

# JOHNS LTD.

## ANNUAL CATALOGUE

APRIL 1930



COMPLETE RADIO EQUIPMENT  
ELECTRICAL APPLIANCES  
BICYCLES AND ACCESSORIES  
GRAMOPHONE PARTS, TOOLS, &c.

CHANCERY ST., AUCKLAND.

## HIRE PURCHASE.

For the convenience of **APPROVED CLIENTS**, we offer

## RADIO SETS, KIT SETS, OR APPARATUS

ON THE FOLLOWING TERMS:—

**DEPOSIT**—As arranged, usually 20 per cent.

**INSTALMENTS**—Equal monthly.

**INTEREST**—Six months' terms, 5 per cent; twelve months' terms, 7½ per cent.

Hire Purchase Clients must be over 21 years of age, or nominate a guarantor.

If other terms are desired, please write us, making known your wishes, and every endeavour will be made to meet you.

ALL HIRE PURCHASE TRANSACTIONS ARE KEPT

**STRICTLY CONFIDENTIAL.**

## Guarantee.

We hereby Certify that our RADIO SETS are to the best of our expert knowledge, free from all defects, either of material or workmanship, when they are despatched from our factory.

We further Guarantee to replace or repair, FREE OF CHARGE, any part which may prove defective, either in material or workmanship, within the guaranteed period specified with each set, provided such defects are not caused by abuse, neglect, accident, or to alterations or repairs not executed by JOHNS LTD.

This Guarantor covers sets only, and does not include accessories, which, however, are usually guaranteed by their respective manufacturers or agents. In respect of such defects, we will always endeavour to obtain replacement, should occasion arise.

Johns Ltd.

## MAIL ORDER SERVICE.

IF, when ordering your RADIO REQUIREMENTS from us, you want any other goods of any description, which are procurable in Auckland, include them in your order.

We can procure these for you, giving you the benefit of our own advice in cases where necessary, and saving you the trouble and inconvenience of two separate orders to different firms.

ASK FOR OUR CATALOGUES AS UNDER:

I. WINTER SPORTS.

2. SUMMER SPORTS.

## JOHNS LIMITED

DIRECTORS:

**A. CLIVE JOHNS**

(Formerly with Messrs. L. D. Nathan and Co. Ltd., Auckland).

**JOHNS BUILDING, CHANCERY STREET, AUCKLAND.**

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

## RETAIL RADIO LIST.

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

## TERMS.

### PAYMENT.

CASH WITH ORDER, UNLESS OTHERWISE PREVIOUSLY ARRANGED.

DEFERRED PAYMENT—See opposite page.

### FREIGHT AND POSTAGE.

#### COMPLETE SETS.

Freight free, and safe delivery guaranteed, to nearest railway station or port.

#### POSTAGE ORDERS.

Free on all **CASE ORDERS** of £1 or more.

EXPRESS—6d. per parcel extra.

FRAGILE—6d. per parcel extra.

**FREIGHT—CASH WITH ORDER** (£1 minimum).

On goods too bulky to be otherwise unsuitable, a half freight or carriage will be allowed to any port or railway station in New Zealand.

#### HOW TO ORDER.

Write plainly, preferably on one side of paper only. Give full name and address with every order.

Give article number, and full description—length, size, etc.

**NEVER ORDER "SAME AS LAST."** It will delay your order. Give full particulars with every order.

#### RETURNS.

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

#### PROCURED GOODS NOT RETURNABLE.

#### VALVES.

See under VALVES for special conditions regarding their sale.

#### DEMONSTRATIONS.

We will gladly arrange a demonstration of any set or speaker at customer's convenience.

#### PRICE ALTERATIONS.

All prices are subject to alteration without notice.

## THANK YOU.

We again take this opportunity of thanking our customers for their support in past years.

To-day, Radio has changed entirely from what it was even two years ago, but though there are still many Radio manufacturers now as formerly, there is still a very marked demand for apparatus, kits, etc., not only in the Radio field, but also for electric gramophones, public address sets, etc.

For complete reception, all sets are now required for, through most dealers have specialised on electric sets, to the virtual exclusion of battery sets, which still are, and must continue to be, used by a large section. We are still however, catering for these requirements in the radio experiments that won us our reputation during ten years of business.

We have at last satisfied ourselves that A.C. receivers can be confidently offered to our customers. We

are importing some from America, but we also construct others locally, chiefly in an endeavour to secure economy of working expenses, and to be enabled to compete with the imported receiver, built possibly for entirely different conditions.

Prominence has recently been given to the **UNEMPLOYMENT PROBLEMS** which can help to solve by employing the unemployed. You will, we trust, and daughters to get work when they leave school. Do you assist to provide this work for them, by buying local produce, when possible? If so, you should not complain if work is scarce. Think this over. We are proud of the fact that we can compete successfully with the imported receiver, built **PRIMARILY** for **WORKMANSHIP**, **PERFECT** with imported articles.

We can therefore confidently appeal to you to **SUPPORT YOUR FELLOW WORKERS**.

HELP US TO HELP YOU.

## HAMMARLUND MEANS "PRECISION."

### HAMMARLUND HI-Q 30 ELECTRIC

THE FINE WORD IN RADIO CONSTRUCTION AND DESIGN is the HAMMARLUND BAND PASS FILTER, originally invented by Hammarlund engineers.

Its object is to obtain the utmost selectivity, without sacrifice of tone. Hitherto, the latter has always been sacrificed in obtaining the former. In the HI-Q 30, however, the single dial control is turned, stations are either "IN" or "OUT," the tone is being always fully preserved.

30  
Radio

£75  
Complete

Hi-Q 30  
Radio-  
Gramophone

£99  
Complete

Chassis  
£43

Easy Terms.



The HI-Q 30 is expensive—one naturally expects it would be. The BAND PASS FILTER must be very well assembled, accurately tested and matched at various stages, with closest scrutiny. The Mass production of such a filter would defeat the object of the BAND PASS. This part of the work is done in the Hammarlund factory, as an absolute guarantee of precision.

Now due to the HI-Q 30 stop there, it uses only the very best components, carefully matched. No expense is spared—no apparatus that will give improvement in working is used.

There is no doubt about the HI-Q 30. Hammarlund chose the very best circuit yet discovered—built it of the very best Radio apparatus manufactured—built it with the same care and precision as product—and obtained results which were never in doubt.

A voltage regulator is fitted, which prevents damage to valves through power fluctuations.

We import the HI-Q 30 chassis, partially assembled and finish and test it in our own factory. A JENSEN DYNAMIC speaker is used by HAMMARLUND—is matched to the chassis. Gramophone PICK-UP terminals are fitted.

FAIR DEAL YOU WILL, either as RADIO or COMBINATION RADIO-GRAMOPHONE, you cannot EQUAL HAMMARLUND results, much less improve on them.

**CABINET.**  
We offer a selection of cabinets, both imported and locally built, thus giving you a wide choice.

**VALVES.**  
Three 224 (screen grid), two 227, two 245, one 280.

### HI-Q 30 BATTERY MODEL.

Price on application, depending on accessories and equipment included. Chassis assembled, less valves, costs £75.

We will gladly quote the HI-Q 30, built into your own cabinet, or fitted in some convenient cupboard or recess in your house.

### TRIUMPH S.G. ELECTRIC.

Radio design to-day tends very strongly towards making the first cost as low as possible, leaving running costs to follow afterwards.

No one, we believe, has ever yet claimed that the valve set used in practically all electric Radios, is superior in operation to the ordinary battery type of valve. No one is ever likely to do so.

The valve valves are made by alternating current obtained from a very cheap and simple transformer. Much more expense is involved in making the Radio operate with filament current which is required and same as that as the "P" or filament current is being "smoothed."

The TRIUMPH involves no new principles—it is simply a well designed direct current Radio, using the famous band pass filter circuit and ordinary type of valves; but whereas in other Radios the "P" supply ONLY is converted before use into direct current, in the TRIUMPH, the "A" or filament current is similarly treated.

Five tuned circuits give utmost selectivity.

The set is still ELECTRIC—it uses no batteries at all. But the valve valves which are used are apparently better than with the so-called A.C. SET.

The TRIUMPH can be supplied in an imported cabinet (see index) or in a cabinet that is specially made to order. The speaker is a JENSEN 10-inch CONCERT DYNAMIC—the finest speakers on the market to-day. Westinghouse rectifiers supply the filament current.

The valves are two screened grid, detector and two audio valves, the last a power amplifier. Volume in plenty for any room—enough volume to turn R.T.T. RUMBLE DOWN—possibly to less costly valves, partly to their much longer life, and partly because there are only SIX stages of volume.

The TRIUMPH RADIO COSTS a little more. Add up the total costs after only one year's running and you will find they are the same for the TRIUMPH as for cheaper Radios. After the first year, the TRIUMPH really provides the economy in current cost is also far from negligible.



### Triumph Radio

£54  
Complete

Triumph  
Radio-  
Gramophone

£75  
Complete

Battery Models  
name price.  
Chassis  
On Application.

BUY TRIUMPH FOR ULTIMATE ECONOMY.

### TRIUMPH RADIO-GRAMOPHONE.

This consists of the TRIUMPH CHASSIS, etc., as above, but housed in a larger cabinet which can be fitted with the best ELECTRIC MOTOR and PICK-UP obtainable. It offers all the advantages of the TRIUMPH CHASSIS.

The TRIUMPH CHASSIS will be supplied less cabinet for fitting to your own cabinet, or in a recess in your house. In the very near future, RADIO will be thus installed in homes, so get in ahead of the fashion.

### ACE ELECTRIC—BEST VALUE FOR MONEY.

### ALTONA PRINCE ELECTRIC.

The ALTONA PRINCE is a straightforward neutrodyne design, ALL-ELECTRIC, but using only five valves (plus one rectifier).

We believe that New Zealand most customers will be quite satisfied with the ALTONA PRINCE, which gives excellent reception on both local and distant stations, coupled with satisfactory selectivity. After all, the radio is a means of entertainment, not a mere number of stations within range, so the inclusion of two or three extra valves to obtain selectivity, is hardly essential, even in the main cities, while it most certainly is in so many miles from the broadcasting stations.

The usual imported valve to ten valve set, therefore, involves much higher maintenance cost, for which little return is given. You have only to ensure the total cost of valves used in the Radio you buy, to obtain an average of 100 hours (or 10 hours for half-yearly!) running cost. Total cost of valves, including rectifier, in the ALTONA PRINCE is only £5 7s.

Apart from the above consideration, the ALTONA PRINCE is locally constructed from the easiest apparatus, specially designed for a beautiful cabinet. Repairs are very unlikely to be required, but if necessary can be promptly taken care of, at minimum expense.

#### CABINET.

This is the same as used with the H-R UNODIAL—See page 6.

We can, nevertheless, quote the chassis only, or any other type of cabinet, either imported or locally built.

PRICE (including valves) . . . . . £33 10 0

### CHALLENGER ELECTRIC.

#### OUR ANSWER TO FOREIGN COMPETITION.

A few years ago the idea of constructing a complete ELECTRIC RADIO at this low price would have been considered ridiculous.

Recently dealers have seen and tested many cheap foreign sets, but none have been imported for sale—very few even survived the first test.

The CHALLENGER is the product of local industry, and is really a very fine and reliable set, which is sold complete with valves and N. and K. Special speaker, AND IS FULLY GUARANTEED. It uses three valves, one being a rectifier.

PRICE  
£13 10s.

Complete  
Easy Terms:  
£1 deposit, 5s. weekly, 56 weeks.

THE PRICE IS AMAZINGLY LOW, considering the quality and guarantee.

### CAN YOU AFFORD NOT

TO HAVE RADIO WHEN

CHALLENGER COSTS SO LITTLE.

### ACE 3 ELECTRIC.

#### 14 REASONS FOR ACE 3 SUPREMACY.

1. Very handsome appearance, with neat wood case, well polished.

2. Three valves (all Radio—not rectifier valve).

3. Westinghouse rectifier, which unlike rectifier valves, is permanent.

4. Terminals enable it to be used as electric gramophone.

5. Locally built, for local conditions, with specially designed electrical equipment.

6. Backed by prompt factory service (experience shows that it suits itself practically never gives the slightest trouble).

7. Design ensures exceptionally long valve life.  
8. LOW FIRST COST.

9. LOW UPKEEP COST—should not exceed £1 per month. We will guarantee to maintain set AND VALVES on good order for 25 per cent.

10. CURRENT CONSUMPTION, 50 to 200 hours for 6d.

11. DESIGNED BY NEW ZEALAND RADIO ENGINEERS.

12. Built by New Zealand workmen.

13. Fully guaranteed.

14. Sold on easiest of easy terms.

### PRICE:

£18 18s.

Complete.

Easy Terms:

£1 deposit, 5s. weekly, 80 weeks.



Little did we think a year ago that the ACE ELECTRIC 3 would prove such a wonderful success. We set out to produce a set that would be very reliable, attractive in appearance, and easy to maintain and maintain cost. Good tone on the local station was the first reproduction requirement, but by many own tests, stations are received very well. It must be remembered, however, that we do not recommend three valve electric sets for long distances, at least for the upper seven valves, as eight valves being generally required for that purpose.

Price includes three best quality valves, and N. and K. Special (or come) speaker.

£18/18/-

Terms from £1 deposit, 5s. weekly (80 weeks).

### THE SET FOR THE MILLION.

### CROSLEY ELECTRICS.

For full particulars, send for LEAFLET. All receivers and chassis complete with valves and speakers.

**CHASSIS.**  
Monotrad, seven-valve, screen grid . . . . . £37 5 0

**TABLE MODEL.**  
With Monotrad chassis . . . . . 41 0 0

**CONSOLE MODEL.**  
Monotrad chassis . . . . . 53 0 0

ASK US ABOUT OTHER MAKES OF ELECTRICS.

## ZENITH—AMERICA'S "BUICK" QUALITY RADIO.



No doubt our many customers have wondered why our firm—practically the oldest in New Zealand—has hitherto not been associated with imported A.C. RADIOS.

The reason is merely that we have hitherto been unconvinced that they represented "VALUE FOR MONEY."

It is now well known that until comparatively recently large numbers of imported A.C. SETS were quite unsatisfactory in more ways than one, but to-day the position has changed.

The A.C. SET having now proved itself, we arranged to offer our customers the finest RADIO made in America to-day. The reasons are convincingly enumerated below:

1. ZENITH RADIO is manufactured by one of the leading radio concerns in America, in a well-equipped factory with 15 years' experience behind it. Production is large enough to keep costs down. RELIABILITY is large enough to keep sets small, large, that each receiver does not receive that individual attention, supervision, inspection, and test that makes one ZENITH as good as any other. ZENITH is the ONLY radio manufacturer to turn out products of other factories. Ordinary mass production never yet resulted in uniform high-grade apparatus.

2. ZENITH RADIO is backed by a real guarantee.

3. ZENITH CHASSIS is built on the latest principles, with infinite precision and care. The result is perfect reproduction, and unfailing regularity of reception.

4. ZENITH uses SCREEN GRID CIRCUIT—the latest development in Radio.

5. ZENITH PUSH FULL AMPLIFICATION neutralises and counter-balances all distortion, enabling the building up of pure natural tone quality.

6. ZENITH employs LINEAR POWER DETECTION, accommodating tremendous power without introducing distortion.

7. ZENITH is at once very SELECTIVE, and very SENSITIVE—Distant stations, one after the other, come in strongly as you turn the dial, which is marked so you can immediately tune in any wave length.

## RADIO CHASSIS.

A RADIO CHASSIS consists of the Radio section of a complete receiver, ready for connecting the valves, and connecting the speaker. If a battery chassis, of course, batteries must also be connected.



We are able to supply the CHASSIS of nearly every RADIO RECEIVER LISTED.

## ZENITH RADIO.



## Zenith Radio

£57

Complete.

## EASY TERMS:

£10 deposit.

## Automatic Control

Extra.

8. ZENITH gives, in addition to the above, absolute fidelity of reproduction—you readily imagine the singer or orchestra to be actually in your own home, performing at their very best.

9. ZENITH RADIO is the only one that can be fitted with AUTOMATIC TUNING. This feature costs more, but it enables nine sets to be tuned in with the touch of a button, merely by pressing a key like a typewriter key. ZENITH is the ONLY RADIO which offers this absolutely exclusive and unique feature.

10. Jacks for pick-ups are fitted.

WE HAVE TAKEN THREE YEARS TO SELECT ZENITH—YOU need take only THREE MINUTES.

## CABINET.

Early American pattern, selected and matched Butta Walnut veneers, with English satin oak overlays. Even without the outstanding features of the chassis already mentioned, the ZENITH would be worth the extra on account of its beautiful cabinet alone.

## CABINET.

Three 224, three 227, two 245, one 280 are included.

## SPEAKER.

Dynamic, of course, carefully matched in every way to suit both chassis and cabinet.

ZENITH GRAMO-RADIO on application.

## RADIO CABINETS.

In the very near future, Radio will be installed in houses in special cabinets or cupboards, thus eliminating the cost of expensive cabinets, and giving greater convenience.

## RADIO-GRAMOPHONES.

Any powerful Radio chassis makes a very fine gramophone, the only extras required being a motor (spring or electric) and a pick-up. These are built into the cabinet, and the motor is connected to the speaker, but gives just as good results if used separately. In fact, the latter arrangement at times is very convenient, you can turn the motor on, place the pick-up alongside you, and play your records without rising from your chair.

## MONARCH—BIG RESULTS—LOW PRICE.

## THE "MONARCH" SCREENED GRID.

## COSSOR RADIOS.

## COSSOR THREE VALVE ELECTRIC.

As illustrated, complete with valves. Screened grid circuit, two tone metal cabinet.



Cossor three-valve Electric . . . £24 0 0

## COSSOR TWO VALVE ELECTRIC.

Assembled complete, in cabinet, with dial control similar to the Cossor Three. Complete with valves. Cossor two-valve Electric . . . £16 16 0

## EMPIRE MELODY MAKER.

This is imported as a Kitset, and correctly assembled in our own factory. All wave, 16 to 550 metres, two dial control, and three valves.

Price (includes cabinet and valves).

## PHILIPS RADIOS (ELECTRIC).

We stock these well-known sets, and can give customers the benefit of our expert service and guarantee. All are complete with valves, speakers being extra.

## BROADCAST FOUR VALVE (2510).

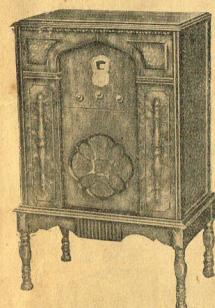
Two screened grid and two ordinary type valves. Long range. Philips 2510 (with valves) . . . £32 0 0

## ALL WAVE FOUR (2502).

Designed for those who wish to receive both long and short waves. Philips 2502 (with valves) . . . £30 0 0

## Q.P.

A small two-valve set, all electric like its larger brothers. Philips Q.P. (with valves) . . . £16 0 0



## Monarch Radio

£45

## Monarch Radio

Gramophone

£65

## EASY TERMS.

## CONSOLE CABINET.

The illustration shows a typical console cabinet, but we will be able to fit the chassis into any of the several imported styles of cabinets which we stock. Alternatively, you can have the arrangement of a smaller cabinet to make a special cabinet to match your furniture, to instal it in your cupboard, and to include glass doors and a plinth, etc.

In fact, we will be glad to have your special instructions, so that we can supply just what you desire.

## MONARCH CHASSIS.

Can be supplied complete with dynamic speaker and valves. Price on application.

## WE CAN BUILD

SPECIAL RADIO RECEIVERS,  
ELECTRIC GRAMOPHONES,  
ADDRESS SYSTEMS.

TO SUIT YOUR SPECIAL REQUIREMENTS.

Just before going to press, some details have become available of a new development of an idea already saved you a great deal of money.

The main features are—

1. Only one valve is used after the detector.
2. No transformers are used, thus reducing costs very considerably.
3. Still purer tone.

Send us your enquiries for LOFTIN WHITE AMPLIFIERS OR KITS.

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## H-R BATTERY RADIOS ABSOLUTELY UNBEATABLE.

### HAMMARLUND-ROBERTS.

The Hammarlund Roberts receiver has gained a wonderful reputation during the past few years. It is now well known throughout New Zealand as the four valve set which has beaten all other makes of battery radios. There are several sets of other makes, operating from batteries. Dealers and experts everywhere, who have expressed surprise at what many seem to consider a radio having been literally astonished when a test was actually made, and have been forced to admit that the HAMMARLUND-ROBERTS is truly a marvel.

Its marvellous results are due to the circuit design, coupled with the very high quality of components used. The special space-wound coils, specially designed by HAMMARLUND, whose name is synonymous with the best in Radio in U.S.A. to-day—not only ensure extreme range, but also stability of operation, and other distinctive sets.

While less efficient Radios have been continually redesigned, the Hammarlund alone has been practically unchanged for four years, except for improvement in appearance, and is today the most popular and established tool in the Radio world. There appears no chance of the Hammarlund ever going out of date. This is especially the case with the battery models, which can later be completely electrified without internal alteration.

It is worth while asking why many other circuits have proved so easily popular for such a long period. Undoubtedly, Hammarlund engineers evolved a design which was much in advance of the time.

The H-R gained its reputation as a battery Radio, for efficiency, and popularity, with dry batteries. Early and strapping its competitors in the accumulator class, it is even more in the lead for dry battery operation; in fact, it is the only type of receiver of four or five which can be relied on to give satisfaction on dry batteries.

It is perfectly obvious that the best dry battery performance must be obtained in order that the best ultimate results can be obtained from an absolute minimum of current. Even the slightest inefficiency means waste of expensive power and expense. Much more advisable to pay perhaps a little more in the first place for the very best quality, than to pay out more in the cost of power in the long run, which can be relied on to give satisfaction on dry batteries.

The actual cost of running an H-R receiver on dry batteries is no more than where accumulators are used, charged at a service station.

Let us again emphasize that in the H-R efficiency is the keynote throughout. On the dry battery receiver, the range is considerably less than with accumulators, the range remaining much the same.

#### REGENRATION.

This principle, embodied in the set, makes it capable of the extraordinary results mentioned above. We have a letter from a customer, giving a list of over 70 stations, including many in U.S.A. brought in on his radio, and showing exceptionally good performances are very common.

Regeneration is thoroughly under control, and so the set does not interfere with other receivers.

#### OPERATION.

The simplest instructions are sent out with each set, and anyone who read should have no difficulty whatsoever in installing and operating the Hammarlund Roberts. Stations can be logged, and always come in on the same readings.

#### RANGE.

Under normal conditions, the H-R will readily bring in the usual Australian stations on the speaker, with ample volume and clarity. In many localities, where conditions are favourable, American stations are regularly heard. Good speaker strength is in fact, where many larger Radios either fail entirely on distance, or bring it in with unbearable noise, the H-R is still strong, sweet and clear. Very few six or seven valve Radios will approach it for results.

On all models the tone is really excellent, this being particularly true of the more expensive machines.

#### SELECTIVITY.

By a simple device, the selectivity, normally excellent, can be increased at will, to a still greater degree.

With each H-R, we send out the valves which we have found by experience to be the most suitable. For radio tube operation, invariably these are UX199, and a meter is fitted to enable these to give maximum results, coupled with long life.

Accumulator valves are usually 221, a new Radiotron working as a six-volt accumulator (only a small one required), taking only .06 amp—less than one-quarter of the 201A. These valves can be used in older H-R Radios, now using 210A, without any alteration.

#### POWER VALVE.

A power valve may be used in the last stage without internal alteration.

#### GRAMOPHONE ADAPTER.

Each model is fitted with special terminals, enabling it to be used in conjunction with a PICK-UP, as an ELECTRIC GRAMOPHONE, the change over being made instantaneously.

#### GUARANTEE.

ONE YEAR, as per conditions inside front cover.

### H-R MODELS.

This season the H-R RADIOS have been modified, chiefly by being made more compact, while the cabinets are much neater and trimmer. The Radio circuit has not been changed.

The H-R CONQUEROR replaces the Junior. The UNODIAL has been retained for those who insist on a single dial control, while the H-R SUPERB and H-R BURGESS models have the extra valve giving PUSH PULL AMPLIFICATION, combining ample power with the finest tone possible.

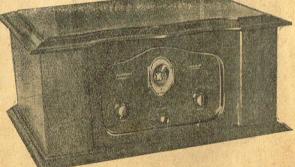
A H-R RADIO-GRAMOPHONE is also included, this being we believe, the only factory built machine of this type in New Zealand.

### H-R UNODIAL.

The efficiency of a Radio is decreased by using a one dial control, but since there is an insistent demand for single control, our factory have built a UNODIAL H-R.

Only the highest grade apparatus is used in its construction, and the cabinet is of exceptionally fine finish, either mahogany or walnut.

The selected accessories are as for the Junior, but with A139 aerial and N. and K. Senior speaker.



Less With  
accessories. accessories.  
ACCUMULATOR MODEL .. £21 0 0 £32 5 0  
DRY BATTERY MODEL .. 22 10 0 31 7 0

## H-R UNRIVALLED EFFICIENCY.

### H-R "CONQUEROR."

On account of its low price, and the fact that its efficiency produces results that are envied by owners of six and seven valve sets of other makes, this will be the most popular of the new H-R RADIOS.

It is particularly suitable for battery operation, and especially so, owing to inconvenience of antenna, charger, and speaker, which can be used. But, by the use of an "ABC" eliminator, it becomes entirely electrically operated, retaining its wonderful range, but costing very little indeed in replacement of valves or other parts, and practically nothing for current.

The cabinet is of best imported oak, and can be supplied either dark or natural finish.



#### SELECTED ACCESSORIES (Accumulator).

Aerial A138, Fuller six-volt 30-amp. accumulator (lasting nearly 120 hours on one charge), two 45-watt Columbia "B" batteries, Columbia "C" battery, four UX199 valves, N. and K. Special speaker. Total value, £10 2 6.

For DRY BATTERY, U.S.A. The UNODIAL is replaced by the Columbia No. 1 dry batteries, while UX199 valves are included. Total value, £17 14 4.

#### ANY SPEAKER OR OTHER APPARATUS LISTED, SUPPLIED AT DIFFERENCE IN LIST PRICES.

Less With  
Accessories. Accessories.

CONQUEROR, accumulator model .. £10 12 6 22 10 0  
CONQUEROR, dry battery model .. 14 9 6 21 19 6

The DRY BATTERY MODEL includes a meter, but is otherwise identical.

### H-R SUPERB.

It has hitherto been impossible for customers who have no electric light to obtain a standard battery Radio of the power type now so common in the ELECTRIC SETS. With the sudden growth of the ELECTRIC SETS, and the consequent demand for battery Radios, manufacturers simply scrambling over one another to produce the ELECTRIC.

It was to fill this breach that we arranged for the production of the H-R SUPERB, which uses the famous H-R circuit, with the inclusion of an extra valve to secure at once ample volume and perfect tone.

With this in view, the SUPERB employs PUSH PULL AMPLIFICATION, and a JENSEN CONCERT DYNAMIC SPEAKER.

The above combination will ensure to battery owners a quality of reception that simply cannot be equalled, let alone surpassed by any Radio on the market to-day.

#### SELECTED ACCESSORIES.

Aerial A139, Reliance six-volt 30 amp. accumulator (working the whole set and speaker for about 70 hours on one charge), three Columbia Layerbit "B" batteries, Columbia "C" battery, Jensen concert dynamic speaker in cabinet, Radiotron valves. (Total value, £24 6/6.)

Less With  
Accessories. Accessories.

H-R SUPERB .. £18 15 0 £39 15 0  
H-R SUPERB CONSOLE, £8 5/- extra.

### CONQUEROR ELECTRIC.

Since the CONQUEROR possesses such wonderful range, and it is natural that a four-valve RADIO, using six valves, will cost far less for upkeep than the usual seven- or eight-valve set (each valve expensive) we have arranged for the CONQUEROR to be supplied with valves to be used with an "ABC" eliminator, the latter being also available for all previous types of H-R sets.

The cabinet will include valves and speaker—merely connect your aerial, and eliminate all worries.

CONQUEROR ELECTRIC, with N. and K. speaker .. £32 10 0  
CONQUEROR ELECTRIC, with Jensen Concert Dynamic speaker .. 38 15 0

### H-R RADIO-GRAMOPHONE.

The H-R RADIO-GRAMOPHONE combines the H-R SUPERB RADIO, with a gramophone motor and electric pick-up, so that records can be played when desired. There is no need here to emphasise the superiority of the H-R RADIO-GRAMOPHONE placed for the first time on the New Zealand market such an instrument capable of playing records on the high-class gramophones throughout the world. B.T.H., Webster, or other high-grade records are used.

The cabinet contains the whole of the apparatus, and operation is extremely simple, both on Radio and on records. The accessories include JENSEN CONCERT DYNAMIC SPEAKER. PRICE, £6 6.

NOTE—If you require a single six-volt accumulator, we will supply the Columbia "B" battery, the H-R and H-R RADIO-GRAMOPHONE, with extra accumulator. With MAGNETO "B" supply, "B" batteries are entirely discarded.

PRICE, extra, approx. £15.

### UNIVERSAL.

#### ALL WAVE SCREENED 4.

Mention is made in other parts of this list of the enormous possibilities of the screened grid valve, especially in the SHORT WAVE field.



The UNIVERSAL is a combined BROADCAST and SHORT WAVE SET, the change being made in a moment, merely by changing two coils.

The coil is wound on a special frame, and the greatest care is taken, not only in the design, but also in the accurate construction of the UNIVERSAL, which is set of coils being wound on the shortest wave included.

The cabinet is of heavy aluminium, providing absolutely thorough shielding, and freed from usual cabinet trolley by a grid of girders, the closest inspection showing no workshop throughout.

Output filter is embedded in the set, protecting speaker windings from undue strain and giving clearer tone.

Four valve valves are recommended, the first being a screened grid and the last a power valve.

#### SELECTED ACCESSORIES.

Aerial A138, four volt 30 amp. Fuller accumulator, three 45-volt Columbia "B" batteries, Columbia "C" battery, N. and K. Senior speaker, four valves (total value, £12 1/2/-).

UNIVERSAL, less accessories .. £16 10 0  
UNIVERSAL, with accessories .. 23 16 0

#### UNIVERSAL ELECTRIC.

As above to work from A.C. .. £39 0 0



If It's Important—It's in

# "RADIO"

The National Radio Magazine.

The  
ONLY ALL RADIO  
Magazine Published  
in New Zealand.

Fortnightly - - - Price Sixpence.

New Zealand Radio Handbook Annual

## THE RADIO 'CYCLOPÆDIA.

For Listeners, Constructors, Transmitters.

Price—Two Shillings and Sixpence.

Publishers: H. G. FARNALL & CO. LTD., Auckland.

On Sale at all News Agents and Radio Dealers throughout New Zealand.

## ELECTRIC GRAMOPHONES FOR RESULTS.

### POWER AMPLIFIERS.

A POWER AMPLIFIER is constructed on the same lines as the last stage of an amplifier in a Radio receiver, but it is designed to obtain at the same time, magnificant volume and faithful reproduction.

To achieve this result, powerful apparatus is used, operated by a rectifier, magnetio "B" or even in special cases where upkeep cost matters little, dry "B" batteries.

### AC. POWER AMPLIFIERS.

These operate entirely from the mains, and are used in theatres, dance halls, pictures, restaurants, hotels, etc. They can be used with a rectifier, pick-up and motor, a radio set, or with a microphone, when special announcements are to be made.

