1/16 in. ea. 5d 3d 4d

1/8 in. ea. 6d 4d 1 3d

3/16 in. ea. 8d 5d 1 3d

1/2 in. ea. 10d 6d 1 3d

5/16 in. ea. 12d 8d 2 3d

3/4 in. ea. 18d 10d 3 0d

7/16 in. ea. 24d 14d 3 6d

1 in. ea. 33d 21d 4 0d





## WIRE GAUGE DRILLS.

SIZES.	A GRADE	B GRADE
1 to 5	.. 8d.	5d.
6 to 10	.. 7d.	4d.
11 to 15	.. 7d.	4d.
16 to 20	.. 6d.	3d.
21 to 30	.. 5d.	3d.
31 to 60	.. 4d.	3d.

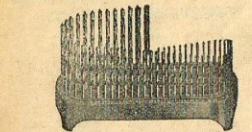
## BIT STOCK DRILLS.

These are twist drills, but have the square shank that fits in the ordinary carpenter's brace (see Reamer X135). Almost every household possesses an ordinary brace, in which these can be used. Stocked in sizes mentioned only.

SIZES.		SIZES.	
1/16 in.	.. 8d.	3/16 in.	10d
1/8 in.	.. 1 2	5/16 in.	1 6
3/8 in.	.. 1 10	7/16 in.	2 3
1/2 in.	.. 2 10	1 in.	4 0
3/4 in.	.. 5 3		

## SETS OF DRILLS WITH BLOCKS.

These sets are extremely handy, since the required size can be immediately found, and missing drills are immediately noted.



## ENGLISH SIZES.

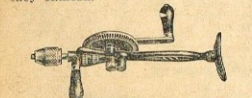
1/16 in. to 1/4 in. by 1/4 in.	Twenty-nine drills with block.
X113 A GRADE, with block	2 0 9
X114 B GRADE, with block	1 10 4
X115 Drills only, no block	1 10 4
X116 DRILL BLOCK ONLY	10 0

## WIRE GAUGE SIZES.

In sets of 60 drills, Nos. 1 to 60.		
X117 A GRADE, with block	1 17 6	
X115 Drills only, no block	1 7 6	
X116 DRILL BLOCK ONLY	10 0	

## BEEHIVE DRILL.

Double geared, positive quick change action. Chuck holds round shank drills from 3/4-inch diameter. Machine cut gears, protected where they mesh.



X186 .. .. .	15 0
U.S.A. manufacture ..	1 2 6

## HAND DRILL.

Extra gear wheel to avoid friction. Machine cut gears. Chuck holds round drills up to 1/4-inch diameter.

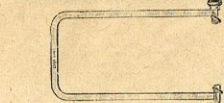


X187 .. .. .	9 0
U.S.A. manufacture ..	13 6

## FRETSAWS.

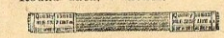
Polished steel frame. Length, 12 inches.

X236 .. .. . Price 2 0



## FRETSAW BLADES.

Round back, 5 inches.



X237 .. .. . dz., 4d.; gr. 3 6

## HACK SAW.

Adjustable for blades 8 to 12 inches long. Nickelled. Pistol grip handle means more work and less broken blades.



X198 .. .. . Price 3 6

## HACK SAW.

Adjustable for blades 8 to 12 inches long. Nickelled; black polished handle.



X197 .. .. . Price 2 9

## HACK SAW BLADES.

Hardened teeth, soft backs. X238 8 or 9 in., ea. 3d.; dz. .. 2 9

## HAMMERS—Carpenters'.

Adze eye nail hammers. Polished ash handles.



X254 24oz. head .. 4 0

## LEVELS.

Well seasoned oak. Tested glasses, visible three sides. Vertical reading also.



X218 18-inch .. .. . Price 5 6

X219 24-inch .. .. . Price 6 6

## PIPE WRENCHES.

Footprint pattern. Teeth cut right across jaws ensure long life. Easily adjustable.



X194 7-inch .. .. . Price 2 0

X195 9-inch .. .. . Price 2 6

X196 12-inch .. .. . Price 4 0

## POCKET KNIVES.

These knives are made in Sheffield, the home of the cutlery trade. They are reasonable in price, but nevertheless are really good value.

## SINGLE BLADE, HEAVY.

The ordinary single blade knife so useful on the farm, or other places where strength is essential. Imitation stag handle. Blade, 3 1/2 in.

K133 .. .. . ea. 1 9

## DOUBLE BLADE STAINLESS.

A very useful knife especially where fruit peeling is concerned. Metal handle, engine turned. An excellent knife. Name (up to about 12 letters) can be engraved for 9d. extra.



K134 .. .. . ea. 3 0

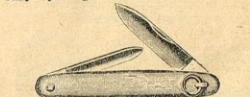
## DOUBLE BLADE, ORDINARY.

Same as K134, but with ordinary blades.

K135 .. .. . ea. 2 3

## DOUBLE BLADE RING.

Each blade fitted with a ring for easy opening. Metal handle.



K136 .. .. . ea. 2 3

K137 As K136, but without rings .. 1 9

## SINGLE BLADE, STAINLESS.

A small metal handle knife, with one stainless blade. Fitted with a ring for attaching to a chain.

K138 .. .. . ea. 1 0

K139 As K138, but without ring .. 9 9

## PLIERS—Insulated.

Forged of finest tool steel. Non-slip handles; black insulated; 6000 volts.



X202 6-inch .. .. . Price 3 0

## PLIERS.

Tool steel. Six tools in one. Black checkered handle; polished jaws.



X203 6-inch .. .. . Price 2 0

## RADIO PLIERS.

Black checkered handle, polished jaws.



X204 5 1/2-inch .. .. . Price 2 3

## RADIO PLIERS.

Insulated handle, 3000 volts.



X205 5 1/2-inch .. .. . Price 3 0

## MILLINERS' PLIERS.

Flat jaws. Wire cutter; with ring.



X206 4 1/2-inch .. .. . Price 2 9

## DIAGONAL CUTTING PLIERS.

Very useful indeed, especially where close cutting is essential.



X207 5 1/2-inch .. .. . Price 3 0

## PLIERS—BERNARD, PLATED.

American pliers, of special make, and very high quality.

The parallel jaw pliers are made with or without cutters and springs. They hold nuts with least damage, and a wire can be passed right through the pliers. The cutters are of best steel, and are very durable, even when cutting hardest metals.



X244 4 1/2 inch .. .. . 4 9

X245 5 inch .. .. . 6 0

X246 4 1/2 in., spring .. .. 6 0

X247 5 1/2 in., spring .. .. 7 0

X248 4 1/2 in., cutter .. .. 8 6

X249 5 1/2 in., cutter .. .. 8 6

X250 4 1/2 in., cutter and spring .. 9 9

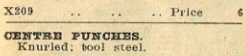
X251 5 1/2 in., cutter and spring .. 9 9

X252 Cycle end cutters .. .. 8 6

X253 Diagonal cutters .. .. 9 9

## NAIL PUNCHES.

Knurled; cup point.



X209 .. .. . Price 6

## CENTER PUNCHES.

Knurled; tool steel.



X210 .. .. . Price 6

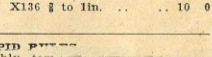
## REAMER.

This tool is always in demand. In Radio, a commencing hole 1/4 in. in diameter can be bored in a panel and then enlarged to any desired size with reamers. Two will cover sizes from 1/4 in. to 1 in. The fittings of jacks, switches and other apparatus rather larger than usual is easy with one of these reamers.

For general purposes it is no less useful. If you purchase one, you would never be without it later. It fits the ordinary brace.

X135 1/2 to 1 in. .. .. 5 0

X136 3/4 to 1 in. .. .. 10 0

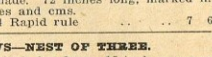


EARLY TEMPERED, VERY HIGH TENSILE, VERY TIGHT, CONCAVE STEEL TAPES, which are coiled in small nickel case. Open and close easily. Tape remains straight when opened, so that vertical measurements are easily made. 72 inches long, marked in inches and cms.

X354 Rapid rule .. .. 7 6

## SAWS—NEST OF THREE.

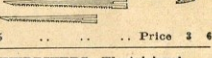
18-inch hand saw, 15-inch compass saw, 12-inch keyhole saw.



X235 .. .. . Price 3 6

## SCREWDRIVERS—Electrician's.

Polished blade. Black fluted handle.



X250 2 inch .. .. . 6

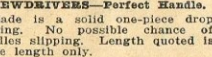
X251 3 inch .. .. . 6

X252 4 inch .. .. . 9

X253 6 inch .. .. . 1 9

## SCREWDRIVERS—Perfect Handle.

Blade is a solid one-piece drop forging. No possible chance of handles slipping. Length quoted is blade length only.



X245 2-inch .. .. . 1 0

X246 2 1/2-inch .. .. . 1 3

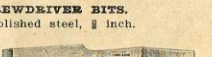
X247 4-inch .. .. . 1 3

X248 6-inch .. .. . 1 6

X249 8-inch .. .. . 2 3

## SCREWDRIVER BITS.

Polished steel, 1/2 inch.



X234 .. .. . 9

## SCREWDRIVERS.

YANKEE RATCHET pattern. Knurled washer for quick operation on loose screws. Right or left hand or rigid. Polished steel blade.



X242 3-inch .. .. . Price 3 6

X243 6-inch .. .. . Price 4 0

## SILVER STEEL.

Silver steel is made in lengths of 12 inches only. It is a special steel that is not only suitable for making small taps, drills, punches, and similar tempered tools, but is also very suitable for driving shafts for motors and models. It is ground accurately to size, and perfectly true.

## INCH SIZES. GAUGE SIZES.

Round.		Square.		GAGE		SIZES.	
s.	d.	s.	d.				Round.
1/16 in.	3		3		40-60		2d.
3/16 in.	4		6		30-40		3d.
1/4 in.	6		9		20-30		4d.
5/16 in.	9	1	3		10-20		5d.
3/8 in.	1	0	2	3	5-10		6d.
1/2 in.	1	0	3	6	0-5	7	



**ADJUSTABLE SPANNER.**

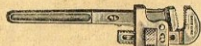
C.T. pattern. Very handy for work and many odd jobs.



X189 6 inch	2	6
X190 8 inch	2	6

**STILLSON PATTERNS WRENCHES.**

Certain grip for pipes or nuts.



X192 14 inch	5	3
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**ADJUSTABLE SPANNER.**

Wood handle. For heavy work on the farm.



X191 8 inch	2	9
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**SQUARES—Carpenters'.**

All metal; polished blades, graduated in 1/16, both sides; nickel-plated 45 degree mitre also.



X214 10-inch	4	6
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**SQUARES—Engineers'.**

All metal; forged steel; polished. Graduated 1/16th, and 1/32 in. X215 3 inch

X215 3 inch	2	6
X216 4 inch	2	6
X217 6 inch	3	0

**RESIN-CORE SOLDER.**

British and best. Highest grade, and used by Government for telephone exchange work, etc. 4 lb. (approx. 35 ft.)

8 ft. length	1	6
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**KESTER RESIN CORE SOLDER.**

S148 1 lb. reels (38 ft. approx.)

S159 Tin (6 ft. approx.)	1	6
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**FEELERLESS FLUX.**

A clean, non-corrosive flux.



