

RAILWAY SIGNALLING APPARATUS



RS
SECTION
1st EDITION.
January, 1923

THE GENERAL ELECTRIC CO. LTD.

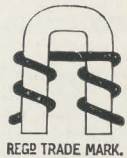
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RS
SECTION

January,
1923.

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G. E. C.
RAILWAY SIGNALLING APPARATUS WORKS

WEMBLEY
ENGLAND



RAILWAY SIGNALLING APPARATUS.

FOREWORD.

The Railway Signalling Apparatus Works of The General Electric Co., Ltd., situated at Wembley, Middlesex, are equipped for the production of all types of Railway Signalling Apparatus and Accessories.

The apparatus described in the present catalogue cover an extremely comprehensive range of Signalling Gear and Accessories, and caters for practically all requirements.

Apparatus can also be supplied to Railway Companies own specifications or samples, special attention being given to this class of work.

Only the highest grade material and best workmanship are employed, whilst all apparatus has to undergo extremely rigid inspection at each stage of manufacture.

Before leaving the works every article is submitted to careful examination and test in a Test Room specially equipped for the purpose, and staffed by engineers experienced in all branches of Railway Signalling.

A well equipped Demonstration Room is also provided where the various gear can be inspected in operation. The works are in easy reach of London and a cordial invitation is extended to those interested to visit them at any time.

In conclusion the Technical Staff of the Company is always prepared to submit schemes to special requirements or design apparatus to perform special functions.

HALL COLOUR-LIGHT SIGNAL.

DESCRIPTION.

The use of Light Signals for both day and night indications is not an innovation in signalling practice, such signals having been used on both steam and electrically operated railways for some years.

The general use of Light Signals has, however, been retarded owing to a number of unsatisfactory features of the light signals hitherto placed on the market. The inefficiency of these signals in the matter of energy consumption has restricted their use chiefly to electrified railways where power for signalling purposes has been available at low cost.

In the **Hall Colour-Light Signal** these objections have been overcome, and careful study and experimental work have resulted in the production of a signal designed on correct scientific principles.

The main feature of the signal is the use of only **one light and one lens**. The source of light is the filament of a focus type lamp in a special holder which maintains the filament of the lamp at the focal point of an elliptical reflector. The general arrangement and optical principle employed will be readily followed by referring to the sectional drawing shown on page 1306.

The point where the reflected rays converge is the focal point of the lens, and here is situated the roundel-carrying member of a relay movement. The light rays are given colour by passing through a small coloured roundel before diverging to pass out through the lens. The use of the reflector allows over 80% of the light to be utilized. As there is only one lens for extraneous light to enter, it is quite impossible for improper phantom indications to be given. This is a most important point and only the Hall Colour-Light Signal can be claimed to be entirely free from this possible source of danger.

The frame carrying the roundels is directly mounted on to the armature in the D.C. Movement, and in the A.C. Movement it is an integral part of the vane. There are no other moving parts. The moving member in each case is mounted on **ball bearings** and ample clearances are allowed.

The signal is arranged for three indication signalling and is therefore provided with three coloured roundels. The Red or stop roundel is mounted in the centre so that the signal **gives the stop indication by gravity**, when no current is passing through the control coils of the movement. The Green and Yellow roundels are arranged on either side of the red and the indications are obtained by passing current through the control coils in one direction or the other. The signal can of course be used for two indication signalling without alteration, current passing through in one direction only being utilized.

The connections required for the control of this signal are of a very simple description, and if desired the existing wiring of motor operated signals may be utilized without any alteration.

Repeating contacts are provided and the indications can be repeated by an ordinary instrument repeater using one wire.

The high efficiency of the signal enables it to be economically operated from primary batteries or small secondary cells when used at isolated locations. This is not possible with any other type of light signal.

The maximum ranges of visibility in daylight are as follows :

Using 6 volt 10 watt bulb	..	4,000 feet.
Using 6 volt 3 watt bulb	..	1,800 to 2,000 feet.

Close up indication is catered for by a special formation of the lens which renders the signal visible from a point immediately underneath.

A further advantage of the Hall-Colour Light Signal is the small amount of space in which it may be installed.

A brief specification of the Hall-Colour Light Signal is given on page 1306/7.

1305 (RS.)

HALL COLOUR-
LIGHT SIGNAL.

HALL COLOUR-LIGHT SIGNAL.

THE LATEST DEVELOPMENT IN DAYLIGHT COLOUR-LIGHT SIGNALS
FOR OPERATION WITH TWO OR THREE INDICATION SIGNALLING.

(Patents applied for).



RS. 187/8.

View showing signal with background removed, fixed to a tubular steel post.

Catalogue No.	Description.	Weight.
RS. 187	Direct Current Operation	160 lbs.
RS. 188	Alternating Current Operation	160 lbs.

Prices on application.

Hall Colour-Light Signals are fitted with "cut-in" relays, for use with double filament bulbs, unless otherwise ordered.

When ordering please specify.—Whether 3 or 10 watt bulbs required.

Frequency (for A.C. Signals).

Roundel Colours (other than standard).

For SPECIAL SIGNAL TRANSFORMERS—See page 1367.

HALL COLOUR-LIGHT SIGNAL—(continued.)

SPECIFICATION.

Volts and Energy.