WELL-MAYDE AMPLIFIERS are locally built, most of the components being made complete in Special cases taken of local conditions, and all transformers, chokes, condensers, etc. are made to withstand much higher loads than are common. To the customer, due to the appearance and finish, they are unsurpassed by imported amplifiers.

### WELL-MAYDE.

Two stages with 227 (not the older 226) in first stage, and two 245, push pull, in the last stage. Rectifier valves 280. This outfit is powerful enough for even large halls, and the high power is attained along with perfect tone quality.

The price is very low—but we can guarantee the amplifiers all bear the "W.M.-Mayde" trade mark does not appear on inferior products.

W.M.—"VIM" AMPLIFIER . . . . . £18 0 0

Full set of valves . . . . . 6 4 0

### WELL-MAYDE "HERCULES."

Three stages, the first two each with 227 valves, and the last with two 245 in push pull. Rectifier valves 280.

W.M.—"HERCULES" AMPLIFIER . . . . . £24 0 0

Full set of valves . . . . . 6 6 0

### WELL-MAYDE "STENTOR" AMPLIFIER.

The most powerful three stage outfit made. Each stage has two valves in push pull, the first two stages using 227, the last stage 250. Rectifiers, two two 281.

This amplifier is suitable for the largest installations, tallies, etc. It will easily operate several speakers, etc.

W.M.—"STENTOR" . . . . . £51 0 0

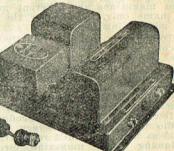
Full set of valves . . . . . 16 18 0

### MICROPHONES.

Where necessary to use microphones in conjunction with the above customers should advise us, as slight alterations in design are advisable, to make for greater compactness.

### WEBSTER A310.

Three stages, two with 226 valves, followed by two 241 in push pull, and 281 rectifier. Supplies 116-230 volts for a name speaker.



PRICE (less valves) £23 17s 6d.

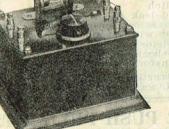
### WEBSTER A271.

Two stages, 226, with two 171 in push pull. PRICE (less valves), £21 15s.

### BATTERY AMPLIFIERS.

As the design of these depends so much on local facilities for charging batteries, etc., we quote to order. Please send us your requirements and we will supply as you can. We are thoroughly experienced, and can meet your special needs.

### WELL-MAYDE CRYSTAL RECEIVER.



#### W.M. CRYSTAL SET.

A Well-Mayde product. Metal case, with Formica top panel, and Formica front panel. Can be fitted with either a Hertzite detector or a diamond detector. Diamond permanent detector, at the same price.

W.M. CRYSTAL SET . . . . . 17 6  
Complete with aerial and phones . . . . . 32 6

#### TRANSANT CRYSTAL SET.

An English set, attractive polished case. Variometer, tuning, earphones, accurate tuning. Enclosed detector. Complete with crystal.

TRANSANT SET . . . . . 24 0

#### FORTEVOX CRYSTAL SET.

Another well-known inexpensive set. Why be without Radio when a set costs only 5s.

FORTEVOX SET . . . . . 5 0

Complete with phones and aerial . . . . . 19 6

## OUR KITSETS ARE EASILY BUILT AND VERY EFFICIENT

### KITSETS.

The faculty implanted in every boy to "make something" or to improve something already made, has been directed primarily for the enormous strides in scientific and mechanical inventions. The work made in the laboratory is simply amazing, and to-day its rate is fully maintained.

One boy may some day emulate Edison, James Watt, Marconi, all of whom started life far worse equipped for fame than any school boy of his time. They made good, and others will make good. The inventive genius displayed by many boys should be encouraged in every way, but it keeps a boy from the work of a better boy, but it will train him so that when the time comes to leave school he will be prepared to secure a position. His self-training will have developed his mind, even though he may not actually become an engineer.

And, in case you are so surrounded by machines and electrical apparatus that scientific knowledge and expertise are highly desirable for every boy. How frequently is a simple defect in a motor car, for instance, met with by a man with some amateur experience, who has a fortunate friend, is held up his hands and says, "Send it to the nearest garage for a mechanic, at great expense, providing the nature of the job."

Radio provides one of the very best hobbies for a boy. He makes something that is very useful, and the proceeds of his work, an education that would hardly be possible otherwise.

### RADIO CIRCUITS.

Examination of the hundreds of so-called Radio circuits of the last few years reveals the astonishing fact that probably 95 percent of receiving sets employed one of only three or four fundamentally different types. A few others are used, but they have not stood the practical test. The countless circuits dashed up in workbooks are less numerous, and are different mostly in name only, merely for the sake of advertising appeal.

To-day, the amateur usually buys a complete KITS, simply because the design work has already been done for him by acknowledged experts, and the time involved in expense is negligible. The assembling therefore can be proceeded with immediately, with the certainty that the design will work well, and that a radio that should be every bit as good as a factory-built receiver will follow. These receiving circuits (many are entirely unsuited for New Zealand conditions) and may even be illegal, are constantly being gathered from different sources, and may not work well together.

### H-R POWER GRAMOPHONE KITS.

**RADIO GRAMOPHONES**  
Any H-R kit can be readily converted into a power gramophone, the only extra required being a gramophone motor and a pick-up. A good selection of these will be found in this list.

**FROM THIS LIST YOU CAN SELECT A KITSET OF ANY TYPE OF RADIO THAT IS RECOGNISED TO-DAY AS BEING WORTH WHILE.** There are now more than 100 different kitsets, including the following:

### HAMMARLUND-ROBERTS KITSETS.

Our Kits are sold merely for the price of the parts, so that expensive design work is really supplied free. Design waste is incurred in the manufacture of the list. Your own built set should give absolutely equal results, and must be previous to the correct item. And, we can improve infinitely more, and more satisfactory in the end.

And if difficulty should arise, we

are always able to advise you, but so explicit are the instructions that a child can follow them. In general, we have very rarely been asked for further explanations.

#### KNOWLEDGE OF CIRCUIT.

The kitsets we offer embody the following circuits:

1. REGENTATIVE (Aee Kits).
2. 1. HAMMARLUND-ROBERTS (Regenerative Neutralised Radio Frequency).
3. SCREENED GRID (using the new type valves).
4. SPECIAL KITS.

#### REGENERATIVE (A.C.E.).

The valves and simplest, and are quite efficient, though if carelessly handled, they may interfere with others. We supply them in sets of 3 valves, and they can be arranged so that they can be added to readily, to finish up with the three valves.

The only valves Aee will give average reception on phones; the two-valve, speaker reception on local stations; and the three-valve, speaker reception on distant stations under fair conditions.

MINI-WAVE SETS use a similar circuit to the A.C.E.

#### HAMMARLUND-ROBERTS.

Supplied in various patterns, and one of the very finest Radios on the market today. The complete set is very reliable. Uses ordinary inexpensive valves, and can be relied on for speaker reception from stations when such is possible with any Radio. It can be electrified completely if desired.

#### YOU WILL NEVER REGRET PURCHASING A HAMMARLUND-ROBERTS.

#### SCREENED GRID.

These sets are made in combined long and short waves, and it appears that they are more successful on the latter. It is this that means greater reliability. The Screened Grid Radio will prove superior to the Hammarlund-Roberts for the ordinary amateur, and the latter for the one who wants the latter for consistent and pleasing results with utmost freedom from trouble.

Our H-R kit will work, however, as unexcited by any others, for they are of the most modern design and all parts are most carefully matched.

### HAMMARLUND-ROBERTS KITSETS.

For further details, see also description of the H-R KITSETS in the previous part of this list. Your own built set should give absolutely equal results, and must be previous to the correct item. And, we can improve infinitely more, and more satisfactory in the end.

But if you wish to avoid soldering, we can furnish all parts with terminals, etc., for the extra charge.

The H-R is a point-interfering neutralised set, strongly approved by the Government. Neutralising is quite easy, and it is this feature which has enabled the H-R to become the somewhat similar Browning-Dracon to become obsolete. Correct neutralising of any set is very important.

This is certainly one of the very best sets on the market, no matter from which angle it is viewed. No other set in the Set capable of extremely good long distance results—excelling many well-known sets and very easily set up. Use it and see.

Best of all, from the amateur's point of view, is the fact that it is very easily assembled from the kit-set and diagrams which we supply. The H-R is a kit-set, but not the H-R, even if they have never previously built a set, or dabbled in Radios.

All parts of this kitset are correctly matched, while the design has been most carefully and accurately worked out to ensure the best.

Build it—and compare it with any other set you like, no matter what the designer says. You will be delighted with the result.

Even a single component of the very best quality procurable. You simply cannot buy better Radio apparatus in the world.

#### Full list of parts given below:

- 2 Hammarlund condensers
- 2 Dials, Formica, walnut
- 1 Set of coils, with knob
- 1 Midget condenser
- 1 Panel, Formica, walnut, engraved
- 1 Panel
- 4 Valve holders
- 1 Rheostat
- 1 Switch
- 1 Grid leak and condenser
- 1 Bypass condenser
- 1 Strip with terminals, engraved
- 1 Baseboard
- 2 Transformers

#### Instructions and diagrams.

Lugs, screws, tinned wire, etc.

### H-R PUSH PULL KITS.

A PUSH PULL AMPLIFYING SYSTEM enables much greater output, with less distortion, and since undoubtedly many will wish to use the H-R as an ELECTRIC GRAMOPHONE, the H-R SUPER, the extra cost for PUSH PULL AMPLIFIERS is given.

Instructions are supplied, but it is felt that little will be gained unless power valves, extra "P" and "C" batteries, and a speech speaker are used.

The extra apparatus in each case is selected to suit the remainder of the KIT.

The extra apparatus in each case

### TIME PAYMENTS IF DESIRED.—Low Deposit.

### H-R SENIOR KITSETS.

This is the old favourite, with HAMMARLUND condensers, Formica panel, high voltage transformer, etc. It meets the requirements of the large numbers of amateurs who still prefer to build absolutely the very best quality, and take pride in the result.

#### H-R SENIOR KIT.

4-valve Kit, complete	£9 18 0
Voltmeter, for dry battery operation, extra	1 8 0
5-valve Push Pull, complete	12 18 0

### H-R CONQUEROR.

For the many wanting a cheaper model of the H-R KITSETS, we offer the H-R CONQUEROR, similar to the H-R JUNIOR, but with latest improvements in details.

The H-R CONQUEROR is an ordinary H-R. In fact, most of the components are identical, but cheaper condensers, smaller transformers and condenser coils, and smaller valves are used.

At this absurdly low price, no handy man need work without Radio sets, and we think that the H-R CONQUEROR gives indifferent results—it does NOT give all the short wave, but will do much more than other kitsets on the market.

#### H-R CONQUEROR KIT.

4 valve	£6 8 0
5 valve, Push Pull	8 10 0

### HAMMARLUND HI-Q 30

The design and construction of the HI-Q 30 has been fully described in the earlier part of this catalogue, so will not be repeated.

The kit is sold either for battery or ELECTRIC (A.C.) operation. The precision pick-up and volume control are assembled, as they demand experience beyond the average amateur. The remaining work is comparatively simple.



The chassis, when assembled, is fitted with valves, connected to a dynamic speaker, and is ready for operation. A speaker is essential.

#### HI-Q 30 ELECTRIC KIT.

Full set Radionet valves	10 14 0
Full set Radionet dynamotor	10 0 0
Jensen, output as above	10 0 0
(165/14/6) . . . . .	60 0 0
ELECTRIC GRAMOPHONE	7 0 0
ELECTRIC PICK-UP . . . . .	7 0 0
VOLUME CONTROL	5 0 0

#### HI-Q 30 BATTERY KIT.

This kit is made to operate from batteries, instead of from the A.C. power supply. Uses four 112A valves and three 222.	PRICE, £3.
HI-Q 5 valve	£17 10 0
HI-Q 6 valve	£17 10 0

### WORLD SCREENED KITSETS.

#### 4 ALL WAVE.

The advent of the new SCREENED GRID VALVE added an entirely new dimension to the amateur's kitsets. It meets the requirements of the large numbers of amateurs who still prefer to build absolutely the very best quality, and take pride in the result.

#### H-R SENIOR KIT.

4-valve Kit, complete	£9 18 0
Voltmeter, for dry battery operation, extra	1 8 0
5-valve Push Pull, complete	12 18 0

### H-R CONQUEROR.

For the many wanting a cheaper model of the H-R KITSETS, we offer the H-R CONQUEROR, similar to the H-R JUNIOR, but with latest improvements in details.

#### H-R CONQUEROR KIT.

4 valve	£6 8 0
5 valve, Push Pull	8 10 0

### HAMMARLUND HI-Q 30

The design and construction of the HI-Q 30 has been fully described in the earlier part of this catalogue, so will not be repeated.

#### H-R CONQUEROR KIT.

4 valve	£6 8 0
5 valve, Push Pull	8 10 0

### GABINET.

These are used in pairs, for wave lengths as follows:

Broadcasting	200-250 metres
Short wave	15-50 metres
Short wave	35-100 metres

### CABINET.

The ordinary kitset is correctly screened, but if a complete metal cabinet is required, the extra cost is £1.11. The cabinet is made from heavy gauge aluminium finished with duco, as used for motor cars.

### ACCESSORIES.

Aerial A138, Fuller 4-valve accumulator, three Columbia "B" batteries, 133-volt "C" battery, N. and K. Spec. 111, and dynamotor	£11 11 0
Accessories, if taken with	1 5 0

### MULLARD 4 VALVE.

This Kit uses Mullard English bass valves—PMV 1, PMV 2, PMV 3, and PMV 4. Extra valves are extra.

Metal cabinet is included, and one set of coils, either for broadcasting or for short wave. Extra sets can be supplied.

### MULLARD KIT.

MULLARD KIT	£8 7 6
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### COSSOR 3 VALVE.

Cossor have re-designed their kits for the coming season, but unfortunately, full details are not available at the present time.

Customers wanting these kits, however, can be sure of having their orders filled at the lowest price for the new models, which will include

using screened grid valves.

### MENIWADE KITSETS.

MENIWADE SETS are fully described earlier in this list, as the main object being to provide a simple kit set for amateur work. Screened grid valves offer some advantages for this purpose, but many amateurs like the older, perhaps more reliable valves and the simple regenerative circuit which has always proved very efficient in this part of the world.

The full kit includes Hammarlund condensers, Formica panel and all other apparatus of the highest grade. Each kit includes a cabinet for the same.

The instructions are very simple, and can be followed by anyone.

For short waves, it is advisable to those requiring cheaper apparatus, but those requiring cheaper apparatus will find the JUNIOR KITS save some money.

### CABINETS extra, 40/-

### SHORT WAVE KIT . . . . . £9 5 0

### ALL WAVE KIT . . . . . 5 0 0

### JUNIOR MENIWADE KITS.

#### Cabinets extra, 40/-

#### SHORT WAVE KIT . . . . . 6 10 0

#### ALL WAVE KIT . . . . . 6 10 0

### MENIWADE ADAPTOR.

If you already have a larger set, you can buy a MENIWADE ADAPTOR in conjunction with it, for short waves. These extra batteries are required, and change over being made in a few moments.

If your set is electric, you should write us for adaptors, particularly, because adaptors will not always work with certain sets.

MENIWADE ADAPTORS contain the same high grade apparatus as the Meniwa sets, but a cheaper kit is also supplied. Full instructions for assembling and working are included.

### MENIWADE ADAPTOR KIT

6 0 0	
JUNIOR KIT	1 5 0

### CABINET extra, 10 0 0

### HI-Q 4 VALVE

This Kit uses Mullard English bass valves—PMV 1, PMV 2, PMV 3, and PMV 4.

Metal cabinet is included, and one

set of coils, either for broadcasting

or for short wave. Extra sets can be supplied.

### MULLARD KIT

MULLARD KIT	£8 7 6
-------------	--------





## A "CHARGER" SAVES MONEY AND WORRY.

(See also under "B" Batteries.)

It is impossible to judge an accumulator by its appearance, actual test by experiment is the only reliable guide. A shilling or two saved in first cost proves expensive in the long run. Glass cells, indescribable "quality" feature.

### SPARTA S.D.G. AND L.D.G.

These have thick plates and therefore must be charged or discharged at heavier rates than those specified. They will hold their charge much longer than ordinary accumulators, though for large outputs the latter must always be used.

Glass cells, indescribable "quality" feature.

The S.D.G. is 12 amp. actual. The L.D.G. is a small accumulator is only 10 amps actual, though often listed by unreliable makers.

These rectifiers are very useful for electric bells, clocks, etc., because they hold their charge for many weeks.

**Maximum charge and discharge rates** are 1 amp. and 1 amp. for the S.D.G. and 11 amp. and 1 amp. for the L.D.G. on 30 amp. size.

One only does the Westinghouse score in durability, but it is also very much more efficient than other rectifiers.

### RELIANCE ACCUMULATORS.

We believe in supporting local industries and confidently advise you to do the same where Reliance Batteries are concerned.

Reliance battery gives you, since the factory is in Auckland, and not away overseas.

**THE RELIANCE RADILO BATTERY** is a silent monoblock battery, in strong black case, fitted with rugged carrying handles, and is particularly suitable for use where the accumulator must be sent to an ordinary garage for recharging. It is made in large capacity only.



### SPARTA S.W.G.

Glass cells, in two-volt units, with liberal space round the plates for acid, and ample space at bottom of cell.

Moulded covers, with large stoppers. Non-corrodible grease cup terminals. A very fine battery.



A213 SWG5, 20 amp. actual 15 0  
A180 SWG7, 30 amp. actual 18 0  
A181 SWG10, 40 amp. actual 20 0  
A196 SWG13, 60 amp. actual 27 0

For 4 or 6 volts, use two or three cells.

### EXIDE TWO-VOLT (GLASS).

Note—We list D.T.G. as 10 amp. actual. Others frequently describe it as 20 amp. (ignition, or false, rating.) A145 D.T.G. 10 amp. actual 12 9  
A179 D.F.T. 22 amp. actual 12 9

"B" ACCUMULATORS—See under

"B" Batteries

### CHARGERS.

#### WELL-MAYDE CHARGERS.

Fully guaranteed for one year.

These are manufactured in Auckland, under Patent License, incorporating the WESTINGHOUSE METAL RECTIFIER, which is British made. The construction of the famous rectifiers is given under RECTIFIERS, in this Catalogue.

These rectifiers consist merely of copper oxide between them. They never seem to wear out, can be left without loss of efficiency. They are definitely guaranteed for a period, and are used in the radio sets in which they are used during the period. In durability, therefore, they are much more reliable than the vacuum rectifiers, which were so successful before the advent of the Westinghouse rectifiers.

One only does the Westinghouse score in durability, but it is also very much more efficient than other rectifiers.

WELL-MAYDE CHARGERS may be permanently wired to your batteries, so that charging is controlled by the battery voltage. There is no need to alter a wire, thus reducing inconvenience to an absolute minimum.

Running costs are so low as to be negligible—you would not notice any difference in your electricity bill. If you are supplied with A.C. current, you will be advised to connect to overtake the WELL-MAYDE CHARGER, especially as you can purchase it at a lower cost than the A.C. unit, making it literally "PAY FOR ITSELF".

When paying for itself in a short time, your battery need never run down, nor need it be taken away for a day or two for the purpose of charging. The WELL-MAYDE is always ready for action. Incidentally, your battery need much longer if not charged about two much.

WELL-MAYDE CHARGERS are made in several patterns, all FULLY GUARANTEED. When buying, one remembers that FIRST COST IS LAST COST.

In the combined "A" and "B" patterns of chargers, both batteries can be charged at the same time, if desired. In every case, the "A" pattern will charge 80 volts in 15 SIEBERS, the charging rate being up to about 50 millamps. This is the first charging rate off the high voltage in series.

Turn Your Charging Pay for Itself.

ALL WELL-MAYDE "A" CHARGERS will charge both batteries SIMULTANEOUSLY.

(Continued next page.)

A153 6 volt, 39 amp. actual 4 10 0  
A154 6 volt, 100 amp. actual 5 10 0  
First charge, free.

### CHARGING—See Charging Table.

### "A" ELIMINATOR.

See under Eliminators.

### D.C. CHARGERS—LARGE SIZES.

Prices on request.

## "WELL-MAYDE" SIGNIFIES UTMOST RELIABILITY.

### "A" CHARGERS.

#### TYPE A.

Charges "A" batteries of 2, 4 or

6 volts, at 1 amp.

150 0

Easy terms, 10s. cash, and five

monthly payments of 10s. each.

1918 . . . . . 2 15 0

TYPE A.

Charges 6 volt batteries at 1 amp,

and will also supply 9 volts 1 amp.

for dynamic speakers, or "A" eliminators.

A206 . . . . . 3 10 0

TYPE A.

Charges 6 volt batteries at 1 amp,

and will also supply 9 volts 1 amp.

for use as TYPE A3.

A207 . . . . . 5 0 0

TYPE A.

Charges 6 volt batteries at 2 amp,

and will also supply 9 volts 2 amp,

for uses as TYPE A3.

A208 . . . . . 5 0 0

TYPE A.

Charges 6 volt batteries at 2 amp,

and will also supply 9 volts 2 amp,

for use as TYPE A3.

A209 . . . . . 5 0 0

TYPE B.

Charges "B" batteries 80-180 volts,

up to 50 millamps.

A205 . . . . . 4 4 0

### "B" CHARGERS.

TYPE B.

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

A205 . . . . . 4 4 0

### "AB" CHARGERS.

TYPE AB.

Charges 6 volt batteries at 1 amp,
and "B" batteries as in TYPE B.

A208 . . . . . 5 15 0

### TYPE A3B.

Charges 6 volt batteries at 1 amp,

and "B" batteries as in TYPE B.

A209 . . . . . 6 6 0

### TYPE A3.

Charges 6 volt batteries at 2 amp,

and "B" batteries as in TYPE B.

A210 . . . . . 7 15 0

For 110 volt supply, 10s. extra,

except TYPE A, 5s.

### EASY TERMS—10s. DEPOSIT

ACID CHARGERS can be converted to one or two amp. Weston bulb adaptors, and 12ft. twin flex. Ready for use.

A158 . . . . . 13 6

### D.C. CHARGING OUTLET.

This comprises a 1 amp. carbon lamp, lamp holder, Weston adaptor,

and 12ft. twin flex. Ready for use.

A158 . . . . . 13 6

### D.C. CHARGERS—LARGE SIZES.

Prices on request.

### FURTHER WELL-MAYDE USES.

TYPE A, A3 and A4 can be used in conjunction with coils, and an electrolytic condenser, for the most efficient "A" eliminator. For this purpose, they are unexcelled.

The same can be used for converting to 9-volt dynamic speakers and A.C. operated speakers. In fact, the 9-volt output of the A3 is specially designed to drive a 9-volt 1 amp. dynamic speaker, forcing 1 amp. through the field coils, thus creating a high voltage, and is ideal for use as a "B" battery eliminator.

It is made for the low cost of £1 10s. the TYPE A3 should fill a very definite need.

### ACB CHARGER, 2 AMP.

Charged six-volt "A" accumulator at 2 amps, and 90-volt "B" accumulator, though not simultaneously. The transformer and the coils are carefully wound, and thoroughly impregnated with varnish.

There is a breakdown is practically unknown, but in any case, the transformer is easily replaced.

Unlike imported chargers, repairs, when required (very rarely) can be readily effected.

The charger is the genuine Tunger bulb. The case is of bright aluminum, and the formica top is very handsomely finished.

Price includes the RECHARGEABLE "A" accumulators. For charging "B" accumulators, a lamp is required, connected in series.

Price includes "A" and "B" terminals. The "A" and "B" terminals in the set are connected (not A + and B +), so that the charger can be permanently connected to both batteries through a simple switch. All charging can then be done without any alteration of wires, thus ensuring utmost simplicity.

1. Cheaper initial cost.

2. No maintenance expense, for there are but two replaceable parts, and the apparatus should be everlasting.

3. Greater efficiency, so much lower expense for current, and cooler running.

4. Simple construction.

5. No cut-outs, etc. required, if power goes off, charging ceases but resumes immediately.

6. Board protects the defect.

7. Silent.

### 36-VOLT 5 AMP. CHARGER.

Charges 1 to 6 volt-acumulators, at 5 amps. Fitted with ammeter.

A151 . . . . . 24 0 0

### 12-VOLT 3 AMP. CHARGER.

Charges 1 or 2 volt-acumulators, at 3 amps.

### 120-VOLT 1.5 AMP. CHARGER.

Some 120 volt chargers, the charger will charge up to 120 volts, at 1.5 amp. Enables garages to charge high tension batteries.

Tungar . . . . . 1 0 0

Recticon type 2 amp. bulb, similar to Tungar, but with plate connection at top instead of at side. Price, £1.

### AC CHARGER, 5 AMP.

Owing to the demand for a larger charger than the 2 amp., we now supply the AC charger in the 5 amp. size, armchair charge 500 "B" batteries. The larger size is useful where dealers have a number of batteries to charge for customers.

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

A190 Acc 5 amp. charger . . . . . 7 10 0

A185 Tuner bulb, 5 amp. . . . . 2 7 6

A161 Lamp for "B" batteries . . . . . 2 3

Charger for 110 volt supply, 5s. extra.

### Guarantee

#### TUNGAR BULBS.

We Guarantee 2 AMP. TUNGAR bulbs sold by us for use in GEN-UNIE ACE or TUNGAR BULBS for use for 12 MONTHS from date of sale by us, subject to the following conditions:

1. TUNGAR bulb has been given PRIVATE USE ONLY.

2. CHARGER RATE has not been altered in any way.

3. 30 months per month is paid for the use of bulb, and the cost of bulb for replacement. Thus, if bulb fails in three months, 9s. is paid towards cost of new bulb.

NO OTHER GUARANTEE IS GIVEN OR IMPLIED.

### GARAGE CHARGERS.

WESTINGHOUSE RECTIFIERS are now available in larger sizes, and the following are recommended to all garage proprietors, simply because they are a great advance on the Tunger bulb type. The advantages are:

1. Cheaper initial cost.

2. No maintenance expense, for there are but two replaceable parts, and the apparatus should be everlasting.

3. Greater efficiency, so much lower expense for current, and cooler running.

4. Simple construction.

5. No cut-outs, etc. required, if power goes off, charging ceases but resumes immediately.

6. Board protects the defect.

7. Silent.

### 36-VOLT 5 AMP. CHARGER.

Charges 1 to 6 volt-acumulators, at 5 amps. Fitted with ammeter.

A151 . . . . . 24 0 0

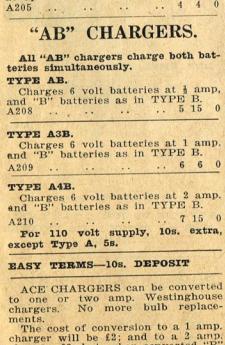
### 120-VOLT 3 AMP. CHARGER.

Charges 1 or 2 volt-acumulators, at 3 amps.

Tungar . . . . . 1 0 0

Recticon type 2 amp. bulb, similar to Tungar, but with plate connection at top instead of at side. Price, £1.

WRITE FOR WESTINGHOUSE BOOKLET. Post free, 3d.



For 110 volt mains, 5s. extra.

A160 Acc. Charger with bulb . . . . . 2 3

A125 Tuner bulb, for Acc. or

Tungar Chargers . . . . . 1 0 0

Recticon type 2 amp. bulb, similar to Tungar, but with plate connection at top instead of at side. Price, £1.

## ALUMINIUM—BEST FOR SHIELDS.

### AERIAL OUTFITS.

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

Normal aerial 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 materials 100 feet 1/2" elliptical wire, two pyrex glass two mm. inch lead-in tubes with wing nuts, Keystone arrester, earth clamp.

A139 ..... 19 0

### AERIAL OUTFIT NO. 2.

A cheaper outfit, but fulfilling insurance requirements. 100 feet 1/2" wire, two pyrex glass two mm. inch lead-in tubes with wing nuts, Keystone 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, shacks, etc. It consists of two porcelain insulators, porcelain lead-in tube, earth clamp.

A137 ..... 4 6

### AERIAL EARTH PLUGS.

A small Formica plate either black or walnut, which is fitted to the wall with two plated sockets (one red, one black), to which the aerial and earth wires are connected.

The aerial and earth leads to the wall are fitted with two plugs, also black, which in turn fit the sockets. The whole set can thus be readily disconnected leaving only a neatly fitting aerial on the wall.

A204 Aerial-earth plug, complete ..... 2 0

### ALUMINIUM.

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

Aluminium is only kept and cut at our factory, and is quoted for the best for shields. Fortunately, special corner rods can be now supplied which enable the whole box being held together with eight screws. Each side is a perfectly plain flat sheet. The boxes are being sold as "WELL-MADE."

Thick aluminium (1/4") is necessary for panels, and is quoted for the best for shields. Fortunately, these can be relied on for extremely good results, and freed from trouble. They are the best for panels, and jacks cannot be used with them as with transformer amplifiers.

Prices for shields will be found under "SHIELDS."

ALUMINIUM SHEET (English).			
S.W. Gauge.	Thickness	Per sq. ft.	
14	.006	4 0	
16	.008	3 0	
20	.016	2 6	
24	.022	2 0	
26	.018	1 6	

### ALUMINIUM PANELS.

These can be supplied either crimped or riveted. Write for prices.

Reduced prices for quantities.

### ALUMINIUM CORNER ROD.

This rod has a groove in it, to take the corner panels, mounted on the top and bottom panels, that is 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 PIECE, extra 6d.

### ALUMINIUM PARTITION ROD.

This rod has one groove only in it, and is used for putting a partition in a box. It is held in place by small screws.

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 small pieces of aluminium, in lengths up to two feet.

### TRANSFORMER AMPLIFIERS—TWO STAGE.

Transformer amplifiers are by far the most common. Two stages give the same amplification as three stages of resistance coupling. The cost will depend almost entirely on the cost of the tubes, these costing from 1/2 to 42/- each. No expensive mounting is required—a piece of ordinary board is quite sufficient.

The prices quoted below are for the most common, mounted in the simplest manner, but always giving maximum efficiency. Suitable terminals are provided so that the amplifier can be connected on without the slightest delay.

### DE JUR.

A beautifully made two stage amplifier, mounted in a very compact case. It contains a valve holder, condensers, resistances, and a terminal block. The terminals are so that it can be connected in two minutes. Frequently used as the amplifier in a set, with a valve setting, owing to its compactness.

A209 £1 4 0

Or with three special valves £2 10 0. In this series, this is the cheapest Radio apparatus we can supply. It will be necessary to order early, as valves and amplifiers are very limited.

### AMPLIFIERS.

MULTI-VALVE sets always contain an AMPLIFIER, but amplifiers are used as separate units for a radio set.

Working on loud speaker by a crystal set. This cannot be done except by using valves and batteries.

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

3. Using in conjunction with a pick-up and a gramophone motor to make an ELECTRIC PHONOGRAPH.

4. With television apparatus. (For this purpose a resistance coupled amplifier is generally reckoned to be the best.)

A205 BEE Amplifier ..... 1 10 0

Or with two special valves to 2 0 0

BUY THE DE JUR OR BEE AMPLIFIERS AND ENJOY LOUD SPEAKER RADIO.

### POWER AMPLIFIERS.

SEE INDEX "AMPLIFIERS."

WE CAN SUPPLY OR MAKE, AMPLIFIERS FOR ALL PURPOSES.

## LAYERBILTS FOR LONG LIFE.

### ARRESTERS—LIGHTNING.

A condition of a fire insurance policy on your house is the fitting of an APPROVED ARRESTER, if you have a Radio set.

Many arresters are on the market and APPROVED by the NZ FIRE UNDERWRITERS, although not by the Fire Underwriters in other countries.