S107 Per tin	1	0
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**WELL MAYE.**

A new flux, which enables soldering to be done easily and with certainty. Although cheaper than others, it is excelled by none.

S174 Per tin	9	
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**SOLDERING IRONS.**

For Radio work a light soldering iron is almost necessary. For heavier work, the larger irons listed will be found entirely satisfactory.

X146 Midget	1	0
X145 Small	1	6
X184 Heavy	3	0

**JUSTRITE SOLDERING IRONS.**

The convenience of the electric iron is so thoroughly appreciated, especially for Radio and small repairs, that it is sadly missed in places where there is no current.

This iron is filled with petrol, lights easily, and in three minutes is ready for soldering. It burns about an hour on one filling. Obtainable with ordinary or fine screw-driver point.

All Radio mechanics must have one of these.



X327 Justrite, ordinary point	21	0
X328 Justrite, screwdriver pt.	21	0

Extra points, either style 3 6

**ELECTRIC SOLDERING IRONS.**

See ELECTRIC FITTINGS.

**STOCKS AND DIES.**

For ordinary apparatus we recommend the U.S.A. sizes—2/56, 3/48, 4/36, 6/32, 8/32, 10/32 as covering the full range likely to be required. In fact, for Radio use, 4/36, 6/32, and 8/32 cover practically all requirements.

For the above standards we carry a full range of screws, nuts, wing nuts, cap nuts, knurled nuts, washers, lock washers, and also threaded rod. This gives your work a wonderful scope.

**STOCKS.**

Made to fit either English or U.S.A. dies, 13/16 in. diameter, this being a standard for smaller threads.

X149 English pattern	3	6
X148 U.S.A. pattern	6	0



DIES (13/16 Round).

X149 English pattern	3	6
X148 U.S.A. pattern	6	0

Made to fit above stocks. Best quality only.

X150 U.S.A. 2/56, 3/48, 4/36, 6/32, 8/32, 10/32; each	4	0
X151 English, Whitworth, 1/16, 1/8, 5/32, 3/16, 1/4; each	2	3
X152 English, B.A., 0 to 10	2	3

**ENGINEERS' STOCKS AND DIES.**

Whitworth thread, with taper and plug taps to each size.



X235 1/2, 3/16, 1/4	12	0
X236 1/2, 3/16, 1/4	18	0

**TAPS.**

X153 U.S.A. 2/56, 3/48, 4/36, 6/32, 8/32, 10/32; each	1	8
X154 English, Whitworth, 1/16 to 1/4; each	1	3
X155 English, B.A., 0 to 10	1	3

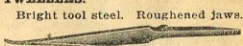
**TAP WRENCH.**

This wrench saves both 1 in 6 and broken taps. U.S.A. made.

X156	5	6
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**TINSNIPS.**

All steel. Half bright blades.		
X212 8 inch	2	6

**TWEEZERS.**

Bright tool steel. Roughened jaws.		
X256	6	

**WRENCHES—SPINTITE, HEXAGON.**

Enables nuts awkwardly situated to be thoroughly tightened with the greatest ease, and without damage. Saves enormous amount of time on all nuts.

X162 Hexagon, set of 3	6	0
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**WRENCHES—SPINTITE, ROUND.**

Made to fit round milled nuts.		
X163 Round, set of 3	6	0

**ELECTRIC FITTINGS.****ADAPTORS—BAYONET.**

Universally used to connect apparatus to the lamp holders. Bakelite, with brass fittings moulded in place, making fitting very easy.

E130 Bakelite adaptor	9	
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**ADAPTORS—DUOLITE.**

Enables two lamps or other apparatus to be used from the one holder. Every home wants one or two of these.



E225	6	0
E212 "Magnet" adaptor	6	9



Consists of E190 plug and adaptor, a length of twin flex and a beautifully finished bakelite moulding, fitted with three sockets to suit a plug as in E190. Two screw holes enable it to be screwed to the wall or table. Its insulation is perfect. It has no metal parts exposed, and it enables, say, a reading lamp, Radio and fan to be operated simultaneously.

E111 Brass	4	6
E226 Brass	6	0

E226, double adaptor, fitted with hanging cord and a four way special bakelite cord switch, enabling either lamp, or both, to be lighted. A very useful device.

E259	7	6
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**ADAPTOR—DOUBLE EDISON.**

This is made of porcelain, fitting only the Edison screw lamp holders.

E131 Each	2	0
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**ADAPTOR, TRIPLE.**

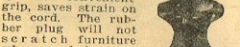
Triple adaptor, bakelite, fitting the plug that usually accompanies American apparatus. Enables three connections to be used instead of only one. Fits E192 or E180.

E179 Triple adaptor	2	0
E190 or E191 Plug to fit, each	1	0

**ADAPTORS AND PLUGS—EDISON.**

The screw adaptor fits American (Edison) lampholders (also our E223 adaptor), standard plugs then fit the adaptor.

THE GRIPTOR BAKELITE PLUG, by its convenient grip, saves strain on the cord. The rubber plug will not scratch furniture when used in your best rooms.



E192	E190-191	E227
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E227 GRIPTOR PLUG

E190 Plug only, bakelite	1	0
E191 Plug only, rubber	1	0
E192 Screw part only	6	

**ADAPTORS—LIGHT AND POWER.**

Fitted with a switch, enabling the enabling the Radio, vacuum cleaner, or another light to be left on.

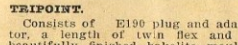
Both are made of bakelite, but the Powerlite has the more convenient switch, as it is very readily operated by one hand.



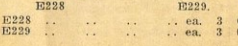
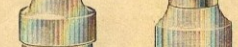
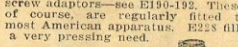
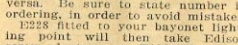
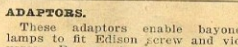
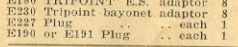
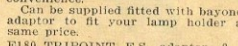
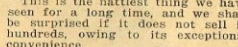
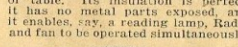
E215	6	0
E212 "Magnet" adaptor	6	9

**TRIPOINT.**

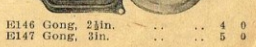
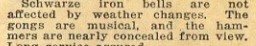
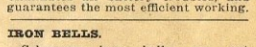
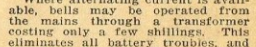
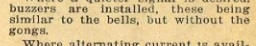
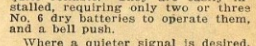
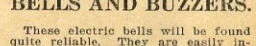
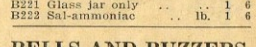
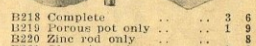
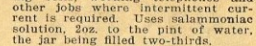
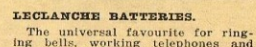
Consists of E190 plug and adaptor, a length of twin flex and a beautifully finished bakelite moulding, fitted with three sockets to suit a plug as in E190. Two screw holes enable it to be screwed to the wall or table. Its insulation is perfect. It has no metal parts exposed, and it enables, say, a reading lamp, Radio and fan to be operated simultaneously.



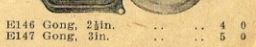
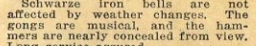
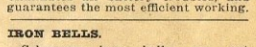
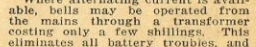
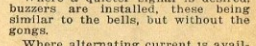
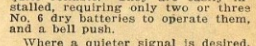
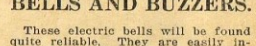
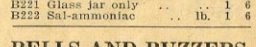
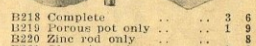
Consists of E190 plug and adaptor, a length of twin flex and a beautifully finished bakelite moulding, fitted with three sockets to suit a plug as in E190. Two screw holes enable it to be screwed to the wall or table. Its insulation is perfect. It has no metal parts exposed, and it enables, say, a reading lamp, Radio and fan to be operated simultaneously.

**FLASHADAPTOR.**

A triple adaptor, for Christmas trees, signs, etc. The two side outlets have a flasher in them, causing the lights to flash on and off.

**LECLANCHÉ BATTERIES.**

The universal favourite for ringing bells, working telephones and other jobs where intermittent current is required. Uses sal ammoniac solution, 2oz. to the pint of water, the jar being filled two-thirds.

**BELLS AND BUZZERS.**

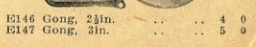
These electric bells will be found quite reliable. They are easily installed, requiring only two or three No. 6 dry batteries to operate them, and a bell push.

Where a quieter signal is desired, buzzers are installed, these being similar to the bells, but without the gongs.

Where alternating current is available, bells may be operated from the mains through a transformer costing only a few shillings. This eliminates all battery troubles, and guarantees the most efficient working.

**IRON BELLS.**

Schwarze iron bells are not affected by weather changes. The gongs are musical, and the hammers are nearly concealed from view. Long service assured.





**BELLS—Continued.**

E148 Tea going, 2 1/2 in. . . 6 0

**WOOD BELLS.**

G.E.C. magnet, wood base, 2 1/2 in. long.



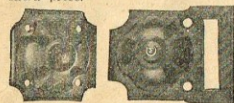
E161 Ordinary quality . . . 6 0

**BUZZERS.**

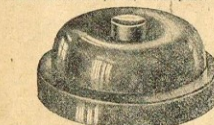
E149 Buzzer similar to E146 . . . 3 9

**BELL PUSHES.****BAKELON BELL PUSH.**

A very neat bakelite switch, in two patterns. The name plate pattern can be fitted with an engraved slip of Formica or Ivorine at slight extra price.



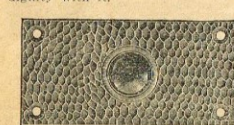
E222 Bakelon push, ordinary . . 1 6  
E223 Bakelon push, nameplate 2 6



E150 Bakelon, push, round . . . 1 6  
E159 Wood push . . . 1 0  
Cheap but quite effective.

**BRASS PUSHES.**

Nickelled or bronzed finish. A very handsome bell push that carries dignity with it.



E170 Brass push, round, concave 4 6  
E171 Brass push, oblong . . . 4 6

**MOTORORN PUSHES.**

Heavy, rugged pushes for motor and motor cycle horns and similar purposes. Very fine action.



P156 Senior type . . . 4 6  
P157 Medium type . . . 3 0  
P158 Junior type . . . 2 6  
P159 Junior type, with handle bar clamp . . 4 0

**PEAR PUSHES.**

Used where the bell wires hang from the ceiling, or where the push must be moved about, as in a sick room. Bakelite moulding.

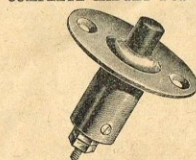


E160 Rosette to match . . . 1 9

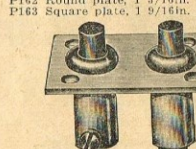
**MIDGET PUSHES.**

A full range of pushes, with small, well-constructed and very neat barrel movements. For bells, meters in Radio sets, combination meters, etc. State whether for thin metal plates or panels to 1 in.

Buttons black, white, red or green. The complete push includes a nickelled plate.

**COMPLETE MIDGET PUSHES.**

P162 Round plate, 1 3/16 in. . . 2 0  
P163 Square plate, 1 9/16 in. . . 2 0

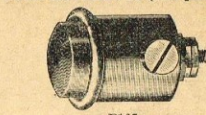


P164 Double, 1 3/16 x 1 9/16 in. . 2 2  
P165 Triple, 1 3/16 x 2 3/16 in. . 3 2

**BLOCKS.**

Polished wood blocks are used for mounting switches, etc.