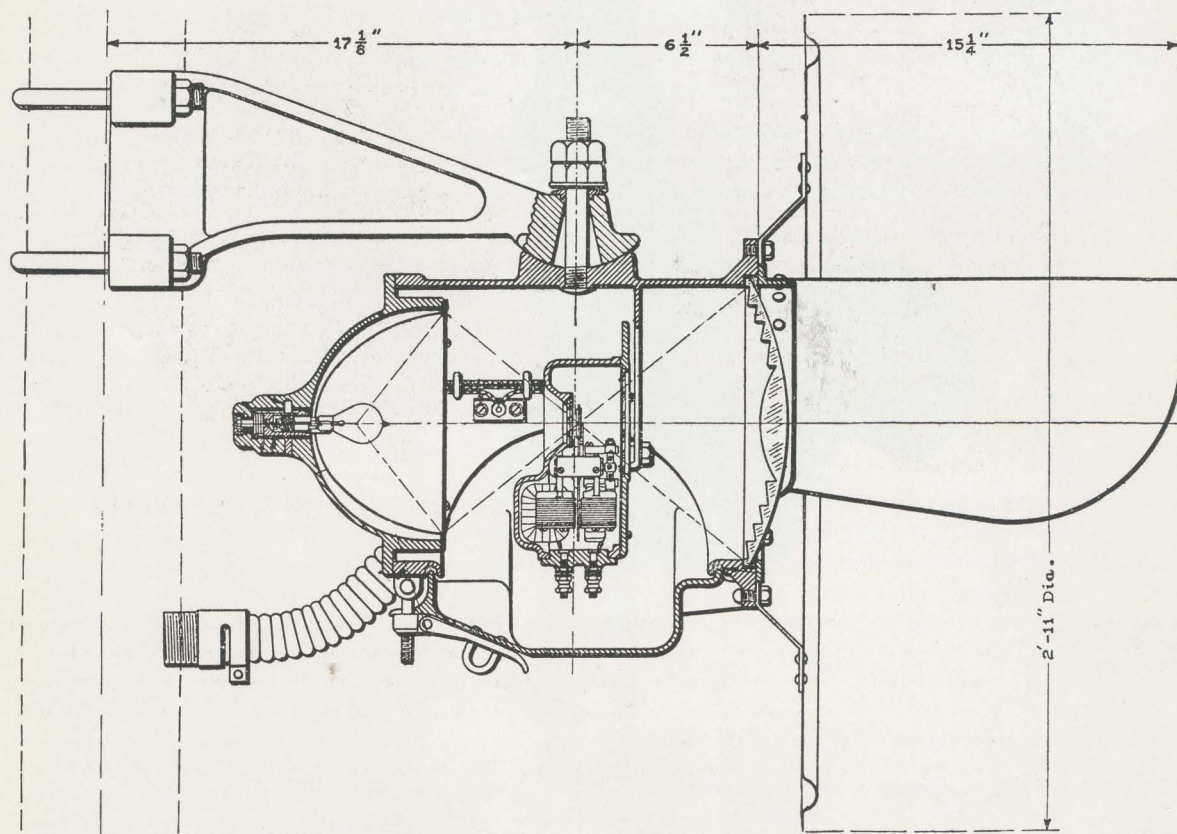
The total voltage required for operation of the signal is 6 volts for D.C., and $8\frac{1}{2}$ to 8 volts for A.C. This will give the necessary 6 volts at lamp terminals. In addition to the energy taken by the lamp (either 3 or 10 watt) the energy required to move the roundels from gravity (red) position is only .18 watt for D.C. and 1.0 volt ampere for A.C. signals.

Reflector.

The reflector has a highly polished surface which is adequately protected from corrosion and permanently retains its brilliancy.

Lens.

The lens is a $10\frac{1}{2}$ ins. diameter clear lens of half toric formation, common for all indications. The standard lens provides a spread of 8 feet in 100, other lens combinations being utilized for special cases, such as curves, when up to 30° spread can be obtained.



RS. 188. HALL COLOUR LIGHT SIGNAL FOR A.C.

(SECTIONAL DRAWING.)

Roundels.

The roundels are 1 inch diameter and $\frac{1}{16}$ inch thick. Red, yellow and green roundels are provided but blue, purple, and lunar white can be supplied if specified. The roundels are made of specially developed heat resisting glass, accurately ground and polished, and conforming to R.S.A. High Transmission Colours. The green glass has been arrived at after much research and will not fade out under 4,000 feet range.

Lamp.

Lamp bulbs are Argon gasfilled, single or double filament and made in two ranges 3 watt and 10 watt. In the double filament types the secondary filament is brought in circuit by a cut-in relay should the main filament burn out.

The bulbs are provided with a bayonet cap accurately aligned with the filament.

Lamp Socket.

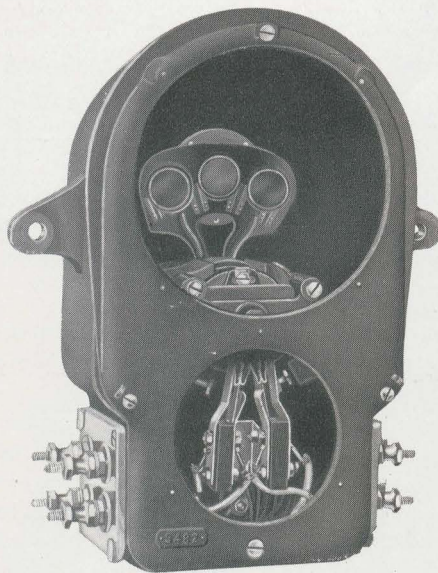
A special socket is provided which ensures the lamps being held rigidly and correctly aligned at the focal point.

HALL COLOUR-LIGHT SIGNAL—(continued.)

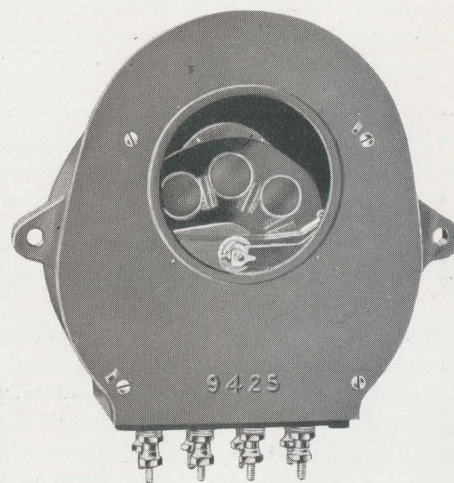
SPECIFICATION—(continued.)