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

ALL ARRESTERS LISTED HERE ARE APPROVED BY THE NZ FIRE UNDERWRITERS.

A properly erected aerial is actually a real protection against lightning. It must be well insulated outside, and wires should be kept as straight as possible.

### KEYSTONE.

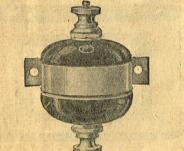
A remarkably fine arrester, with bakelite body, and heavy brass fittings. Includes instructions, diagram, and screws. Thoroughly recommended.



A133 ..... 9 0

LITTLE JOE.

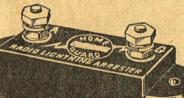
A neat and effective brown porcelain arrester complete with screws for attaching to wall. Approved in New Zealand.



A176 ..... 4 6

### HOMEGUARD.

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



A177 ..... 3 0

### "B" SUPPLY.

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

Dry batteries.

Accumulators.

"B" eliminators (see under Eliminators).

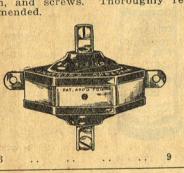
Magneto "B" supply.

### "B" BATTERIES.

"B" or high tension batteries, supply the current that actually operates the speaker, the current they are not being consumed by the incoming signals.

A properly erected aerial is actually a real protection against lightning. It must be well insulated outside, and wires should be kept as straight as possible.

A remarkable fine arrester, with bakelite body, and heavy brass fittings. Includes instructions, diagram, and screws. Thoroughly recommended.



A133 ..... 9 0

Small "B" batteries have a very short life, especially those used with portable sets. It is on this account, however, that the Layerbilt is a valuable set gives indifferent results in actual use. The small batteries are not good, even before they reach New Zealand.

For a set of four or more valves, it is best to purchase the largest and best batteries possible. In this connection we strongly advise the Layerbilt. For two valves, the best economy will be obtained from the ordinary size 45-volt battery.

Avoid cheap or unknown "B" batteries. You will never regret using the cleverly expert cannot judge a battery from its carton. We will list cheaper batteries as soon as they are received.

When purchasing a car, you pay considerable attention to the benzine consumption. You should pay equal attention to the consumption of a battery radio, for some cost twice as much for "B" batteries as others and have a shorter life. Our advice is to buy the best. Our own Radios are designed with special attention to this point, and the most economical on the market.

Different valves may affect "B" consumption very considerably. This is the case in case of the following advertisement valves which have very low "B" consumption. These lose on "B" far more than they save on "A" batteries.

This will make you realise the absolute necessity of knowing how much current is required. Do not blame batteries for running down quickly when the fault is in the design of the set, and there is no way whatever due to the battery. Many poorly designed Radios cost at least 1/- extra per year for "B" batteries alone.

Can you consider them a good purchase?

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

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

### COLUMBIA "B" BATTERIES.

Columbium "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. Columbia is the manufacturer of the Columbia battery control, the largest factory in the world.

For a set of four valves the Layerbilt commands first choice.

We have selected Columbium batteries as standard equipment on all sets supplied by us. Since we have been making supplies of Columbium batteries arriving direct from the factory, custom-made to our requirements, saving fresh stock. Only our large turnover makes this possible. A word of caution, however, in regard to batteries offered by some dealers at a shilling or two less.

Small "B" batteries have a very short life, especially those used with portable sets. It is on this account, however, that the Layerbilt is a valuable set gives indifferent results in actual use. The small batteries are not good, even before they reach New Zealand.

For a set of four or more valves, it is best to purchase the largest and best batteries possible. In this connection we strongly advise the Layerbilt. For two valves, the best economy will be obtained from the ordinary size 45-volt battery.

The Layerbilt battery is undoubtedly the finest "B" battery in the world. Like the egg, it is full of meat. It is made in two sizes, each of which have a 224 volt tapping.



B102 Layerbilt Super (4400) 1 10 0  
B102 Layerbilt M.G. (4485) 1 4 0

### COLUMBIA 45 VOLT.



B101 Flat, taps 161-224 (4767) 20 0  
B102 Vertical, tap 225 (4772) 20 0

### COLUMBIA, PLAT. 224 VOLT.

B100 Tapped 161-223 (4766) 11 6

### COLUMBIA, PLAT. 90 VOLT.

As built for the English market, and used on 2 or 3-valve Radios. B232 99 volt (4755) ..... 25 0

## MAGNETO "B" FOR REAL POWER—LOW EXPENSE.

### MAGNETO "B" SUPPLY.

In England these are known as Accumulators, but we have adopted the above name as more in keeping with the terms used in America.

The MAGNETO "B" SUPPLY consists of a compact motor and generator, very carefully built to consume an absolute minimum of current, and usually driven by an electric motor. For economy a strong permanent magnet generated can be used, but to put to useful work.

The machine is enclosed in a small and neat case, with precision bearings, requiring only a few drops of oil every two or three months. No other attention is necessary.

For RADIO, the MAGNETO "B" SUPPLY is mainly intended to supply the power for RADIOS, those who have no electric power installed, and for electric power installed, the cost of dry "B" batteries is prohibitive, but the MAGNETO "B" SUPPLY "B" batteries can be easily charged, provided ample power is available. It could, of course, be used without a motor, for charging "B" accumulators.

Fuller "B" batteries are now made in 10-volt motor sets. This not only gives much more substantial batteries, but also considerably the size, quality, etc., of the same.

Two sizes are offered, but the same price is charged for the same quality, so either can be purchased with equal confidence.

FOR THE FIRST TIME, the most reliable "B" accumulators can now be purchased at a price which is actually lower than competitors of much lower quality.

Fuller "SPARTA" MHG 10 VOLT. 3000 millamp capacity. Best quality plates. Battery troubles practically unknown with this battery.

Fuller "SPARTA" MHG 10 VOLT. 3000 millamp capacity. Best quality plates. Battery troubles practically unknown with this battery.

Special winding, usually 20s. extra.

TYPE B. Input, 6 volts. Output, 150 volts. 15 millamps. B225 With filter . . . . . 12 10 0 B226 Less filter . . . . . 7 15 0

TYPE C. Input, 12 volts. Output, 300 volts. 55 millamps. B227 With filter . . . . . 15 10 0 B228 Less filter . . . . . 9 0 0

TYPE E. Input, 12 volts. Output, 300 volts. 15 millamps. B229 With filter . . . . . 25 0 0 B230 Less filter . . . . . 18 0 0

Mr. Polson, Kiripaka, writes: I enclose a list of stations tuned in so far, all at standard times of course, and on the same Grid 3. It is quite marvel: 2Y2, 2ZQ, 4ZL, 3ZC, 4ZQ, 4ZG, 2ZQ, 2ZN, 4ZL, 3ZC, 2ME, 1YA, 2BL, 3ZC, 4QG, 2YA, 2FC, 2ME, 3AR, 5CL, 3UZ, 3BE (or 3OB), 1ZG.

### B ACCUMULATORS.

#### COLUMBIA "C" BATTERIES.



B112 44 volt, tapped at 3 . . . . . 3 6  
B121 9 volt (4756) . . . . . 3 6

BURGESS BATTERIES, 45 VOLT.

B111 Flat (2306) . . . . . 1 1 0  
B153 Vert. (2308) . . . . . 1 1 0  
B154 Vert. (21308) Super . . . . . 1 1 2 6  
B145 4.5 volt (2370) . . . . . 3 9  
B145 4.5 volt C (5540) . . . . . 5 0

#### COLUMBIA NO. 6.

This battery has no rival in quality. It is used in sets of Radio sets (where accumulators cannot be used), for telephone, bells, buzzers, etc.

Thousands of these batteries are used annually by the U.S. Army and Government, having been selected after searching test.

B113 13 volt . . . . . 2 6

#### COLUMBIA HOT-SHOT.

Largely used for motor car and boat ignition and for Radio.

B184 6 volt . . . . . 13 6

#### CHARGING "B" ACCUMULATORS.

First charge, Inc. acid 1 . . . . . 1 0  
Recharging . . . . . 1 . . . . . 1 0

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

WARNING. Beware of 30, 6 at cut rates—almost invariably they have been many months in stock, and already considerably run down.

## WELL-MAYDE ELIMINATORS ARE SUPERB.

### BATTERY CABLES—

#### A.C.E.

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

The following describes a few of the sizes.

Single hemi brackets are used for mounting tubular coils vertically on baseboard, or sub-panel to main panel used for motors and for panel mounting of aluminum.

No. 143 is very suitable for masking shields, as it is both long and strong.

Z brackets are used for mounting platforms and for mounting coils in baseboard.

Straight strips (B140) and frequent use as they are, but they can easily be bent to any size.

Include a few brackets with your order, as they will soon prove useful.

Various gauges can be cut to size. Special thickness rolled to order, up to about 1/8 inches wide.

Price on application.

#### AC CABLES (Twin Leads, 1/16 in. Long.)

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

#### AC CABLES (Cut to Length, 1/16 in. 50 ft.)

B173 5 wire . . . . . 5d 24 0  
B176 6 wire . . . . . 5d 24 0  
B177 7 wire . . . . . 5d 24 0  
B216 9 wire . . . . . 5d 22 0

#### FLEXO CABLES.

A very high grade cable for those who want best quality. These cables are specially treated and so rendered acid proof. They are all five wires, and have lugs fitted.

Very useful where a broadcast and a short wave set are used, for either can be joined up to the same set independently and without the slightest danger of wrong connections.

C509 Multi-plug Cable . . . each 9 0  
"A" battery clips extra, per pr. 1 6

#### MULTI-PLUG CABLES (7 Wire.)

These are similar to the above, but are fitted with a plug and socket, either 1/16 in. or 1/8 in. These batteries can be connected or disconnected immediately.

Very useful where a broadcast and a short wave set are used, for either can be joined up to the same set independently and without the slightest danger of wrong connections.

C509 Multi-plug Cable . . . each 9 0  
"A" battery clips extra, per pr. 1 6

#### SINGLE BEND—4 Holes.

Width Length arms ea. dz.

B131 1in. 1in. 2d 1 3  
B132 1in. 1in. 2d 1 6  
B134 1in. 1in. 2d 1 9  
B135 1in. 1in. 2d 1 12  
B137 1in. 1in. 3d 2 6

"A" battery clips extra, per pr. 1 6

#### SINGLE BEND—Slotted Holes.

Width Length arms ea. dz.

B196 1in. 1in. 4d 2 0

Width Length arms ea. dz.

B197 1in. 1in. 4d 2 0

B198 1in. 1in. 4d 2 0

B199 1in. 1in. 4d 4 0

Width Length arms ea. dz.

B133 1in. 1in. 3d 2 0

B139 1in. 1in. 3d 2 0

B217 1in. 1in. 3d 7 6

B218 1in. 1in. 3d 7 6

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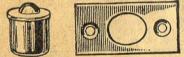
## CABINET FITTINGS GIVE "DISTINCTION."

## CABINET FITTINGS.

## BALL CATCHES.

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 black plates. All nickel plated.

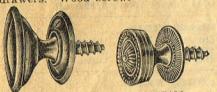


## CABINET KNOBS.

Used for small cabinets of Radio sets, gramophones and similar purposes. They are supplied either nickel plated or antique finish.

## PLAIN PATTERN—PLATED.

Supplied in two sizes. A solid or pattern suitable for small or drawers. Wood screw.



C487-C488

C489-C491

## DRAW HANDLES.

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

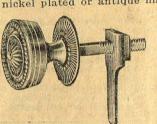
C502 Plated

C503 Antique



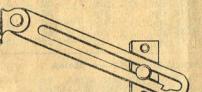
## CUPBOARD LOCKS.

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



## LID SUPPORTS.

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



## 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.

Rubber feet are made in two types. The pin type has a thin nail embedded in the rubber, and is driven into the cabinet with a hammer. The screw type is attached with a wood screw.



Set of 4

## SCREW TYPE.

G151 No. 3 size ... 6d

G152 No. 4 size ... 9d

## PIN TYPE.

G149 No. 1 size ... 6d

G150 No. 2 size ... 9d



C407 21 x 1in. nickel plated

C408 23 x 1in. gold plated

C409 18 x 2in. nickel plated

## CELLULOID SHEET.

Transparent, white, grained or black.

Celluloid is freely used for making up-to-date coils. We carry large stocks of fresh celluloid, guaranteed to cement easily, and to stick to almost any surface. Any size supplied.

For coil winding 10/1000in. thick celluloid should not be exceeded, 6/1000 being better if it can be had.

For strips for cementing to finished coils, 50/1000 thick is recommended.

C104 10/1000 thick, sq. ft. 1 1 0

C401 5/1000 thick, sq. ft. 1 10

C453 50/1000 thick, sq. ft. 3 3

Full sheet, sq. ft. 3 0

We can also supply 50/1000in. thick in black, white, white lino, or at the same price as transparent. Can be had engraved name plates.

NOTE.—Many grades of celluloid, especially those used for motor starters, are very brittle and cement, and are not suitable for Radio purposes. The celluloid listed by us is guaranteed to cement readily and firmly.

See "CELLULAC" CEMENT for celluloid—under INSULATORS.

## CLIPS—BATTERY

Made in two sizes, and of best material. Unlike cheap clips, these never give trouble. Used for dry B batteries, and also for general testing work.

## (CADMIUM PLATED)



C107 The popular

size, 1 1/8in. ea. 5 0 48 0

## (NICKEL PLATED)



C414 Nickelated

4d. 3 6 36 0

## (LEAD COATED)

Radio cabinets should have long hinged fitted door. The names here are best English, brass, and either nickel or gold plated, and width 4in. is in the open hinge.

The price of these hinges is now so low that no builder need use the clumsy old-fashioned hinges.



C110 25 amp. 23in. ea. 11 0 120 0

C111 50 amp. 35in. ea. 13 14 0 155 0

## WELL-MAYDE COILS FOR EFFICIENCY.

## WELL-MAYDE COILS.

## ALL WAVE.

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

A full set of coils comprises the PRIMARY, mounted on a Forme base, and the secondary, held together by strong, yet thin dielectric material, selected for its great efficiency, and wound right through in its correct position, thus rendering short circuit impossible.

It is essential that capacity and resistance losses be reduced to an absolute minimum, and these are amply demonstrated in WELL-MAYDE COILS.

Based on accurate machines, the method of manufacture ensures that the coils are very uniform in section and insulation.

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

The coils are manufactured in various sizes, and in lengths of about 12 inches. Shorter lengths are then cut from these.

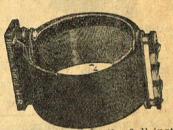
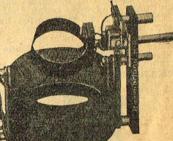
Standard parameters are 1b, 2, 2s, 3, and 3s, the spacing being 10, 20, 30, or 40 turns per inch, suitable for 1000, 2000, 3000, or 4000 ohms.

Other sizes could be supplied to order in quantity.

WELL-MAYDE COILS must appeal to all Radio constructors, as much to the amateur as to the manufacturer.

## WELL-MAYDE HAMMARLUND-ROBERTS COILS.

The Hammarlund-Roberts receiver contains two coils, which are the heart of this popular set. Since they are 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.



## WELL-MAYDE SPACED COILS.

## (New Zealand Patent No. 58824)

## WELL-MAYDE SPACED COILS.

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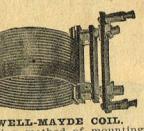
The finish is up to the usual WELL-MAYDE standard—a standard which is already famous throughout New Zealand.

The coils are manufactured in various sizes, and in lengths of about 12 inches. Shorter lengths are then cut from these.

Standard parameters are 1b, 2, 2s, 3, and 3s, the spacing being 10, 20, 30, or 40 turns per inch, suitable for 1000, 2000, 3000, or 4000 ohms.

Other sizes could be supplied to order in quantity.

WELL-MAYDE COILS must appeal to all Radio constructors, as much to the amateur as to the manufacturer.



## WELL-MAYDE COILS.

## Showing PRIMARY COIL and

## BASE, WITH TWO EXTRA INTER-

## CHANGEABLE COILS.

## PRIMARY COIL, with Base.

C331 Each ... 11 0

## INTERCHANGEABLE COILS.

C326 A, range 240-650

C327 B, range 168-322

C433 C, range 232-402

C434 D, range 232-59

Other sizes, or quantity order, quoted on application.

## FULL SET—“ALL WAVE.”

This comprises No. C331, with four coils A, B, C, D, and MENTIWAVE PRIMARY COIL, with BASE, and DIAGRAMS.

C456 ... 1 16 0

## WELL-MAYDE “WORLD” S.G. COILS.

Showing construction these are similar to the “ALL-WAVE” COILS, but they are designed to work with a double set of coils, giving 1000, 2000, 3000, or 4000 ohms capacity. It is only by securing a condenser of very low minimum capacity that this range can be obtained readily low.

These short wave coils will be found to give excellent results, provided care is taken in the design of the sets.

## PRIMARY COIL, with Base.

C331 Each ... 11 0

## INTERCHANGEABLE COILS.

C430 J, range 26-57

C431 K, range 24-60

C432 L, range 23-38

C433 M, range 15-26

C451 ... 1 16 0

## FULL SET, “SHORT WAVE.”

Comprising C331, with four coils A, B, C, D, and MENTIWAVE PRIMARY COIL, with BASE, and DIAGRAMS.

C451 ... 1 16 0

## HONEYCOMB COILS.

Excellent assortment of these coils suitable for short wave sets. Each 2s, to 7s, 6ds.

Honeycomb coils, in various sizes from 2s to 7s, are made of well annealed wire, the length of WELL-MAYDE COIL, 11 inch diameter will also suit splendidly. These could be readily adjusted to exact requirements.

## C505 Per set, as illustrated 1-10 0

## HONEYCOMB COILS.

All sizes, 2s, to 7s, 6ds.

1000, 2000, 3000, or 4000 ohms.

Comprising C331, with four coils A, B, C, D, and MENTIWAVE PRIMARY COIL, with BASE, and DIAGRAMS.

C451 ... 1 16 0

## CHOKE COILS BUILT TO ORDER.

## R.F. CHOKES.

Radio frequency chokes are a necessity for short wave work, since practically every circuit employs them.

## HAMMARLUND R.F. CHOKES.

The Hammarlund types are enclosed in beautiful bakelite cases, instructional diagrams being included. They carry 60 milliamperes, have a voltage rating of 1000, and the effective resistance is such as to eliminate resonance bands. Made in two sizes.

## HAMMARLUND 85.



85 Millihenries, capacity 3 mmfd., resistance 215 ohms.  
C343 Each . . . . . 10 0

## HAMMARLUND 250.

250 millihenries, capacity 2 mmfd., 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. Complete with bakelite base, and plated clips.



C419 Each . . . . . 5 0

## DE JUR R.F. CHOKES.

This is the neatest choke we have seen. It is small, containing a ray magnet wire coil, and is entirely protected from moisture by a mahogany mottled bakelite case. Bound to please.



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

## ACME 23.

Used either for impedance amplification which is capable of really excellent results, or for speaker output. It is a full size coil, having a 2 or 3 m.f. condenser, and when fitted, only improves tone and volume. It is used in all types of the speaker windings. Practically all good modern Radios include such a device.

Z223 Acme 22 choke, 200 hz. 18 0  
Condenser to suit, 4 m.f. 5 0

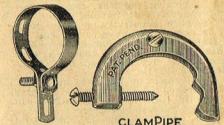
## CHOKE COILS.

## CHOKE FILTERS.

## CLAMPS—EARTH.

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

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



C227 Clampipe . . . . . each 1 0  
A lighter clamp, also adjustable.  
C227 . . . . . 4

## COILS.

## ACE COIL.

The range of this coil is approximately 300-400 metres, with a .0005 condenser. It consists of a bakelite tube, wound with primary, secondary and tertiary, all correctly spaced. Brackets are fitted for base board mounting.

The coil employs a "T" principle for frequency control, this principle being widely used. ACE SETS, as well as many New Zealand RADIO circuits, are of this type

50-100 milliamps, for use with the H.T.1 rectifier, when making an eliminator.

The coil has a voltage range of about 20 volts. Also suitable for eliminators using other rectifiers, such as Raytheon, Radiotron,

etc.

500 W-M H.T.1 choke, 30 henry 35 0

## WELL-MAYDE CHOKES, HT4.

For use with HT3 or HT4 rectifiers.

C548 W-M choke, HT4 . . . . . 30 0

## WELL-MAYDE CHOKES A3.

A

low resistance choke, for use with the type A3 charger (or the A2 rectifier) and transformer, and an electrolytic condenser, to make an "A" eliminator, with output of 6 watts, and an approximate 100 volt. Could also be used with the type A, 3 amp. charger, giving 6 watts, 5 amp. for the valves.

C567 W-M choke A3 . . . . . 1 10 0

## WELL-MAYDE CHOKES A4.

Similar to the A3, for 2 amp. output.

C560 W-M choke, A4 . . . . . 40 0

Full instructions for assembling the ACE KITSET included with each C434 . . . . . 10 0

## PILOT S.W. COILS.

Bakelite coil formers, with loop attached at top, and pins to fit UX valve holders. Used with .00015 condenser.

C536 S-W coil, not wound 6 6

C541 S-W red, 17-30 metres 9 9

C542 S-W orange, 36-52 metres 9 9

C543 S-W yellow, 52-70 metres 9 9

C544 S-W green, 73-292 metres 9 9

C545 S-W blue, 200-500 metres 11 9

C539 Pilot S.G. coils, set of 3 49 6

Six for . . . . . 8

C325 S.W. bakelite tube each 6

Six for . . . . . 8

C538 .00016 . . . . . 10 0

C529 .00025 . . . . . 10 0

C531 .00032 . . . . . 11 6

C531 .00045 . . . . . 11 6

C242 . . . . . 1 5 0

C242 . . . . . 1 5 0

C242 . . . . . 1 5 0

C242 . . . . . 1 5 0

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C242 . . .



## HERTZITE FOR GUARANTEED SATISFACTION.

**"HYDRA" BUFFER CONDENSERS.**  
The Buffer Condenser is a very important part of the eliminator, because it is connected across the full voltage, generated by the transformer. It must be of a high voltage test. The "HYDRA" unit, consisting of two 1 m.f. condensers tested at 1000 vols. D.C., and a battery of 1500 vols. D.C., such a unit can be absolutely relied upon.

C404 Hydra buffer condenser  
unit . . . . . 6 0

## CONDENSER—TRANSMITTING.

The ACME transmitting condenser is built to work at 750 vols.  
C174 3mf. each . . . . . 10 6

## T.C.C. CONDENSERS.

A well-known condenser in a green case, capacity 400, working voltage 250 volts.  
C513 .1 m.f. 2/4 . . . . . C516 1 m.f. 2/1  
C514 .25mf. 3/4 . . . . . C517 .4 m.f. 1/2  
C515 .5 m.f. 2/1 . . . . . C518 .8 m.f. 8/3

**ELECTROLYTIC CONDENSERS.**  
Until the advent of the Electrolytic condenser, it was practically impossible to manufacture condensers of 2000 and 4000 m.f. capacity, and the Electrolytic is the eliminator possible, for large capacity condensers are essential, and the ordinary types are far too heavy.

Suitable for any voltages up to 12. Must be connected correct way, or the condenser will be ruined.  
C511 2000mf. . . . . 1 0 0  
C512 4000mf. . . . . 1 15 0

## MERSION CONDENSERS.

Sofie heating, high voltage, large capacity condensers. These are used in many leading radio sets in U.S.A. because of the much larger measure of "smoothing" in a small space.  
Sample stocks of 32 and 25 mf. types are due to arrive; prices to be fixed later. Other types are made.

## CRYSTALS.

## RED DIAMOND (PERMANENT).

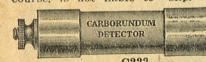
The RED DIAMOND is made from selected materials throughout, the crystal being sensitive practically all over. It can, however, be adjusted if found necessary.



C526 Red Diamond permanent 2 6

## CARBONOIDUM.

Carbonoidum crystal is fairly sensitive, but its chief virtue is that it requires a heavy pressure, which, of course, is not liable to "slip".



C222 Detector only; each . . . . . 7 6  
C301 Stabilizer, with detector 18  
Z136 Battery only; each . . . . . 8

## 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. We HERZITE and RUSSELL'S have taken its place as the best known crystal in the world. RUSSELL'S HERTZITE THE crystal that has been consistently sold for many years, and is still the leader in England, and has been sold in hundreds of thousands have been sold.

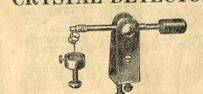


So sure are we that you cannot buy better than RUSSELL'S BLUE HERTZITE, we offer you GUARANTEED SATISFACTION. If you are not satisfied, ask for YOUR MONEY BACK. What could be fairer?

Supplied in the boxes with catcher and tweezers, which make it unnecessary to touch the crystal with the hand.

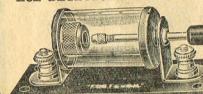
C232 Hertzite—Blue . . . . . 1 0

## CRYSTAL DETECTORS



A well made set of parts for making your own detector. Screws, crystal, and catwhisker included. Nickel plated.  
C291 Without base; each . . . . . 9  
C403 Fortevox, best . . . . . 1 6

## ACE DETECTORS.



As illustrated, this is a fully mounted, highly nickel plated detector. Glass enclosed, to prevent dust and moisture from getting in. It is up with screwed and knurled cap. Catwhisker included.

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

C446 MOUNTED, with crystal 3 0  
C182 . . . . . without crystal 2 6  
C181 PARTS, on card . . . . . 2 0  
D138 . . . . . 3 0

## DIALS.

## K-X PORT VERNIER.



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

The walnut dial is wonderfully beautiful, and matches Fomica wall panel perfectly. The vernier movement is set using this combination makes the average set, no matter what the quality, look very poor in comparison.

D142 4in. black . . . . . 6 6  
D135 4in. walnut . . . . . 6 6

## K-X JUNIOR PORT VERNIER.

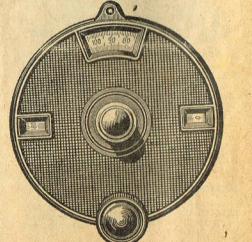
A three-inch edition of the famous PORT VERNIER. Smaller in size, it is a replica of the dial, being of the same design, and will considerably enhance the appearance of any set where compactness is desired. It is of course,

D136 3in. black . . . . . 6 0  
D137 3in. walnut . . . . . 6 0

## ACE VERNIER.

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

D151 . . . . . each 10 6



D152 As illustrated . . . . . 25 0  
D144 EMMCO VELMO DIAL 6 0  
D146 EMMCO BABY VELMO 5 0  
D153 Illuminated . . . . . 28 0

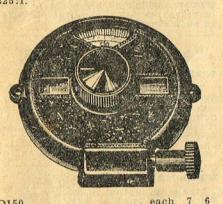
## EASY TERMS ON APPARATUS.

## DE JUR DIAL.

For SHORT WAVE SETS. It is highly desirable to have a dial with a high ratio, as the tuning must be done very quickly. It is also important to be able to turn the knob to the approximate position quickly. Both these features are secured in the dials offered.

## PRECISE.

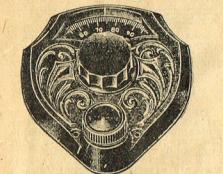
A small dial with worm gearing. Small knob can be instantly moved to leave the dial free to turn easily in an ordinary dial. Ratio about 225:1.



D150 . . . . . each 7 6

## DIALS.

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



D151 . . . . . each 10 6

## ARISTOCRAT.

A vernier dial that looks exactly like an ordinary dial. Vernier is not constant, but ratio is very large, 160:1, hence where very fine tuning is essential, the Aristocrat suits admirably. Black bakelite, 4in. diameter.

D131 Each . . . . . 9 0

Try one of your short wave set or adaptor.

EMMCO VERNIER.

A standard bakelite dial, made in either black or mahogany. State whether wanted with dial marked 0 on left (anti) or on right (clockwise).

D127 Black bakelite; each . . . . . 7 6  
D128 Mahogany . . . . . 7 6

D144 EMMCO VELMO DIAL 6 0

D146 EMMCO BABY VELMO 5 0

D152 As illustrated . . . . . 25 0

D153 Illuminated . . . . . 28 0

Controlled by a knob giving simple but smooth and sensitive action. Will open as many as five condensers.

D152 Black, 1in. . . . . 3 6  
D149 Black, 4in. . . . . 3 6  
D103 Black, 2in. rheostat . . . . . 1 0  
D119 Black, moulded, 4in. . . . . 1 0

See Better Radio  
**Hammarlund**  
PRECISION  
PRODUCTS

It requires only the name HAMMARLUND to stamp an article as "Hammarlund".

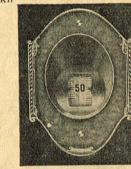
Hammarlund Midline condensers are now matched, and so the resultant loss of efficiency is reduced to a minimum when they are coupled or "ganged" together.

## 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. The driving mechanism has absolutely no backlash, and simply cannot slip.

Can be supplied with black or walnut knur.



D147 Hammarlund single drum dial . . . . . 22 6

## PILOT ILLUMINATED DIAL.

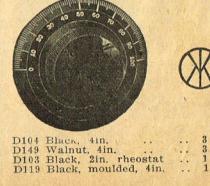
Complete with small light.  
D154 Pilot dial . . . . . 14 3  
D155 Pilot dial, less light . . . . . 11 6

## PILOT DRUM DIAL.

Bakelite drum, cord driven. No backlash, even with heavy condensers.  
D156 Pilot drum, with light 18 0  
D157 Pilot drum, less light . . . . . 15 0  
D158 Pilot drum, . . . . . 6 6

## K-X BAKELITE (ORDINARY).

The finest dials procurable. Beautifully moulded and accurately made. In a value appearance and strength you cannot afford to overlook K-X dials.



## "WELL-MAYDE" ELIMINATORS FULLY GUARANTEED.

### DIALS—

#### MOULDED DIALS.

Although not possessing the superb beauty of K-K dials, these dials are cheap and quite suitable for home constructed Radios. The hole, Magna, 3 in.  $\dots \dots \dots$  9d. Hercules, 2½ in.  $\dots \dots \dots$  6d. Hercules, 2 in. chrome  $\dots \dots \dots$  6d.

#### PILOT DIAL LIGHTS.

Red jewelled, without bulb, but any flashlight bulb can be used. D158 Dial light  $\dots \dots \dots$  2 9

#### DIAL MARKERS.

Nickel plated pointers, fitted with screw and nut.

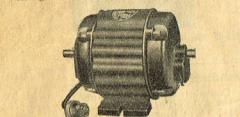
D112  $\dots \dots \dots$  6

#### DYNAMOS.

This dynamo will charge a six-volt accumulator at any rate up to 12 rpm.

In milking sheds, two accumulators will enable you to always have on charge for lighting the shed when wanted, while the other is operating the pump. Little trouble is involved in installing.

No pulley is included owing to different sizes required. Take up the rod, fit the pulley and diameter of your engine flywheel, and we will gladly quote for the pulley. Little, if anything else, is required except a belt.



A188  $\dots \dots \dots$  5 0  
We can frequently quote special prices for dynamos, six-volt and upwards, for lighting purposes, and also for charging Radio "B" batteries. Please, write, stating your requirements.