E114 Round, 3 1/2 in.; each . . . 6  
E115 Rectang., 6 x 3 . . . 1 0  
E116 Rectang., 9 x 3 . . . 1 6

**PUSH MOVEMENTS (less plates)**

P167 Midget for thin plates . . 1 6  
P161 Midget, for thick panels . 1 6  
P162 MEDIUM type . . . 1 6  
P167 LARGE type . . . 2 0  
P168 HIGH TENSION PUSH. Made for voltages up to 350, but suitable also for ordinary bell work . . . 2 6

**CONNECTORS—PORCELAIN.**

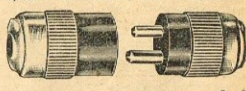
Brass connectors, held in porcelain



C412 One way . . . 2d. 1 9  
C413 Two way . . . 3d. 2 6  
C425 Three way . . . 4d. 3 6

**CONNECTORS.**

Small two pin connectors, for loud speaker extensions, etc. Polarised.



E135 Each . . . 2 6

**CUT-OUTS.**

For charging accumulators on cars or from milking or other engines. When speed drops or engine stops this automatically switches off the accumulator, preventing damage to it. Suitable for all cars, etc.



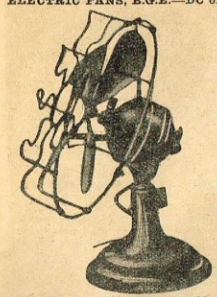
E268 Cut-out . . . 5 6

**FUSES.**

As used in all American stoves, etc. Best quality. Always keep a few by you. 10, 15, 20 or 30 amps.—state which.

E194 Fuse 6d.  
E196 6lb. size . . . 7 6  
E197 32 volt or 110 volt . . . 8 6

RADIO FUSES—See RADIO Section.

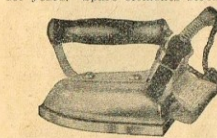
**ELECTRIC FANS, B.G.E.—DC or AC.**

E239 Electric fan, 12 in. . . £3 3 3  
E210 Electric fan, oscillating 4 13 6

**ELECTRIC IRONS—230 or 32 volt.**

The EAGLE IRON is sold with a definite guarantee of service. It is a well-finished, nickel plated iron, complete with best connector, asbestos covered cord, and plug.

The heating element—the life of the iron—is wound on best mica, with nichrome wire, and it will last for years. Spare elements stocked.



E185 Eagle iron . . . 27 0

**"MAGNET" IRON.**

Balanced weight, comfortable grip. 6lbs. Element guaranteed for three years. With connector and cord.



E207 Magnet iron . . . 1 5 0

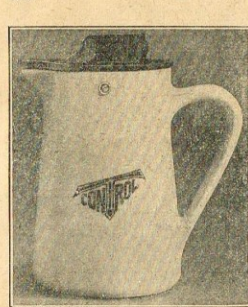
**IRON ELEMENTS—230 Volts.**

Best mica wound with highest grade nichrome wire. Etc. most electric irons on the market. A small extra charge is made for fitting to your iron.

E195 5lb. size . . . 7 6  
E196 6lb. size . . . 7 6  
E197 32 volt or 110 volt . . . 8 6

**HOT WATER JUGS.**

These porcelain jugs, fitted with solid boiling elements, have proved very successful indeed. They are perfectly safe, since the lids cannot be opened while the current is "on." Every bit of heat goes into the water. For alternating current only. Elements are definitely guaranteed, and are readily renewable in any case.



E223 "Control," 2 pts. approx. 33 0  
E224 "Thermal" 5 pints . . . 42 0

**MAGNET ELECTRIC KETTLES.**

A beautifully nickel plated kettle, made in two sizes. Fitted with safety fuse, preventing damage to element if kettle boils dry. Guaranteed.



E212 Magnet kettle, 2 pints 2 5 0  
E208 Magnet kettle, 3 pints 3 0 0

**MOTOR CAR LAMPS, Westinghouse.**

Very best quality motor car lamps. In ordering, please state: (1) voltage, (2) candle power, (3) single or double contact.

Voltage is now 6-8 for most cars, three or six candle power lamps being used for dash and tail, while larger sizes are used for head lamps. If in doubt what lamp to order, please state make and model of car.

E195 5lb. size . . . 7 6  
E196 6lb. size . . . 7 6  
E197 32 volt or 110 volt . . . 8 6

**LAMPS—OSRAM**

Electric lighting now extends to all quarters of the globe, and it is safe to say that OSRAM lamps are known wherever electric current is available. British made, of uniform excellence.

**METAL FILAMENT.**

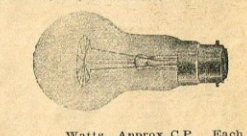
Very durable, giving approximately one candle power per watt.

L178 20 watt . . . 2 3  
L179 40 watt . . . 2 3  
L180 60 watt . . . 2 3

**GAS-FILLED—OSRAM.**

This style of lamp is essential where real brilliance is desired. In the smaller sizes they give 50 per cent., and in the larger sizes 100 per cent. more light for the SAME CURRENT costs less.

They can be supplied clear or in the new pearl finish, in sizes up to 100 watt. Larger sizes are clear only. The 150 watt is the largest lamp that can be supplied for the ordinary bayonet holder.



Watts. Approx. C.P. Each  
L217 40 80 3 0  
L218 60 90 3 8  
L219 75 100 4 3  
L182 100 150 6 6  
L215 150 300 7 6  
L220 200 400 10 0  
L221 300 600 14 0  
L232 500 1000 20 0

**CARBON LAMPS, 230 volt.**

Used in places where severe bumps may be encountered. They are not efficient for lighting. As resistances for charging from D.C. mains they are invaluable.

L254 50 c.p. lamp . . . 4 6  
L255 32 c.p. lamp . . . 2 9

**OSGLIM LAMPS.**

Useful for night lights, where little illumination is required, but far more useful to the experimenter, since they are a form of neon tube. For testing valves, lamps, flashlight bulbs, condensers, coils, circuits, an OSGLIM is simply invaluable. Made to fit ordinary bayonet holder. Current consumption is practically negligible.

The actual light is in the form of a letter or number, any of which can usually be supplied. 230 volt.

L216 OSGLIM LAMP . . . 4 3

**DECORATION LAMPS.**

For Christmas trees, shop window dressing, birthday parties, etc. The lamps themselves resemble birds, flowers or fruit, and form a very effective display. They are sold in sets of 16, with cord and adaptor, ready to connect to your ordinary 230 volt supply.

E252 Decoration lamps, set £2 5 0

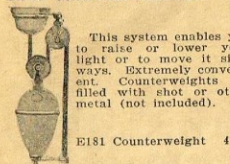


## READING LAMPS.



E202 Reading lamp . . . 16 6

## LAMP COUNTER-WEIGHTS.



This system enables you to raise or lower your light or to move it sideways. Extremely convenient. Counterweights are filled with shot or other metal (not included).

E181 Counterweight 4 0

## LAMP EXTENSIONS.

There are times when everyone wants an extension cord, so that an electric lamp can be used in some special place. It may be near a sewing machine, or near the mirror in a bedroom, or in some position convenient for reading.

E267 Extension, 12 ft. . . 6 0  
Extra length, per ft. . . 3

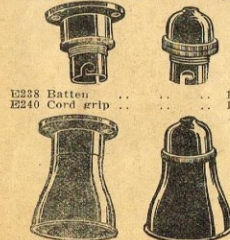
## LAMP HOLDERS.

Nowadays, practically all lamp fittings, ceiling roses, etc. are made from bakelite. Fewer parts are used, defects are much rarer, while fittings are much easier to install and safer in use.

Lamp holders are stocked in bayonet, miniature, bayonet, Edison Goliath (for very large lamps), Edison standard (E.S.), miniature Edison (flashlight bulb size, M.E.S.).

## BAKELITE-BAYONET.

These are all strengthened with brass inserts, giving great strength.



E238 Batten, with shield . . . 2 3  
E241 Cord grip, with shield . . . 1 9

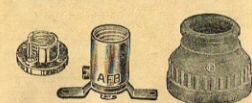
## BRASS-BAYONET.

E160 Batten . . . 1 3  
E101 Cord grip . . . 1 3  
E124 C.G. with switch . . . 3 6  
E123 Batten, miniature . . . 1 3  
E159 Cord grip, miniature . . . 1 3

E254 Batten, miniature, S.C. . . 1 3  
E256 Cord grip, miniature, S.C. 1 3  
E254 and E245 ft motor car, single contact lamps.

E255 Miniature, double contact 1 3  
E257 Miniature, single contact 1 3  
E254 and E256 ft motor car, single your car, for trouble lamps, etc.

## EDISON SCREW HOLDERS.



E103 E.S. porcelain, batten . . . 1 3  
E104 E.S. brass, cord grip . . . 1 3  
E124 E.S. Goliath, brass . . . 6 0  
E100 M.E.S. porcelain . . . 5  
E102 M.E.S. brass . . . 1 0  
E107 M.E.S. bakelite . . . 1 0  
M.E.S. holders are regularly used with bulbs as Radio fuses.

## INSTANTLY HOLDERS.

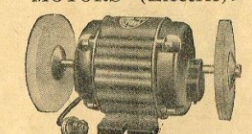
For decorating lamps. The holders clip to cords, wires, Christmas trees, or any convenient place for bulbs.

E258 ea. 1 0; dz. 10 6

## MAGNETS-PERMANENT.

We can supply a variety of magnets suitable for experiments, toys, etc. Magnets always will have a wonderful fascination for children. Pairs, 6d. each for small size, and 1s. 6d. each for large, powerful size. Electro magnets of any type can be made to order.

## MOTORS (Electric).



For amateur use this 1/2 h.p. motor will serve most purposes. It will drive a small engineer's lathe, or a drilling machine, by removing the polishing mop, and fixing a pulley in its place.

It is normally built as a grinder and polisher, being supplied with a six inch carbide type wheel and a six inch cotton polishing mop. It can be used on any lighting circuit, if desired.

M106 230 volt 50 cycles A.C., single phase . . . £6 10 0  
M107 230 volt D.C. . . 7 0 0

## ASK FOR QUOTATIONS FOR LARGER MOTORS.

## CENTURY.

1/2 h.p. for 230 volts 50 cycles A.C. only. Very powerful and smooth running. Get this motor to drive your small machinery, for it costs practically nothing to run.

Pulley and shaft rails, 5s. extra.

M202 Century 1/2 h.p. . . 5 5 0

## MARATHON.

A rather cheaper but perfectly reliable 1/2 h.p. motor, for 230 volts 50 cycles A.C. only. Pulley is fitted.

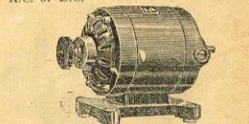
M236 Marathon 1/2 h.p. . . 4 15 0

## MIDGET ELECTRIC MOTORS—230 volt.

Smaller motors are listed, but we can supply or procure any electric motor you may want. With our experience in electricity, and our close connection with the electrical trades, we know which makes are the most reliable.