**Movement
(Relay) D.C.
Signal.**

The motor principle of operation is employed. By the use of a special armature and field all necessity of a winding on the armature with the consequent objectional flexible connections is dispensed with. The moving element consists therefore of the iron armature to which is secured the roundel carrier.



RS. 191. D.C. SIGNAL MOVEMENT.



RS. 192. A.C. SIGNAL MOVEMENT.

**Movement
(Relay) A.C.
Signal.**

A standard polyphase vane relay is employed, the roundels being directly mounted on the moving vane in such a manner that they may be readily changed without interfering with any other part of the movement. There are no moving parts other than the vane, and its simplicity ensures reliability. The entire movement is sealed up in a metal case provided with plate glass covered apertures for inspection and the passage of the light rays.

The A.C. and D.C. movements are interchangeable and one may be readily substituted for the other. Each type of relay is fitted with silver to silver repeating contacts.

Hood.

A short hood is provided to protect the lens from accumulations of snow and dirt, being cut away to give the fullest visibility at maximum angle of spread.

Background

A reinforced sheet metal background 3 feet in diameter is provided.

Body.

The body is of grey cast iron, with door on underside efficiently gasketed. The iron is specially treated by a reliable anti-rust process before being painted dull black. The generous proportions and special finish ensure a life-long service under most exacting climatic and atmospheric conditions.

Sighting.

A special sighting arrangement is fitted which enables the signal to be correctly aligned and secured in a few seconds by *one* man.

**Universal
Support.**

The signal is mounted on a cantilever bracket by means of a universal joint which enables the signal to be swung in all directions for correct alignment. The locking of one nut effectually holds the signal in the required position. The cantilever construction allows the signal to be mounted in front or at either side of the post. It can be equally well fitted to walls or gantries.

Conduit.

A length of flexible armoured conduit with fixing elbow is supplied to carry wires away from the signal.

STYLE "L" SIGNAL.

The **Style "L" Signal Machine** is the result of experience and development extending over many years. Knowledge gained with previous machines together with the progress made in the manufacture of accurate and reliable ball and roller bearings, have assisted in producing a machine which is robust in construction and efficient and reliable in operation.

The **main features of the mechanism** are as follows:—

The post clamp and spindle bearing, with "U" bolts, operating segment, adjustable stop screws, outside blade stop and lamp bracket, form one complete part of the machine. The spindle bearing consists of two flexible roller bearings which run in an oil bath, the reservoir having inlet and outlet plugs to facilitate changing of the oil when necessary.

The main case is rigidly held to the clamp bearing by three large bolts. The cover is hinged at the bottom and arranged to swing downwards. It is held in the closed position by a strong spring clamp which firmly compresses the gasket, rendering the case weatherproof. External connections are brought into the case through a flexible armoured conduit and elbow which is fitted to the case.

Gears are cut with the stub form of tooth and the centres are dimensioned to give ample clearances between the pitch lines. All the gears are keyed and pinned to their respective shafts with the single exception of the motor pinion which drives the spindle through a double cone slip clutch, the tension of which is adjustable. This clutch prevents the possibility of damage to the gears due to any exterior obstruction of the blade or over-running of the motor armature.

Operation of the machine may be affected by either direct or alternating current without alteration other than changing the motors. These are interchangeable and form a self-contained and enclosed unit which is held in the main case by two bolts.

The D.C. Motor is bi-polar. The pole pieces are spiralled to eliminate pulsation of torque and the commutator segments are moulded into a high-grade non-hygroscopic insulation. Brush holders are mechanically prevented from touching the commutator, and are readily accessible. They are furnished in duplicate on each side, so that the copper-graphite brushes may be changed without interfering with the signal operation. The hold-clear mechanism consists of a strong electro-magnet operating a latch lever. The lever holds a small dog or catch which engages with a system of rollers on the motor spindle, when the hold-clear is energised. Standard resistance of hold-clear magnet is 500 ohms.

The A.C. Motor is of the standard induction type with separate reactance. The hold-clear is similar to that employed in the D.C. machine except the magnet, which is in this case a miniature induction motor of which the rotor operates a toothed sector directly coupled with the latch-lever.

The checking of the signal arm on the return to the 45° or 0° positions is affected by driving the motor backwards, causing it to generate. At a suitable position one of the controller cams is arranged to connect a low resistance across the motor, producing a magnetic drag which effectively checks the descent of the signal blade.