### EBONITE

Ebonite sheet is stocked in 2/16 thickness only, and any size panel up to 24 inches square. If a panel with a wall is less than 2s, a cutting charge of 3d. per panel is made. Small panels are generally available at greatly reduced prices. It should be noted that Exxon and Formica are superior for use for panels. E124 Ebonite panel  $\dots \dots$  sq. ft. 6 6

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

Bore  $\frac{1}{2}$   $\frac{5}{16}$   $\frac{1}{2}$   $\frac{1}{4}$   $\frac{5}{8}$   $\frac{3}{4}$   
Per ft. 19/16  $\frac{1}{2}$  1/2 1/4 1/2

**ROD**  
Diam.  $\frac{1}{4}$   $\frac{5}{16}$   $\frac{3}{8}$   $\frac{1}{2}$   $\frac{5}{8}$   $\frac{3}{4}$   
Per ft. 4/6  $\frac{7}{8}$   $\frac{1}{2}$  1/2 1/4 1/2

Larger tubes and rods are frequently available.

### ELIMINATORS.

The "A", "B" or "C" batteries of a Radio may be replaced by eliminators, which eliminate the need of having to draw direct from the mains, without batteries at all.

The usual A.C. Radio embodies a power pack, or "B" and "C" eliminator, but mainly a simple form of eliminator is used instead of an "A" eliminator.

If your Radio is now operating on batteries, and getting good results, there is no need to discard it, for by the addition of a suitable "ABC" eliminator, it will convert the Radio into a power pack, perhaps even better than many new Electric Radios do. This assumes, of course, that the eliminator chosen is really high grade.

In an eliminator, a A.C. current first gives a suitable A.C. current, which is passed through a rectifier to change the direct current. Condensers and chokes are used to smooth the D.C. current, and these controls control the output voltages.

Westinghouse are really the best rectifiers and can be used in most cases. Though their first cost is higher, they are permanent, and are the most reliable units, and are the most economical mainly on account of lower first cost. They need periodical replacement. In a few cases, valves are advisable, simply because the Westinghouse rectifiers are not always obtainable in suitable sizes.

"B" eliminators first appeared on the market to reduce the high cost of "B" batteries. "C" eliminators are rarely combined with the "B", but since "C" batteries cost so little, and last so long, it is not always advisable to replace them with an eliminator.

"A" eliminators were not possible until a later period, because suitable condensers were not available, nor were electrostatic condensers effectively solved this problem.

To-day, therefore, "ABC" eliminators are perfectly reliable and wonderfully efficient.

Good battery radios can be brought up to date by their use, and at comparatively small expense.

#### LIBBED TUBE.



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

B128 3in. diam. 6in. long  $\dots \dots \dots$  2 0

B137 1½in. diam. 6in. long  $\dots \dots \dots$  1 9

#### WELL-MAYDE ELIMINATORS.

We have already installed a large number of WELL-MAYDE ELIMINATORS, fitted with the famous Westinghouse rectifiers, which are extremely popular. Customers everywhere have expressed their high delight with the results, and the elimination of the "A" as well as to be indistinguishable from batteries as a general rule, but a very marked increase in "C" is also obtained.

In WELL-MAYDE ELIMINATORS there is nothing to wear out, so they should last without renewals of any kind.

Special eliminators can be built

to order and quotations will be gladly given on receipt of full particulars, which should state number of valves required, and the type of valve in each stage.

#### "A" ELIMINATORS.

##### WE WELL-MAYDE "HALF AMP."

Output 180 volts 30 mils, or 150 watts 50 mils. Following Radios: TUNED VALVE—  
A.C., New Zealand Radio, Screened Grid, etc.

**FOUR VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**FIVE VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**SIX VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**SEVEN VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**EIGHT VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**NINE VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**TEN VALVE**—  
Almond and Roberts, Browning-Drake, Screened Grid, etc.

**ELIMINATOR**—  
Almond and Roberts, Browning-Drake, Screened

## ELIMINATOR KITS.

These kits can be wired together in a few minutes. As there are no more difficult than connecting a set of batteries, in the case of the "A" eliminators.

Details of outputs are the same as for the corresponding WELL-MAYDE "A" ELIMINATORS, and in operating, please note if voltmeter is wired in, and also note that voltmeter is to be used, so that the correct rheostat can be seen. The voltmeter is to be connected in parallel with rheostats on the set itself will do, provided the meter is wired up to the eliminated terminals.

With each kit instructions are given together with the Westinghouse booklet, "THE ALL METAL WAY, 1930", which contains much information.

After much experimenting, however, we have made modifications in our own kits, embodying the circuit which after many trials, we have found most suitable to New Zealand conditions.

## "A" ELIMINATOR KITS

(METERS EXTRA).

## HALF-AMP KIT (E170).

This kit comprises the following apparatus to be wired up on a baseboard. It can be wired up in a few minutes, no soldering being necessary. Supply voltage is on the five valves of the four-volt 1 amp. type. Thus the "A" accumulator can be entirely dispensed with.

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

Meter extra £5 9 6

## ONE-AMP KIT (E171).

As above, but supplying 6 volts at 1 amp. and being suitable for up to 1 1/2 amp. 6 volt valves.

Well-Mayde A3 rectifier 1 10 0  
Westinghouse A3 rectifier 1 8 0  
Two Well-Mayde 1 amp. 6 volt 4 6  
Well-Mayde A3 choke 1 10 0  
Rheostat, baseboard, wire 4 6

Meter extra £6 12 6

In this type the transformer and rectifier may be the TYPE A3 CHARGER, costing £3 10/-, instead of £2 18/- for the first two items above.

## TWO-AMP. KIT (E172).

Well-Mayde A4 transformer 2 5 0  
Westinghouse A4 rectifiers 2 8 0  
Two Well-Mayde 1 amp. 6 volt 4 6  
Well-Mayde A4 choke 2 0 0  
Rheostat, baseboard, etc. 7 0

Meter extra £9 0 0

**METERS**—Although not essential, it is advisable to fit these. A cheap one can be supplied at £1/-. and the current moving coil (recommended) at 28/6.

## "B" ELIMINATOR KITS

## H.T.3 (E176).

Output 120 volts, 20 miliams. Suitable for smaller Radios, but it would probably be better to choose the next larger size, which costs £1.50 more, but is more powerful. Nevertheless, on Radios up to three valves, this eliminator will give a good result.

W.E.11—Mayde transformer H.T.1. . . . . 1 10 0  
Rectifier H.T.2. . . . . 1 10 0  
Well-Mayde choke H.T.4. . . . . 1 10 0  
2 Hydr. 4 m.f. 500 volt condensers. . . . . 15 0  
3 Hydr. 2 m.f. 500 volt condensers. . . . . 12 0  
Well-Mayde resistance, mounted 13 6  
Baseboard, wire, terminals, etc. . . . . 3 0

£6 11 6

## H.T.4 (E177).

Output 150 volts, 50 miliams. Quite a powerful eliminator, especially as it can be relied always to be working at full strength.

Three valves in parallel circuit, with a transformer giving only 125 volts enables a considerably higher output voltage to be obtained.

It is easy to adapt this to give 150 volts as well as 120 volts.

W.E.11—Mayde transformer H.T.4. . . . . 1 10 0  
Rectifier H.T.2. . . . . 1 10 0  
Well-Mayde choke H.T.4. . . . . 1 10 0  
3 Hydr. 4 m.f. 750 volt condensers. . . . . 1 2 6  
3 Hydr. 2 m.f. 500 volt condensers. . . . . 12 0  
Well-Mayde resistance, mounted 13 6  
Baseboard, wire, terminals, etc. . . . . 3 0

£7 19 0

## H.T.1 (E178).

Output 180 volts, 100 miliams. Very powerful, and suitable for 150-170 V.A. sets in power pull in final stage. These give ample undistorted volume for any house, or for a small hall.

W.E.11—Mayde transformer H.T.1. . . . . 1 15 0  
Rectifier H.T.2. . . . . 1 15 0  
Well-Mayde choke H.T.1. . . . . 1 15 0  
2 Hydr. 4 m.f. 750 volt condensers. . . . . 15 0  
3 Hydr. 2 m.f. 500 volt condensers. . . . . 12 0  
Well-Mayde resistance, mounted 13 6  
Baseboard, wire, terminals, etc. . . . . 3 0

£10 3 6

## PILOT POWER PACK, K.112A.

Plate current for a set using up to two 171A valves. Filament output for three 6 volt .25 amp. valves and four 227, and four 230, if not used, five 227. 230 rectifier, 230 rectifier, 230 rectifier.

E188 Power pack K.112A. . . . . 8 0 0

## PILOT POWER PACK, K.112A.

Plate current for up to two 245 valves and current limiting for 245 or seven 227 valves, as well as for two 245 and 230 rectifier.

E188 Power pack K.112A. . . . . 10 12 6

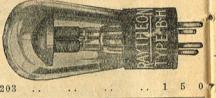
## "ABC" ELIMINATOR KITS.

## "ABC" ELIMINATOR KITS.

Details of these are hardly necessary, as the apparatus used in the "A" and "B" kits, with the addition of one or two extra resistors will give the "C" supply. Circuits can be 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 360 volts, 125 millamps.

RAYTHEON B.H. VALVE. A glass tube with a metal base. The base has three pins labeled "RAYTHEON" and "TYPE BH". The glass tube is labeled "RAYTHEON" and "TYPE BH".

## ENGRAVING MACHINE.

£1 5 0

## B205 . . . . . 1 5 0

## ERINOID.

Erinoid is a bakelite material of peculiar interest to us in New Zealand, as it is a casein product. It is made in rods, in a large variety of sizes and shapes.

It can be easily turned, cut, and polished. It is already used very largely in electrical work, for special knobs, etc. Unexcelled for special knobs.

Erinoid is unaffected by weather, ordinary chemicals, and high temperatures. It is very strong and durable, does not warp or discolour with age. It looks as fresh after years of use as when first made.

It can be easily turned, cut, and can be very easily drilled.

It can be very easily engraved, either in white or gold letters.

There are many other bakelite products, and the company is the acknowledged leader, chosen by the British Government for their work, although the most expensive.

Any size panel up to 60 by 30 cm. can be supplied. Add extra charge for cutting for panels below 28 x 28.

## EXELON TUBE.

Natural brown colour, strong but thin, in great demand for winding all kinds of Radio coils. With the same size of wire as the OUTSIDE DIAMETER of the tube is given.

External diameter, 1 11 13 2 21 21 23 3  
1/9 2/2 2/6 2/6 2/9 3/2 3/3 3/6 3/9

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## GOOD INSULATORS PREVENT ACCIDENTS.

## BEADS.

In places where it is necessary to insulate short flexible wires, the beads are used. They are threaded on the wire, just loosely enough to allow free movement.

INTA-LOCK beads have one end round, the other end being flat, fitting one end into the hole of the other. They allow great freedom of movement, without any risk of the wire breaking. INTA-HEADS are made with plain flat ends.

## INTA-LOCK.

	To fit	per oz	per oz	per oz	per lb
J148	17 S.W.G.	42 in.	1	0	0
J149	16 S.W.G.	32 in.	1	0	0
J150	15 S.W.G.	22 in.	1	0	0
J151	9 S.W.G.	9 in.	1	0	0

## ORDINARY.

	18 S.W.G.	45 in.	6	6	6
J152	16 S.W.G.	32 in.	6	6	6
J153	14 S.W.G.	22 in.	6	6	6
J154	12 S.W.G.	8 in.	6	6	6
J155	10 S.W.G.	9 in.	6	6	6
J156	8 S.W.G.	6 in.	6	6	6

## INSULATING COMPOUNDS.

As a protection from dampness, it is usual to cover the windings of small transformers with a wax or similar compound, taken in the shape of a small, irregular, material, which must have a fairly high melting point, and will run very freely. It should stand any subsequent changes of climate without showing signs of softening.

Caution must be taken in melting these compounds, to see they are not burnt.

## TRANNY WAX.

This fulfills the conditions mentioned above, and will be found entirely suitable for use in this country.

J164 Black . . . . . 1 3

## SABLOON COMPOUND.

A cheaper compound, satisfactory in many cases, especially if it is not so expensive. TRANNY WAX, it is rather more inclined to soften slightly in hot weather.

J165 . . . . . 1 6

## CHATTERTON'S COMPOUND.

The well-known insulating compound.

J166 . . . . . per lb. 4 6

## EMPIRE COUCH.

Used for insulating cores of transformers and armatures, for separating electrical windings, and covering finished coils. 30 in. wide, 1 in. thick. 1 in. 6 6

J159 10/100 in. thick, sq. yd. 4 6

## MICA.

Mica is stocked in two sizes, and the prices are given per inch in thickness. It is the only guide, that can be split to any desired size, or cut smaller, if desired, by the purchaser. 21 in. per inch thick 6 9

M175 4 x 2 in. 15 0

PARAFFIN.

Finished coils are frequently soaked in melted paraffin, to increase insulation, and to prevent action of moisture.

J119 Per lb. . . . . 1 6

## PRESSPAHN.

	sq. ft.				
0.28 in. thick	1	0	0	0	0
1/16 in. thick	1	0	0	0	0
1/8 in. thick	2	0	0	0	0
3/16 in. thick	3	0	0	0	0

## SHELLAC.

Shellac, for making varnish, per packed . . . . . 6

## SAGNETTE.

Sagnette is varnished fabric tubing, which is used for the wires used in building sets and other apparatus, for insulation purposes. It can be supplied in a variety of sizes, and so should be chosen on order. Length is 36 in.

J100 Per 26 in. length . . . . . 6

## SILK.

Silk though expensive is one of the very best insulators. For light insulation, it is invaluable, since it is very thin, thus saving space, yet ensuring perfect insulation. This silk is oiled, and is sold in lengths 3 inches wide, 5 miles thick. It will stand 6500 volts.

J161 Oiled silk, 3in. wide, per yd. 9

## INSULATING TAPE (3in Wide).

Insulating tape is used where electric wiring can be seen. It is made of silk, but the cheaper grade listed will be found to possess the properties of the more expensive tape, at the same price.

Not only can this be supplied in the ordinary black, but also in white, which is far more suitable in many places.

J117 Black . . . . . 2oz. 6

J118 White . . . . . 2oz. 10

J162 White . . . . . 4oz. 1 0

## GLASS.

Similar to Pyrex, but made of ordinary glass. Quite reliable.

J144 Each . . . . . 1 0

## ABRIAL. SHELL.

A super Egyptian cotton tape, 1 in. wide. Used for binding coils of all kinds, and is white. Very strong, and could be used for any purpose in the household, where ordinary white cotton tape of exceptional strength is required.

J132 . . . . . per 12yds. 6

## DYNAMIC TAPE.

Insulating varnishes are used for binding coils of all kinds of electrical coils, mainly in order to prevent electrical short circuits. Some do not hold the wires together, and some do not hold the coils together. In motors, dynamos, magneto, transformers, etc., the wire insulation is very inclined to break down, especially in the moist atmosphere of the Zambesi. By applying proper varnish, the risk is reduced to a minimum.

## SHELLAC.

Shellac varnish, made by dissolving shellac in methylated spirit, serves as a good amateur spirit varnish, especially if instruments are not used on power circuits. It is frequently soaked in melted paraffin, to increase insulation, and to prevent action of moisture.

J120 Per tin . . . . . 1 0

## GOOD INSULATORS PREVENT ACCIDENTS.

For dynamos, motors or transformers, insulating varnishes of the highest grade are strongly advised. It is a golden varnish, which for the amateur has the advantage of drying very quickly. Further, it does not harden, so repairs are possible when it has been used. Dries in about four hours.

J175 Per tin . . . . . 2 0

## AMBERLAC.

For dynamos, motors or transformers, insulating varnishes of the highest grade are strongly advised. It is a golden varnish, which for the amateur has the advantage of drying very quickly. Further, it does not harden, so repairs are possible when it has been used. Dries in about four hours.

J152 Per tin . . . . . 2 0

For winding celluloid coils, the best method is to wind the wire on the celluloid, and then brush on with Celluloid. Then, when the wire is wound securely to the celluloid, without actually less the wire, covered with celluloid cement. Keep well corked.

J146 Per bottle . . . . . 1 6

## CLOUTS.

For leading wires around walls, or along any woodwork.

J117 Set of 2 . . . . . 3d. 2 6

J168 Length 75in. . . . . each 9

## INSULATORS.



## PYREX.

Pyrex glass insulators cost a little more, but they are less affected by moisture and dirt. Used in our best aerial outfalls.

J115 . . . . . 1 6

## GLASS.

Similar to Pyrex, but made of ordinary glass. Quite reliable.

J144 Each . . . . . 1 0

## ABRIAL. SHELL.



## MADE OF BEST PORCELAIN, THESE ARE THE MOST POPULAR INSULATOR ON THE MARKET.

The shell type has a longer life, resistance power than the egg type, and is actually better in use. Sold in three sizes.

J155 Small . . . . . 1 0

J156 Medium . . . . . 1 0

J157 Large . . . . . 1 0

## AERIAL. EGG.



## J122-124 J113-109-112 J114

## JIN. TUBE, KNUBBED NUTS.

J122 6in. . . . . 9 8 6

J123 8in. . . . . 1 0 11 0

J124 12in. . . . . 1 5 15 6

J107 Small . . . . . 1 0 9 7

J128 Medium . . . . . 3 6 37

J108 Large . . . . . 5 6 60

J120 Per tin . . . . . 1 0

## JIN. TUBE, WING NUTS.

J113 6in. . . . . 1 0 11 6

J109 9in. . . . . 1 3 14 0

J112 12in. . . . . 1 6 17 0

J106 Small . . . . . 1 0 11 6

J129 Medium . . . . . 3 6 60

J110 Large . . . . . 5 6 60

J121 Per tin . . . . . 1 0

## JIN. TUBE, LEAD-PROOF LEADIN.

J150 S.C.C. 2 springs . . . . . 2 3

J593 D.C.C. 4 springs . . . . . 2 6

J145 S.C.C. F.C. 3 springs . . . . . 3 0

J504 S.O.C. F.C. 3 springs . . . . . 3 0

J502 S.C.C. 2 springs . . . . . 2 3

J592 D.C.C. 4 springs . . . . . 2 6

J146 S.C.C. F.C. 3 springs . . . . . 3 0

J501 S.O.C. 1 spring . . . . . 2 0

J147 S.C.C. F.C. 3 springs . . . . . 3 0

J148 S.C.C. F.C. 3 springs . . . . . 3 0

J149 S.C.C. F.C. 3 springs . . . . . 3 0

J150 S.C.C. F.C. 3 springs . . . . . 3 0

J151 S.C.C. F.C. 3 springs . . . . . 3 0

J152 S.C.C. F.C. 3 springs . . . . . 3 0

J153 S.C.C. F.C. 3 springs . . . . . 3 0

J154 S.C.C. F.C. 3 springs . . . . . 3 0

J155 S.C.C. F.C. 3 springs . . . . . 3 0

J156 S.C.C. F.C. 3 springs . . . . . 3 0

J157 S.C.C. F.C. 3 springs . . . . . 3 0

J158 S.C.C. F.C. 3 springs . . . . . 3 0

J159 S.C.C. F.C. 3 springs . . . . . 3 0

J160 S.C.C. F.C. 3 springs . . . . . 3 0

J161 S.C.C. F.C. 3 springs . . . . . 3 0

J162 S.C.C. F.C. 3 springs . . . . . 3 0

J163 S.C.C. F.C. 3 springs . . . . . 3 0

J164 S.C.C. F.C. 3 springs . . . . . 3 0

J165 S.C.C. F.C. 3 springs . . . . . 3 0

J166 S.C.C. F.C. 3 springs . . . . . 3 0

J167 S.C.C. F.C. 3 springs . . . . . 3 0

J168 S.C.C. F.C. 3 springs . . . . . 3 0

J169 S.C.C. F.C. 3 springs . . . . . 3 0

J170 S.C.C. F.C. 3 springs . . . . . 3 0

J171 S.C.C. F.C. 3 springs . . . . . 3 0

J172 S.C.C. F.C. 3 springs . . . . . 3 0

J173 S.C.C. F.C. 3 springs . . . . . 3 0

J174 S.C.C. F.C. 3 springs . . . . . 3 0

J175 S.C.C. F.C. 3 springs . . . . . 3 0

J176 S.C.C. F.C. 3 springs . . . . . 3 0

J177 S.C.C. F.C. 3 springs . . . . . 3 0

J178 S.C.C. F.C. 3 springs . . . . . 3 0

J179 S.C.C. F.C. 3 springs . . . . . 3 0

J180 S.C.C. F.C. 3 springs . . . . . 3 0

J181 S.C.C. F.C. 3 springs . . . . . 3 0

J182 S.C.C. F.C. 3 springs . . . . . 3 0

J183 S.C.C. F.C. 3 springs . . . . . 3 0

J184 S.C.C. F.C. 3 springs . . . . . 3 0

J185 S.C.C. F.C. 3 springs . . . . . 3 0

J186 S.C.C. F.C. 3 springs . . . . . 3 0

J187 S.C.C. F.C. 3 springs . . . . . 3 0

J188 S.C.C. F.C. 3 springs . . . . . 3 0

J189 S.C.C. F.C. 3 springs . . . . . 3 0

J190 S.C.C. F.C. 3 springs . . . . . 3 0

J191 S.C.C. F.C. 3 springs . . . . . 3 0

J192 S.C.C. F.C. 3 springs . . . . . 3 0

J193 S.C.C. F.C. 3 springs . . . . . 3 0

J194 S.C.C. F.C. 3 springs . . . . . 3 0

J195 S.C.C. F.C. 3 springs . . . . . 3 0

J196 S.C.C. F.C. 3 springs . . . . . 3 0

J197 S.C.C. F.C. 3 springs . . . . . 3 0

J198 S.C.C. F.C. 3 springs . . . . . 3 0

J199 S.C.C. F.C. 3 springs . . . . . 3 0

J200 S.C.C. F.C. 3 springs . . . . . 3 0

J201 S.C.C. F.C. 3 springs . . . . . 3 0

J202 S.C.C. F.C. 3 springs . . . . . 3 0

J203 S.C.C. F.C. 3 springs . . . . . 3 0

J204 S.C.C. F.C. 3 springs . . . . . 3 0

J205 S.C.C. F.C. 3 springs . . . . . 3 0

J206 S.C.C. F.C. 3 springs . . . . . 3 0

J207 S.C.C. F.C. 3 springs . . . . . 3 0

J208 S.C.C. F.C. 3 springs . . . . . 3 0

J209 S.C.C. F.C. 3 springs . . . . . 3 0

J210 S.C.C. F.C. 3 springs . . . . . 3 0

J211 S.C.C. F.C. 3 springs . . . . . 3 0

J212 S.C.C. F.C. 3 springs . . . . . 3 0

J213 S.C.C. F.C. 3 springs . . . . . 3 0

J214 S.C.C. F.C. 3 springs . . . . . 3 0

J215 S.C.C. F.C. 3 springs . . . . . 3 0

J216 S.C.C. F.C. 3 springs . . . . . 3 0

J217 S.C.C. F.C. 3 springs . . . . . 3 0

J218 S.C.C. F.C. 3 springs . . . . . 3 0

J219 S.C.C. F.C. 3 springs . . . . . 3 0

J220 S.C.C. F.C. 3 springs . . . . . 3 0

J221 S.C.C. F.C. 3 springs . . . . . 3 0

J222 S.C.C. F.C. 3 springs . . . . . 3 0

J223 S.C.C. F.C. 3 springs . . . . . 3 0

J224 S.C.C. F.C. 3 springs . . . . . 3 0

J225 S.C.C. F.C. 3 springs . . . . . 3 0

J226 S.C.C. F.C. 3 springs . . . . . 3 0

J227 S.C.C. F.C. 3 springs . . . . . 3 0

J228 S.C.C. F.C. 3 springs . . . . . 3 0

J229 S.C.C. F.C. 3 springs . . . . . 3 0

J230 S.C.C. F.C. 3 springs . . . . . 3 0

J231 S.C.C. F.C. 3 springs . . . . . 3 0

J232 S.C.C. F.C. 3 springs . . . . . 3 0

J233 S.C.C. F.C. 3 springs . . . . . 3 0

J234 S.C.C. F.C. 3 springs . . . . . 3 0

J235 S.C.C. F.C. 3 springs . . . . . 3 0

J236 S.C.C. F.C. 3 springs . . . . .

## LEARN MORSE CODE.

## KEYS (Telegraph).

The ALEX 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.



K144 Key and buzzer	14	6
K116 Key only	10	0
K140 Heavy brass transmitting	24	0
K141 Heavy, Brown, aeroplane	33	0

## KNOBS.

## ARROW KNOBS.

High quality bakelite, K-K knobs. The arrow is deeply engraved and plainly marked.

Made in two sizes, both for 1/4 in. shafts, with set screws.



K129	K107
K127 1 1/4 in. diam., black; ea.	10
K128 1 1/4 in. diam., walnut, ea	10
K119 1 1/4 in. diam., black, ea	10
K126 1 1/4 in. diam., walnut, ea	10

## MOULDED ARROW KNOB.

The arrow is a raised moulding on this knob, 1/4 in. shaft. Diameter 1 1/4 in. Cheap but good. K132 Black 6

## FEUILLÉ DE LIS KNOBS.

A new style of knob, as illustration. Made by K.K. For 1/4 in. shaft.

K129 Black	10
K130 Walnut	10

## POINTER KNOBS.

Made of highly polished bakelite by K.K. The marking is distinct. Shaft 1/4 in.



K129 3 1/4 in. circle, black	2	0
K125 3 1/4 in. circle, walnut	2	0
K123 2 1/2 in. circle, black	1	6
K131 2 1/2 in. circle, walnut	1	6

## LOUD SPEAKERS.

## HORN 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, although it is usually the most expensive.

CONE SPEAKERS are now fitted with much improved mechanism, the comes themselves being much more reliable than formerly. Good reliable units are now obtainable, though these speakers will not, of course, operate on the most powerful RADIOS, with the result of distortion and noise.

HORN SPEAKERS are still the best, for smaller RADIOS, because, being more sensitive, they enable the receiver to bring in more stations at a lower volume.

For speech, they usually exceed all other speakers.

In general, buy a DYNAMIC SPEAKER if your set is powerful, and you will have current in the house, or can get your "A" battery charged very easily.

If your set is powerful, but batteries are not readily charged, a good cone speaker may be the answer for these smaller RADIOS, the horn speaker will probably give the best satisfaction.

## N. AND K. SPECIAL.



An entirely new speaker. Just arrived from the old design house, now being offered by bargain houses everywhere. It is the same size as the SENIOR, but the tone will be identical, cabinet and horn shape. It differs only in that the tone arm is made of piano wire.

Some speakers are quite equal to the SENIOR—itself rarely surpassed even by speakers costing twice as much. The tone arm, however, is, of course, more robust.

When you realize that the SPECIAL N. and K. is easily giving more for less, you will have summed up its wonderful merits.

L263 N. and K. Special 2 2 0 TERMS: 5/-, balance eight payments of 6/- each

BUY  
JENSEN DYNAMICS.

## HORN SPEAKERS.

## N. AND K. SENIOR.

Horn speakers supply the happy medium between size and cost, and low price, and are quoted as being with the ordinary sets.

Our final selection of a horn speaker is that which comes on the score of excellent tone qualities, accuracy of construction, freedom from noise, and right prices, and yet at a reasonable price, has fallen on the N. and K. To hear it is—*to believe it*. The speaker and speaker unit incorporated—is to be convinced of its superiority. It is equal to, if not better than, most speakers at twice the price.

Best of all, it is sold with an absolute guarantee for one year, a guarantee given by the U.D.C. who will immediately replace or renew any part becoming defective through ordinary use.

No expensive repairs—no anxiety—when you buy N. and K.



The horn of the N. and K. speaker, having the usual flared shape, is quite long, and it is to this approximation to an exponential horn that the speaker owes its outstanding success.

The speaker is remarkably compact.

L210 N. and K. Senior 3 3 0

## THREADED.

The following knobs will fit 8/32 American screwed rods, and so are very useful for tickler and other controls.



K106 1 1/4 in. diameter; each	9
K107 1 1/4 in. diameter; each	6
K115 2 1/2 in. diameter, similar K107, 2 B.A. thread; each	6

## BROWN COILS (all patterns).

Per set, 8s. Fitting, 2s. per set extra.

## WELL-MAYDE SPEAKERS FOR TONE.

## WELL-MAYDE "SUPERB."

The dimension is very light, being made of the thinnest aluminum, so that the speaker is extraordinarily sensitive. Can be thoroughly recommended to those who cannot use dynamic, and especially to those who operate battery RADIOS.

Butiful as a speaker may be, however, it is by its reproductive qualities that it must be judged. The speaker of the WELL-MAYDE is so marked that we welcome any comparison with any other speaker in the field of electric speakers.

The WELL-MAYDE brings out the bass notes that other speakers (excluding dynamics) usually suppress, but it does not do so with the distortion which causes the higher notes to be lost. In fact, it reproduces with a delightful balance over a wide scale range.

Guaranteed, of course.



L109 Brown Sovereign 5 10 0  
COILS, diaphragms, etc., for all BROWN SPEAKERS carried in stock.



L236 W-M Superb 6 0 9

## EXPONENTIAL HORN SPEAKERS.

Next to the MOVING COIL SPEAKER in order of merit is this EXPONENTIAL HORN. These are designed so that the aperture area increases at a certain proportion as the distance from the horn to the horn being about six feet long, at least. In order to save space, the speaker is usually curved in some way, and the whole enclosed in a cabinet.

With exponential horns, a loud speaker is not required. The purpose of the horn is to bring out the lower musical notes which are lost on a shorter horn not conforming to the exponential principle.

## POWER SPEAKER (EXPONENTIAL).

Consists of a solid cast aluminum horn, 48 in. long, made in two pieces and able to stand hard usage without damage. A bracket is included for attaching to a wall or floor. The speaker unit is specially chosen for its power and clarity. The ideal speaker for indoor and outdoor use, for indoor work in large halls, no trouble is required to operate it.

L263 Aluminium horn (no power unit) 12 10 0  
L264 Power unit for above 3 10 0

## N. AND K. CONE.

A very small and neat cone speaker, with the famous N. and K. polarised unit. The attractive case and cabinet are exceptionally good. Like all N. and K. apparatus, the price is astonishingly low.



L207 PCJJ 5 10 0  
L256 CJJJ Junior 4 10 0  
L257 Baby Grand 3 10 0

L259

## MOVING COIL SPEAKERS.

Moving coil, or dynamic speakers, as they are usually called, are used in most RADIOS and are beginning to come into prominence until recently, chiefly because it required the moderate power and adequate power, to operate them successfully.

Compared with ordinary speakers, the dynamic handles enormous volume, and gives no feeling of strain, such as is usually experienced with other speakers. Further, it gives the base notes which are almost entirely lost in the ordinary speaker, and also, incidentally, in the ordinary gramophone—their true value, making the tone marvellously rich, rich.

If more power were necessary of the unit, the speaker is the DYNAMIC, nevertheless will greatly add to the enjoyment from RADIOS of four valves and upwards, provided that power valves and adequate "B" current is used.

There are several limitations on the use of dynamics, being of a practical nature, concerning the baffle supply.

Dynamics may not be practicable with RADIOS where there is no electric dry battery, and it is furnished by the modern RADIOS and electric gramophones, all of which use dynamics.

There are several limitations on the use of dynamics, being of a practical nature, concerning the baffle supply.

JENSEN SPEAKERS USE ONLY 4 AMPS., thus being the lowest consumption speakers yet made. Thus, JENSENS are possible on account of their economy, where other speakers would be too extravagant on current.

ACTION.

In a moving coil speaker, very strong magnet poles are required, and the speaker is usually secured by passing direct current into a special electric magnet, which is then connected in direct (the field) current, usually derived:

1. From a six volt accumulator, using up to 1 amp.
2. From the D.C. mains, 110 or 220 volts.

3. From the A.C. mains, the current being rectified before passing to the coil.

4. From the "B" supply of the Radio or amplifier itself, in which case the speaker core serves as a choke, the current being less to be included in the amplifier.