Although only smaller motors are listed here, we frequently have in stock new or used motors at special prices. For instance, at time of printing, we have a new Repulsion induction A.C. motor, 1/2 h.p., at £12 10s., a reduction of £5 in price—a 1/2 h.p. ball bearing motor, with switch, used only a few times, £4, and a 1/4 h.p. Emerson, at £2 10s.—1 1/2 h.p. D.C., new, £12.

Let us know your requirements, A.C. or D.C.



Small electric motors find far too many uses to enumerate here. Sewing machines, milk churns, shop model driving, small grinding attachments furnish a few examples. Every boy wants to experiment with a small motor, and these are just the thing for him. They run from the mains, using practically no current. They have real power, and will drive Meccano and other models really well.

Midget motors are supplied to run on A.C. or D.C. without alteration. Small pulleys are fitted as a rule.

H.P. Price  
E234 1/50 . . . £2 15 0  
E235 1/20 . . . 2 3 0  
E236 1/10 . . . 4 0 0

## HAMILTON BEACH MOTORS.

This well-known U.S.A. firm manufactures a large variety of small motors, running off either A.C. or D.C., and used for sewing machines, jewellers' lathes, and similar purposes.

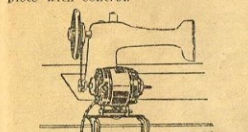
E213 Sewing machine motor 5 15 0  
E232 Tailors' motor . . . 9 0 0  
E242 1/2 h.p. No. 04 . . . 10 0 0  
E244 Jewellers' No. 2 . . . 6 10 0  
E245 Jewellers' No. 3 . . . 8 2 6  
E236 Heavy vibrator outfit 6 2 6

## CONTROLS.

For sewing machines and other purposes where special variable controls are desired, we can supply these to suit your needs.

## SEWING MACHINE MOTORS.

Attach one of these to your sewing machine, and avoid the drudgery of pedalling. Speed under full control, merely by foot pressure. Complete with control.



E213 Sewing machine motor 6 0 0

## PLUGS-BAKELITE.

Plugs suitable for irons, toasters, radiators, etc. Bakelite, with strong phosphor bronze clips, with spring tongues, ensuring contact even if the clips should spread with heat. Special lock nuts—do not work loose.

E188 Bakelite plug . . . 2 6

## PLUGS-ARMORED.

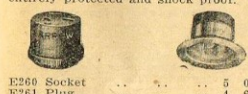
Plugs suitable for irons, toasters, radiators, etc. Made of bakelite, with strong phosphor bronze clips and extra spring tongues, which ensure perfect contact, even under intense heat. Special non-slipping locknuts.

The armored pattern is illustrated; it is protected against breakage by a metal covering.

E189 Armoured plug . . . 2 6

## PLUGS-SOCKETS.

Heavy pattern sockets with plugs. The plugs have internal contacts, entirely protected and shock proof.



E260 Socket . . . 5 0  
E261 Plug . . . 4 6

## MAGNET RADIATOR.

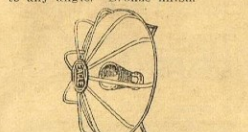
Polished copper reflector, which can be adjusted to any angle. Connector and cord included. The heating element is constructed so that the coils of nichrome wire do not loosen on the porcelain and touch, thus causing instant blow out. 750 watts.



E205 Magnet radiator . . . £1 10 0

## RADIATORS.

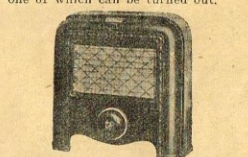
Twelve inch copper bowl, polished and lacquered. Heavy iron base to give ample stability. Adjustable pivot, to enable heat to be focussed to any angle. Bronze finish.



E290 Eagle radiator . . . 27 0

## MAGNET ELECTRIC FIRE.

1000 watts, therefore capable of ample heat. Uses two elements, one of which can be turned out.

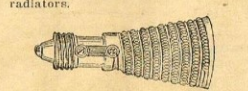


E206 Magnet electric fire . . . £2 15 0

## RADIATOR ELEMENTS.

The elements listed here are wound with nichrome, and are equally as good as any other, regardless of price. There is only one grade of nichrome.

Cone, porcelain, wound with nichrome, to suit 230 volt radiators. Will fit 600 watt size. Fits most radiators.



E152 Cone pattern . . . 6 6  
E193 Parallel pattern . . . 6 6

## BAKELITE ROSES—CEILING.

E251 Ceiling rose, complete . . . 1 6

## SOLDERING IRONS—

Electric soldering irons are very popular because of their extreme convenience.

Drake irons fill requirements of all soldering work. Best materials and good design give them unusual lasting qualities, while they are beautifully finished. 110 or 230 volt.



X239 Junior, 50 watts . . . 16 0  
X240 Radio, 70 watts . . . 1 4 0  
X241 Master, 80 watts . . . 1 12 0  
X242 Mechanics, 130 watts . . . 2 8 0  
X243 Tinners, 500 watts . . . 5 12 0

## SWITCHES.

## SEE ALSO SWITCHES IN RADIO SECTION.

Bakelite is now used for best switches. Those listed below are of really first quality, and have quick make and break.

E242 5 amp. 1 way . . . 1 9  
E243 5 amp. 2 way . . . 3 6  
E244 10 amp. 1 way . . . 4 6

E105 5 amp. . . . . 1 2  
E107 10 amp. . . . . 3 6

## CRABTREE CEILING SWITCH.

Ceiling switches are controlled by the Crabtree cord. The Crabtree cord does not enter the switch itself, and can be replaced easily.

E109 . . . . . 5 0

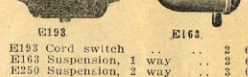
## BAKELITE PLUGS.

These may be used without switches.

E245 3 pin socket 1 9  
E246 3 pin plug 1 9  
E247 2 pin socket 1 2  
E248 2 pin plug 1 9

## CORD SWITCHES.

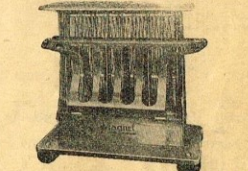
E193 is composition, and fits over twin flex, only one wire being cut. E163 is bakelite, suspension type. These switches are very convenient for many purposes.



E193 Cord switch . . . 2 6  
E163 Suspension, 1 way . . . 2 6  
E250 Suspension, 2 way . . . 3 0

## MAGNET PICES.

Toasts two pieces simultaneously, in about three minutes. Toast already made can be kept warm.



E204 Magnet toaster . . . £1 12 6

## TOASTERS.

Toasts two pieces at one time, the bread being reversed by a simple patent action, without removing it from the slides. Highly nickel plated.

E201 Eagle toaster . . . 30 0



## TORCHES.



COLUMBIA BATTERY AND EDISON-MAZDA BULB is included with each torch. We do not use cheap batteries and bulbs in order to make a few pence more in profit.

## FOCUSING.

Fitted with special bulbs and reflectors, these torches can be instantly adjusted to throw a concentrated beam of light on any object within their range. Thus for observing things at a distance, they are absolutely invaluable.

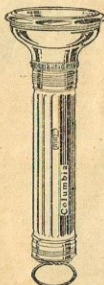


## TWO CELL, SMALL REFLECTOR.

Range 300 feet.  
Length 6 1/2 in. Battery Z112. Bulb Z114.  
Z124 (1271) Black .. 11 9  
Z125 (1273) Nickel .. 13 0

## THREE CELL, SMALL REFLECTOR.

Range 400 Feet.  
Length 9 1/2 in. Battery Z113. Bulb Z117.  
Z126 (1272) Black .. 17 3  
Z127 (1274) Nickel .. 18 6



## THREE CELL, LARGE REFLECTOR.

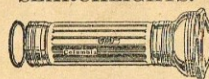
Range 800 Feet.  
Length 10 in. Battery Z113. Bulb Z117.  
Z128 (1242) Black .. 21 0  
Z129 (1244) Nickel .. 23 0

## FIVE CELL, LARGE REFLECTOR.

Range 1500 Feet.  
This is made in nickel only, and is the most powerful obtainable. It uses five unit cells (Z136) and a special focussing bulb (Z141).  
Z130 (1245) Nickel .. 30 0



## SEARCHLIGHTS.



## TWO CELL, SMALL.

Length 5 1/2 in. Battery Z111. Bulb Z115.  
Z118 (1260) Black .. 8 3  
Z119 (1261) Nickel .. 9 0

## TWO CELL, LARGE.

Length 6 1/2 in. Battery Z112. Bulb Z115.  
Z120 (1216) Black .. 9 9  
Z121 (1234) Nickel .. 11 6

## THREE CELL, LARGE.

Length 8 1/2 in. Battery Z113. Bulb Z116.  
Z122 (1219) Black .. 12 3  
Z123 (1233) Nickel .. 13 6

## ORDINARY PATTERN.

This has a reflector the same size as the torch, and is the most convenient for carrying.



## TWO CELL SMALL.

Length 5 1/2 in. Battery Z111. Bulb Z115.  
Z118 (1262) Black .. 6 9  
Z101 (1230) Nickel .. 7 9

## TWO CELL LARGE.

Length 6 1/2 in. Battery Z112. Bulb Z115.  
Z102 (1204) Black .. 8 0  
Z103 (1231) Nickel .. 9 0

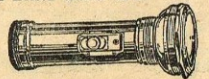
## THREE CELL LARGE.

Length 8 1/2 in. Battery Z113. Bulb Z116.  
Z105 (1212) Black .. 9 9  
Z106 (1232) Nickel .. 11 0

## SUNBEAM NICKELLED TORCHES.

A good nickel-plated flashlight, similar in shape to the Columbia and taking the standard batteries. The switch is arranged for flashing, or it can be locked for continuous light.

The SUNBEAM TORCH must not be judged by its price. It is a strong and durable torch that cannot fail to give satisfaction. All complete with Columbia batteries, and Edison Mazda bulbs.



Z137 TWO CELL SMALL .. 6 0  
Z138 TWO CELL LARGE .. 7 6  
Z139 TWO CELL FOCUSING .. 10 6  
Z140 TWO CELL FOCUSING .. 12 6  
large reflector .. 12 6

## TORCH BATTERIES.

Only COLUMBIA are stocked, since they have proved the most reliable, and therefore the cheapest in use.



Z135 Small unit cell (4925) .. 8  
Z111 Small two cell (4791) .. 1 4  
Z136 Large unit cell (4950) .. 8  
Z112 Large two cell (4790) .. 1 4  
Z113 Large three cell (4795) .. 2 0  
Z134 Flat three cell (4702) .. 1 9

## TORCH BULBS.



EDISON-MAZDA metal filament bulbs are best for all torches. They give a maximum amount of light, with a minimum amount of current. Cheap bulbs run your batteries down very quickly.

## ORDINARY.

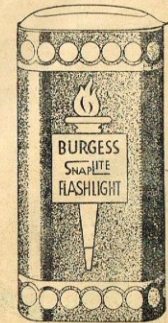
Z115 Two cell, 2.5 volt .. 1 0  
Z116 Three cell, 3.8 volt .. 1 0

## FOCUSING.

Z114 Two cell, 2.5 volt focus .. 1 2  
Z117 Three cell, 3.8 volt focus .. 1 3  
Z141 Five cell, 6.2 volt focus .. 1 3

## BURGESS SNAPLITE.

A tiny flashlight, the illustration being actual size. Simply snap the top open, and it lights—snap it shut, and the light is off.