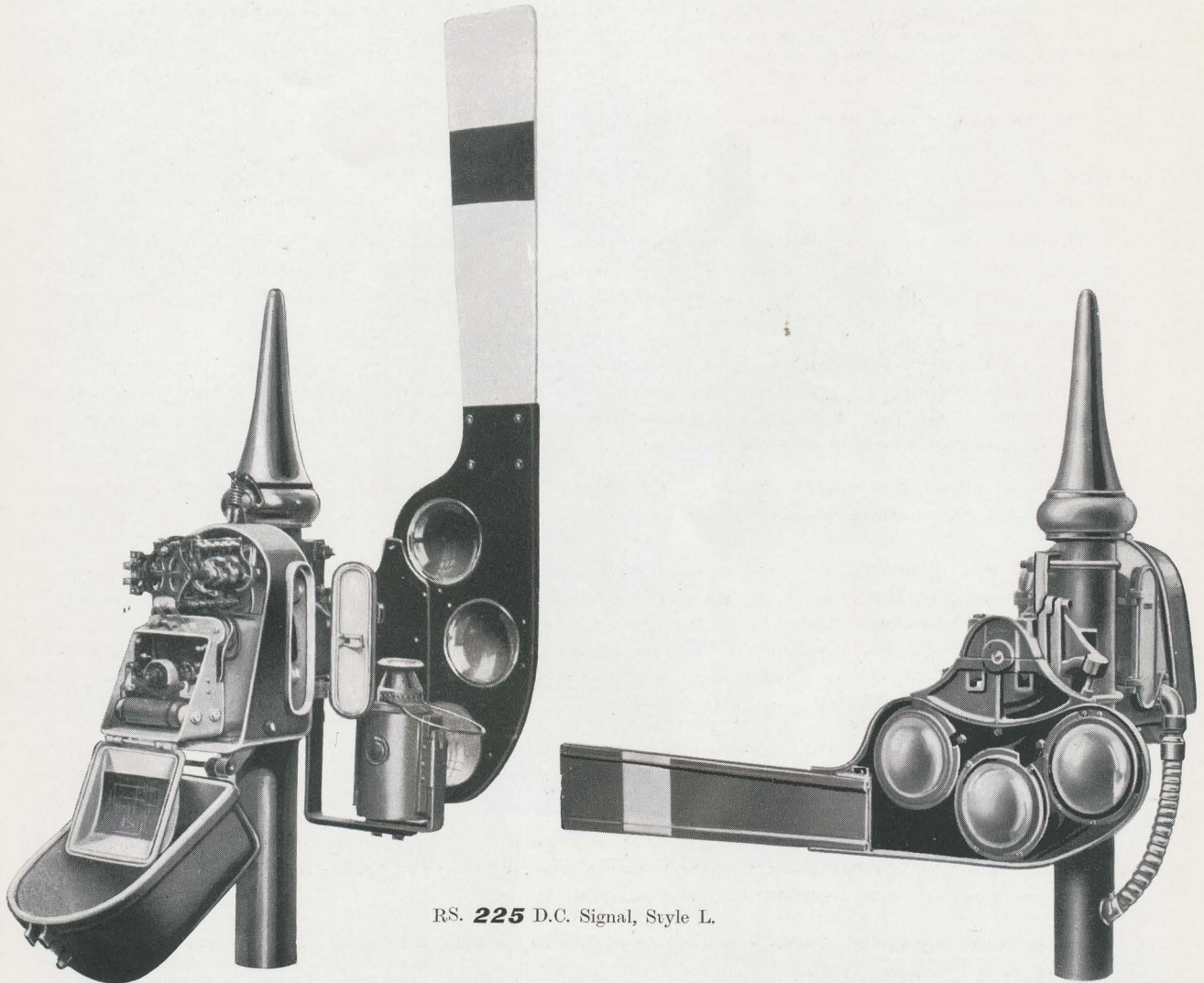
The controller is arranged for twelve circuits including a pole-changer and is built up as a complete unit. Veeder counters are mounted on the frame for recording the number of 45° and 90° operations.

Operating Characteristics.

Operating Current	Frequency	Normal.		Time (seconds)		Minimum		Hold clear
		Volts	Ampères	45° from 0°	90° from 0°	Volts	Ampères	
D.C.	—	10	2.8	3.5	7	5	2.7	500 ohms. 0.16 amps
A.C.	25	55	7.8	4	8	43	6.6	·275 amps.
A.C.	25	110	2.7	4.5	9	88	2.3	·120 „
A.C.	60	110	2.7	4.5	9	88	2.3	·120 „

STYLE "L" SIGNAL.

Complete signal machines for two or three position signalling; upper left quadrant type, top or bottom post.

RS. **225** D.C. Signal, Style L.

Back view, opened for inspection.

Front view.

Cat. No.	Description	Weight
RS. 225	Direct Current, Top Post, Upper Left Quadrant.	375 lbs.
RS. 226	„ „ Bottom „ „ „ „	225 lbs.
RS. 227	Alternating „ Top „ „ „ „	375 lbs.
RS. 228	„ „ Bottom „ „ „ „	225 lbs.

Prices on application.

Complete signal includes :—

1. Signal machine and Controller.
2. Blade stop and lamp bracket.
3. Pole clamps
4. Spectacle.

} Top post machines only.

Right Quadrant and Double Bottom Post Machines can be supplied to order.

When ordering please specify :—Size of post, voltage and frequency (for A.C. Signals).

FOR ENAMELLED STEEL BLADES see page 1320.

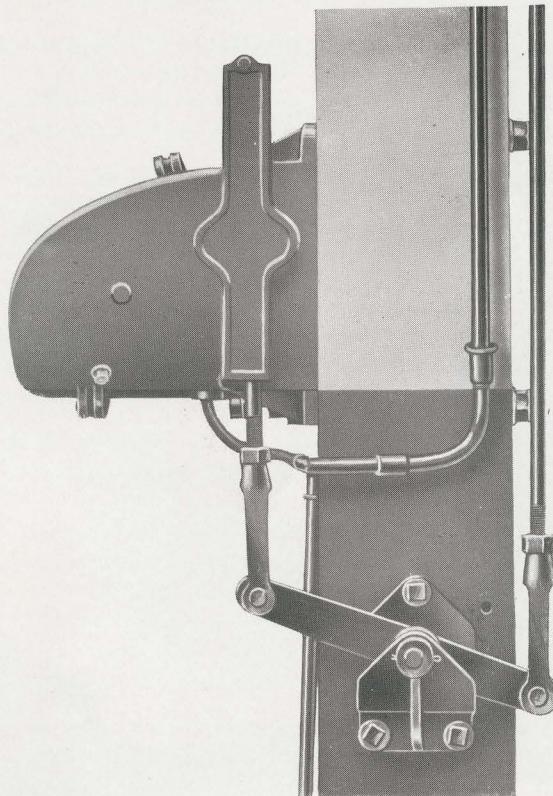
(RS.) 1310

**SIGNAL
MACHINE.**

SIGNAL MACHINE.