The field current is kept on all the time, and is only removed when the speaker is not in use.

Actually, fitting between the poles of the field magnet, is a light coil, which, when the current (or even one turn), commutes, indirectly through a transformer included with the speaker, to the speaker terminals or jack of the set.

## JENSEN—EVEN SCALE PRODUCTION.

This coil moves in sympathy with the broadcast music or voice, yet with a very powerful vibration capable of producing great volume. The coil is never bent or more without touching anything, hence the moving coil speaker will not blast. This is the main secret of the speaker.

The coil is in turn attached to a cone, which is made of leather, it is, of course, the cone which actually imparts the vibration to the air, and produces the music.

MOVING COIL SPEAKERS are very strongly built. There is no reason why they should not stand for the fine wire coils of the ordinary speakers are replaced everywhere by heavy wires.

## MOVING COIL UNITS.

The working part is solid without cabinet when desired, and it can be shipped into the cabinet of his own set, or, perhaps, better still, if possible, into the wall of the room which would give the best results of all.

Otherwise the unit may be housed in a strong box, or in two pieces (say, 1 ft. x 3 ft. at least) of thick plywood. It is necessary to make the air path from front to back as the speaker cannot be at 24 or 3 feet the sound is lost.

The speakers are, of course, supplied complete in handsome cabinets.

## N. AND K. DYNAMIC.

Apparently the only dynamic in New Zealand made to world standards on the 32-volt battery system that are quite common. It is merely connected to a light or power point. For reading, etc., it is as good as unassisted, while it possesses ample volume, even for a hall.

N. and K. Dynamic, 32-volt 6 17 6

## MAGNAVOX MOVING COIL SPEAKERS.

The speakers are supplied in two sizes, 7-inch and the new Concert 10-inch, indicated by the letter "a".

## MAGNAVOX D-6.

Field coil 8.5 ohms, taking 7 amps. on 6 volt. accumulator, or will work from a N. and K. 1 amp. charger. L223 D-6 Unit . . . . . 6 17 6 L223 D-6a Concert Unit . . . . . 7 10 6

## MAGNAVOX D-7.

Field coil 2000 ohms, for working from D.C. mains, 110 to 180 volts. L224 D-7 Unit . . . . . 6 17 6 L227 D-7a Concert Unit . . . . . 7 10 6

## MAGNAVOX D-9.

Field coil 7500 ohms, for working on the plate current of the amplifier. L230 D-9 Unit . . . . . 6 17 6 L273 D-9a Concert Unit . . . . . 7 10 6

## MAGNAVOX D-90.

Works direct from the 220 volt A.C. mains. L226 D-80 Unit . . . . . 10 0 0 L229 D-80a Concert Unit . . . . . 10 12 6

JENSEN DYNAMICS do not over-emphasise the **LOW** at the expense of the **HIGH** notes.

## JENSEN

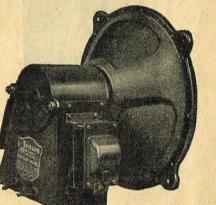
## NU-CORE DYNAMICS.

Last season we introduced the NEWCOMBE-HAWLEY DYNAMIC to New Zealand. It is a moving coil speaker, and was placed mainly because they were then the dynamic recommended by the Newcombe-Hawley company. The Newcombe-Hawley speaker has been discontinued. It was certainly the finest dynamic sold in this country last year.

We have again this season, however, followed the lead set by Hammarlund, and the recommendations for the fine wire coils of the ordinary speakers are replaced everywhere by heavy wires.

IT'S GOOD ENOUGH FOR HAMMARLUND, IT'S GOOD ENOUGH FOR A KING.

Consequently, we make no apology for introducing the JENSEN TO NEW ZEALANDERS.



## JENSEN NU-CORE.

It is well known that special alloys are more magnetic than others. Thus NU-CORE, universal in the U.S.A., has been specially made for the purpose, because a core made from it can be rendered more magnetically magnetic than other materials.

The special NU-CORE used in the JENSEN speaker is specially treated to allow for its competitiveness. You have merely to hear its performance, and compare it with other dynamics to prove its worth. The JENSEN is further proof in availability—JENSEN six volt speakers USE ONLY 4 AMPFS FOR THE D-6, D-7, D-9, D-90, and D-90a, use 7 amps. or more. Economy is gained, with better actual performance.

Do not think that because JENSEN DYNAMICS are cheaper than others, that the quality is necessarily inferior. We willingly refer you to any American catalogue, where you will see that all well-known dynamics sell for the same price.

But, if further proof is necessary, BUY JENSEN AND TRY IT. WE will refund your purchase price if you are not satisfied.

## JENSEN MODELS.

These are of three types, the STANDARD with 7-inch cone, CONCERT with 10-inch cone and AUDITORIUM with 12-inch cone.

Since the STANDARD 7 INCH DYNAMIC costs the same as the 10-inch type, we are concentrating on the 7-inch, but will always endeavour to supply the former where specially required.

## JENSEN CONCERT DYNAMICS.

All JENSEN CONCERT DYNAMICS are specially fitted with ordinary input transformers, as with other dynamics. For 55s. extra, however, a push pull transformer of these units fitted, rendering the use of these units necessary when building an amplifier or receiver. This means that the JENSEN DYNAMIC without coils, etc., can be built up to cut factors to suit the special requirements of the New Zealand market.

By thus cutting down the various losses, the output is considerably increased—otherwise we could never offer JENSEN QUALITY at such a low price.

As an example of the enterprise of our factory, on hearing that the orders for our radio receiver, so widely used in U.S.A. had been declared an infringement on the Westinghouse patents, under which we are licensed, we made arrangements to manufacture this part of the A.C. speakers here.

Presently, we offer JENSEN DYNAMICS to work from 220 volt A.C. mains, fitted with the ENGLISH WESTINGHOUSE RECTIFIER, and a transformer which we can absolutely guarantee.

## JENSEN 12-inch AUDITORIUM DYNAMIC.

Similar to the D-6 unit, but fitted with WESTINGHOUSE METAL RECTIFIER, to operate on 220 volts A.C. The most permanent rectifier ever made.

L275 Jensen D-80 Concert Unit . . . . . 10 0 0

## ALL DYNAMICS ON

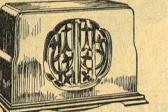
## EASY TERMS.

## N. AND K.—PRACTICALLY EVERLASTING.

## SPEAKER CABINETS.

Fitting is free, when both cabinet and speaker units are ordered.

Speaker units must be used in a cabinet, or on a large baffle board, or they will sound very poor indeed.



These cabinets are specially designed to enable speakers and cone speakers to operate at their best.

## WELL-MADE "SOVEREIGN."

Handsomerly finished and polished in a dark wood. Suitable for 10-inch Concert Dynamics, but could be used with cone units like the Blue Spot, Brown, etc.

L231 Sovereign cabinet . . . . . 3 10 0

## WELL-MADE "MONARCH."

A less expensive unit, but strongly made, suitable for dynamic and cone speakers. No wood grain, but it is made to make this cabinet the best at the price, and it is certain to give satisfaction. For 10-in. speaker.

L232 Monarch cabinet . . . . . 2 12 6

## WELL-MADE "WONDER."

A lighter cabinet, suitable for cone speakers. It is made for dynamics. Nicely polished and finished. Will fit such units as Blue Spot, Brown, etc. For 10-inch cone.

L233 Wonder cabinet . . . . . 2 5 0

## MAGNAVOX CABINETS and SCREENS.



L239 Carlton . . . . . 5 15 0  
L234 Belvedere . . . . . 5 15 0  
L255 Belvedere floor screen . . . . . 2 17 6

## BROWN DIAPHRAGMS.

These are aluminium, very light and fragile.

L115 Junior . . . . . 5 0 0  
L118 Other speakers . . . . . 5 0 0

Fitting and adjustment extra.

## LOUD SPEAKER MATS.

Sponge rubber mats, on which speaker is placed. Eliminates tendency of speaker to howl due to microphone action.

L212 . . . . . 3 0 0

## SPEAKER UNITS.

## SPEAKER UNITS.

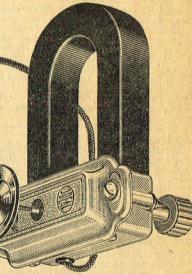
By using a speaker unit with a horn, using a speaker and speaker cabinet, it is possible to have a speaker unit which is not only good in sound, but is constructed with the utmost precision, but with a very thin speaker.

This unit finds many favour with constructors of cone speakers, or thin diaphragm speakers. In fact, it is almost impossible to speak of this purpose by local journals.

## BLUE SPOT SPEAKER UNIT.

The Blue Spot unit is a New Zealand reputation in a short time, though it is great popularity in England, and it is known that this would be so. It is constructed not only with utmost precision, but with a very thin speaker.

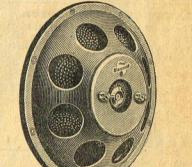
This unit finds many favour with constructors of cone speakers, or thin diaphragm speakers. In fact, it is almost impossible to speak of this purpose by local journals.



## BLUE SPOT CHASSIS.

This consists of a cone ready mounted in a metal frame, to which a Blue Spot unit is attached. It takes a minute or two. A very fine speaker is the result, which can be used as a speaker, or in a special cabinet, or in the Radio chassis cabinet.

Remember, you buy a fine output fit in the BLUE SPOT.



## L267 Blue Spot chassis . . . . . 20 0

## CONTINENTAL CONE UNIT.

To fill the demand for a very cheap unit, we are offering the Continental. It is not to be gauged by its price, for its quality is excellent. It is supplied with a long tongue, and also with the small conical metal clips for attaching to the speaker itself, enabling home-made cones to be fitted with the utmost simplicity.

L247 Continental unit . . . . . 15 0

## ALL SPEAKERS REPAIRED.

### N. AND E. FARREND INDUCTOR.

Recently, there was invented in U.S.A. an entirely new type of speaker, in which the armature is "floated" between two pairs of magnets. Like the dynamic speaker, a very great movement of the armature can take place without touching the magnets. The claim is that this type of speaker is equal to the dynamic in results. It uses a permanent magnet, and an external source is required to operate it. THIS IS A DECIDED ADVANTAGE.

At the moment of going to press, samples have not arrived, so we cannot speak from actual test. N. and E. Farrend can be relied upon to supply a very fine product, and if, as we anticipate, the INDUCTOR SPEAKER is a success, it will be highly good, supplies will be immediately cabled for.

The speaker will include cone and chassis, ready for mounting in a cabinet, and will be about £5.

### ORMOND CONE UNIT.

A British unit, adjustable, which can be bought with its own cone and chassis. Will make an excellent speaker.

L289 Ormond unit only ... 18 0  
L291 Ormond chassis with cone ... 12 0  
L291 Ormond unit and chassis ... 30 0

### LOUD SPEAKER CORDS.

Speaker cords are made in pairs, braided together. The wires must be very flexible to stand constant vibration without breaking.

### SPEAKER CORDS—2 PINS, 2 EYES.

These are made for direct attachment to the speaker, since most speakers have two pins and two eyes, in which the eyes are fitted. The two pins then suit the phone plug or terminal on the set.

T247 6ft. ... 1 6  
T249 10ft. ... 2 0  
T250 25ft. ... 3 6  
T251 50ft. ... 6 0

### SPEAKER CORD CONNECTOR.

These little connectors enable two speaker cords to be joined together instantly. Bakelite, light, neat and strong.



L214 Connector ... 1 3

### CONE PAPER.

In this country it is generally difficult to get suitable material for experiments, so the reason we have imported special sheets of paper as used by the manufacturers of speakers. It is very difficult to use either on your experimental speaker or to renew the cone on your old speaker.

Packing L249 11x35in. ... 2 0 1 0  
L250 18x35in. approx. ... 6 0

Packing charge is made because special wood crates must be used to ensure safe delivery. Any number of sheets can be had in the one package for the charge named.

### POWER UNIT (See Page 37). L264 For exponential horns 3 10 0

### SPAKER EXTENSION CORDS—Plugs.

Although four pins cords will fit direct to some speakers, they are generally used for extending the cable to a speaker, or cords, when desired to use the speaker at some distance from the set.

On all except the six foot cord, connectors are supplied, ready for instant attachment.

The speaker will include cone and chassis, ready for mounting in a cabinet, and will be about £5.

T230	6ft. (no connector)	1	6
T248	10ft., with connector	3	3
T250	25ft., with connector	5	6
T251	50ft., with connector	7	6
T252	100ft., with connector	12	0

Less connector, is deducted.

### TAKE ADVANTAGE

OF OUR

### EASY TERMS

ON

### ALL APPARATUS.

### MR. T. H. Harte, Stephen's Island, writes.

I have much pleasure in advising you that the Radio parts arrived here in excellent condition and the results are splendid.

The instructions were most explicit, and no difficulty was experienced in assembly. Having had over twelve years' experience as a Radio operator, I extend to you my congratulations on the purchase of the speaker, a set of reasonable price, giving a performance equal to any receiver I have heard or used irrespective of cost.

**DIAPHRAGMS—See Telephones.**

### SPEAKER COILS.

We carry a very large range of assorted bobbins for speakers and telephones, and are ready for fitting.

The speaker coils are made so it is burr out and ask us to quote for fitting it with new coils, and making it as good as new again.

### DIAPHRAGMS—See Telephones.

### SPEAKER FILTERS.

WELL-MAYDE. See also output transformers.

These are becoming more and more popular for modern Radio sets. Not only do they use improve the tone of the whole installation, but also reduce the strain of the speaker from the overload strain of too much current.

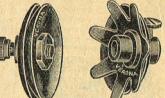
This is a very good present.

Capacity effects are all greatly reduced.

The Well-Mayde filter is supplied with a cord to connect the set with the speaker coil itself, connected to the filter. These connections are made in two or three seconds.

### SPEAKER CONE WASHERS.

Small coned washers, to fit speaker units to their cones. Chuck attachment.



L270 Circular pattern ... 1 6

L271 Star pattern ... 1 6

### SPEAKER SPARES.

We carry spares for all speakers recommended in this list, and can quote for any repairs, in which we can claim experience extending right from 1926.

While it is not always possible to repair speakers other than those listed, we will do our best. If repairs are possible, JOHNS LTD. can do them.

With all apparatus, the question of repairs, should they ever be necessary, is one well worthy of deep thought.

Diaphragms and coils can be supplied in many other sizes—quoting prices on application. We will send the defective part, or, failing this, full measurements, etc.

### SPEAKER COILS.

We carry a very large range of assorted bobbins for speakers and telephones, and are ready for fitting.

### DIAPHRAGMS—See Telephones.

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This is a very good present.

Capacity effects are all greatly reduced.

The Well-Mayde filter is supplied with a cord to connect the set with the speaker coil itself, connected to the filter. These connections are made in two or three seconds.

### L252 Well-Mayde speaker filter ... 1 10 0

### PILOT SPEAKER FILTER.

Similar to Well-Mayde.

Pilot speaker filter ... 1 6

L254 Well-Mayde speaker filter ... 1 10 0

L255 Well-Mayde speaker filter ... 1 10 0

L256 Well-Mayde speaker filter ... 1 10 0

L257 Well-Mayde speaker filter ... 1 10 0

L258 Well-Mayde speaker filter ... 1 10 0

L259 Well-Mayde speaker filter ... 1 10 0

L260 Well-Mayde speaker filter ... 1 10 0

L261 Well-Mayde speaker filter ... 1 10 0

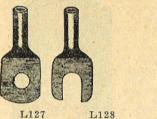
L262 Well-Mayde speaker filter ... 1 10 0

L263 Well-Mayde speaker filter ... 1 10 0

L264 Well-Mayde speaker filter ... 1 10 0

## MASTS ERECTED CORRECTLY.

### PLATED.



L127 ... ea. ... 3d. ... 2 6  
L128 ... ea. ... 3d. ... 2 6  
L133 Phone tips ... 1 6 5 0

### TINNED.



L131 8 holes ... 3 2 6  
L169 8 hole, as L131 ... 3 2 6  
L170 10 hole, as L131 ... 6 5 0  
L129 No. 8 hole, as L131 ... 3 2 6  
L167 6 hole, double ... 6 5 0  
L132 8 hole ... 3 2 6

### PINTERS FOR TERMITS.



L166 No. 8 hole ... 6 6 5 0  
L166 8 ... 6 6 5 0

### PLATED.



L165 ... ea. ... 3d. ... 6 5 0  
L166 ... ea. ... 6 6 5 0

### HEAVY COPPER (Plated).



L191 Fork, 1in., 5/32 hole ... 6 6 5 0  
L192 Loop ... 6 6 6 0  
L193 Fork, 2in., 3/16 ... 8 7 6 0  
L194 Fork, 2in., 1/4 ... 8 7 6 0  
L195 Fork, 1in., 1in. ... 10 9 6 0  
L196 Loop ... 10 9 6 0

### HEAVY COPPER (Tinned).



L197 Fork, 2in., 3/16 ... 8 7 6 0  
L198 Loop ... 8 7 6 0  
L199 Side Loop ... 8 7 6 0  
L200 Fork, 1in., 5/16 ... 1 0 10 6 0  
L201 Loop ... 1 0 10 6 0

### MAST CABLE.

Cable for hauling aerial into place may be rope, but this will probably rot a great deal, so it is necessary to lower the mast to replace it. The galvanised cable listed here is very strong, overhauled with a pulley, and will last many years.

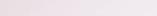
It is formed of 49 very thin steel strands, which will run freely over the smallest pulley.

Although rather expensive, its advantages are well worth the price. Any length can be cut to order, as it is too valuable to sell in standard lengths, with resultant waste.

W113 Steel cable, per 100ft. 12 0

### GUY WIRE—See under WIRE.

### FUZZIES.



M164 Cleats, galvanised ... 6 M102 Pulleys, galvanised ... 10

### MAST CLEATS.



M164 Cleats, galvanised ... 6

### M102 PULLEYS.



M102 Pulleys, galvanised ... 10

### MASTS AND FITTINGS

#### LAKE MASTS.

A complete mast at a low price. Lengths can be easily cut.

M152 26ft. ... Complete ... 24 0  
M153 30ft. ... Complete ... 30 0  
M154 34ft. ... Complete ... 37 0

#### GALVANISED MASTS.

Heights given are approximate, depending on the lengths of pipes available.

NOTE.—These masts are supplied in sections and must be assembled into one mast. The usual fittings, such as base, strong mast stays, mast bands, pulley, and cleat.

PRICES for single masts, not FAIRS.

M155 10ft. high, 2 sets guys ... 5 0  
M156 14ft. high, 2 sets guys ... 5 0  
M161 40ft. high, 2 sets guys ... 22 0  
M162 50ft. high, 3 sets guys ... 6 0

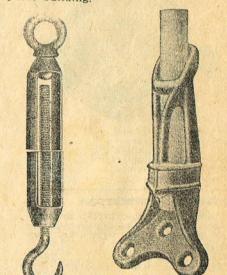
#### MAST BANDS—GALVANISED.

Made with three eyes, for three sizes of masts.

M180 13in. hole ... 1 6 0  
M181 20in. hole ... 2 2 0  
M184 23in. hole ... 2 2 0  
M185 3in. hole ... 3 0 0

#### STRAINERS—SOCKETS (Galv.).

STRAINERS are used to adjust the tension of guy wires, these being required for each wire. The illustration shows the small galvanised strainers, which can also supply aero-plane strainers, made of very hard bar steel. Although not galvanised, they may be very strong strainers, either for Radio work or in aero-plane building.



#### SOCKETS (Galvanised).

The galvanised socket is set into the outer wall, and hold a wood rod to support the down lead can be attached to the wall clear of the eaves, spouting, etc.

M104 For 3in. rod ... 1 6  
M163 For 1in. rod ... 2 6

## METERS (Electrical).

For accurate measurements, moving coil or other high-priced meters are essential. For general use, however, where exactness is of no great consequence, moving iron meters will serve admirably.

We have in our LABORATORY an extensive line of selection of accurate meters, including a MICRO-A.METER, which measures the current of an antenna. These meters are for testing and calibrating your instruments. Cost will depend on the accuracy required.

## MOVING COIL METERS.

Where accuracy is desired, or when using meters with a very current consumption are necessary, MOVING COIL meters are the usual type. Such meters are made especially to be used in a high-class meter.

In CRESCENT MOVING COIL METERS, however, a high degree of accuracy is attained, together with a fine appearance, with a current consumption much less than has previously been possible in a high-class meter.

## CRESCEMET MILLIAMMETERS.

The body fits a 1½ in. hole in the panel, and is nickel plated, and highly polished. Easy fitting clamp and an indicator pin is provided. A knife edge for accurate reading. A precision instrument, comparing very favourably with the best known makes, costing far more.



M181	0-5	milliamps	..	23	6
M182	0-25	milliamps	..	23	6
M183	0-100	milliamps	..	23	6
M184	0-100	milliamps	..	23	6
M185	0-300	milliamps	..	23	6
M186	0-1.5	amps	..	23	6

## CRESCENT VOLTMETERS.

These are similar to the milliammeters. The current consumption is very low, while the meters are very accurate.

M187	0-6	volts	..	28	6
M188	0-6/120	volts (double)	..	32	6
M189	0-7/150	volts (double)	..	32	6

## FERRANTI METRES.

All high-grade moving coil instruments, of unchallenged precision. Either flush or projecting.

M220	15, 50, 150	milliamps,	..	17	6
M221	1.5, 15	volts	.. each	17	6
M222	150, 250	volts (1000 ohms per volt)	.. each	3	0
M223	2.5	milliamperes	.. each	2	12

M224	2	milliamperes for milliammeters	.. each	1	0
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## VERTICAL METERES.



These have a vertical scale and a switch, and fit an oblong hole cut in the panel. Two switches are provided, so that readings can be taken only when a switch is pressed. Thus no current passes through the meter, except when a test is being made.

## MOVING IRON METERES.

Panel meters, of small size, nickel plated, and very neat.

A good range of readings is given, but it is only possible to supply a meter to give any reading desired.

The motor car types read both charge and discharge.

M120 0-200 millamps .. 12 6

M121 0-200 millamps .. 12 6

M122 0-6 amps .. 12 6

M123 0-10 amps .. 12 6

M124 20-6000 millamps .. 12 6

M126 0-6 volts .. 12 6

M127 0-12/150 volts (double) 15 0

M128 0-12/240 volts (double) 15 0

## CRESCEMET MULTIMETERS.

These particularly have meters consist of a CRESCEMET METER, mounted in a case, and adapted to give the following readings merely by inserting a plug into the meter socket. It serves for measuring both "A" and "B" currents in the ordinary sense, and even resistance should have one. Nothing like it has ever been offered before, even at double the price.

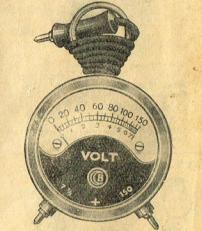
In addition to measuring volts and millamps, the meter will read ohms if the meter is connected to a suitable battery. Full instructions attached to each. Resistance is 250 ohms per volt.

Volt readings 0-10 and 0-200. Millamp readings 0-10, 0-100, and 0-1000. Ohms 0-100,000.

## POCKET METERS.

## CRESCEMET.

The ordinary pocket type of meter is very cheaply made, but here is something much better than the ordinary. It is both accurate and accurate. Knife edge pointer. Resistance is no less than 15,000 ohms, which is several times higher than in most pocket meters.



M196 0-150 volts .. 10 6

M197 073/150 volts (double) 12 0

## BEDE METERS (Pocket).

An inexpensive line of meters, sufficient accurate for many testing purposes.

M128	0-50	volts	..	6	0
M129	0-50	volts	.. 0-50	amps	.. 6

## A.C. VOLTMETER—250 Volts.

An inexpensive A.C. voltmeter for checking the voltage of your mains. You can also use it for a voltage reading from 250 volts, up or down. High voltage means short valve life.

M235	250	A.C. voltmeter	.. each	9	0
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Similar in appearance to the Crescemet.

M199 0-6/120 volts .. 9 0

## DUPLEX.

A cheap double range pocket voltmeter which will suit most users of sets who merely wish to check their batteries from time to time. A 12 volt battery will not afford such a meter. Never any doubt about "B" batteries—merely test them. It takes only a few seconds.

M200	0-150	volts	..	10	6
M201	073/150	volts (double)	..	12	0

## FERRANTI METRES.

All high-grade moving coil instruments, of unchallenged precision. Either flush or projecting.

M220	15, 50, 150	milliamps,	..	17	6
M221	1.5, 15	volts	.. each	17	6
M222	150, 250	volts (1000 ohms per volt)	.. each	3	0
M223	2.5	milliamperes	.. each	2	12

M224	2	milliamperes for milliammeters	.. each	1	0
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## A.C. VOLTMETER—250 Volts.

An inexpensive A.C. voltmeter for checking the voltage of your mains. You can also use it for a voltage reading from 250 volts, up or down. High voltage means short valve life.

M235	250	A.C. voltmeter	.. each	9	0
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Similar in appearance to the Crescemet.

M199 0-6/120 volts .. 9 0

Price, £35. Special price on in-

dent.

## A.C. VOLTMETER—250 Volts.

An inexpensive A.C. voltmeter for checking the voltage of your mains. You can also use it for a voltage reading from 250 volts, up or down. High voltage means short valve life.

M235	250	A.C. voltmeter	.. each	9	0
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An inexpensive A.C. voltmeter for checking the voltage of your mains. You can also use it for a voltage reading from 250 volts, up or down. High voltage means short valve life.

M235	250	A.C. voltmeter	.. each	9	0
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## A.C. VOLTMETER—250 Volts.

An inexpensive A.C. voltmeter for checking the voltage of your mains.

M235	250	A.C. voltmeter	.. each	9	0
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## PUBLIC ADDRESS SYSTEMS SUPPLIED.

## WESTON 506 D.C.

For the majority of ordinary purposes, moving iron meters will prove perfectly satisfactory, and are not so accurate as moving coil meters, but frequently great accuracy of measurement is by no means essential.

It should be noted, however, that cheap voltmeters should not be used for measuring where small currents are involved, as the voltmeter may draw more current than the normal load, giving a reading that is quite inaccurate. This does not apply to ammeter measurements.

It is recommended, however, that cheap voltmeters should not be used for measuring where small currents are involved, as the voltmeter may draw more current than the normal load, giving a reading that is quite inaccurate. This does not apply to ammeter measurements.

Made especially for Radio. Fitted with a 1/4 in. hole drilled in a panel into which is held a Weston 506 D.C. meter.

M112 3, 5, 7, 9, 15, 30, 150 or 200 volts .. 2 0 0

M113 140/7, 150/7, 200/8 .. 2 0 6

M114 140/7, 150/7, 200/8 .. 2 0 6

M115 10, 15, 25, 50, 100, 300 .. 2 0 6

M116 1.5, 3, 5, 10 or 15 .. 2 0 6

M117 10, 15, 25, 50, 100, 300 .. 2 0 6

M118 1.5 milliamps .. 2 11 6

M119 1.5 milliamps .. 2 11 6

M120 1.5 milliamps .. 2 10 0

M121 1.5 milliamps .. 1 12 0

M122 1.5 milliamps .. 1 12 0

M123 1.5 milliamps .. 1 12 0

M124 1.5 milliamps .. 1 12 0

M125 1.5 milliamps .. 1 12 0

M126 1.5 milliamps .. 1 12 0

M127 1.5 milliamps .. 1 12 0

M128 1.5 milliamps .. 1 12 0

M129 1.5 milliamps .. 1 12 0

M130 1.5 milliamps .. 1 12 0

M131 1.5 milliamps .. 1 12 0

M132 1.5 milliamps .. 1 12 0

M133 1.5 milliamps .. 1 12 0

M134 1.5 milliamps .. 1 12 0

M135 1.5 milliamps .. 1 12 0

M136 1.5 milliamps .. 1 12 0

M137 1.5 milliamps .. 1 12 0

M138 1.5 milliamps .. 1 12 0

M139 1.5 milliamps .. 1 12 0

M140 1.5 milliamps .. 1 12 0

M141 1.5 milliamps .. 1 12 0

M142 1.5 milliamps .. 1 12 0

M143 1.5 milliamps .. 1 12 0

M144 1.5 milliamps .. 1 12 0

M145 1.5 milliamps .. 1 12 0

M146 1.5 milliamps .. 1 12 0

M147 1.5 milliamps .. 1 12 0

M148 1.5 milliamps .. 1 12 0

M149 1.5 milliamps .. 1 12 0

M150 1.5 milliamps .. 1 12 0

M151 1.5 milliamps .. 1 12 0

M152 1.5 milliamps .. 1 12 0

M153 1.5 milliamps .. 1 12 0

M154 1.5 milliamps .. 1 12 0

M155 1.5 milliamps .. 1 12 0

M156 1.5 milliamps .. 1 12 0

M157 1.5 milliamps .. 1 12 0

M158 1.5 milliamps .. 1 12 0

M159 1.5 milliamps .. 1 12 0

M160 1.5 milliamps .. 1 12 0

M161 1.5 milliamps .. 1 12 0

M162 1.5 milliamps .. 1 12 0

M163 1.5 milliamps .. 1 12 0

M164 1.5 milliamps .. 1 12 0

M165 1.5 milliamps .. 1 12 0

M166 1.5 milliamps .. 1 12 0

M167 1.5 milliamps .. 1 12 0

M168 1.5 milliamps .. 1 12 0

M169 1.5 milliamps .. 1 12 0

M170 1.5 milliamps .. 1 12 0

M171 1.5 milliamps .. 1 12 0

M172 1.5 milliamps .. 1 12 0

M173 1.5 milliamps .. 1 12 0

M174 1.5 milliamps .. 1 12 0

M175 1.5 milliamps .. 1 12 0

M176 1.5 milliamps .. 1 12 0

M177 1.5 milliamps .. 1 12 0

M178 1.5 milliamps .. 1 12 0

M179 1.5 milliamps .. 1 12 0

M180 1.5 milliamps .. 1 12 0

M181 1.5 milliamps .. 1 12 0

M182 1.5 milliamps .. 1 12 0

M183 1.5 milliamps .. 1 12 0

M184 1.5 milliamps .. 1 12 0

M185 1.5 milliamps .. 1 12 0

M186 1.5 milliamps .. 1 12 0

M187 1.5 milliamps .. 1 12 0

M188 1.5 milliamps .. 1 12 0

M189 1.5 milliamps .. 1 12 0

M190 1.5 milliamps .. 1 12 0

M191 1.5 milliamps .. 1 12 0

M192 1.5 milliamps .. 1 12 0

M193 1.5 milliamps .. 1 12 0

M194 1.5 milliamps .. 1 12 0

M195 1.5 milliamps .. 1 12 0

M196 1.5 milliamps .. 1 12 0

M197 1.5 milliamps .. 1 12 0

M198 1.5 milliamps .. 1 12 0

M199 1.5 milliamps .. 1 12 0

M200 1.5 milliamps .. 1 12 0

M201 1.5 milliamps .. 1 12 0

## WESTINGHOUSE RECTIFIERS FOR PERMANENCY.

## PHONE PLUGS.



## WANDER PLUG - FITZ-ALL.

A large Wander plug is made of pressed metal, which is made to fit valve sockets, but will actually fit sockets much larger. It makes definite contact and is much the best Wander plug we have seen. Brass plated, with tops in six colours. You will like this Wander plug.