Z142 Snaplite, complete .. 2 6  
Z143 Battery refill .. 2 6

## GRAMO. FITTINGS.

The Radio valve has entirely revolutionized the GRAMOPHONE INDUSTRY, both in the actual making of records, and in their reproduction. Formerly, when records were being made, it was necessary to take great care in placing the artists in front of the large recording horns. No method existed of actually increasing musical sounds.

Today, the artists are able to have plenty of room for each, if necessary could use a separate microphone. The "output" from each artist can be modified, and the whole performance "mixed" to give any part predominance. Radio valves finally increase the volume, so that a deep groove is cut on the record. In reproducing, Radio valves again enable volume to be increased as much as wanted. The old complicated horns have disappeared.

Truly, the electric gramophone of today is a marvellous instrument. Your Radio can be used as an electric gramophone—see under Pick-ups for further details. Little cost is involved, and very good results are easily obtained.

## GRAMO. MOTORS.

All gramophone motors are supplied complete with turntable, and where necessary, with governors and speed controls.

The electric motors can usually be made to suit different voltages, by adjustment, but please state your voltage in ordering.

## B.T.H. ELECTRIC—A.C. or D.C.

Made by one of the oldest and largest firms in England, commutator type, made chiefly for D.C., but working equally well on A.C. A reliable motor.



G187 B.T.H. motor .. £5 5 0

## PAILLARD ELECTRIC.

A beautifully made motor by a famous Swiss firm. Induction type, for A.C. only. Each includes automatic stop. Two sizes, each of which can be supplied with or without plated mounting plate.

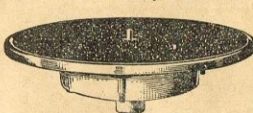


G188 Paillard, with plate .. £5 5 0  
G189 Paillard, less plate .. 1 0 0  
G193 Paillard, with plate .. 8 0 0  
G194 Paillard, less plate .. 7 13 6

## HAMMOND—230 Volts A.C.

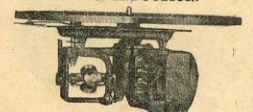
An entirely new departure in motors, because it has no governors, no gears, only one moving part and only one bearing, which runs for over a year without oiling.

Speed is controlled entirely from the mains current, and cannot vary from 78 per minute—the correct speed for reproduction. No switch even is required. The motor is given a twist by hand to start it, and is stopped by hand, while current is left switched on to it. Small and easily fitted.



G190 Hammond motor .. £6 10 0

## "FLYER" A.C. INDUCTION.



G174 Blue Flyer .. £6 10 0  
G175 Green Flyer .. 5 0 0  
G192 Flyer automatic stop .. 9 6

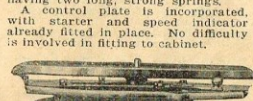
## GARRARD SPRING (British Made).

On Garrard motors, the gears are accurately cut, to ensure smooth and silent running, as well as long life.

All are complete with turntable, brake, speed indicator, winding handle, escutcheon plate, screws, etc. The springs are contained in a separate unit, which can be detached in a few seconds, without dismantling the remainder of the motor. This makes the fitting of new springs a much easier job.

## GARRARD SUPER.

Without question the finest motor made to-day. All working parts are solidly and completely enclosed in a heavy iron case, not only preventing accidental damage, but excluding every trace of dust. To ensure perfect lubrication, a patent oil pump is fitted, so that every part is efficiently oiled, with a minimum of attention. Turntable, 12 in., plush. It will play three 12-inch records, having two long strong springs. A control plate is incorporated, with starter and speed indicator already fitted in place. No difficulty is involved in fitting to cabinet.

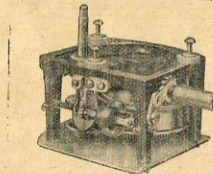


G120 Garrard Super .. £8 5 0

The following Garrard motors are somewhat similar in appearance, differing mainly in size and in strength of springs. All have 12 inch turntables, except G123, 10 inch.

## GARRARD 10—Two Spring.

Plays three 12 inch records.



G121 Garrard 10 .. £4 5 0

## GARRARD 11—Two Spring.

Plays two 12 inch records.  
G122 Garrard 11 .. £3 5 0

## GARRARD 12—Single Spring.

Plays two 10 inch records.  
G123 Garrard 12 .. £2 2 0

## MONARCH GRAMO. MOTORS.

These are Swiss make, and are of marvellous quality, when the low price is considered. Certainly, no one need hesitate about purchasing one of these motors on the score of expense.

Each is complete with winding handle, fixing screws, rubber washers, regulator, brake and turntable. The number of records played at one winding is given.

## MONARCH "CHAMPION."



G160 Champion .. £1 16 0

## MONARCH "CHIEF."

Double spring, with 12 inch turntable. Plays two 12 inch records. Worm governor, push regulator. Design similar to "Champion".  
G161 Chief .. 2 8 0

## MONARCH "SUPERIOR."

A very high grade motor, novel design, with double spring motor, playing two 12-inch records.



G163 Superior .. 4 0 0



**AUTOMATIC RECORD PLAYERS.**

These machines enable a number of records to be played in succession, without any attention. Full details available on the Presto price being about £25. 0/- apparatus, including electric grammo. motor.

**HOME RECORDING.**

Special records and needles are now being made, which enable a good Radio to be used for record making at home. Details will probably be available by the time this catalogue reaches you, and your enquiries will be welcomed.

**GRAMO. PICK-UPS.**

Electrical gramophone pick-ups are used with a steel needle much as an ordinary reproducer. Instead, however, of creating sound waves, they generate electric alternations, which may then be greatly magnified in an amplifier, and finally turned again into sound waves by a good speaker.

Pick-ups are so popular to-day that all the best gramophones use them. You can use one with your Radio, or with one of the amplifiers described in this list. See under Amplifiers, on page 9, for full details. Pick-ups are usually fitted with volume controls, enabling any volume from a mere whisper to full band strength to be obtained at will.

**B.T.H.**

British—a marvellously good pick-up, simply because it makes music so exactly like the original. Volume, too, which perhaps not so great as with some other pick-ups, is quite sufficient for theatre work, and large numbers are used for this purpose.

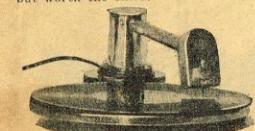
Owing to the peculiar needle movement, record wear is reduced to an absolute minimum, and this is further assisted by the balanced tone arm, gold finished, and the offset end, making the needle track accurately. Separate volume control included. Head swings upwards, enabling needles to be readily changed.



G176 B.T.H. pick-up .. £4 7 6  
G185 Less volume control 4 0 0  
G186 B.T.H. head only .. 2 0 0

**HYDRO PICK-UPS.**

An up-to-date pick-up, embodying years of experience, giving really fine results. Complete with tone arm and volume control. Actually improves with use. No scratchy bits required. Higher priced than usual, but worth the extra.



G195 Hydro pick-up .. £8 10 0

**PRESTO PICK-UPS.**

Special theatre pick-ups with long arms. Tone is a revelation. Those who want the best for home use are recommended to try the Presto. The arm is long enough for 16 inch records, and the Presto is, of course, designed for talkie, theatre and cabaret use.

Volume control included.  
G177 Presto theatre pick-up £10 10 0

**WEBSTER.**

A well-known U.S.A. pick-up. Model 2A has tone arm, incorporating a volume control, while Model 2B is without tone arm, but with separate volume control.  
G168 Webster Model 2A .. £4 15 0  
G169 Webster Model 3B .. 3 15 0

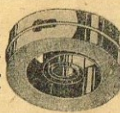
**PHILIPS PICK-UP.**

G174 With tone arm, and volume control .. £5 5 0

**GRAMOPHONE REPAIRS, MAIN-SPRINGS, etc.**

quoted on application.

See CABINET FITTINGS for other accessories.

**VOLUME CONTROLS.**

These are connected between the pick-up and the Radio or amplifier, giving full control over the volume—from a whisper, to the fullest possible—merely by turning a knob.

For illustrations, see ROYALTY and ROYAL GIANT RESISTANCES. The usual size is 500,000 ohms.

**ROYALTY VOLUME CONTROL.**

This is type 1, Royalty, resistance being 500,000 ohms.  
R263 Royalty volume control 7 6  
R243 Table type .. 13 6

**REPRODUCERS.**

We now have a very large sample range of TONE ARMS and REPRODUCERS.

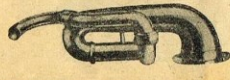
You can improve your machine wonderfully with a modern tone arm and reproducer.

**NOVATONE TONE ARM.**

This is something very special, and will make a vast improvement in any gramophone fitted with the older style tone arm. Its novel construction enables it to act like the exponential horn, so well known and successful in Radio.

Arrange for a trial—you will not be asked to keep it, unless you are quite sure that you want it.

English made—ball bearing—nickel plated.



G164 Novatone tone arm .. £1 16 0

**DURO REPRODUCERS AND TONE ARMS.**

Duro reproducers are very popular in U.S.A., and are fitted to many expensive and well-advertised machines. Strongly constructed, with due care to the production of really fine tonal results, and smoothly nickel plated.



G125.

**DURO QUALITONE, MATCHED.**

A reproducer that is generally sold with its own matched tone arm, thus assuring the best results. It will give better results than your present reproducer, however, even on your own tone arm. A trial will be gladly arranged.

G125 Reproducer and tone arm .. £2 8 0  
G126 Reproducer only .. 1 5 0  
G127 Tone arm only .. 1 5 0

**SIMPLEX.**

Develops a remarkably clear and melodious tone. Can be supplied either alone or with tone arm. Very suitable for portable machines. Beautifully nickel plated.

G128 Reproducer and tone arm .. 1 4 0  
G129 Reproducer only .. 12 9  
G130 Tone arm only .. 12 9

**TONE ARMS—Brass Plated.**

Similar in shape to G125, but made in three grades—No. 1 plain bearing—No. 2 double row ball bearing—No. 3 extra heavy, ball bearing, for best machines.

G181 Tone arm No. 1 .. 9 9  
G182 Tone arm No. 2 .. 12 9  
G183 Tone arm No. 3 .. 21 0

**NOVAVOX REPRODUCER.**

The best low-price reproducer. Sturdy construction, excellent finish, and splendid tone. Marvellous value.  
G184 Novavox reproducer .. 7 6

**GRAMOTROPE.**

This converts your Radio into an electric gramophone, so that you can either enjoy Radio concerts, or play your favourite records at will.

It consists of a cabinet fitted with a suitable gramophone motor and pick-up. It is simply connected to your Radio by a speaker cord.

In actual use, this will be found far more convenient than the combination Radio-gramophone, for with the latter you must constantly rise from your chair and attend to it. You merely place the Gramotrope alongside you, with your selected records, and run through them in absolute comfort. You can even play them from the next room.

Results, of course, are exactly equal—the Gramotrope is NOT a substitute.

# FREE TO YOU!

## EACH WEEK FOR ONE MONTH.

SEND to us a copy of the letter below and we will post

direct to your home a copy of the "Radio Record and Home Journal."