The Siemens Signal Machine shown below is a simple and compact two-position machine for operating ordinary mechanical semaphore signals, which has proved its efficiency during many years of service under all conditions.

This machine requires the Contact Maker (Cat. No. R.S. 345), Type C1, shown on page 1340 as an accessory, the contact maker acting as controller for the motor.



RS. 344.

View showing motor fixed to signal post with mechanical connections.

Brief Description.

The mechanism is contained in a light cast iron case bolted to the back of the post. The motor revolves a coupling magnet through a worm gearing into teeth formed on the magnet casting. The ends of the magnet coil are connected to two slip rings which, together with the magnet, are free to revolve on the main spindle. Current is conveyed to the magnet through insulated brushes and the slip rings.

A disc forming the armature of the magnet is keyed to the shaft, and this latter carries a pinion, on the outside of the case, gearing into a rack. The rack rod connects directly to the signal rod *via* the cross lever, as shown in illustration.

The current received from the signal cabin passes through the coupling magnet, in shunt with which is the motor. In circuit with the latter is the circuit Contact Maker Type C1, shown on page 1340. The magnet when energised forms with its armature a magnetic clutch which couples the motor, through the gearing, to the signal arm.

When the arm is completely lowered the contact maker cuts off the motor current and the clutch holds the signal off until the current is cut off, when the arm returns to normal by gravity. A vacuum dash pot is fitted to the balance lever bracket to steady return of the arm.

Operating Data.

Normal volts 60/120 : Operation 180 watt-seconds.

Cat. No.	Description.	Height.		Width.		Depth.	Weight.
		ft.	ins.	ft.	ins.	ins.	lbs.
RS. 344	Signal Machine	1	3	1	2	9	90

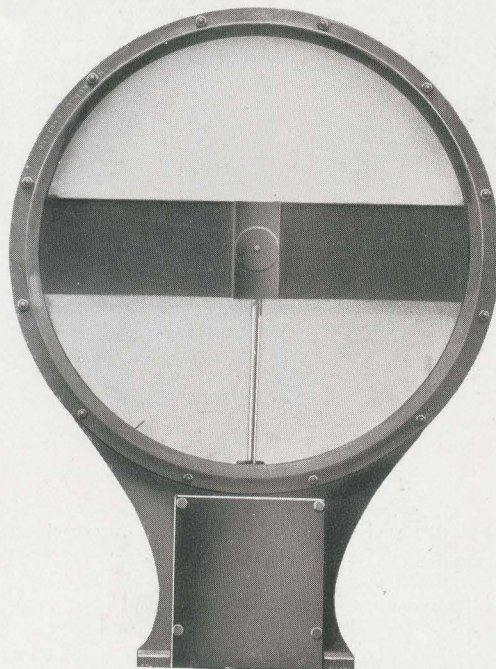
Price on application.

1311 (RS.)

BANNER
SIGNAL.

BANNER SIGNAL.

A low voltage Signal especially suitable for platform work.



RS. 341.

SPECIFICATION.

Working Current—750 amperes. Hold-off—.003 amperes.

Voltage—4 volts.

Size of banner—2ft. 6ins. \times 6½ins.

Banner of red unfadable material.

Repeating contacts fitted.

Cast-iron case with clear glass front and opaque glass back.

Operating mechanism in weatherproof case.

Banner is operated positively by a stout rod connection.

Operating movement of high efficiency.

A lamp can be supplied for night illumination if specified.

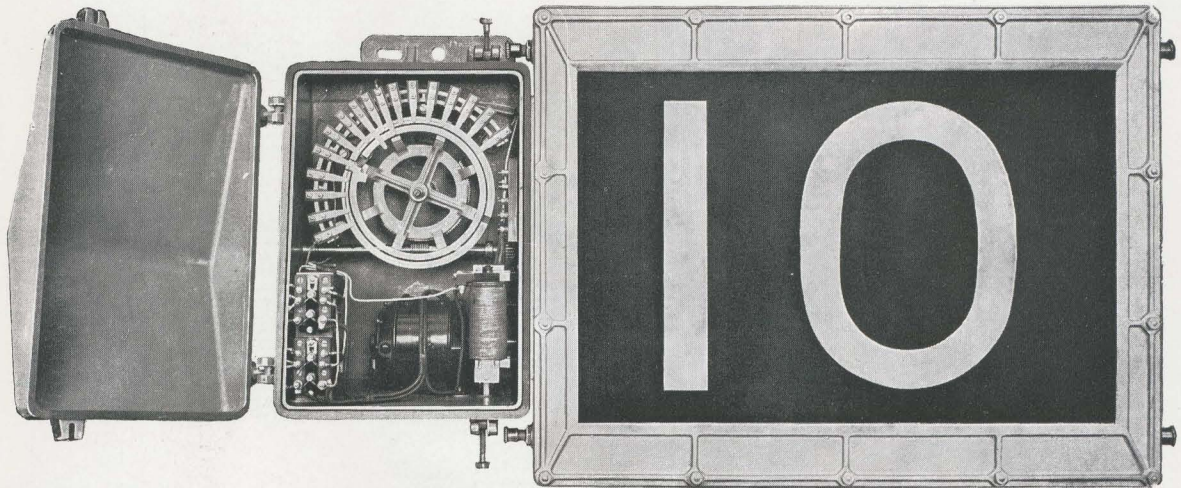
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 341	Banner Signal	ft. 3 ins. 8	ft. 2 ins. 10	ins. 6	lbs. 75

Price on application.

(RS.) 1312

ROUTE
INDICATORS.

ROUTE INDICATORS.



RS. 340.

The advantages of Route Indicators are well known. They effect a large reduction in the number of signals, and also, in many cases, of the number of levers required.

The Siemens Route Indicator illustrated above is the result of careful study and development over a long period.