P138 Wander plug, Fitz-all ea. dz. 4d. 3 9

## WANDER.

WESTON has always been considered the best plug obtainable. It has quick grip and retains its grip when the tops are gripped. It is impossible to pull the cords out. Yet by pressing the small projections, the cords fall out readily.

P108 Weston plug ... 3 6

P109 Facnet plug, bakelite 1 9

## 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

## PLUGS.

See also VALVE PINS and SOCKETS, which are largely used as small plug and sockets.

**BANANA.** These are very much appreciated after using other kinds of plugs. They can be supplied either red or black.

Banana plugs are so called from the resemblance of their shape to the banana. They slide very easily into the sockets, yet perfect contact is secured at four points at least. They are very simple and very much like 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

P118 Socket only ... 3d. 2 6

## BANANA COIL PLUG.

For Meniwave coils, a banana plug can be supplied without coloured top, but with a screw on mounting strip. These are used on MENIWAVE and were SHORT WAVE COILS, and were specially made for us.

ea. dz. 3d. 2 6

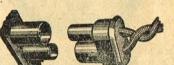
P137 Banana coil plug ... 3d. 2 6

## TWIN PLUG AND SOCKET.

All metal parts are completely insulated, and connection can only be made one way, ensuring correct polarity. The two parts, when joined, are securely gripped, without use of tools, or waste of time. Can be used for permanent connections.

For aerial earth, transformer, aerial, battery, connections, etc.

Prier includes the twin plug, and two parts attached to small panel shown, but not the piece of panel itself.



P146 Twin plug and socket ... 2 0

## PLUGS.

Plated, red or black tops. Easily attached to wire. Split, and fits English valve sockets.

P108 Weston plug ... 3 6

P109 Facnet plug, bakelite 1 9

## WANDER.

P130 Best quality ... 4d. 3 6

P136 Second quality ... 3d. 2 6

## DISTINCTA.

Plugs are braided thimbles, red, white, black, green, blue, yellow. Sockets have colour coded to match the plug bases, and plated. Used for battery connections, making mistakes practically impossible.

P133 ... ... 1 0

P132 Plug and socket ... 6d. 5 6

## DISTINCTA.

P148 Mono plug and socket, embodying protective fuse 1 6

P147 Mono plug and socket, single. Red or black ... 1 0

P149 Wander plug with fuse ... 1 6

P151 Fused wire fuse, complete ... 2 0

P152 Baseboard fuse and holder ... 2 6

P156 Spare fuses, for above ... 9

## BELLING-LEE.

The Belling-Lee types have sprung and are made in six colours—red, white, black, green, blue, yellow. Sockets have colour coded to match the plug bases, and plated. Used for battery connections, making mistakes practically impossible.

P133 ... ... 1 0

P132 Plug and socket ... 6d. 5 6

## BELLING-LEE.

The Belling-Lee types have sprung and are made in six colours—red, white, black, green, blue, yellow. Sockets have colour coded to match the plug bases, and plated. Used for battery connections, making mistakes practically impossible.

P133 ... ... 1 0

P132 Plug and socket ... 6d. 5 6

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The Belling-Lee types have sprung and are made in six colours—red, white, black, green, blue, yellow. Sockets have colour coded to match the plug bases, and plated. Used for battery connections, making mistakes practically impossible.

P133 ... ... 1 0

P132 Plug and socket ... 6d. 5 6

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The Belling-Lee types have sprung and are made in six colours—red, white, black, green, blue, yellow. Sockets have colour coded to match the plug bases, and plated. Used for battery connections, making mistakes practically impossible.

P133 ... ... 1 0

P132 Plug and socket ... 6d. 5 6

## BELLING-LEE.

The Belling-Lee types have sprung and are made in six colours—red, white, black, green, blue, yellow. Sockets have colour coded to match the plug bases, and plated. Used for battery connections, making mistakes practically impossible.

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## 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.

## 200 OHMS.

A bakelite potentiometer, complete with knob. This will serve all purposes, as it will do equal with 200 ohms.

1. Maximum efficiency, small current waste.

2. Permanence.

3. Maximum reliability.

4. Very robust, no delicate parts to break.

5. Absolute silence in operation.

6. Easy to use, as transformer voltage is not critical.

7. Only a simple secondary necessary for "B" eliminators.

8. Only a simple primary necessary for "A" eliminators.

9. Permanence, efficiency, reliability, and silence.

10. Eliminators, as transformer voltage is not critical.

11. Permanence, efficiency, reliability, and silence.

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## FIXED RESISTORS

LYNCH FIXED RESISTORS are the "pick of the pack" in fixed resistors. They consist of a thin glass rod with a very thin film of metal electrically deposited on it, this being accurately measured and wound in a spiral hemispherically about the ends as well as the side.



R161 Single mount	1	3
R162 Double mount	1	9
R164 Clips only; per pair		9

## WELL-MAYDE MOUNTS.

Made in either single or double, with R167 clips and Formica base. All resistors are made of the best filament wire.

R101 GRID LEAKS, 25, 5, 1, 2, 3, 4, 5, 6, 8, 10 megs.	2	6
R102 RESISTORS, 12,000, 25,000, 50,000, 75,000 ohms	3	9
R127 RESISTORS, 500, 750, 1000, 1500, 2000, 3000, 5000, 10,000 ohms	5	6

EVERY LYNCH RESISTOR GUARANTEED.



## GRID LEAK CLIPS.



R167 Brass, best quality, plated; pair	1	9
R164 De Jure pair		9

## POWER RESISTORS.

POWER RESISTANCES are essential to all radio sets which derive any power from vacuum tubes. Particularly are they a component of "B" ELIMINATORS for A.C. mains.

## DE JURE.

DE JURE VITREOUS ENAMELED RESISTORS are designed to satisfy fully the requirements of modern radio equipment. The filament wire is the highest grade, and is wound on a porcelain refractory tube, firmly secured to lugs which do not work loose.

Each resistance is calibrated to obtain accuracy. Then after a final test, the whole resistance is covered with vitreous enamel and baked at a high temperature to harden the enamel.

Made in the following values, and used for power amplifiers, and other purposes where the ordinary grid leak is too small. Two watt rating.



## GRID LEAKS—POWER.

Made in the following values, and used for power amplifiers, and other purposes where the ordinary grid leak is too small. Two watt rating.



## GRAHAM-PARISH MEGHES.

Supplied in 1, 2, 3, 4, 5 and 10 megs. R157 Megites, each

1 9

## GRAHAM-PARISH STANDARD.

A good but cheap grid leak, made in England. Unit is enclosed in a bakelite tube.

R158 1, 2, 3, 4 or 5 megs

1 0

## DE JURE—20 WATTS.

R218 500, 750, 1000, 1500, 2000, 2500, 3000 ohms	3	9
R219 1000, 1500, 2000, 2500, 3000 ohms	5	0
R220 20,000, 25,000 ohms	6	3
R221 50,000 ohms	7	6

## DE JURE—10 WATTS.

R222 500, 750, 1000, 1500, 2000, 2500, 3000 ohms	6	3
R223 3500, 5000, 7500, 10,000, 15,000, 20,000 ohms	7	9
R224 3500, 5000, 7500, 10,000, 15,000, 20,000 ohms	10	0
R225 50,000 ohms		10

## WARD LEONARD.

These are made single and double. The best and best phosphor bronze nickel plated, and designed to grip the resistor at the ends as well as the side.

Their resistors are used under the name of "Ward Leonard". They are made by winding a special resistance wire with practically zero temperature coefficient.

Ward Leonard are not the cheapest resistors on the market, but what is more to the point, they are the best.

## WARD LEONARD 507-6, 200 Watts.

For intermediate voltages of 45, 67, 90, 135 and 400 in a current supply. 1000 ohms, 1500 ohms. Total resistance 350 ohms. Maximum current 70 millamps.

## R126 Single mount

1 0

## R127 Double mount

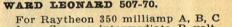
1 9

## R128 Clips only; per pair

9

## R129 2 Each

45 0



## R172 Each

45 0

## R173 Each

45 0

## WARD LEONARD 507-70.

For Raytheon 350 millamps A.B.C. voltage. Intermediate B voltages of 22, 45, 67, 135 and 180, also C negative bias of 40. Direct current of the rectifier under load should be about 220 volts.

## R174 2 Each

45 0

## WARD LEONARD 507-24 to 67.

Type S are rated 44 watts in free air. Obtained in a wide range of values.

## R175 1,500, 2,000, 2,500

3,000, each

6 0

## R176 4,000, each

9 0

## R177 5,000, each

10 6

## R178 10,000, each

13 6

## R179 15,000, each

15 6

## R180 25,000, each

16 6

## R181 50,000, each

19 6

## R182 100,000, each

31 6

## R183 150,000, each

31 6

## R184 200,000, each

31 6

## R185 300,000, each

31 6

## R186 500,000, each

31 6

## R187 1,000,000, each

31 6

## R188 1,500,000, each

31 6

## R189 2,000,000, each

31 6

## R190 3,000,000, each

31 6

## R191 5,000,000, each

31 6

## R192 10,000,000, each

31 6

## R193 20,000,000, each

31 6

## R194 40,000,000, each

31 6

## R195 80,000,000, each

31 6

## R196 150,000,000, each

31 6

## R197 300,000,000, each

31 6

## R198 600,000,000, each

31 6

## R199 1,200,000,000, each

31 6

## R200 2,400,000,000, each

31 6

## R201 4,800,000,000, each

31 6

## R202 9,600,000,000, each

31 6

## R203 19,200,000,000, each

31 6

## R204 38,400,000,000, each

31 6

## R205 76,800,000,000, each

31 6

## R206 153,600,000,000, each

31 6

## R207 307,200,000,000, each

31 6

## R208 614,400,000,000, each

31 6

## R209 1,228,800,000,000, each

31 6

## R210 2,457,600,000,000, each

31 6

## R211 4,915,200,000,000, each

31 6

## R212 9,830,400,000,000, each

31 6

## R213 19,660,800,000,000, each

31 6

## R214 39,321,600,000,000, each

31 6

## R215 78,643,200,000,000, each

31 6

## R216 157,286,400,000,000, each

31 6

## R217 314,572,800,000,000, each

31 6

## R218 629,145,600,000,000, each

31 6

## R219 1,258,291,200,000,000, each

31 6

## R220 2,516,582,400,000,000, each

31 6

## R221 5,033,164,800,000,000, each

31 6

## R222 10,066,329,600,000,000, each

31 6

## R223 20,132,659,200,000,000, each

31 6

## R224 40,265,318,400,000,000, each

31 6

## R225 80,530,600,000,000, each

31 6

## R226 161,060,200,000,000, each

31 6

## R227 322,120,000,000,000, each

31 6

## R228 644,240,000,000,000, each

31 6

## R229 1,288,480,000,000,000, each

31 6

## R230 2,576,960,000,000,000, each

31 6

## R231 5,153,920,000,000,000, each

31 6

## R232 10,307,840,000,000,000, each

31 6

## R233 20,615,680,000,000,000, each

31 6

## R234 41,231,360,000,000,000, each

31 6

## R235 82,462,720,000,000,000, each

31 6

## R236 164,925,440,000,000,000, each

31 6

## R237 329,850,880,000,000,000, each

31 6

## R238 659,700,160,000,000,000, each

31 6

## R239 1,319,400,320,000,000,000, each

31 6

## R240 2,638,800,640,000,000,000, each

31 6

## R241 5,277,600,120,000,000,000, each

31 6

## R242 10,555,200,240,000,000,000, each

31 6

## R243 21,110,400,480,000,000,000, each

31 6

## R244 42,220,800,960,000,000,000, each

31 6

## R245 84,441,600,192,000,000,000, each

31 6

## R246 168,883,200,384,000,000,000, each

31 6

## R247 337,766,400,768,000,000,000, each

31 6

## R248 675,532,800,153,600,000,000,000, each

31 6

## R249 1,351,065,600,307,200,000,000,000, each

31 6

## R250 2,622,131,200,614,400,000,000,000, each

31 6

## R251 5,244,262,400,122,800,000,000,000, each

31 6

## R252 10,488,524,800,245,600,000,000,000, each

31 6

## R253 20,977,049,600,491,200,000,000,000, each

31 6

## R254 41,954,099,200,982,400,000,000,000, each

31 6

## R255 83,908,198,400

## LYNCH LEAKS ARE "SILENT."

### AUTOMATIC FILAMENT RESISTORS.

As soon as marketed, these resistors automatically adjust the filament current, enabling rheostats to be dispensed with.

They can be used with any vacuum tubes, either 4 or 6 volts, and in order that it is necessary only to tell us what valve they are to be used with, we can assure you that all are to be used on the one resistor. For English and American values.

### LYNCH EQUALIZER.

The best quality obtainable, made by a firm specializing in resistors.



R234 Lynch equalizer, with mount, all sizes ... 5 0

### DE JUN THERMOTROL.

Uses a nickel resistance element, with 100% complete overload without burning out.

R235 Thermotrol, with mount 4 3

AMPERITES.

All are supplied complete with a mount.

R236 Amperites ... 4 6

### VARIABLE RESISTORS (SPECIAL TYPE).

Recent improvements in the continuously variable type of resistor make it possible for these to be used in radio chassis where previously it was inadvisable to do so, owing to lack of durability.

### EMMCOSTADS.



R237 No. 1 25-100 ohms 7 6  
No. 1A 0-2,000,000 ohms 7 6  
No. 2 2,500-10,000 ohms 7 6  
No. 3 25,000-500,000 ohms 7 6  
No. 4 50,000-500,000 ohms 7 6  
No. 6 .25-10 megs 7 6

### ENMCO 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

### BRADLEYLEAK.

A variable grid leak, 1 to 10 megs. G111 Each ... 7 6

### FROST HUM BALANCER.

A 20 ohm potentiometer, to centre tap filament in A.C. Radios, thus eliminating hum.

R239 ... 7 6

### ROYALTY (POTENTIOMETER).

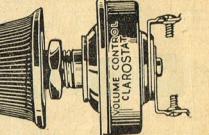
In this the resistance element is incorporated with the switch, so that by its peculiar method of fitting, merely acts as a set of switch studs, thus providing a variable element.

In appearance it is exactly like a rheostat, and can be used either as a rheostat or potentiometer fash-

### CLAROSTATS.

Clarostats are continuously variable resistances made in U.S.A.

### STANDARD—20 WATTS.



R169 0.5 megs. 1500 ohms infinity ... 12 6  
1500 ohms ... 12 6

### POWER—40 WATTS.

R239 200-100,000 ohms ... 19 6

### POWER—60 WATTS.

R240 200-100,000 ohms ... 42 0

### VOLUME CONTROL.

A vacuum circuit specially made for the control of volume (from a pick-up), plate voltage, regeneration, or stabilization. Not meant for use in power circuits. Range 10-500,000 ohms.

R241 Volume control clarostat 8 6

### VOLUME CONTROL—TABLE TYPE CLAROSTAT.

This is No. R241 mounted in a container, and fitted with long cords and connector, so that the set can be controlled from any distance. Range 10-500,000 ohms.

R242 Table volume control ... 13 6

Note—All ROYALTY RESISTANCES are fitted with THREE TERMINALS.

The lowest resistance possible should not be reckoned as less than about 10 per cent. of the figures given.

Range Current  
Ohms. Millamps s. d.

	Range	Current	Ohms.	Millamps	s. d.
R208	F	2,000	23.0	6	6
R209	K	5,000	20.0	6	6
R199	G	10,000	16.5	6	6
R200	H	25,000	10.2	6	6
R247	F	5,000	7.5	6	6
R255	B	100,000	5.0	6	6
R201	J	200,000	4.0	6	6
R203	L	500,000	2.5	6	6
R205	P	2,000	2.0	6	6
R256	A	1 megs	.2	6	6

### ROYALTY HEAVY DUTY.

A 10 watt variable resistance similar to the Clarostat. Range from 5000 to 10 megs, over several turns of the coil, powerful enough for filament control.

As R242 but with an A.C. snap switch, for 230 volts. Very substantial switches are used, so that the Frost will give every satisfaction. 2000, 25,000, 200,000 or 500,000 ohms.

R243 Table volume control ... 13 6

### FROST, WITH A.C. SWITCH.

As R242 but with an A.C. snap switch, for 230 volts. Very substantial switches are used, so that the Frost will give every satisfaction. 2000, 25,000, 200,000 or 500,000 ohms.

R244 Table volume control ... 13 6

### R257 ... 10 6

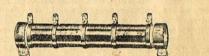
### FROST, WITH D.C. SWITCH.

This variable resistance has a switch incorporated with it, for filament operation as well as the resistance element. The filament is automatically lighted, volume control being then secured by further movement of the knob. 2000, 50,000, 200,000, or 500,000 ohms.

R245 ... 11 6

### ACE RESISTANCES—50 watt.

Wound with special wire on a smooth polished tube, about 7 inch long and 1 1/2 inch diameter. The threaded mounting clip secures the resistance to baseboard, while there are five adjustable contact bands. A very fine resistance.



R231 Ace 10,000 ohms ... 9 0  
R232 Ace 15,000 ohms ... 10 6  
R233 Ace 20,000 ohms ... 12 0

## SHAKEPROOF WASHERS ARE "SAFE."

### WASHERS.

#### B.A. SCREWS AND NUTS.

B.A. is the standard for all British electrical apparatus. Sizes 1 to 8, B.A. are listed, but other sizes from 1/2 to 1/4 inch are available.

The SCREWS are brass, nickel plated, either round head or countersunk.

The hexagon nuts are also brass, nickel plated.

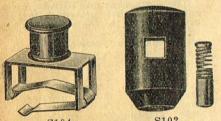
Length. 1 B.A. 2 B.A.

## WELL-MAYDE SHIELDS—NEAT AND EFFICIENT.

## SLIDERS.

## ACE SHIELD.

Sliders are made to fit  $\frac{1}{4}$  in. square brass rod. Rods can be purchased either plain brass or ready drilled and plated.



S104

S102

S104 Plated, coloured knob ... 6d.  
S102 Black, with sprung plunger 4d.

## SLIDER ROD—PLATED.

These are in square to fit above sliders 6 in. long. Plated and drilled ready for use ... 8d.

For plain brass rod, see under BRASS.

SPECIAL QUOTATIONS FOR SCREWS AND NUTS IN QUANTITIES.

## SOLDER AND FLUX.

## RESIN-KOKE SOLDER.

A high-grade solder, made in England, and used locally by responsible authorities. Better than all others. S187 1 lb. (approx. 35 fl.) 4 6  
S188 8 ft. length ... 1 6

(See under Tools.)

## SHIELDS.

Most modern Radio sets are shielded by enclosures all or part of the aperture in aluminium boxes. These are most effective when they are made of thick sheet, but when necessary, thinner lighter shields are very effective indeed.

By co-operation with New Zealand and the Radio Record, we intend to manufacture shields in standard sizes, and to keep them to dimensions which will adhere to standard sizes as far as is possible. Special sizes can always be made to order, but are naturally rather more costly.

## WELL-MAYDE SHIELD.

Made from 14 g. aluminium (about 1/16 in. thick), with special ground corner rods. Rigidly held together with eight screws and nuts, etc. Plate, engraved on-off, included. Size, 9 x 6 x 5 inches. The shield for the expert.



S181 ... ... 2 6

## LEADERS IN RADIO

Since 1920.

## PORCELAIN BASE.

A light shield, designed for easy assembly and efficient working. Size 9 x 6 x 5 in.

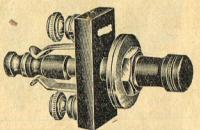
S183 ... ... 9 0

## SWITCHES.

## WELL-MAYDE "A" BATTERY.

A simple, efficient and durable switch, mounted on Formica base, all brass parts being nickel plated. The springs are made of steel, making the switch very free from trouble. Working parts can be inspected—a decided advantage. Single hole mounting.

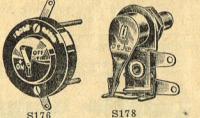
S104 Plated, coloured knob ... 6d.  
S102 Black, with sprung plunger 4d.



S114 Well-Mayde switch ... 1 6

## TOGGLE SWITCH.

In this a small lever is moved up and down in bakelite frame. "On" and "Off" words moulded in.



S176 Toggle switch ... ... 1 6

## DE JURE.

Different from the usual push-pull switch, in that it turns. Very small and neat. Contacts are self-cleaning. Complete with handsome bakelite knobs.

S178 Each ... ... 2 0

## RADIO POWER SWITCH.

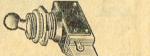
For use with A.C. sets, switches are not entirely different from the older push pull type. Tumbler switches could be used, but are much too large. A small switch which can be mounted on a panel, has a quick make and break, and is very suitable for A.C. sets, etc. Plate, engraved on-off, included.

S179 Each ... ... 2 0

## WELL-MAYDE SHIELD.

Made from 14 g. aluminium (about 1/16 in. thick), with special ground corner rods. Rigidly held together with eight screws and nuts, etc. Plate, engraved on-off, included.

Size, 9 x 6 x 5 inches. The shield for the expert.



S181 ... ... 2 6

## LEADERS IN RADIO

Since 1920.

## ACRE SHIELD.

A light shield, designed for easy assembly and efficient working. Size 9 x 6 x 5 in.

S111 Single pole, double throw; each ... 1 6

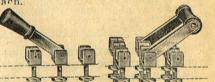


S111 Double pole, double throw; each ... 2 6

Aerial switch, with spark gap, similar to S111 ... 1 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  
S116 S.P., D.T. B quality; ea 1 9  
S115 D.P., D.T. A quality; ea 2 0  
S117 D.P., D.T. B quality; ea 1 6

## SWITCH ARMS—Plated.

These are used in conjunction with the switch arms and also available separately for other purposes.

Both are nickel plated on brass, with plated brass nuts. The points are  $\frac{1}{16}$  in. diameter,  $\frac{1}{4}$  in. deep.

S122 ... ... 1 0

S133-179 (bearing) Taper knob, with plated adjustable blade to  $\frac{1}{16}$  in. Brass bearing.

S122 Each ... ... 1 0

S133-179 (bearing) Brass bearing.

S122 Each ... ... 1 0

## BEARINGS.

Brass bearings, nickel plated, as used in switch arms, and also available separately for other purposes.

Where a  $\frac{1}{16}$  in. bearing is required, especially suitable for extending control shafts.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

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S179  $\frac{1}{16}$  in. hole ... ea. 6d.

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S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

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S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

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S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

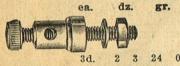
S179  $\frac{1}{16}$  in. hole ... ea. 6d.

S133 3/16in. hole ... ea. 1 4.

S

## TERMINALS AND STRIPS ENGRAVED TO ORDER.

## TERMINALS—PLATED



T102 ea. dz. gr.

**BELLING-LEE**  
TERMINALS

In the past, a number of Belling-Lee Type B terminals that proved defective were inadvertently sold.

If any customer received these, he can have them replaced with new terminals on sending the old ones back to us.

No trouble will be experienced with the new terminals, and the terminal made practically perfect.

See stock list of names.

## ENGRAVED TERMINALS.

There is no doubt that terminals, suitably engraved or named, not only add considerably to the appearance of a home-built Radio set, but also make it easier to identify and set up the correct connection, especially if it is ever disconnected some time after construction.

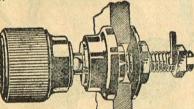
The extra cost of these terminals is very small indeed, while a large variety of names can be engraved. These are in the common terms used in New Zealand, not the little-used English terms. It is best to engrave the terminals with any name to suit—this is a service a few firms can offer.

As a general rule, engraved terminals, engraved terminal strips can be used, and are described later.

See stock list of names.

## TYPE D—ENGRAVED.

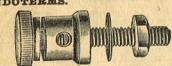
These terminals are of substantial size and are of milled and moulded bakelite, have a special appearance. The terminals are not rotatable, so that once the terminals are fixed, the readings always line up. 1/8 inch diameter, and include a sleeve. Each end is slotted to grip wire firmly without soldering. Non-removable type.



See stock list of names.

T136 Small ..... 3d. 2 6 27 0  
T137 Medium ..... 4d. 3 6 35 0

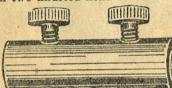
## BINDOTERMS.



Double purpose terminals, gripping a wire under the screw top, or through the hole. The top screw is bored to take a washer plus a lock washer. 4d. 3 9 44 0

## CONNECTORS.

Brass connectors, nickel plated, with two knurled head screws



T256 CONNECTORS ..... ea. dz. gr.

CONNECTORS—INSULATED.

Similar to T256, but with an Erinoid sleeve, either black or red, over the tubular part.

T257 ..... ea. dz. gr.

## TYPE M—ENGRAVED.



A very neat and effective plated brass terminal, with non-rotating name and other features as in Type D. This terminal is very good and can be thoroughly recommended for the best class of set.

See stock list of names.

T225 Engraved ..... ea. dz. gr.

## TYPE R—ENGRAVED.



A small black terminal, non-removable top. Brass parts nickel plated. See special list of names.

T226 ..... 5 4 9

## TERMINAL STRIPS.

## DE JURE READIMENT.

A very handy bakelite moulded strip, with the terminals permanently engraved thereon. Nine soldering lugs, firmly riveted in grooves in the lugs, to prevent rotation and the bakelite to prevent corrosion and the terminals to contact. The screws are very large heads, and there are no loose nuts to turn as the screw tightens the terminals. Ridge between the wires prevents wires making contact with each other. The total width is only 61mm. The terminal can be screwed to a base board without any metal coming in contact with the board.



## FORMICA STRIPS.

Terminal strips are made of Formica, about 1/8 in. wide, 9 to 12 inches long. Any special size can be made to order.

FORMICA STRIP, about 1/8 in. wide, per inch 1d.

## TINFOIL.

Packets containing about 50 sheets, 5 x 23in.

T115 Packet ..... 6

## TRANSFORMERS BUILT TO ORDER.

## TRANSFORMERS.

## AUDIO FREQUENCY TRANSFORMERS.

These handy terminals are made from spring bronze, plated, not spring brass usually supplied by other makers. They are short and make it easy to identify and set up the correct connection, especially if it is ever disconnected some time after construction.

The extra cost of these terminals is very small indeed, while a large variety of names can be engraved. These are in the common terms used in New Zealand, not the little-used English terms. It is best to engrave the terminals with any name to suit—this is a service a few firms can offer.

As a general rule, engraved terminals, engraved terminal strips can be used, and are described later.

See stock list of names.

## TYPE LIST TERMINAL NAMES.

ABRIAL	PHONES
BARTH	B BATT.
A BARTH	+ DET.
B BARTH	+ R.F.
B BARTH	+ A.F.
C BARTH	+ F.W.R.
G BARTH	+ P.W.R.

T108-T109-T110 ..... dz. gr.

T108 Small ..... 1 6 0

T109 Medium ..... 2 0 21 0

T110 Large ..... 2 3 24 0

T111 Includes screws ..... 2 3 24 0

T112 ..... dz. gr.

T113 Double 1/2 1/16 in 3 6 26 0

T112 Double, 1/3 in 3 0 33 0

T113 ..... dz. gr.

T114 ..... dz. gr.

T115 ..... dz. gr.

T116 ..... dz. gr.

T117 ..... dz. gr.

T118 ..... dz. gr.

T119 ..... dz. gr.

T120 ..... dz. gr.

T121 ..... dz. gr.

T122 ..... dz. gr.

T123 ..... dz. gr.

T124 ..... dz. gr.

T125 ..... dz. gr.

T126 ..... dz. gr.

T127 ..... dz. gr.

T128 ..... dz. gr.

T129 ..... dz. gr.

T130 ..... dz. gr.

T131 ..... dz. gr.

T132 ..... dz. gr.

T133 ..... dz. gr.

T134 ..... dz. gr.

T135 ..... dz. gr.

T136 ..... dz. gr.

T137 ..... dz. gr.

T138 ..... dz. gr.

T139 ..... dz. gr.

T140 ..... dz. gr.

T141 ..... dz. gr.

T142 ..... dz. gr.

T143 ..... dz. gr.

T144 ..... dz. gr.

T145 ..... dz. gr.

T146 ..... dz. gr.

T147 ..... dz. gr.

T148 ..... dz. gr.

T149 ..... dz. gr.

T150 ..... dz. gr.

T151 ..... dz. gr.

T152 ..... dz. gr.

T153 ..... dz. gr.

T154 ..... dz. gr.

T155 ..... dz. gr.

T156 ..... dz. gr.

T157 ..... dz. gr.

T158 ..... dz. gr.

T159 ..... dz. gr.

T160 ..... dz. gr.

T161 ..... dz. gr.

T162 ..... dz. gr.

T163 ..... dz. gr.

T164 ..... dz. gr.

T165 ..... dz. gr.

T166 ..... dz. gr.

T167 ..... dz. gr.

T168 ..... dz. gr.

T169 ..... dz. gr.

T170 ..... dz. gr.

T171 ..... dz. gr.

T172 ..... dz. gr.

T173 ..... dz. gr.

T174 ..... dz. gr.

T175 ..... dz. gr.

T176 ..... dz. gr.

T177 ..... dz. gr.

T178 ..... dz. gr.

T179 ..... dz. gr.

T180 ..... dz. gr.

T181 ..... dz. gr.

T182 ..... dz. gr.

T183 ..... dz. gr.

T184 ..... dz. gr.

T185 ..... dz. gr.

T186 ..... dz. gr.

T187 ..... dz. gr.

T188 ..... dz. gr.

T189 ..... dz. gr.

T190 ..... dz. gr.

T191 ..... dz. gr.

T192 ..... dz. gr.

T193 ..... dz. gr.

T194 ..... dz. gr.

T195 ..... dz. gr.

T196 ..... dz. gr.

T197 ..... dz. gr.

T198 ..... dz. gr.

T199 ..... dz. gr.

T200 ..... dz. gr.

T201 ..... dz. gr.

T202 ..... dz. gr.

T203 ..... dz. gr.

T204 ..... dz. gr.

T205 ..... dz. gr.

T206 ..... dz. gr.

T207 ..... dz. gr.

T208 ..... dz. gr.

T209 ..... dz. gr.

T210 ..... dz. gr.

T211 ..... dz. gr.

T212 ..... dz. gr.

T213 ..... dz. gr.

T214 ..... dz. gr.

T215 ..... dz. gr.

T216 ..... dz. gr.

T217 ..... dz. gr.

T218 ..... dz. gr.

T219 ..... dz. gr.

T220 ..... dz. gr.

T221 ..... dz. gr.

T222 ..... dz. gr.

T223 ..... dz. gr.

T224 ..... dz. gr.

T225 ..... dz. gr.

T226 ..... dz. gr.

T227 ..... dz. gr.

T228 ..... dz. gr.

T229 ..... dz. gr.

T230 ..... dz. gr.

T231 ..... dz. gr.

T232 ..... dz. gr.

T233 ..... dz. gr.

T234 ..... dz. gr.

T235 ..... dz. gr.

T236 ..... dz. gr.

T237 ..... dz. gr.

T238 ..... dz. gr.

T239 ..... dz. gr.

T240 ..... dz. gr.

T241 ..... dz. gr.

T242 ..... dz. gr.

T243 ..... dz. gr.

T244 ..... dz. gr.

T245 ..... dz. gr.

T246 ..... dz. gr.

T247 ..... dz. gr.

T248 ..... dz. gr.

T249 ..... dz. gr.

T250 ..... dz. gr.

T251 ..... dz. gr.

T252 ..... dz. gr.

T253 ..... dz. gr.

T254 ..... dz. gr.

T255 ..... dz. gr.

T256 ..... dz. gr.

T257 ..... dz. gr.

T258 ..... dz. gr.

T259 ..... dz. gr.