YOU may judge how useful and pleasant Radio can be, directed by knowledge drawn from this truly modern journal.

YOU will see how everyone in the home will demand their turn to read and study the pages, packed with interest and news.

AND vie with each other to be first to instruct those who do not know the joy of Radio.

# "RADIO RECORD AND HOME JOURNAL."

SOLD BY ALL BOOKSELLERS.

3d. WEEKLY.

Contains Full Main Station Programmes.

Address to "Radio Record,"  
Box 1032, Wellington.

As I am not a regular reader of the "Radio Record and Home Journal," I would like to have your journal in my home for one month. There are\* ..... persons in my home.

Signature.....

\*State how many.

THIS FREE OFFER ENDS SEPTEMBER, 1931.



**BIGGER — BRIGHTER — BETTER**

# NEW ZEALAND RADIO Handbook Annual

for 1931.

Full Sections devoted to A.C. and Short Wave  
Constructional Details for numerous A.C. and  
D.C. Sets.

Power Packs, Eliminators, Amplifiers, Chokes,  
Boosters, Transformers, Etc., Etc. Etc.

Up-to-date call-signs of N.Z. Amateur Trans-  
mitters. Latest Broadcast and S.W. call-signs.

**A Veritable Encyclopaedia of Radio Information.**

PRICE **2/6**

Every Radio Transmitter, Listener, and Constructor should have one

If your Bookseller or Radio Dealer cannot supply, apply to the Publishers:

**H. G. FARNALL & Co., Ltd. - 10 Civic Square, Auckland.**

## TRY EXELON TYRES.

75

The test of convenience is the number of records you actually DO play on your combination machine. Probably, you rarely use it. You will use a Gramotrope far more.

### MODEL A.

Fitted with high grade electric motor, B.T.H. or similar high-grade pick-up, volume control and 20 feet speaker cord.

G170 Model A Gramotrope £12 0 0

### MODEL B.

Fitted with Garrard Super spring motor, otherwise same as Model A.

G171 Model B Gramotrope £14 10 0

### MODEL C.

Fitted with Thornens motor (G178) and good quality pick-up. Good, in spite of its inexpensiveness.

G172 Model C Gramotrope £6 10 0

**DOUBLE GRAMOTROPES** — Price on application.

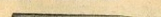
## FITTINGS.

### BRAKES.



G153 Outside type .. .. each 1 8  
G154 Outside type, high quality .. .. each 2 8  
G155 Inside type .. .. each 2 8

### "ALTONA" NEEDLES.



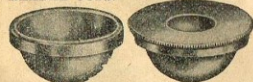
**ALTONA NEEDLES** are made by a first-class Sheffield steel firm, who also make needles for many of the prominent gramophone firms, who sell them under their own name, of course, at a much higher price.

**ALTONA NEEDLES ARE THE BEST QUALITY IT IS POSSIBLE TO OBTAIN**, so that you can use them with every confidence.

	Per box of 200	Five boxes
G134 Soft .. ..	1 0	4 9
G135 Loud .. ..	1 0	4 9
G136 GOLDEN, box 100	1 3	6 0

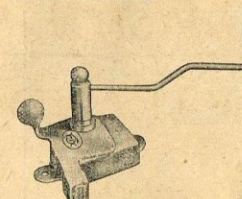
**GOLDEN TONE** needles play eight or ten records without changing. Best for automatic players.

### NEEDLE CUPS.



G133 Nickel plated, with covers 1 0  
G144 Set of two, one with cover through a small hole in which used needles can be dropped. No mistake in using needles twice over.  
G144 Per set .. .. 2 0

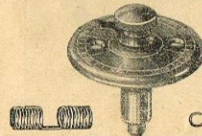
## AUTOMATIC STOPS.



These will stop the gram. motor when the record is finished. Light but certain trigger action. The electric model includes switch. .. 5 0  
G179 Automatic stop .. .. 5 0  
G180 Automatic stop, electric 8 6

## SPEED REGULATORS.

Consists of a nickel plated disc engraved with numbers to denote revolutions per minute. A knurled nut and pointer regulate the speed, by adjusting the brake arm under the motor board of the gramophone.



G158. G145. G157  
G146 Speed regulator .. ea. 2 6

## SPRINGS.

G157 Brake springs .. each 3d.  
G158 Check springs (replacing winding ratchet) .. each 6d.

## TONE ARMS.

Although most pick-ups will fit the average tone arm, many like to fit a special tone arm on their gramophone for the pick-up. A tone arm is necessary, of course, for those who purchase a motor to build up their electric gramophone.

Not suitable for ordinary gramophones.

G141 TONE ARM, plain .. 6 6  
G142 TONE ARM, hinged .. 7 6

## TONE ARM SUPPORTS.

Small plated arms, which screw to cabinet lid alongside the turntable, and shaped at the top to support tone arm when it is not on the record.



G143 With nut .. .. ea. 1 6

## CONSULT US ON

**"SOUND" INSTALLATIONS.**

## CYCLE ACCESSORIES.

NOTE.—Only the main items are listed here. Write us for any cycle accessory, and it will be promptly supplied.



## BALLS—HOFFMAN.

Guaranteed true to a 10 000th part of an inch.

	dz.	gr.
Y100 1/8-inch .. ..	2d.	1 3
Y101 3/16-inch .. ..	3d.	2 0
Y102 1/4-inch .. ..	4d.	3 0

## BELLS.

Lucas excel in bells as well as in lamps for cycles. The Lucas brand is your guarantee of a really reliable article.



	Diam.	Each
Y103 Lucas No. 236	2 3/16	1 6
Y104 Lucas No. 216	2 1/16	2 0
Y105 Lucas No. 256	2 5/16	3 0
Y106 Rouser (not Lucas)	2	1 0

## BRACKET AXLES.

Made by Brampton, carefully hardened, and accurately ground.

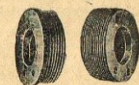
Y107 Bracket axle .. .. 2 0

## BRACKET CUPS.

Also made by Brampton, the cottered type for use with cotter pins.



and the cotterless type with left and right threads, the latter used with a lock nut on the left side of the cycle.



Y111 Bracket cup, cottered .. 1 0  
Y112 Bracket cup, cotterless, right .. 1 0  
Y113 Bracket cup, cotterless, left .. 1 0  
Y114 Bracket lock ring for Y113 .. 6  
Y115 Bracket coppers, complete .. 3



# THE 'ACE' BICYCLE

£8:12:6  
CASH.

Lady's 7/6 extra.

Speedy!  
Reliable!  
Rustless!

EASY TERMS.

3/6 Weekly



Delivered Free to any Port or Railway Station.

## SPECIFICATION.

### FRAME.

To ensure ample strength, only the best WELDLESS STEEL TUBE is used, with machined lugs. All parts are assembled with the utmost precision before brazing, so that true and easy running is guaranteed.

### BEARINGS.

Ball bearings are fitted throughout, accurate to one thousandth of an inch, while the cones and cups are hardened and ground with equal precision.

### WHEELS.

Best chromium plated rims, non-rusting spokes. Built true and remain true. Eadie coaster rear hub, combining a never failing powerful brake, with a perfect free wheel.

### HANDLEBAR.

Upturned, adjustable as standard, but other types can be fitted to order.

### CHAINWHEEL and CRANKS.

Best English, the chain wheel being flanged and attached to the specially toughened cranks with the standard five screws.

### PEDALS.

Rat-trap or rubber.

### SADDLE.

Brooks Legion, or three-coil saddle of exceptional comfort.

### CHAIN.

Brampton roller.

### TYRES.

English best Dunlop roadster covers, and Dunlop tubes. Fully guaranteed. The longest wearing tyre that can be purchased.

### FINISH.

Best stove enamel, with gold lines.

### ACCESSORIES.

Bell, tool bag and tools, pump and clips, rear reflector and oil can.

Chromium-Plated—Non-Rusting.

## EASY TERMS:

Deposit	Weekly	Payments.	Total Price
3/6	58	3/6	£10/6/-
£1/-	52	3/6	10/2/-
£4/-	30	3/6	9/5/-

NOTE THE CONSIDERABLE SAVING by paying a LARGER DEPOSIT.

CHEAPER BICYCLES (not recommended) from £6.

**FREE!** AN ELECTRIC CYCLE LAMP INCLUDED WITH CYCLE WHEN DEPOSIT OF £1 OR MORE IS PAID.

### CARRIERS—REAR.

Both are complete with straps. The Hercules is a very strong carrier, suitable for heavy parcels, while the Sturdi is quite rigid, and perfectly safe for light parcels such as an overcoat.

Y116 Hercules carrier ..	3	9
Y117 Sturdi carrier ..	2	9

### CHAINS—Roller.

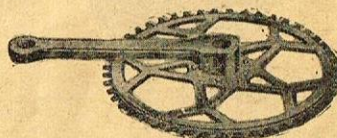
Brampton chains are very strong and smooth running. See if you can see between your chain wheel and chain. If so renew your chain, which has stretched, and will quickly wear out the wheels.



Y118 Brampton 1/2 x 1/2 or 3/16	4	6
Y119 Brampton military, extra strong ..	7	6
Y120 Renold chain ..	6	0

### CHAIN WHEELS, CRANKS, ETC.

These are the best quality, the chain wheel being flanged to secure enormous strength, and the cranks being specially toughened. Complete set includes two cranks, and chain wheel.



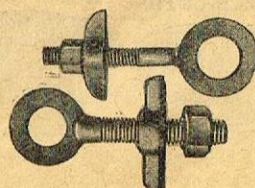
Y121 Complete set ..	10	6
Y122 Right crank ..	5	6
Y123 Left crank ..	4	0

Y124 Crank cotter ..	3	
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Y125 Chain wheel screw ..	2	
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### CHAIN ADJUSTERS.

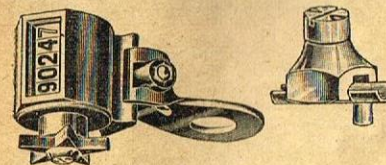
Standard pattern, plated. Good threads, with well-fitting nuts.



Y126 Chain adjusters, curved caps ..	8	
Y127 Chain adjusters, straight caps ..	8	

### CYCLOMETERS.

Complete with striker, for 28 inch wheels only. These are soundly constructed, and read to 10,000 miles. Why not know how far you cycle—every motor car carries a speedometer.



Y108 Ace cyclometer ..	5	0
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### FORKS.

Standard sizes, enamelled and plated, ready for fitting. Send measurement of fork stem, or, better still, the old fork, as pattern.



Y128 Fork, front ..	12	6
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### HEAD FITTINGS.

Brampton quality, well nickel-plated. Two patterns the head clip fitting stems that are slotted, while the screwed race is used for expander type stems.

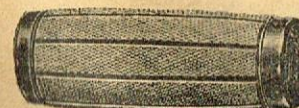


Y129 Head clip and bolt ..	2	9
Y130 Head lock ring ..	1	0

Y131 Head bolt and nut, as illustration ..	6	
Y132 Head bolt and nut, plain ..	6	
Y133 Head race, black ..	6	
Y134 Head crown race, plated ..	9	
Y135 Head screwed race, plated ..	1	0

### HANDLE GRIPS.

Celluloid is the usual pattern, the Bluemel grip being especially durable. For comfort, some prefer the rubber grip. All are very easily fitted.