Brief Description.

The indication figures or letters are on a blind of suitable material, which is unaffected by atmospheric conditions, and which works on the roller blind principle, the rollers being geared to a motor. A device is provided to keep the blind at even tension in all positions. The blind is arranged to work from the centre of its length, six indications being arranged on each side, the centre or normal exposure being blank.

The selection can be made either through levers in signal box or by means of point detectors. The indications can be repeated in signal box and slotted if required.

Each indication has its independent circuit, so that these circuits may be used for operating check-locks.

An important feature is that *all* indications are given at the *front* of the case, which is double sided, so that similar indications can be given back and front.

The signal arm is not lowered until the correct indication is given, after which it is illuminated from within the case.

This indicator works equally well on electrical or manual signals.

Standard machine operates on 24 volts. Average operation 100 watt-seconds.

Weather-proof case-opening for indicator 27ins. × 18ins.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 340	Siemens Route Indicator.	ft. ins. 2 1	ft. ins. 3 10	ins. 11	lbs. 224

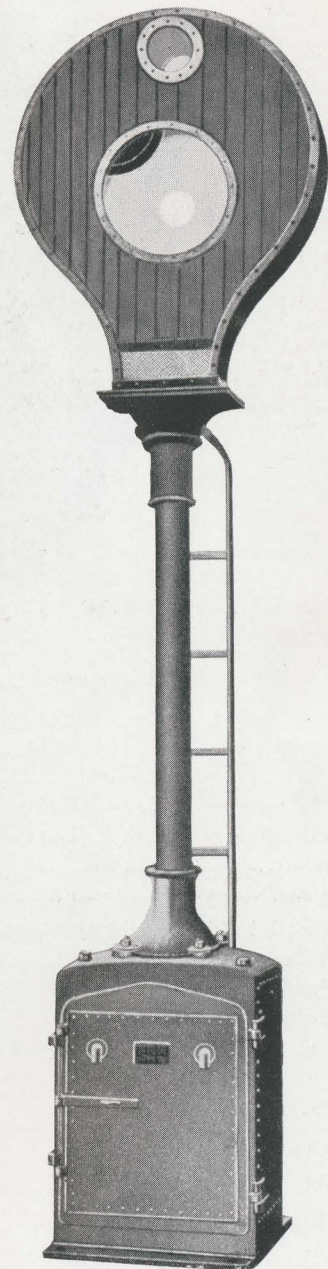
Price on application.

SIGNALS.**HALL HIGHWAY CROSSING WARNING.****A Crossing Warning Signal adapted from the Hall Disc Signal.**

This signal admirably meets the present demand for safeguarding unprotected crossings. It gives a distinctive warning of danger that can be seen as well as heard. A loud sounding gong is housed either inside the casing of the signal head or is fixed on the pillar. A large red disc displayed by day, swinging slowly to and fro, and a red light at night flashing at intervals gives unmistakable warning of danger ahead. When the line is clear and it is safe for road traffic to move over the crossing, the disc is withdrawn from view, leaving a white background, the red light at night similarly becoming white.

The method of clearing and holding the signal clear is by magnetic attraction. On the approach of a train, the disc commences to oscillate by means of making and breaking the magnetic circuit intermittently. Should the controlling circuits break down or any other part of the mechanism fail, the signal immediately assumes a stationary danger position of red disc by day and red light at night. The extreme simplicity of the mechanism prevents any parts catching or clogging and the light weight of the apparatus makes for extreme economy in operation. The pattern illustrated is only one of many various types of this description of crossing signal.

These signals operate on low voltage D.C. Circuits usually through an interlocking relay. Track circuiting is not essential, but in lieu, some form of track operated circuit breaker is required. For this purpose the Sleeper Contact shown on page 1374 is recommended.

Price on application.For INTERLOCKING RELAYS *see page 1328.*For EDISON PRIMARY CELLS *see page 1368.**Further information supplied on request.*

RS. 240.
HIGHWAY CROSSING SIGNAL.

(RS.) 1314

UNIVERSAL LAMP
SIGNAL.

SIGNALS. UNIVERSAL LAMP.

Suitable for Marker Lights, Terminal Buffers, Level Crossings, Etc.



RS. 224. UNIVERSAL LAMP.

SPECIFICATION.

Cast iron construction adequately protected from deterioration by rust.

Highly polished silvered reflector of permanent brilliancy.

Supplied with length of flexible armoured conduit for wires and bracket for general fixing.

Takes standard $8\frac{3}{8}$ in. diameter roundel, flat or convex. Lamps are fitted with red convex roundel unless otherwise specified.

Special lampholder as used in colour light signal ensures lamp being held rigidly in correct position.

Terminals fitted in top of case.

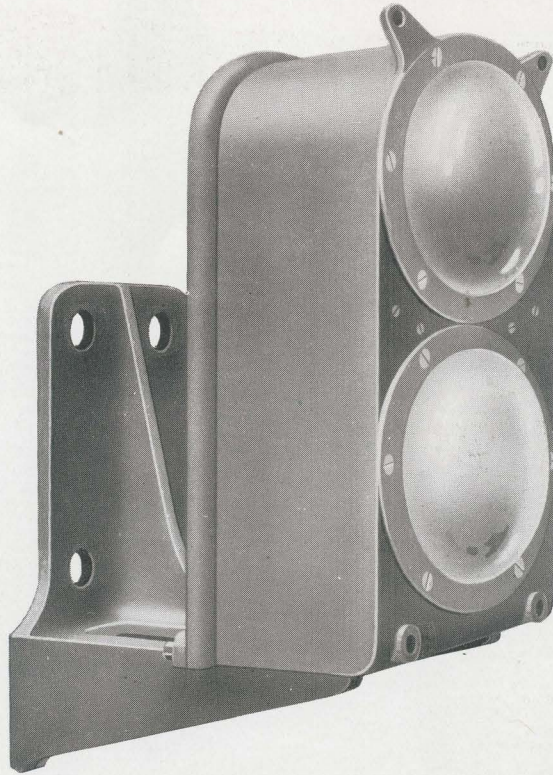
Unless otherwise specified supplied with 6 volt 3 watt lamp as used in the Hall Colour-Light Signal.