T260 ..... dz. gr.

T261 ..... dz. gr.

T262 ..... dz. gr.

T263 ..... dz. gr.

T264 ..... dz. gr.

T265 ..... dz. gr.

T266 ..... dz. gr.

T267 ..... dz. gr.

T268 ..... dz. gr.

T269 ..... dz. gr.

T270 ..... dz. gr.

T271 ..... dz. gr.

T272 ..... dz. gr.

T273 ..... dz. gr.

T274 ..... dz. gr.

T275 ..... dz. gr.

T276 ..... dz. gr.

T277 ..... dz. gr.

T278 ..... dz. gr.

T279 ..... dz. gr.

T280 ..... dz. gr.

T281 ..... dz. gr.

T282 ..... dz. gr.

T283 ..... dz. gr.

T284 ..... dz. gr.

T285 ..... dz. gr.

T286 ..... dz. gr.

T287 ..... dz. gr.

T288 ..... dz. gr.

T289 ..... dz. gr.

T290 ..... dz. gr.

T291 ..... dz. gr.

T292 ..... dz. gr.

T293 ..... dz. gr.

T294 ..... dz. gr.

T295 ..... dz. gr.

T296 ..... dz. gr.

T297 ..... dz. gr.

T298 ..... dz. gr.

T299 ..... dz. gr.

T300 ..... dz. gr.

T301 ..... dz. gr.

T302 ..... dz. gr.

T303 ..... dz. gr.

T304 ..... dz. gr.

T305 ..... dz. gr.

T306 ..... dz. gr.

T307 ..... dz. gr.

T308 ..... dz. gr.

T309 ..... dz. gr.

T310 ..... dz. gr.

T311 ..... dz. gr.

T312 ..... dz. gr.

T313 ..... dz. gr.

T314 ..... dz. gr.

T315 ..... dz. gr.

T316 ..... dz. gr.

T317 ..... dz. gr.

T318 ..... dz. gr.

T319 ..... dz. gr.

T320 ..... dz. gr.

T321 ..... dz. gr.

T322





## IN ORDERING, STATE UX OR ENGLISH BASE.

## VALVES.

## A.C. VALVES.

The ELEMENT of every VALVE is tested before despatch on sale, and no claims for valves returned with defective filaments CAN BE ENTERED.

UNDER NO CIRCUMSTANCES are valves sent out on trial or approval. We cannot offer subsequent customers second hand valves. We supply only the RELIABLE BRANDS, BRAND NEW.

## VALVE BASES.

The American bases—UX for ordinary and UX for A.C. valves are by far the most common in New Zealand, and should always be used. English and Continental valves are made with UX bases, but American valves are not made with English bases.

ALWAYS STATE UX OR ENGLISH BASE in ordering—otherwise UX BASE WILL BE SENT.

## CURRENT CONSUMPTION.

This is important to those who use dry batteries, especially "B" batteries. The valve with the smallest "A" consumption far more than make it up in "B", which is really much more expensive. Only valves are always available on the choice of valves.

## PENTODE.

This has three grids, and is used as a last stage audio. Properly used, it may be used as a power stage, giving 20 or 30 per cent. in power.

When used, it must be in a specially designed circuit, with every stage carefully shielded.

Details are given in table below.

## POWER VALVES.

Ample volume with pure tone can be obtained only by use of power valves, requiring high "A" current, and a speaker capable of handling the increased output. For theatre and hall use, however, the valve and horn are more marked with "A".

The BLACK "P" should be used. The UX45 is very popular because of its very great power on only 250 volts "B".

WHEN IN DOUBT, CONSULT US ABOUT VALVES.

## A.C. VALVES.

These have filaments heated, directly or indirectly, by low voltage A.C. power packs, etc., although Westinghouse rectifiers are preferable.

Valves of this kind must not be interchanged when replacement is made, great care being taken to see that a valve identical in characteristics with the old one is fitted. Otherwise the output volts and milliamps are given. Equivalent Philips in brackets.

UX280 P 300v, 125mA (1500) 25 0  
UX281 H 650v, 125mA (1500) 50 0  
Raytheon, F 300v, 125 mA 25 0

## RADIOTRON A.C. VALVES.

Screened grid valves have amplifying possibilities up to over 500 times, but unfortunately, no satisfactory circuit has yet been devised which can give a voltage output above about 20 to 50 times. It is a valve with enormous possibilities, but, as far as we know, at present, it can't perhaps be said to be definitely more satisfactory than all round, though, a very good valve.

When used, it must be in a specially designed circuit, with every stage carefully shielded.

Details are given in table below.

## PHILIPS 4-volt, A.C.

E408 E409 E424 E430 E435 C443 30 0  
E415, 27/6 E442, 32/6, E443 40 0

## MULLARD A.C.

164V 354V . . . . . 30 0  
164V, 35/—, 34V, 40/—, PM24A 40 0

## OSRAM 4 volt 1 amp. A.C.

M414 Screened grid . . . . . 32 6  
M114 Detector or Radio ampf. . . . . 27 6  
M114 Detector, Radio or audio . . . . . 27 6  
ML4 Audio . . . . . 30 0

## RADIOTRON UX221.

A new Radiotron valve, taking only .06 amps. at 6 volts, and designed to replace 201A in any circuit. The radiotron valve is so important, that we are listing it specially here, as well as in the table below.

So far, we have sold a great quantity, with excellent results, and encourage you to 201A with it, and cut down your "A" battery charging to less than a quarter.

The BLACK "P" should be used. The UX45 is very popular because of its very great power on only 250 volts "B".

Radiotron UX221 . . . . . 13 6

## CURRENT PRICES ALWAYS CHARGED FOR VALVES.

## VALVE TABLE.

## IMPORTANT.—STATE ENGLISH OR U.X. BASE IN ORDERING.

Type.	Purpose.	A BATTERY				B BATTERY				C Batt.	Ampfn.	Factor	Impedance	Price
		Kind	Volt	Amps	Rheo	Detector	Amplifier	Volts						

## RADIOTRON VALVES—U.X. BASE ONLY. (CUNNINGHAM ARS IDENTICAL).

WX-12	AD	Dry	1.5	.25	6	22	90-180	4.5-10.5	6.6	15,500	12	6
UX-19	DAR	Dry	4.5	.06	30	22-45	90	4.5	6.6	15,500	13	0
UX-120	P	Dry	4.5	.12	30	135		2.25	3.3	6,300	15	0

## RADIOTRON VALVES—U.X. BASE ONLY. (CUNNINGHAM ARS IDENTICAL).

UX-200A	D	Acc.	6.	.25	6	45			20	30,000	25	0
UX-221	DARP	Acc.	6.	.06	30	25-50	90-180	4.5-9	8.	11,000	9	0
UX-112A	DP	Acc./A.C.	6.	.25	6	45	90-180	4.5-10.5	8.	5,000	18	0

## RADIOTRON VALVES—U.X. BASE ONLY. (CUNNINGHAM ARS IDENTICAL).

UX-171A	P	Acc./A.C.	6.	.25	6		90-180	16.5-40.5	3.	2,500	18	0
UX-245	P	A.C./Acc.	2.5	1.5	2		180-250	33-50	3.5	1,900	28	6
UX-210	P	A.C./Acc.	7.5	1.25	2		250-425	18-35	8.	6,000	50	0

## RADIOTRON VALVES—U.X. BASE ONLY. (CUNNINGHAM ARS IDENTICAL).

UX-226	AR	A.C.	1.5	.105	6		90-180	6-13	8.2	9,400	14	0
UX-227	D	A.C.	2.5	.175	6	45-90			8.	10,000	25	0

## PHILIPS VALVES—U.X. OR ENGLISH BASE.

B406	DA	Acc.	4.	.1	30	20-45	45-150		6.	4,300	13	6
B405	P	Acc.	4.	.15	30		150		5.	2,500	13	0
B409	P	Acc.	4.	.15	30		150		9.	4,500	15	0

B403	AP	Acc.	4.	.15	30	50-120	15-24		3.	2,100	15	0
A415	D	Acc.	4.	.08	30	20-45	50-150		15.	7,500	13	6

A409	DAR	Acc.	4.	.06	30	10-45	60-120	1.5-9	9.	7,300	13	6
E605	DA	Acc.	6.	.06	30	20-45	60-150	1.5-9	5.	4,000	13	6
E603	D	Acc.	6.	.1	30	20-45	60-150	4.1-18	5.	2,800	13	6

A630	DRG	Acc.	6.	.05	30	50-150	50-150		30.	35,000	13	6
C502	P	Acc.	6.	.06	30	20-45	50-150		3.3	1,500	15	0
A615	D	Acc.	6.	.06	30	20-45	50-150		15.	6,250	13	6

## OSRAM OR MARCONI (both are identical) U.X. or English Base.

DEH210	DRC	Acc.	2.	.10	6	40-80	120-150	0-1	35.	50,000	13	6
HL210	DAC	Acc.	2.	.1	6	50-90	120-150	1-2	20.	22,000	13	6
DEL210	DAR	Acc.	2.	.10	6	40-80	70-150	3-7	11.	12,000	13	6
DEP215	AP	Acc.	2.	.15	6	70-150	45-120	7.	5.	5,000	13	6

DEH240	DRC	Acc.	2.	.1	6	40-80	70-150	0-1	40.	60,000	13	6
DEL160	DAR	Acc.	4.	.10	6	70-150	120-150	1-3	16.	8,500	13	6
DEP410	DAR	Acc.	4.	.10	6	75-150	44-105	7.5	5.	5,000	13	6
P425	P	Acc.	4.	.25	6	90-150	72-163	4.5	2,300	20	0	

DEH140	DRC	Acc.	4.	.10	6	40-80	70-150	0-1	40.	60,000	13	6
HL160	DAR	Acc.	6.	.10	6	70-150	120-150	0-1	35.	10,000	13	6
DEL160	DAR	Acc.	6.	.10	6	70-150	120-150	0-1	35.	7,500	13	6
DEP610	P	Acc.	6.	.10	6	70-150	120-150	0-1	35.	8,500	13	6

P235	P	Acc.	6.	.25	6		100-250	6-24	6.	2,400	20	0
P235A	P	Acc.	6.	.25	6		100-180	131-30	3.7	1,600	20	0
L55	P	Acc.	6.	.8	6		150-400	9-40	5.	6,000	35	0
L55A	P	Acc.	6.	.8	6		150-400	30-100	2.5	2,700	35	0

L56A	P	Acc.	6.	.8	6		150-400	50-128	2.5	1,400	40	0
L56	P	Acc.	6.	.8	6		150-400	50-128	2.5	1,400	40	0

P3M3	DAR	Acc.	4.	.06	20	30-100	50-125	2-6	14.	15,000	13	6
P3M4	DAR	Acc.	4.	.06	20	30-100	50-125	2-6	14.	15,000	13	6
P3M4	A	Acc.	4.	.1	6	75-125	44-12	8.	4,450	13	6	
P3M4D	D	Acc.	4.	.1	6	30-100	50-125	2-6	15.	7,500	13	6

P3M5	DR	Acc.	6.	.06	30	30-100	50-125	2-6	17.5	14,700	13	6
P3M6	DR	Acc.	6.	.06	30	30-100	50-125	2-6	17.5	15,000	13	6
P3M6	AP	Acc.	6.	.1	6	75-125	44-12	8.	4,450	13	6	
P3M6D	D	Acc.	6.	.1	6	30-100	50-125	2-6	15.	7,500	13	6

P3M25	P	Acc.	6.	.25	10	75-

## NEW LINES CONSTANTLY ARRIVING.

## INSTRUMENT WIRES.

## DOUBLE COTTON.

SWG.	Yds. per lb.	lb.	lb.	lb.	B. AND S.		S.W.G. S.W.G. S.W.G. S.W.G. DATA		Lbs. per 1000 ft.	Ohms per 1000 ft.	Amps per sq. in.
					Diam. (in.)	GAUGE	Diam. (in.)	1000 ft.			
14	15	10	1/2	2/5	3/8	1000 ft.	13	.104	148.8	1.868	12.87
15	28	13	1/2	2/5	3/8	1000 ft.	14	.098	98.24	2.831	8.498
16	48	17	1/4	2/5	3/8	1000 ft.	15	.092	88.5	3.272	5.277
17	70	22	1/4	2/5	3/8	1000 ft.	16	.087	77.29	7.478	3.217
18	125	34	1/4	2/5	3/8	1000 ft.	17	.083	70.9	13.28	1.810
19	202	39	2/5	3/8	5/16	1000 ft.	18	.08	60.9	10.81	1.616
20	233	36	2/5	3/8	5/16	1000 ft.	19	.076	52.22	13.24	.380
21	250	39	2/5	3/8	5/16	1000 ft.	20	.073	47.29	17.05	.354
22	721	50	2/5	5/8	6/10	1000 ft.	21	.07	42.92	63.24	.320
23	940	54	2/5	3/8	6/10	1000 ft.	22	.068	37.29	26.25	.294
24	1273	63	4/6	8/14	14/22	1000 ft.	23	.065	32.98	36.17	.264

## DOUBLE SILK-GREEN.

SWG.	Yds. per lb.	lb.	lb.	lb.	B. AND S.		S.W.G. S.W.G. S.W.G. S.W.G. DATA		Lbs. per 1000 ft.	Ohms per 1000 ft.	Amps per sq. in.
					Diam. (in.)	GAUGE	Diam. (in.)	1000 ft.			
16	29	14	1/9	2/3	5/16	1000 ft.	20	.036	11.77	25.62	1.838
18	45	19	2/9	3/8	5/16	1000 ft.	22	.028	7.36	39.35	2.116
20	50	24	2/9	3/8	5/16	1000 ft.	24	.022	4.392	63.24	.380
22	138	33	2/6	4/9	9/16	1000 ft.	26	.018	2.942	94.48	.254
24	222	39	2/6	5/6	10/12	1000 ft.	28	.0143	1.98	139.8	.1730
26	339	47	3/6	6/12	13/16	1000 ft.	30	.012	1.359	121.1	.1297
28	414	56	3/6	6/12	13/16	1000 ft.	32	.0103	1.029	262.5	.0914
30	664	66	4/6	8/6	16/24	1000 ft.	34	.0092	.7688	361.7	.0665
32	886	76	5/6	9/6	18/24	1000 ft.	36	.0076	.5249	530.0	.0454
34	1200	85	6/6	11/6	21/24	1000 ft.	38	.0060	.3272	807.3	.0328
36	1777	127	6/6	13/6	23/24	1000 ft.	40	.0048	.2048	1338	.0181
38	2690	121	10/6	17/6	33/24	1000 ft.	42	.0040	.1463	1913	.0125
40	4009	142	12/6	23/6	44/24	1000 ft.	44	.0032	.0930	2988	.0080
42	5491	167	15/6	25/6	57/24	1000 ft.	46	.0024	.0623	5313	.0048
44	8103	192	21/6	40/75	75/24	1000 ft.					

## ENAMELLED.

SW.G.	Turns per in.	lb.	lb.	lb.	B. AND S.		S.W.G. S.W.G. S.W.G. S.W.G. DATA		Lbs. per 1000 ft.	Ohms per 1000 ft.	Amps per sq. in.
					Diam. (in.)	GAUGE	Diam. (in.)	1000 ft.			
15	15	1/2	1/9	3/2	7/16	1000 ft.	16	.025	100.00	1.868	12.87
18	20	20	2/9	3/8	5/16	1000 ft.	17	.023	98.24	2.831	8.498
20	35	33	1/3	2/3	5/16	1000 ft.	18	.021	88.5	3.272	5.277
22	33	33	1/4	2/3	5/16	1000 ft.	19	.019	77.29	13.24	.380
24	42	42	1/6	2/6	5/16	1000 ft.	20	.017	60.9	26.25	.264
26	50	50	1/6	2/9	5/16	1000 ft.	22	.015	52.22	36.17	.234
28	51	51	1/6	2/9	5/16	1000 ft.	24	.013	42.92	94.48	.204
30	72	72	2/6	3/3	5/6	1000 ft.	26	.011	32.98	139.8	.1730
32	93	93	2/6	3/6	5/6	1000 ft.	28	.009	2.942	181.1	.1427
34	98	98	2/5	4/6	9/16	1000 ft.	30	.0076	1.98	139.8	.1297
36	122	122	2/5	4/6	9/16	1000 ft.	32	.0060	1.359	262.5	.1014
38	148	148	2/5	5/6	10/12	1000 ft.	34	.0048	.969	361.7	.0765
40	180	180	4/6	8/6	14/22	1000 ft.	36	.0036	.623	5313	.0524
42	211	211	5/6	10/6	18/24	1000 ft.	38	.0024	.406	120.0	.0328
44	258	258	8/6	14/6	26/24	1000 ft.	40	.0025	.253	733.2	

## RADIO CABLES.

For many radio purposes, the power cables are used, but frequently the power insulation and wire is all that is necessary.

## RAYON RADIO WIRE.

RAYON flex is composed of ten thin strands of wire, insulated with rubber, and then covered with a protective skin, taping. It is made in several colours.

It makes an excellent wire for frame, and is particularly suitable, especially though in Radio it finds a large number of other uses. It is important in being very long, and can be supplied 1000 feet long, if necessary. Any length cut.

W129 Per yd. 3d. If more than 20 yds. per yd.

2d.

W109 100 ft. coil ... each 9

W109 100 ft. coil ... each 9  
W109 16g. round ... 9d. 5 6  
W109 16g. square ... 9d. 5 6

## FLEXIBLE GLAZITE.

This is far more convenient than the single Glazite for wiring, especially where the wires are to be bent. It consists of 19 strands 30 wire, each well tinned, and very easy to solder. Various colours.

W123 100 ft. coil 1/2, 100yd. coil 48 0

## WIRE TABLES.

B. AND S.	S.W.G.	S.W.G.	S.W.G.	S.W.G.	S.W.G. S.W.G. S.W.G. S.W.G. DATA		Lbs. per 1000 ft.
					Diam. (in.)	GAUGE	
1/2	10	1/2	2/5	3/8	.104	148.8	1.868
1/2	13	1/2	3/8	5/16	.098	98.24	2.831
1/2	14	1/2	3/8	5/16	.092	88.5	3.272
1/2	15	1/2	3/8	5/16	.087	77.29	13.24
1/2	16	1/2	3/8	5/16	.083	60.9	26.25
1/2	17	1/2	3/8	5/16	.076	52.22	36.17
1/2	18	1/2	3/8	5/16	.073	42.92	94.48
1/2	19	1/2	3/8	5/16	.068	32.98	139.8
1/2	20	1/2	3/8	5/16	.065	22.98	181.1
1/2	21	1/2	3/8	5/16	.060	17.05	.320
1/2	22	1/2	3/8	5/16	.056	12.730	

## NICHROME WIRE (Bare).

GAUGE	AMPS	B. AND S.		S.W.G. S.W.G. S.W.G. S.W.G. DATA		Lbs. per 1000 ft.	Ohms per 1000 ft.	Amps per sq. in.
		Diam. (in.)	GAUGE	Diam. (in.)	1000 ft.			
1/2	1000 ft.	7.2	1000 ft.	.253	148.8	1.868	12.87	
1/2	1000 ft.	4.42	1000 ft.	.252	98.24	2.831	8.498	
1/2	1000 ft.	3.64	1000 ft.	.24	88.5	3.272	5.277	
1/2	1000 ft.	1.77	1000 ft.	.17	77.29	13.24	.380	
1/2	1000 ft.	1.12	1000 ft.	.16	60.9	26.25	.264	
1/2	1000 ft.	.70	1000 ft.	.15	52.22	36.17	.234	
1/2	1000 ft.	.44	1000 ft.	.14	42.92	94.48	.204	
1/2	1000 ft.	.276	1000 ft.	.11	32.98	139.8	.1730	
1/2	1000 ft.	.177	1000 ft.	.10	22.98	181.1	.1427	
1/2	1000 ft.	.11	1000 ft.	.09	17.05	.320	.1014	
1/2	1000 ft.	.069	1000 ft.	.08	12.730			

The resistance given is taken at ordinary temperatures. At 220 degrees centigrade the resistance increases 10 per cent., at 500 degrees 20 per cent., and at 776 degrees 32 per cent. approximately.

The current carried is at ordinary temperatures. At 220 degrees centigrade the resistance is increased by 3, and at 776 degrees by 6, approximately.

The above tables are self-explanatory.

## TINNED WIRE.

ADVANCE is used where changes in temperature are not to be accompanied by a large change in resistance. Rheostats, and all forms of radio resistances of high value, use this type of wire, and it is for high resistances that it is mainly used.

Such resistances are usually wound with very thin wire, double covered, and then covered with a protective skin, taping. It is made in several colours.

It makes an excellent wire for frame, and is particularly suitable, especially though in Radio it finds a large number of other uses. It is important in being very long, and can be supplied 1000 feet long, if necessary. Any length cut.

W129 Per yd. 3d. If more than 20 yds. per yd.

2d.

W109 100 ft. coil ... each 9

W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

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W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

W109 16g. square ... 9d. 5 6

W109 16g. round ... 9d. 5 6

## DEVELOP YOUR ENGINEERING TENDENCIES.

## CHUCKS.

CHUCKS—CUSHMAN PATTERN.



Three jaw chucks, supplied with self-centering plate castings included. Back plate castings are included in the rough, since chuck will always be mounted on the lathe on which they are used. We believe we are the only firm who include these castings in the price of the chuck.

## CUSHMAN PATTERN.

Well made for all classes of machinery. Best English quality. T279 Gross box, assorted 1 3

## COUNTERS.

Revolution counters are used with the aim of tally of the number of revolutions (or to and fro movements) must be kept. Price includes, cyphometer, winding machine, admission gates, engines, etc.

## HAND COUNTER.

Counts to 1000. Adds one each time the lever is pressed. No larger than a medium sized watch. Nickel plated.

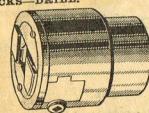


The jaws, of which there are four, can be moved one at a time only. Jaws are reversible. Back plate casting included.

**DRILL CHUCKS—Three Jaws.**  
These chucks will hold round drills from 1/16 in. down to the smallest size. The 1 in. parallel shank will fit 1 Morse ordinary drill. The 1 in. Morse taper shank will fit lathe head stocks, and some smaller drilling machines.

X227 Parallel shank, 1 in. 5 0  
X228 No. 1 Morse shank 5 6

## CHUCKS—DRILL.



Two jaws, operated by key. Strong design. The body is made of steel, and the two jaws are very strong. The key ensures a rigid grip. Suitable for drilling machines and lathes.

X226 0-in.; each 0 15 0  
X263 0-in., each 1 0 0

## CHUCKS—DRILL.



This chuck will save its cost in a very short time. These drills have to be frequently changed. The locking pin, which runs on ball-bearings, and so a firm grip can be obtained by hand pressure. It is necessary to hold the key at each change. When the drill is adjusted, the harder the pressure the tighter the grip. The chuck will readily unscrew when desired.

X264 0-9/16 in. drills 1 16 0

## SPLIT CUTTER PINS.

Well made for all classes of machinery. Best English quality. T279 Gross box, assorted 1 3

## COUNTERS.

Revolution counters are used with the aim of tally of the number of revolutions (or to and fro movements) must be kept. Price includes, cyphometer, winding machine, admission gates, engines, etc.

## HAND COUNTER.

Counts to 1000. Adds one each time the lever is pressed. No larger than a medium sized watch. Nickel plated.

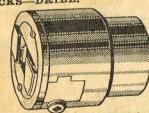


The jaws, of which there are four, can be moved one at a time only. Jaws are reversible. Back plate casting included.

**DRILL CHUCKS—Three Jaws.**  
These chucks will hold round drills from 1/16 in. down to the smallest size. The 1 in. parallel shank will fit 1 Morse ordinary drill. The 1 in. Morse taper shank will fit lathe head stocks, and some smaller drilling machines.

X227 Parallel shank, 1 in. 5 0  
X228 No. 1 Morse shank 5 6

## CHUCKS—DRILL.



Two jaws, operated by key. Strong design. The body is made of steel, and the two jaws are very strong. The key ensures a rigid grip. Suitable for drilling machines and lathes.

X226 0-in.; each 0 15 0  
X263 0-in., each 1 0 0

## CHUCKS—DRILL.



## GIANT V.

As Giant V, but counts one way only to 1,000,000. 60 0  
T285 . . . . .

## COUNTERSINK.



Cuts metal, formica, ebonite, etc. Short round shank, small enough to fit hand drill. 2 0  
X166 . . . . .

## COUNTERSINK DRILL.



5/32 drill, for 6/32 and 8/32 U.S.A. screws. Bore holes in wood, metal and plastic for snow head, rapidly and accurately in one operation. Fits hand drill. 1 6  
X167 . . . . .

## COUNTERSINKS.



Rose head, for metal or hard wood.

X224 . . . . . Price 9

## GIMLET BITS.

Cobra twist; screw point. Tough tool steel.



X220 1 in. ed. X231 With handle 6d

X221 3/16 in. ed. X232 With handle 6d

X222 1 in. ed. X233 With handle 8d

## CRAMPS—Malleable Iron.

Black; swivel screw end.



X240 4 inch . . . . . 1 9

X241 6 inch . . . . . 2 9

## CBOID.

A liquid glue of unrivaled tenacity 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 size holes from 1/16 in. to 1 in. in diameter, etc. This tool is practically essential for

this work. This tool, now much more costly, is very much improved.

14 6  
T284 . . . . .

## PROGRESS.

A larger counter, to 100,000. Instantaneous zero set. Can be used right or left hand.

T283 Black, with set key 32 6

T284 Black, with set key 32 6

T285 . . . . .

Figures 5/16 in. high, counting to 100,000. Can count backwards.

48 0  
T284 . . . . .

Figures 5/16 in. high, counting to 100,000. Can count backwards.

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## TOOLS ARE IDEAL PRESENTS.

## SINGLE BLADE, HEAVY.

The ordinary single blade knife is used on fruit, pencils, etc. where strength is essential. Imitation stag handle. Blade, 3½ in. K133 . . . . . 1 9

## DOUBLE BLADE KNIFE.

A very useful knife especially where fruit, pencils, etc. are concerned. Metal handle, engine turned. Name (up to about 12 letters) can be engraved for 5d. extra.



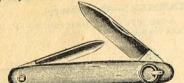
K134 . . . . . ea. 3 0

DOUBLE BLADE, ORDINARY.

Same as K134, but with ordinary blades. K135 . . . . . ea. 2 2

DOUBLE BLADE RING.

Beach blade fitted with a ring for easy opening. Metal handle.



K136 . . . . . ea. 2 3  
K137 As K136, but without rings . . . . . ea. 1 9

SINGLE BLADE, STAINLESS.

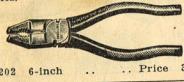
A small metal handle knife, with one stainless steel blade. Fitted with a ring for attaching to a chain. K138 . . . . . ea. 1 0  
K139 As K138, but without ring . . . . . ea. 9

## PLIERS-EYELET-PEXTO.

Specially designed for cutting copper bus wire, and for the true eyelet at the end. Makes eyelets to fit either 1/8" or U.S.A. screws. Each . . . . . 3 0

PLIERS-Insulated.

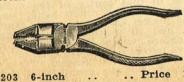
Forged of finest tool steel. Non-slip handles; black insulated; 5000 volts.



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 5½-inch . . . . . Price 2 8

## RADIO PLIERS.

Insulated handle, 3000 volts.



X205 5½-inch . . . . . Price 3 0

## MILLINERS' PLIERS.

Flat jaws. Wire cutter; with ring.



X206 4½-inch . . . . . Price 2 9

## DIAGONAL CUTTING PLIERS.

Very useful indeed, especially where close cutting is essential.



X207 5½-inch . . . . . Price 3 0

## NAIL PUNCHES.

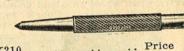
Knurled; cup point.



X209 . . . . . Price 6

## CENTRE PUNCHES.

Knurled; tool steel.



X210 . . . . . Price 6

## BEAMER.

This tool is always in demand. In Radio, a commencing hole 1 in. in diameter can be bored, and then can be enlarged to any desired size with beamers. The will cover sizes from 1/8" to 1 in. The tools, which are switched and other apparatus rather larger than usual is easy with one of these beamers.

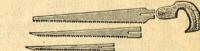
For general purposes it is no less useful. If you purchase one, you would never be without it later. It fits the ordinary brace.

X135 1/4 in. to 1 in. . . . . 5 0

X136 1/4 in. to 1 in. . . . . 10 0

## SAWS—NEST OF THREE.

18-inch handsaw, 18-inch compass saw, 12-inch keyhole saw.



X235 . . . . . Price 3 6

## SCREWDRIVERS—Electricians'.

Polished blade. Black fluted handle.



X250 3 inch . . . . . s. d.

X251 5 inch . . . . . 1 9

X252 4 inch . . . . . 1 9

X253 6 inch . . . . . 1 0

S. D.

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 . . . . . Price s. d.

X246 3-inch . . . . . 1 0

X247 4-inch . . . . . 1 6

X248 6 inch . . . . . 2 3

X249 8 inch . . . . . 2 3

S. D.

SCREWDRIVER.

YANKEE RATCHET pattern. Knurled washer for quick operation on loose screws.

Right, left hand or rigid. Polished steel blade.



X342 3-inch . . . . . Price 3 6

X243 6-inch . . . . . Price 4 0

## SCREWDRIVER BITS.

Polished steel, 1/8 inch.



X234 . . . . . Price 9

## SILVER STEEL.

Silver steel is made in lengths of 12 inches only. It is a special steel that is not easily forged for making small taps, drills, punches, and similar temple tools, but is also very suitable for cutting and filing for motors and models. It is ground accurately to size, and perfectly true. The sizes, which are standard, range from 1/16" to 1 in. by 1/16ths. are stocked, as well as wire gauge sizes in round only, from 1/16" to 1 in.

The main sizes are given in pairs of all other sizes are the same as the next larger size. All prices in pairs, 13 inches.