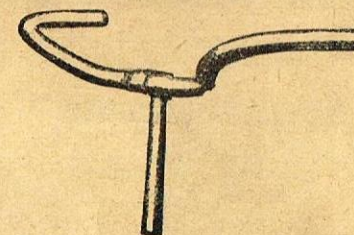
Y138 Celluloid ..	pair	1	0
Y139 Celluloid, Bluemel ..	pair	1	6



Y140 Rubber ..	pair	2	0
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### HANDLEBARS—CANADIAN.

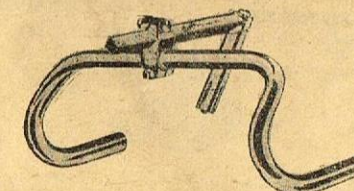
The Canadian handle-bar is the most popular shape, and it can be used down or up, since it has a reversible clip. Well plated, and fitted with grips.



Y136 Canadian handlebar ..	10	6
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### HANDLEBARS—MAJOR TAYLOR.

Fitted with outrigger, giving forward as well as up and down adjustment. The pattern usually seen on racing machines. Complete with grips and thoroughly nickel plated.

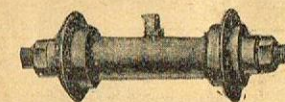


Y137 Major Taylor handlebar ..	18	0
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### HUBS—ORDINARY.

Hubs fitted to your wheel, new spokes, 8s. extra.

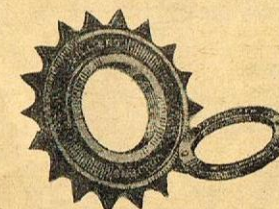
Brampton hubs are perfectly reliable, and reasonably priced.



Y144 Brampton front hub ..	3	9
Y145 Front spindle ..	6	
Y173 Front cone ..	6	
Y174 Front nut ..	3	
Y175 Brampton rear hub ..	7	0



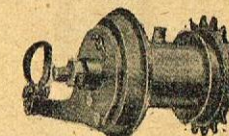
Y176 Rear spindle ..	6	
Y177 Rear cone ..	6	
Y178 Rear nut ..	3	



Y179 Rear sprocket, 12-18 teeth ..	1	9
Y180 Rear sprocket, 20-22 teeth ..	2	6
Y181 Rear lock nuts ..	6	

### HUBS—EADIE.

The Eadie coaster hub combining free wheel and back pedal brake, is easily the best on the market. Many have attempted to imitate the Eadie, but it has readily maintained its undoubted supremacy for over 20 years. The brake is powerful and absolutely reliable.



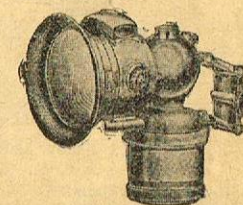
Y141 Eadie coaster hub ..	27	6
Y142 Eadie coaster hub, fitted with new spokes ..	33	6
Y143 Eadie coaster hub, complete new wheel, plated ..	39	6

### EADIE PARTS.

Y146 Friction Plate ..	62R	4	6
Y147 Bronze brake ring ..	63R	3	0
Y148 Brake cone and lever ..	64R	3	0
Y149 Brake spring lever ..	65R	1	6
Y150 Clutch nut, toothed ..	66R	2	6
Y151 Right cup, toothed ..	67R	2	6
Y152 Driving nut ..	68R	3	6
Y153 Sprocket, 16-18 teeth ..	69R	3	0
Y154 Sprocket (not Eadie) ..	70R	1	9
Y155 Left cup ..	70R	2	0
Y156 Brake clips, comp. ..	71R	1	3
Y157 Lock nuts ..	72R	1	3
Y158 Retainers & balls, lg. ..	73R	1	0
Y159 Retainers & balls, sm ..	74R	1	0
Y160 Clutch spring ..	75R	1	4
Y161 Adjusting cone ..	76R	1	6
Y162 Clutch spring screw ..	77R	3	
Y163 Split collar, narrow ..	78R	3	
Y164 Split collar, wide ..	79R	3	
Y165 Packing piece, B.S.A. ..	80R	6	
Y166 Spindle collar ..	81R	8	
Y167 Packing piece, std. ..	82R	6	
Y168 Chain stay clip nut ..	83R	2	
Y169 chain stay clip screw ..	84R	3	
Y170 Spindle nut ..	85R	3	
Y171 Lubricator ..	86R	6	
Y172 Spindle only ..	87R	1	6

### LAMPS—ACETYLENE.

These give a very fine light, which is essential for safe riding on country roads.



Y182 Panther ..	10	0
Y183 Revenge ..	17	6
Y184 Acetylene burner ..	1	0
Y185 Burner cleaners ..	6	

### LAMPS—ELECTRIC.

Small magneto generators, driven from the front wheel, supply electricity for lighting the head lamp, designed like a motor car headlight, with efficient reflectors. Magneto is sturdily built, and contains only one moving part. The no trouble light.

Y244 Record lamp, complete ..	26	6
Y245 Record generator ..	18	0
Y246 Record headlight ..	9	6
Y190 P. and H. ..	30	0
Y191 Balaco ..	30	0
Y192 Bulbs for above ..	1	6



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Speedy!  
Reliable!  
Rustless!

EASY TERMS.

3/6 Weekly



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To ensure ample strength, only the best WELDLSS STEEL TUBES is used, with machined lugs. All parts are assembled with the utmost precision before brazing, so that true and easy running is guaranteed.

### BEARINGS.

Ball bearings are fitted throughout, accurate to one thousandth of an inch, while the cones and cups are hardened and ground with equal precision.

### WHEELS.

Best chromium plated rims, non-rusting spokes. Built true and remain true. Eadie coaster rear hub, combining a never failing powerful brake, with a perfect free wheel.

### HANDLEBAR.

Upturned, adjustable as standard, but other types can be fitted to order.

**Chromium-Plated—Non-Rusting.**

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NOTE THE CONSIDERABLE SAVING by paying a LARGER DEPOSIT.

**CHEAPER BICYCLES** (not recommended) from £6.  
**FREE!** AN ELECTRIC CYCLE LAMP INCLUDED WITH CYCLE WHEN DEPOSIT OF £1 OR MORE IS PAID.

### CARRIERS—REAR.

Both are complete with straps. The Hercules is a very strong carrier, suitable for heavy parcels, while the Sturdi is quite rigid, and perfectly safe for light parcels such as an overcoat.

Y116 Hercules carrier	3 9
Y117 Sturdi carrier	2 9

### CHAINS—ROLLER.

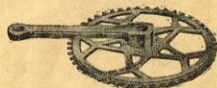
Brampton chains are very strong and smooth running. See if you can see between your chain wheel and chain. If so renew your chain, which has stretched, and will quickly wear out the wheels.



Y118 Brampton 3/4 x 3/16	4 6
Y119 Brampton military, extra strong	7 6
Y120 Renold chain	6 0

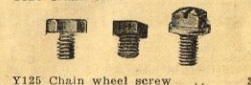
### CHAIN WHEELS, CRANKS, ETC.

These are the best quality, the chain wheel being flanged to secure enormous strength, and the cranks being specially toughened. Complete set includes two cranks, and chain wheel.



Y121 Complete set	10 6
Y122 Right crank	5 6
Y123 Left crank	4 0

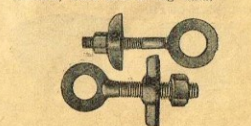
Y124 Crank cotter	3
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Y125 Chain wheel screw	2
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### CHAIN ADJUSTERS.

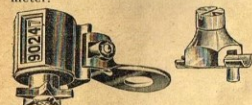
Standard pattern, plated. Good threads, with well-fitting nuts.



Y126 Chain adjusters, curved caps	pair 8
Y127 Chain adjusters, straight caps	pair 8

### CYCLOMETERS.

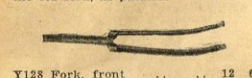
Complete with striker, for 28 inch wheels only. These are soundly constructed, and read to 10,000 miles. Why not know how far you cycle—every motor car carries a speedometer.



Y108 Ace cyclometer	5 0
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### FORKS.

Standard sizes, enamelled and plated, ready for fitting. Send measurement of fork stem, or, better still, the old fork, as pattern.



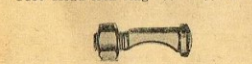
Y128 Fork, front	12 6
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### HEAD FITTINGS.

Brampton quality, well nickel-plated. Two patterns the head clip fitting stem that are slotted, while the screwed race is used for expander type stems.



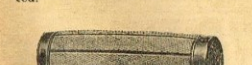
Y129 Head clip and bolt	2 3
Y130 Head lock ring	1 0



Y131 Head bolt and nut, as illustration	6 6
Y132 Head bolt and nut, plain	6 6
Y133 Head race, black	6 6
Y134 Head crown race, plated	6 6
Y135 Head screwed race, plated	1 0

### HANDLE GRIPS.

Celluloid is the usual pattern, the Blumel grip being especially durable. For comfort, some prefer the rubber grip. All are very easily fitted.



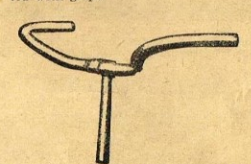
Y138 Celluloid	pair 1 0
Y139 Celluloid, Blumel	pair 1 6



Y140 Rubber	pair 2 0
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### HANDLEBARS—CANADIAN.

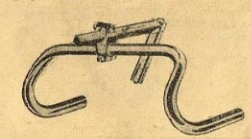
The Canadian handle-bar is the most popular shape, and it can be used down or up, since it has a reversible clip. Well plated, and fitted with grips.



Y136 Canadian handlebar	10 6
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### HANDLEBARS—MAJOR TAYLOR.

Fitted with outrigger, giving forward as well as up and down adjustment. The pattern usually seen on racing machines. Complete with grips and thoroughly nickel plated.



Y137 Major Taylor handlebar	18 0
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### HUBS—ORDINARY.

Hubs fitted to your wheel, new spokes, 8s. extra. Brampton hubs are perfectly reliable, and reasonably priced.



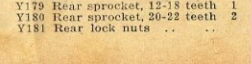
Y144 Brampton front hub	3 9
Y145 Front spindle	6
Y146 Front cone	6
Y147 Front nut	3
Y148 Brampton rear hub	7 0



Y176 Rear spindle	6
Y177 Rear cone	6
Y178 Rear nut	3

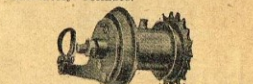


Y179 Rear sprocket, 12-18 teeth	1 9
Y180 Rear sprocket, 20-22 teeth	2 6
Y181 Rear lock nuts	6



### HUBS—EADIE.

The Eadie coaster hub combining free wheel and back pedal brake, is easily the best on the market. Many have attempted to imitate the Eadie, but it has readily maintained its undoubted supremacy for over 20 years. The brake is powerful and absolutely reliable.