Cat. No.	Description.	Height	Width	Depth	Weight
RS. 224	Universal Lamp	ins. $12\frac{3}{4}$	ins. $11\frac{3}{8}$	ins. $9\frac{1}{2}$	lbs. 46

Price on application.

For TRANSFORMERS see page 1367.

For EDISON PRIMARY CELLS see page 1368.

FOG REPEATER SIGNALS.

RS. 297.

These light signals are used for repeating signals to train drivers in foggy weather, or for tunnel use. They are fixed on a suitable post or attached to a wall at a level with drivers' eyes.

Lenses of any colour can be supplied and enamelled iron name-plate fitted if desired.

SPECIFICATION.

The lamp case is attached to the fixing bracket by means of a device which enables the signal to be sighted to a fine degree.

Porcelain lamp holders. Standard optical lenses, 6 $\frac{3}{8}$ ins. dia.

Easy access to the lamps by lifting the iron slide at back of case.

Terminals fitted inside case. Lugs on case for attaching name plate.

Substantial weather-proof body.

Supplied complete with fixing bracket.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 297	Fog Repeater Signal, 2-light.	ins. 20	ins. 8 $\frac{1}{2}$	ins. 11	lbs. 62

Price on application.

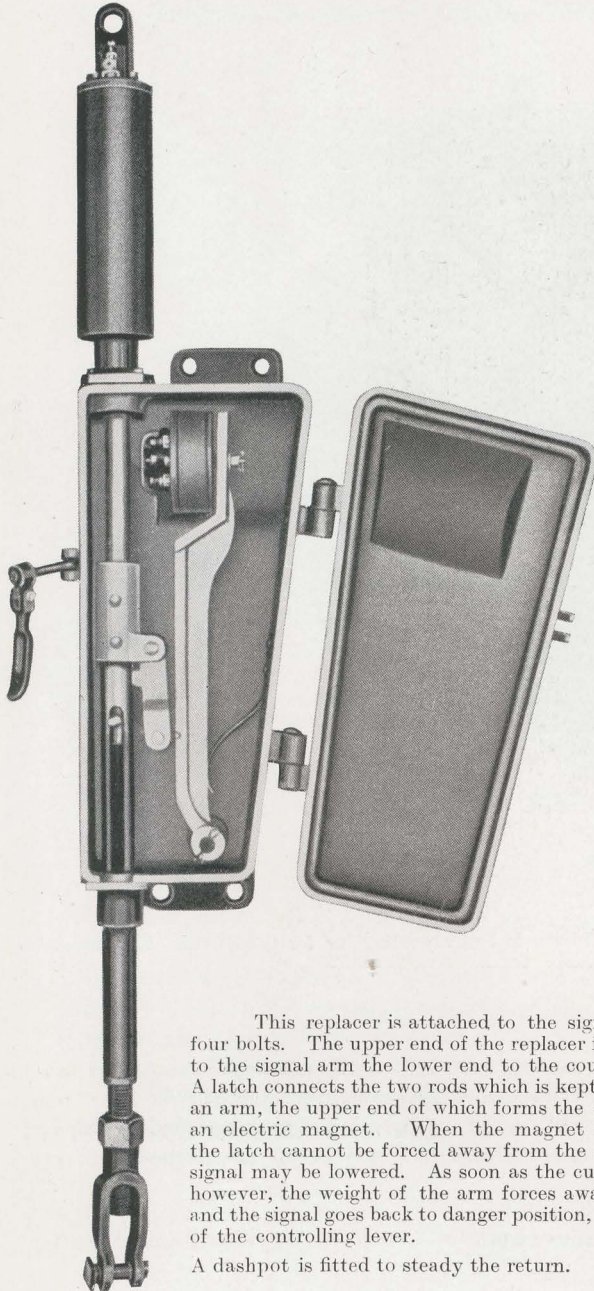
Prices and particulars of Special Focus type Lamps on application.

(RS.) 1316

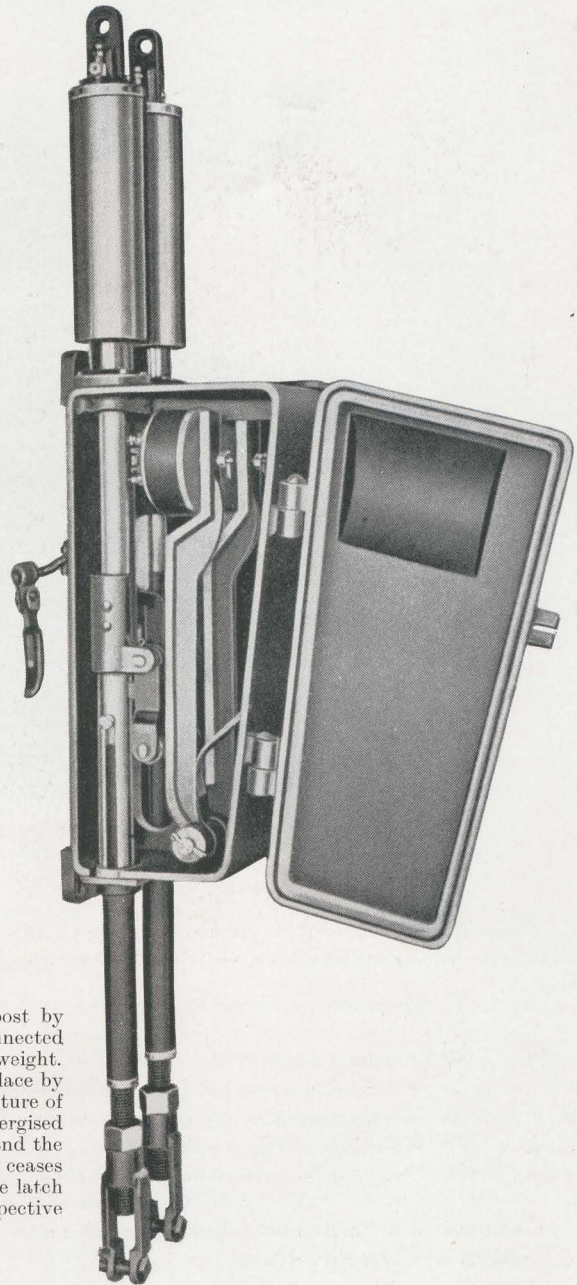
SIGNAL
REPLACERS.