## INCH SIZES. GAUGE SIZES. SIZES.

| s. d.    |
|--------|--------|--------|--------|----------|
| 1/16   | 1/16   | 1/16   | 1/16   | 1/16     |
| 3/32   | 3/32   | 3/32   | 3/32   | 3/32     |
| 1/8    | 1/8    | 1/8    | 1/8    | 1/8      |
| 5/64   | 5/64   | 5/64   | 5/64   | 5/64     |
| 3/16   | 3/16   | 3/16   | 3/16   | 3/16     |
| 7/64   | 7/64   | 7/64   | 7/64   | 7/64     |
| 1/4    | 1/4    | 1/4    | 1/4    | 1/4      |
| 9/64   | 9/64   | 9/64   | 9/64   | 9/64     |
| 5/32   | 5/32   | 5/32   | 5/32   | 5/32     |
| 11/64  | 11/64  | 11/64  | 11/64  | 11/64    |
| 3/16   | 3/16   | 3/16   | 3/16   | 3/16     |
| 13/64  | 13/64  | 13/64  | 13/64  | 13/64    |
| 1/2    | 1/2    | 1/2    | 1/2    | 1/2      |
| 15/64  | 15/64  | 15/64  | 15/64  | 15/64    |
| 31/64  | 31/64  | 31/64  | 31/64  | 31/64    |
| 1/4    | 1/4    | 1/4    | 1/4    | 1/4      |
| 17/64  | 17/64  | 17/64  | 17/64  | 17/64    |
| 33/64  | 33/64  | 33/64  | 33/64  | 33/64    |
| 19/32  | 19/32  | 19/32  | 19/32  | 19/32    |
| 1/2    | 1/2    | 1/2    | 1/2    | 1/2      |
| 21/32  | 21/32  | 21/32  | 21/32  | 21/32    |
| 13/16  | 13/16  | 13/16  | 13/16  | 13/16    |
| 25/32  | 25/32  | 25/32  | 25/32  | 25/32    |
| 15/16  | 15/16  | 15/16  | 15/16  | 15/16    |
| 27/32  | 27/32  | 27/32  | 27/32  | 27/32    |
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| 105/32 | 105/32 | 105/32 | 105/32 | 105/32   |
| 95/16  | 95/16  | 95/16  | 95/16  | 95/16    |
| 107/32 | 107/32 | 107/32 | 107/32 | 107/32   |
| 97/16  | 97/16  | 97/16  | 97/16  | 97/16    |
| 109/32 | 109/32 | 109/32 | 109/32 | 109/32   |
| 99/16  | 99/16  | 99/16  | 99/16  | 99/16    |
| 111/32 | 111/32 | 111/32 | 111/32 | 111/32   |
| 101/16 | 101/16 | 101/16 | 101/16 | 101/16   |
| 113/32 | 113/32 | 113/32 | 113/32 | 113/32   |
| 103/16 | 103/16 | 103/16 | 103/16 | 103/16   |
| 115/32 | 115/32 | 115/32 | 115/32 | 115/32   |
| 105/16 | 105/16 | 105/16 | 105/16 | 105/16   |
| 117/32 | 117/32 | 117/32 | 117/32 | 117/32   |
| 107/16 | 107/16 | 107/16 | 107/16 | 107/16   |
| 119/32 | 119/32 | 119/32 | 119/32 | 119/32   |
| 109/16 | 109/16 | 109/16 | 109/16 | 109/16   |
| 121/32 | 121/32 | 121/32 | 121/32 | 121/32   |
| 111/16 | 111/16 | 111/16 | 111/16 | 111/16   |
| 123/32 | 123/32 | 123/32 | 123/32 | 123/32   |
| 113/16 | 113/16 | 113/16 | 113/16 | 113/16   |
| 125/32 | 125/32 | 125/32 | 125/32 | 125/32   |
| 115/16 | 115/16 | 115/16 | 115/16 | 115/16   |
| 127/32 | 127/32 | 127/32 | 127/32 | 127/32   |
| 117/16 | 117/16 | 117/16 | 117/16 | 117/16   |
| 129/32 | 129/32 | 129/32 | 129/32 | 129/32   |
| 119/16 | 119/16 | 119/16 | 119/16 | 119/16   |
| 131/32 | 131/32 | 131/32 | 131/32 | 131/32   |
| 121/16 | 121/16 | 121/16 | 121/16 | 121/16   |
| 133/32 | 133/32 | 133/32 | 133/32 | 133/32   |
| 123/16 | 123/16 | 123/16 | 123/16 | 123/16   |
| 135/32 | 135/32 | 135/32 | 135/32 | 135/32   |
| 125/16 | 125/16 | 125/16 | 125/16 | 125/16   |
| 137/32 | 137/32 | 137/32 | 137/32 | 137/32   |
| 127/16 | 127/16 | 127/16 | 127/16 | 127/16   |
| 139/32 | 139/32 | 139/32 | 139/32 | 139/32   |
| 129/16 | 129/16 | 129/16 | 129/16 | 129/16   |
| 141/32 | 141/32 | 141/32 | 141/32 | 141/32   |
| 131/16 | 131/16 | 131/16 | 131/16 | 131/16   |
| 143/32 | 143/32 | 143/32 | 143/32 | 143/32   |
| 133/16 | 133/16 | 133/16 | 133/16 | 133/16   |
| 145/32 | 145/32 | 145/32 | 145/32 | 145/32</ |

## VALVES—GOOD VALVES are Best in the End.

### ELECTRIC FITTINGS. ADAPTORS—DOUBLE.

#### ACCUMULATORS—MOTOR CAR, SIX VOLTS.

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

#### 80 AMP. SPECIAL.

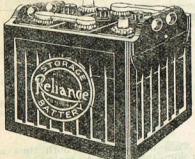
A good accumulator, at a very competitive price. Suitable for all placements. Fits same cars as A218 below.

A217 80 amp. special ... 3 15 0

#### 32 AMP.

As used on the majority of cars. Well constructed and very reliable. Note the size is just a little larger than usually quoted at the price.

For Buick 4, Chevrolet, Ruby, Erskine, Essex, Ford, Whippet, etc.



A218 32 amp. ... 5 0 0

#### 110 AMP.

For larger cars, and general heavy duty work.

For Buick Master 6, Chandler, Chrysler, Dodge 6, Graham-Paige, Hudson, Nash, Oldsmobile, Peerless, Plymouth, Studebaker, Reo, A219 110 amp. ... 5 17 6

Write for full price list, or name you can get, and we will quote you, if not mentioned in above list.

#### ADAPTORS—BAYONET.

Bayonet adaptors are universally used in order to work apparatus from the lamp holder. Both adaptors listed are standard, and the wires can be very readily connected, since the metal parts cannot turn.



E130 Each ... 1 0  
E110 "MAGNET" BAKELITE adapter ... 1 0

#### ADAPTORS—MAGNET BAKELITE.

Fitted with a switch, enabling the light to be turned on or off, but enabling an iron or other light to be left on.



112 Bakelite; each ... 8 0  
215 Bakelite, push switch ... 6 6

#### ADAPTORS—DOUBLE.

Enabling two lamps or other apparatus to be used from the one holder. Every home wants one or two of these.



E111 Brass ... each 4 6

#### ADAPTORS.

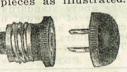


This adaptor fits into the ordinary bayonet holder, and enables lamp or other connection. U.S.A. standard connection. The base fills a very pressing need, as it enables all American apparatus to be connected to our bayonet lamp holders.

E212 ... 5 0  
E213 Fitting U.S.A. holder, enabling bayonet lamp to be used ... 5 0

#### ADAPTOR—EDISON SCREW.

This double fitting is used in connection with American (Edison) screw lamp holders. Price includes the two pieces as illustrated.



E119 Plug only, bakelite ... 1 0  
E121 Plug only, rubber ... 1 0  
E122 Screw part only ... 6

#### TRIFLE OUTLET.

Consists of E1190 plug and adaptor, a length of twin flex and a beautifully finished bakelite moulding, fitted with a standard outlet and E1190. Two screw holes enable it to be screwed to the wall or table. Its insulation is perfect, it has no sharp edges exposed, and it enables, say, a reading lamp, Radio and fan to be operated at the same time.

The adaptor can be changed for a bayonet adaptor in a few moments the plug then being used for the outlet. Extra outlet plugs, see E119, 18.



This is the nastiest thing we have seen for a long time, and we shall be surprised if it does not sell in hundred thousand, owing to its exceptional convenience.

E1190 Triple outlet ... 9 0  
E1191 Plug to fit, each ... 1 0

#### ADAPTOR—DOUBLE EDISON.

This is made of porcelain, fitting on to the Edison screw lamp holders. E131 Each ... 2 0

#### ADAPTOR, TRIPLE.

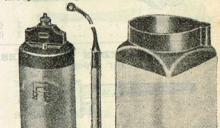
Triple adaptor, bakelite, fitting the plug that usually accompanies American apparatus. Enables three connections to be used instead of only one. Fits E122 or E180.



E179 Triple adaptor ... 2 0  
E190 or E191 Plug to fit, each 1 0

#### LECLANCHE BATTERIES.

The Leclanche is favorite for ringing bells, wireless, 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.



E218 Complete ... 3 6  
E219 Porous pot only ... 1 9  
E220 Zinc pot only ... 1 6  
E221 Glass jar only ... 1 6  
E222 Sal ammoniac ... lb. 1 6

#### BELL PUSHES.

##### MOULDED.

Wood push button, now superseded by bakelite, which is not only far more satisfactory, but is also cheap. Brown or black.



##### YEAR PUSHES.

Used where the bell wires hang from the ceiling, or where the push must be made above the floor in a sick room. Bakelite moulding.



E160 Rosette to match ... 1 9

## INSULATION IS ALWAYS IMPORTANT.

### BELLS AND BUZZERS.

These electric bells will be found useful in many ways. They are easily installed, requiring only two or three No. 6 dry batteries to operate them, and are very quiet.

Where a quieter signal is desired, buzzers are installed, these being similar to the bells, but without the gong.

Where alternating current is available, bells may be operated from the magnet, or from 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.



E146 Gong, 2 1/2 in. ... 3 9  
E147 Gong, 3 in. ... 3 4

#### WOOD BELLS.

G.E.C. magnet, wood base, 2 1/2 in. going.



E161 Ordinary quality ... 4 9

#### BUZZERS.



E149 Buzzer, similar to E146 ... 3 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.

##### BAKELITE.

Small two pin connectors, for loud speaker connections, etc. Can be connected only one way.

E135 Each ... 2 0

#### BLOCKS.

Polished wood blocks are used for mounting switches, etc.



E114 Round, 3 1/2 in. each ... 1 6  
E115 Rectang. 6 x 3 ... 1 0  
E116 Rectang. 9 x 3 ... 1 6

#### ELECTRIC FANS.

As sold by the B.G.E., who make the MAGNETIC ELECTRIC APPARATUS, 230 volt, either D.C. or A.C. Ten inch fan.



E148 Tea gong, 2 1/2 in. ... 5 3

#### WOOD BELLS.

##### going.



E160 Electric fan, oscillating ... 4 9

#### FUSES.

Screw fuses, as used in all American electric sets, etc. All tested, to make sure that you get a set protected. There are no better fuses made, regardless of price paid.

You should always keep one or two of these in stock.



Stocked in 5, 10, 15, 20, 25 and 30 amps. State which is required in ordering.

E149 Screw fuse ... each 6

FOR FUSES FOR RADIO USE, see Edison screw fuses. Use bulb holder which is used with a flat light bulb as a fuse, and also under PLUGS, for Bellring-Lee Radio fuses.

#### ELECTRIC IRONS—230 Volt.

The EAGLE IRON is sold with a definite guarantee of service. It is a well-made, nickel plated iron, complete with best connector, asbestos covered cord, and plug.

The heating element has the life of the magnet wound on best mica, with nichrome wire, and it will last for years. Spare elements are always in stock, ready for instant replacement, should ever be necessary.



E185 Eagle iron ... 27 0

#### EAGLE HOUSEHOLD IRON.

A full weight, perfectly reliable iron, complete with connector, cord, and plug. Nickel plated. Uses the standard Eagle element. Guaranteed.

E119 Eagle household iron ... 21 0

Write for prices of 32 or 110 volt iron or elements.

**MAGNET IRON.**  
Balanced weight, comfortable grip. 6 lbs. Element guaranteed for three years. With connector and cord.



E207 Magnet iron ... 1 5 0

#### PLUGS—BAKELITE.

Plugs suitable for irons, toasters, radiators, etc. Bakelite, with strong pins, and with a slot, with a spring tongue, ensuring contact even if the clips should spread with heat. Special lock nuts, which do not work loose.

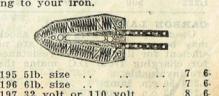
E188 Bakelite plug ... 2 6

**PLUGS—ARMORED.**  
Similar to the bakelite plug, but with a plated steel cover, making it practically unbreakable.

E139 Armored plug ... 2 6

#### IRON ELEMENTS—230 VOLTS.

The best mica wound with highest grade nichrome wire. Fits 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

## K-N IRONS—BRITISH MADE.

**MAGNET ELECTRIC KETTLES.**  
A magnificently nickel plated kettle, made in two sizes. Fitted with safety fuse, preventing damage to element if kettle boils dry. Guaranteed.



E212 Magnet kettle, 2 pt. 1 17 6  
E208 Magnet kettle, 3 pt. 2 12 6

### LAMPS—OSRAM 230 Volt.

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.

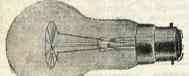
#### METAL FILAMENT.

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 red brilliancy 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. These better lighting actually costs less.

They can be supplied clear or the glass partially filled 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 60 3 0  
L218 60 90 3 8  
L219 75 100 4 3  
L220 100 150 6 0  
L219 150 200 8 0  
L221 200 300 10 0  
L221 300 600 14 0  
L222 500 1000 20 0

**CARBON LAMPS, 230 volt.**  
Used in places where severe shocks may be encountered. They are not safe for D.C. use. All resistances for charging from D.C. mains they are invaluable.  
L554 50 c.p. lamp . . . . . 4 6  
L555 50 c.p. lamp . . . . . 2 9

#### OSGLIM LAMPS.

Useful for night lights, where illumination is wanted, but far more useful to the experimenter. For testing valves, etc. The light bulb is not supplied, coils, circuits, an OSGLIM is invaluable. Made to fit ordinary bayonet base. Consumption is practically negligible.

The actual light of one of a number, any of which can be supplied, 230 volts. L216 OSGLIM LAMP . . . . . 5 0

#### SEWING LAMPS.

Flexible arm, with heavy metal base. The lamp can be "bent" to any position. Ideal for table use, bedroom lamp, etc. Lamp included.

E202 Reading lamp . . . . . 16 6

E203 Sewing machine lamp . . . . . 25 0

E204 . . . . . 1 6

E205 Magnet radiator . . . . . 1 7 6

E206 Magnet electric fire . . . . . 2 12 6

E207 Magnet electric fire . . . . . 2 12 6

E208 Magnet electric fire . . . . . 2 12 6

E209 Magnet electric fire . . . . . 2 12 6

E210 Magnet electric fire . . . . . 2 12 6

E211 Magnet electric fire . . . . . 2 12 6

E212 Magnet electric fire . . . . . 2 12 6

E213 Magnet electric fire . . . . . 2 12 6

E214 Magnet electric fire . . . . . 2 12 6

E215 Magnet electric fire . . . . . 2 12 6

E216 Magnet electric fire . . . . . 2 12 6

E217 Magnet electric fire . . . . . 2 12 6

E218 Magnet electric fire . . . . . 2 12 6

E219 Magnet electric fire . . . . . 2 12 6

E220 Magnet electric fire . . . . . 2 12 6

E221 Magnet electric fire . . . . . 2 12 6

E222 Magnet electric fire . . . . . 2 12 6

E223 Magnet electric fire . . . . . 2 12 6

E224 Magnet electric fire . . . . . 2 12 6

E225 Magnet electric fire . . . . . 2 12 6

E226 Magnet electric fire . . . . . 2 12 6

E227 Magnet electric fire . . . . . 2 12 6

E228 Magnet electric fire . . . . . 2 12 6

E229 Magnet electric fire . . . . . 2 12 6

E230 Magnet electric fire . . . . . 2 12 6

E231 Magnet electric fire . . . . . 2 12 6

E232 Magnet electric fire . . . . . 2 12 6

E233 Magnet electric fire . . . . . 2 12 6

E234 Magnet electric fire . . . . . 2 12 6

E235 Magnet electric fire . . . . . 2 12 6

E236 Magnet electric fire . . . . . 2 12 6

E237 Magnet electric fire . . . . . 2 12 6

E238 Magnet electric fire . . . . . 2 12 6

E239 Magnet electric fire . . . . . 2 12 6

E240 Magnet electric fire . . . . . 2 12 6

E241 Magnet electric fire . . . . . 2 12 6

E242 Magnet electric fire . . . . . 2 12 6

E243 Magnet electric fire . . . . . 2 12 6

E244 Magnet electric fire . . . . . 2 12 6

E245 Magnet electric fire . . . . . 2 12 6

E246 Magnet electric fire . . . . . 2 12 6

E247 Magnet electric fire . . . . . 2 12 6

E248 Magnet electric fire . . . . . 2 12 6

E249 Magnet electric fire . . . . . 2 12 6

E250 Magnet electric fire . . . . . 2 12 6

E251 Magnet electric fire . . . . . 2 12 6

E252 Magnet electric fire . . . . . 2 12 6

E253 Magnet electric fire . . . . . 2 12 6

E254 Magnet electric fire . . . . . 2 12 6

E255 Magnet electric fire . . . . . 2 12 6

E256 Magnet electric fire . . . . . 2 12 6

E257 Magnet electric fire . . . . . 2 12 6

E258 Magnet electric fire . . . . . 2 12 6

E259 Magnet electric fire . . . . . 2 12 6

E260 Magnet electric fire . . . . . 2 12 6

E261 Magnet electric fire . . . . . 2 12 6

E262 Magnet electric fire . . . . . 2 12 6

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E300 Magnet electric fire . . . . . 2 12 6

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E302 Magnet electric fire . . . . . 2 12 6

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E318 Magnet electric fire . . . . . 2 12 6

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E320 Magnet electric fire . . . . . 2 12 6

E321 Magnet electric fire . . . . . 2 12 6

E322 Magnet electric fire . . . . . 2 12 6

E323 Magnet electric fire . . . . . 2 12 6

E324 Magnet electric fire . . . . . 2 12 6

E325 Magnet electric fire . . . . . 2 12 6

E326 Magnet electric fire . . . . . 2 12 6

E327 Magnet electric fire . . . . . 2 12 6

E328 Magnet electric fire . . . . . 2 12 6

E329 Magnet electric fire . . . . . 2 12 6

E330 Magnet electric fire . . . . . 2 12 6

E331 Magnet electric fire . . . . . 2 12 6

E332 Magnet electric fire . . . . . 2 12 6

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E334 Magnet electric fire . . . . . 2 12 6

E335 Magnet electric fire . . . . . 2 12 6

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E339 Magnet electric fire . . . . . 2 12 6

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E341 Magnet electric fire . . . . . 2 12 6

E342 Magnet electric fire . . . . . 2 12 6

E343 Magnet electric fire . . . . . 2 12 6

E344 Magnet electric fire . . . . . 2 12 6

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E359 Magnet electric fire . . . . . 2 12 6

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E361 Magnet electric fire . . . . . 2 12 6

E362 Magnet electric fire . . . . . 2 12 6

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E365 Magnet electric fire . . . . . 2 12 6

E366 Magnet electric fire . . . . . 2 12 6

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E401 Magnet electric fire . . . . . 2 12 6

E402 Magnet electric fire . . . . . 2 12 6

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E404 Magnet electric fire . . . . . 2 12 6

E405 Magnet electric fire . . . . . 2 12 6

E40



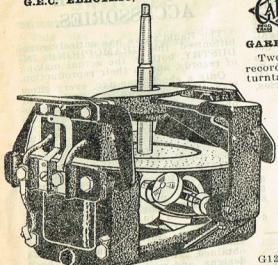
## ALTONA NEEDLES—PURER TONE, LESS WEAR.

G.E.C. ELECTRIC. INDUCTION.



## GARRARD 10A.

Two-spring, playing three 12 inch records. Very powerful; 12 inch turntable.



A very fine American motor, with no moving contacts, consequently no noise. For A.C. current only. Will run without attention until the bearings wear out.

G165 G.E.C. induction motor 8 10 0

## GARRARD SPRING (British Made).

Our Garrard motors, the gears are accurately cut, to ensure smooth and silent running, as well as long life. Their general excellence is shown in every detail. The "GARRARD MOTOR" is the hall-mark of the good gramophone.

All are complete, with turntable, pick-up, motor, winding handle, escutcheon plate, screws and washers.

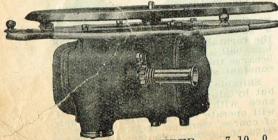
The springs are contained in a separate unit, which can be detached in a few seconds, without dismantling the remainder of the motor. This makes the fitting of new springs a much easier job.

## GARRARD SUPER.

Without question, the finest motor we have made to-day. All working parts are solidly and completely enclosed in a heavy case, not only preventing accidental damage, but ensuring every trace of oil to ensure perfect lubrication. A patent oil pump fitting is used, so that every part is definitely oiled, with the minimum of attention. Turntable, 12in., plush covered.

It will play three 12in. records with one winding, having two long and one sprung springs.

A control plate is incorporated, with start and speed indicator, already fitted in place. No difficulty is involved in fitting to cabinet.



G120 GARRARD SUPER ... 7 10 0

G122

... 2 17 6  
GARRARD 12.

Single spring, playing two 10 inch records; 10 inch turntable.

Small size, suitable for portable machines.

## MONARCH GEAMO. MOTORS.

These are Swiss make, and are of marvellous quality, and the low price is considerably. Certainly, no need hesitate about purchasing one of these motors, or any of the expense involved in importing them direct.

Each is complete with winding handle, fixing screws and washers, regulator, turntable and turntable. The number of records played at one winding is given.

MONARCH "SIMPLEX."

Single spring, with 8½-inch turntable. Plays 12-inch record. Design similar to Champion.

G159 Simplex ... 25 0

G121 GARRARD 10A ... 3 15 0

## MONARCH "CHAMPION."

Single spring, with 10-inch turntable. Plays 12-inch record. Worm governor, special regulator.

G160 Champion ... 33 0

## MONARCH "CHIEF."

Double spring, with 12-inch turntable. Plays two 12-inch records. Worm governor, special regulator. Design similar to Champion.

G161 Chief ... 39 0

## MONARCH "LEADER."

Single spring, with 12-inch turntable. Plays 12-inch record. Worm governor, all enclosed gearing. A fine motor.

G162 Leader ... 45 0

## MONARCH "SUPERIOR."

A very high grade motor, similar in construction to the LEADER, but with double spring motor, playing with two 12-inch records.

G163 Superior ... 63 0

## GRAMOPHONE PICK-UPS.

Electrical gramophone pick-ups are used with a steel needle, much as are ordinary recorders. Instead, however, of creating sound waves, they generate electric waves, which may be increased by a magnet, which may be increased by a magnet, which may be increased by a magnet, and finally turned again into sound waves by a good speaker.

Excellent results can be obtained with any good Radio, provided one uses a good valve, such as a 25" super-

power valve, or a 25" super-

## B.T.H. PICK-UPS—SWEETEST TONE.

## REPRODUCERS.

The best British pick-up on the market and superior to all others we have tried for the most faithful reproduction of the original. While it is only a little better than other pick-ups, this is far more than compensated by its wonderful tone, especially when used in the home and small halls.

It is fitted with a very fine gun-finished tone arm with special offset end, so that it "turns" better on a record than other pick-ups. This prevents undue record wear.

Separate volume control is in-

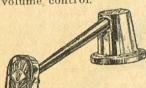


G170 B.T.H. pick-up ... 4 10 0

## WEBSTER.

A well-known and very powerful American pick-up, usually chosen when full volume is desired.

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 ... 45 0 0  
G169 Webster Model 2B ... 4 0 0

## EDISON BELL.

Another well-known British pick-up, which, though cheaper, gives very satisfactory results. Complete with volume control. Try one of these and you will find that you are not more than a week away.

G138 Edison Bell pick-up ... 2 0 0

## VOLUME CONTROLS.

These are connected between the pick-up and the Radio or amplifier, giving full control over the volume from the volume control, the fullest power possible—merely by turning a knob.

For illustrations, see ROYALTY, RESISTANCES and CLAROSTATS, w. & s.

A CONVENTY VOLUME CONTROL, with s.t., already in type L Royalty, resistance is involved 0.000 ohms, volume control 6 6

## VOLUME CONTROL.

up to 500,000 ohms, made for fitting to 12 volt 6A6 vacuum tubes, can be table mounted for controlling a radio set, from a dis-

control clarostat 8 6  
alloy type ... 13 6

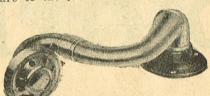
## DURO REPRODUCERS AND TONE ARMS.

We now have a very large sample range of TONE ARMS and REPRODUCERS. You can make your own machine and make a wonderful improvement in it by replacing the tone arm, by a modern type.

Write for details. We will make arrangements for you to try the above, returning same if our claims are not justified.

## DURO QUALITONE, MATCHED.

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



## DURO SIMPLEX.

A reproducer that is generally sold with its own matched tone arm, thus assuring the best results. You will give best results than your present reproducer, however, even on your own tone arm. A trial will be gladly arranged.

G121 Tone arm ... 2 2 0  
G122 Reproducer and tone arm ... 1 2 6  
G126 Reproducer only ... 1 2 6  
G127 Tone arm only ... 1 2 6

## NOVATONE TONE ARM.

Develops a remarkably clear and melodious tone. Can be supplied either alone with tone arm. Very suitable for portable machines. Beautifully nickel plated.

G128 Reproducer and tone arm ... 1 2 6

G129 Reproducer only ... 1 2 0  
G130 Tone arm only ... 1 2 0

## G154 OUTSIDE TYPE.

It is something very special, and will make a vast improvement in any gramophone fitted with the older-style tone arms. It acts like the exponential horn, so well known and successful in Radio.

Arrange for a trial—you will not be sorry to keep it, unless you are quite sure that you want it.

English made—ball bearing—nickel plated.

Novatone tone arm ... 1 15 0

G164 Novatone tone arm ... 1 15 0

## GRAMOTROPE.

This converts your Radio into an electric gramophone, so that you can either enjoy Radio concerts, or play your favourite records at any time. It consists of a cabinet fitted with a suitable gramophone motor and pick-up. It is simply connected to the Radio, and can be used with any records.

You can select the records, and put them alongside you on the table together with your Gramotrope, and have them at your leisure, without getting up from your chair.

Even when you have a large number of records, you will appreciate the great convenience of being able to avoid the constant getting up and down when it is, when records are to be changed.

## MODEL A.

Fitted with G.E.C. induction motor, 12 volt, pick-up and volume control, and 20 foot speaker cord.

G170 Model A Gramotrope 16 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 Garrard Super spring motor, and good quality pick-up.

G172 Model C Gramotrope 8 0 0

Double turntables quoted on request.

## FITTINGS.

## BRACKETS.

These serve to stop the motor when the record is played. They are all designed so that the turntable comes on the outer, and some on the inner edge. Nickel plated.

## G153 OUTSIDE TYPE.

ea. 1

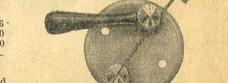


## G154 OUTSIDE TYPE.

best ea. 2 6

G155 INSIDE TYPE.

ea. 1 6



## 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

G144 WITH NUT ... ea. 1 6

GRAMOPHONE REPAIRS, MAIN SPRINGS, etc. quoted on application.

See CABINET FITTINGS for other accessories.

G120 GARD.

## ACE CYCLES. BEST BRITISH.

## "ALTONA" NEEDLES.

ALTONA NEEDLES are made by a first-class Sheffield steel firm, who also makes needles for many of the prominent firms. They will sell them under their own name, of course, at a much higher price.

## ALTONA NEEDLES.

THE BEST QUALITY IT IS POSSIBLE TO OBTAIN, so that you can use them with every confidence.

Per box Five

of 200 boxes

G134 Soft ... 1 0 4 9

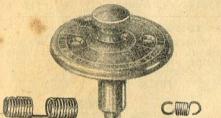
G135 Loud ... 1 0 4 9

G136 GOLDEN, box 100 1 3 6 0

GOLDEN TONE needles play eight or ten records without requiring to be changed.

## SPEEDY REGULATORS.

Consists of a nickel plated disc engraved with numbers and divided into 1000 revolutions per minute. A secured nut and pointer regulate the speed, by adjusting the brake arm under the motor board of the gramophone.



## G158. G145. G157

G145 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 tone arm on their gramophone for the pick-up. A tone arm is necessary, of course, for those who have a radio, and wish 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

GRAMOPHONE REPAIRS, MAIN

SPRINGS, etc. quoted on application.

See CABINET FITTINGS for other

accessories.

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SPRINGS, etc. quoted on application.

See CABINET FITTINGS for other

## ACE CYCLOMETERS COUNT YOUR MILES.

## CYCLE ACCESSORIES.

NOTE—Only the main items are listed here. Write us for any cycle accessory, and it will be promptly supplied.



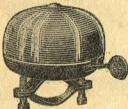
## BALLS—HOFFMAN.

Guaranteed true to a 10,000th part of an inch.

	dz.	gr.
Y115 1/8-inch	24	1 3
Y101 3/16-inch	34	2 0
Y102 1/4-inch	44	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. 216	2 5/16	3 0
Y106 Rouser (not Lucas)	2 1/16	1 0

## BRACKET AXLES.

Made by Brampton, carefully hardened, and accurately ground.

	Y107 Bracket axle	2 0
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## BRACKET CUPS.

Also made by Brampton, the cottered type for use with cotter pins.



and the cottered 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, cotteredless, 1/4" thick	1 0	
Y113 Bracket cup, cotteredless, left	1 0	
Y114 Bracket lock ring for Y113	6	
Y115 Bracket cotters, complete	3	

## CARRIERS—REAR.

Both are complete with straps. The Hercules is a very strong rear carrier, suitable for heavy packages, while the Sturdic is quite rigid, and perfectly safe for light parcels such as an overcoat.

	Y116 Hercules carrier	3 9
Y117 Sturdic carrier	2 9	

## CHAINAS—ROLLER.

Brampton chains are very strong and smooth. See if you can get 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 1/8 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 flamed to secure the chain and the cranks enormously strengthened and the chain set completely toughened. Complete chain set includes two cranks, and chain wheel.



	Y103 Lucas No. 236	1 6
Y104 Lucas No. 216	2 1/16	2 0
Y105 Lucas No. 216	2 5/16	3 0
Y106 Rouser (not Lucas)	2 1/16	1 0



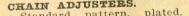
	Y121 Complete set	10 6
Y122 Right crank	5	6
Y123 Left crank	4	0



	Y124 Crank cotter	2
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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	1 6
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	Y127 Chain adjusters, straight caps	1 6
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	Y128 Celluloid	1 0
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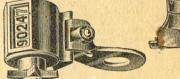
	Y129 Celluloid	1 0
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	Y130 Rubber	pair 2 0
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	Y140 Rubber	pair 2 0
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## CYCLOMETERS.

Complete with striker, for 28 inch wheel. These are woundly constructed, and read to 10,000 miles. Why not know how far you cycle every motor car carries a speedometer.



	Y108 Ace cycloometer	6 0
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## FORKS.

Standard size, enamelled and plated, ready for fitting. Send measurement of fork stem, or, better still, the old fork, as pattern.



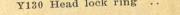
	Y128 Fork, front	12 6
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## HEAD FITTINGS.

Brampton quality, well nickel plated. Two patterns are offered, while fitting stems are well seated, while the screwed race is used for expander type stems.



	Y129 Head clip and bolt	2 9
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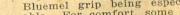


	Y130 Head lock ring	1 0
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	Y131 Head bolt and nut, as illustrated	6
Y132 Head bolt and nut, plain	6	
Y133 Head race, black	6	
Y134 Head crown race, plated	9	
Y135 Head screwed race, plated	1 0	



	Y134 Head bolt and nut	6
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	Y135 Head race	6
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	Y136 Head crown race	9
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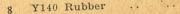
	Y137 Head screwed race	1 0
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	Y138 Head burner	1 0
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	Y139 Head cleaner	1 0
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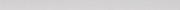
	Y140 Rubber	pair 2 0
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	Y141 Rubber	pair 2 0
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	Y142 Rubber	pair 2 0
--	-------------	----------



	Y143 Rubber	pair 2 0
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	Y144 Rubber	pair 2 0
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	Y145 Rubber	pair 2 0
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	Y146 Rubber	pair 2 0
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	Y147 Rubber	pair 2 0
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	Y148 Rubber	pair 2 0
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	Y149 Rubber	pair 2 0
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	Y150 Rubber	pair 2 0
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	Y151 Rubber	pair 2 0
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	Y152 Rubber	pair 2 0
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	Y153 Rubber	pair 2 0
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	Y154 Rubber	pair 2 0
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	Y155 Rubber	pair 2 0
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	Y156 Rubber	pair 2 0
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