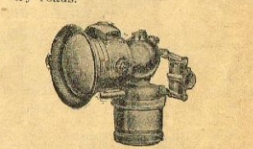
Y141 Eadie coaster hub	27 6
Y142 Eadie coaster hub, fitted with new spokes	33 6
Y143 Eadie coaster hub, complete new wheel, plated	39 6

### RADII PARTS.

Y146 Prietion Plate	62R 4 6
Y147 Bronze brake ring	62R 3 0
Y148 Brake cone and lever	64R 3 0
Y149 Brake spring lever	65R 1 6
Y150 Clutch nut, toothed	66R 2 6
Y151 Right cup, toothed	67R 2 6
Y152 Driving nut	68R 3 6
Y153 Sprocket, 16-18 teeth (9H)	70R 4 4
Y154 Sprocket (not Eadie)	71R 1 9
Y155 Left cup	70R 2 0
Y156 Brake clip comp.	71R 3 0
Y157 Lock nuts	72R 1 3
Y158 Retainers & balls, lg.	73R 1 0
Y159 Retainers & balls, sm	74R 1 0
Y160 Clutch spring	75R 4
Y161 Adjusting cone	76R 1 6
Y162 Clutch spring screw	77R 3 3
Y163 Split collar, narrow	78R 3 3
Y164 Split collar, wide	79R 3 3
Y165 Packing piece, B.S.A.	80R 6 6
Y166 Spindle collar	81R 8 8
Y167 Packing piece, std.	82R 6 6
Y168 Chain stay clip screw	83R 2 2
Y169 chain stay clip screw	84R 2 2
Y170 Spindle nut	85R 3 3
Y171 Lubricator	86R 6 6
Y172 Spindle only	87R 1 6

### LAMPS—ACETYLENE.

These give a very fine light, which is essential for safe riding on country roads.



Y182 Panther	10 0
Y183 Revenge	17 6
Y184 Acetylene burner	1 9
Y185 Burner cleaners	6

**LAMPS—ELECTRIC.**  
Small magneto generators, driven from the front wheel, supply electricity for lighting the head lamp, designed like a motor car headlight, with efficient reflectors. Magneto is sturdily built, and contains only one moving part. The no trouble light.

Y244 Record lamp, complete	26 6
Y245 Record generator	18 0
Y246 Record headlight	9 6
Y249 P. and H.	20 0
Y251 Balancer	30 0
Y252 Bulbs for above	1 6



**LAMPS—OIL.**

These are cheap, and sufficiently powerful for use on good roads. They require very little attention.



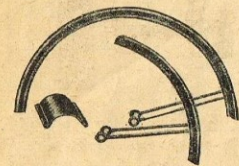
Y186 Demon pattern	3 6
Y187 Lumo	6 0
Y188 Wicks	1
Y189 Oil per tin	1 0

**LAMP BRACKETS.**

Y185 Head, ordinary pattern	9
Y194 Fork	9
Y195 Outrigger, for Major Taylor	1 6

**MUDGUARDS.**

Made from heavy steel, stove enamelled, strong stays.



Y196 Defiance	3 6
Y197 Protector, extra wide	4 6
Y198 Screws for front guard	2

**OIL CAMS.**

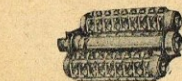
Y199 Plated, with screw cap	9
Y200 Plated, best quality	1 0
Y201 Oil, best cycle quality, tin	1 0

**PEDALS.**

Good quality, strong and durable.



Y202 Brampton rat-trap	pair 4 9
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Y203 Brampton rubber	pair 5 6
Y204 Cellotina, rat-trap	pair 4 0
Y205 Pedal rubbers, set of 4	2 3

**PUMPS.**

Both styles are strong, and capable of standing up under hard usage. Connections and washers are best quality.



Y206 Nickel plated, 15 x 1	2 9
Y207 Celluloid	3 6



Y208 Pump connections, best	9
Y209 Pump washers genuine leather	2



Y210 Pump clips, black, light pair	6
Y211 Pump clips, plated, heavy pair	1 6

**REFLECTORS.**

Rear, red light. Necessary for safety.



Y212 Rear reflector	1 6
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**RIMS.**

Supplied plated or enamelled, drilled 32 holes for front, and 40 for rear wheels. Plated rims are lined in colour.

Y212 Front rim, 28 x 1 1/2, plated	8 9
Y214 Rear rim, 28 x 1 1/2, plated	8 9
Y215 Fitting, with new spokes, extra	6
Y215 Enamelled rim, 28 x 1 1/2	7
Y217 Rim tapes	4

**SADDLES.**

Y218 Brooks B18	13 3
Y219 B18 pattern	10 6
Y220 Three spring pattern	9 0

**SPANNERS—See also TOOLS.**

Y221 B.S.A. spanners, block	1 6
Y222 B.S.A. spanners, cone	1 6

**SPOKES (State Wheel Size).**

Y223 Spokes and nipples, rustless	dz. 1 0
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**TOE CLIPS.**

Skeeta metal toe clips, easily attached.

Y109 Skeeta toe clips	1 6
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**TOOL BAGS.**

Y224 Leather, 6in.	2 6
Y225 Leather, 7in. strong	3 9

**TROUSER BANDS.**

Y226 Plated bands	pr. 6
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**EXELON TYRES.**

EXELON TYRES are made to our special order in one of the largest tyre factories in the world. Every tyre is fully guaranteed against defects in material or workmanship, and adjustments will be promptly made on a proportional basis. Claims are so rarely made, that we can afford to be generous with them.

Rubber of an amber colour, frequently referred to as crude rubber, has become prominent recently. Tennis shoes with crude soles practically never wear out.

EXELON CRYSTAL TYRES are of this amber rubber, supported by extra strong and flexible fabric. Thus the tyre is resilient, comfortable and fast. CRYSTAL TUBES are of similar rubber, and you are welcome to test them—AT OUR RISK—by stretching them several times their original length.

Altogether, EXELON CRYSTAL TYRES are bound to give every satisfaction.

THE GREY TYRES are also excellent value for money, and carry a similar definite guarantee.

**EXELON CRYSTAL.****GUARANTEED 12 MONTHS.**

Y233 Exelon "Crystal" cover	10 6
Y234 Exelon "Crystal" tube	4 6
Y244 Two covers, two tubes	25 0

**EXELON "GREY."**

A cheaper cover and tube, but very good value indeed. There is no need to risk using old tyres when new ones that are quite reliable cost so little.

**Guaranteed 9 Months.**

Y235 Exelon Grey cover	6 6
Y236 Exelon Grey tube	2 6
Y237 Two covers, two tubes	17 6

**SPECIAL OFFER.**

We have discontinued SPECIAL OFFERS in which there is a so-called FREE GIFT with a set of tyres. Usually the gift is of no use to you. Instead, we have reduced our prices considerably for a complete set of tyres, and these will be sent POSTPAID PAID.

17/6—2 COVERS, 2 TUBES—17/6

**DUNLOP TYRES.**

Y110 Roadster cover, cord	12 6
Y239 Tube	5 6
Y240 Bates Red cover	10 0
Y241 Bates Red tube	4 0
Y242 Mercury cover	9
Y243 Mercury tube	3 0

**SOLUTION.**

Y227 Dunlop	.. tube 4
Y228 Dunlop	.. tube 6
Y229 Dunlop, in tins	.. tin 1 3

**TYRE LEVERS.**

Y230 Set of three	.. set 8
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**VALVE TUBING.**

Y231 Special grade rubber, yd.	8
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**FOUNTAIN PENS.**

All fountain pens listed have genuine 14 carat gold nibs, and their low price is certainly not to be recorded as a criterion of quality. The nibs, even in the Regent quality, ARE GENUINE 14 carat gold, and are tipped, although it is difficult to believe it possible at the price. The manufacture is entirely British, by a firm established in 1899.

We can engrave your name on these pens at 1s. extra.

State whether fine, medium or broad nib.

**REGENT.**

Vulcanite, chased barrel, with self-filler, and 14 carat gold nib, iridium tipped. Pocket clip fitted. Cap SCREWS on either end, so is much safer than usual. An absolute marvel at the price.

Z159 Regent, black	3 9
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**BEAVER.**

A larger pen than the Regent, self-filler, and 14 carat gold nib, iridium tipped. Larger and heavier 14 carat gold nib. Z160 Beaver, black 9 6 || Z161 Beaver, red, mottled | 11 |
| Z162 Beaver, black, oversize | 12 0 |

**MAJOR SERVICE.**

A very strong pen, with extra large nib, carrying definite guarantee of service, according to price.

A really good pen, nib carrying a five-year guarantee. Self-filler, complete with pocket clip, barrel in black vulcanite. The same quality pen is usually sold at 15s. or fl. Z163 Major Service "B" 10 6 |

**MAJOR SERVICE "A."**

Highest quality, with extra large 14 carat nib, fitted with best iridium tipped nibs by experts, and consequently guaranteed for years of service. Self-filler, large capacity, barrel of red mottled vulcanite, with rolled gold clip, lever and two bands. Makes a very fine presentation pen. Z164 Major Service "A" 22 6 |

**MAJOR SERVICE "Eternite."**

Made of the new unbreakable Eternite, in a variety of very attractive colours, including jade green, lapis lazuli blue and flame. 25-year nib, self-filler, two bands and clips of rolled gold. Lady's size. Z165 Major Service "Eternite" 22 6 |

**PROPELLING PENCILS.**

These match the fountain pens above. Screw action, with special point to keep the lead from turning or moving when writing. Six extra leads included. Black or beautifully assorted colours. Z166 Propelling pencil 4 0 |

**PENCIL LEADS.**

These will fit most pencils on the market. One gross leads in box. Why buy one dozen in a small metal case which is worth more than the contents? Z167 Pencil leads; per gross 3 0 |

**PENCIL SHARPENERS.**

A necessity in every office. See 3-blade cutter is a great improvement on the older six blade. Z154 has a special centreing device, which ensures true sharpening.

Z153 Ergo	24 0
Z154 Ergo special	32 0
Special prices to schools.	

**CASEMENT STAYS—10 inch.**

Z152 Black finish	9 8 6
Z153 Black, malleable joint	1 0 11 6

**CASEMENT FASTENERS—Black.**

State whether mortice or hook plate.

Z154 ea. 5d	7 0
Z152 9d	8 6
Z153	8 11 0
Z154 Mortice Hook	8 0
Z152 9d	1 0 11 0
Z153	8 7 6

**WINDOW FASTENERS.**

Z155 Iron, bronzed	ea. 6d., dz. 4 6
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**HAT AND COAT HOOKS.**

Z156 Bronzed finish	ea. 5d., dz. 4 0
Z157	5d., dz. 4 0
Z157 Bronzed finish	5d., dz. 4 0

**WARDROBE HOOKS.**

Z158	Z159
Z158 Single, black ea.	3d., dz. 2 6
Z159 Triple, bronzed	6d. 5 9

**SUFFOLK LATCHES.**

Z160	ea. 1s. 6d., dz. 15 0
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**SURFACE LATCHES—BUTTONS.**

Z161	ea. 10 9 6
Z162 Cupboard but'n's, 2in	1 9

**DOOR BOLTS.**

Z163 Door bolts, 6in.	1 0 11 0
Z164 Cupboard bolts, 2 1/2in	6 5 0

**DRAWER PULLS.**

Z165-Z166	ea. dz.
Z165 Bronzed, 4in.	3 2 6
Z166 Bronzed, 3 1/2in.	3 2 9

**PLAYING CARDS.**

High grade cards, both pleasant to play with and durable. Single pack, 4s.; double pack, 7 6