HALL SIGNAL REPLACERS.

SINGLE AND DOUBLE. DIRECT CURRENT.



RS. 262.



RS. 263.

This replacer is attached to the signal post by four bolts. The upper end of the replacer is connected to the signal arm the lower end to the counterweight. A latch connects the two rods which is kept in place by an arm, the upper end of which forms the armature of an electric magnet. When the magnet is energised the latch cannot be forced away from the rod and the signal may be lowered. As soon as the current ceases however, the weight of the arm forces away the latch and the signal goes back to danger position, irrespective of the controlling lever.

A dashpot is fitted to steady the return.

SPECIFICATION.

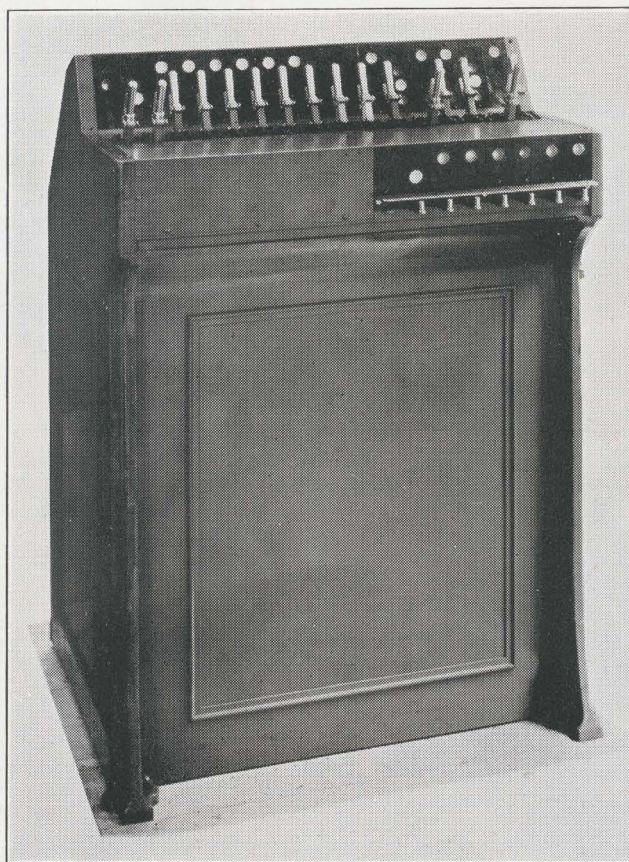
Weatherproof cast iron case containing complete mechanism which is simple and effective. Former wound impregnated coil, resistance 300 ohms. Dashpot fitted with adjustable valve. Supplied complete as shown above.

Cat. No.	Description.	Weight.
RS. 262	Single Electric Replacer.	92 lbs.
RS. 263	Double Electric Replacer.	190 lbs.

Prices on application.

ROUTE SIGNALLING.

FERREIRA & INSELL'S ONE-LEVER SYSTEM.



This forms **the latest development in all-electric signalling.** The main feature is that a single lever is used to set up a complete route with all points and signals, instead of using separate levers for each signal and points as hitherto. As one lever only has to be operated to set up a route, the time occupied is governed by the slowest point motor or signal machine, as all those concerned operate simultaneously. This arrangement materially reduces the time occupied in setting up a route. The average time may be stated as 6 seconds.

The number of levers required being cut down to minimum and the whole frame being constructed on a small scale, this system is peculiarly applicable where space is limited.

Coloured light indications are given to show the state of signals, tracks, etc.

Further information will be supplied on request.

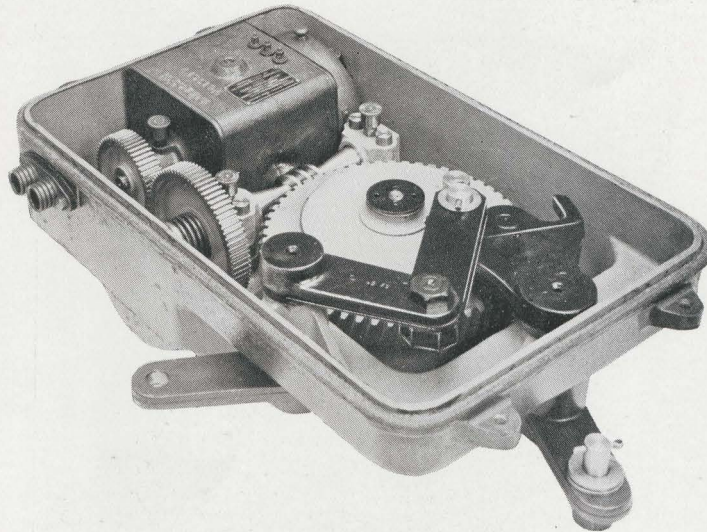
(RS.) 1318

POINT
MACHINES.

POINT MACHINES.

SIEMENS TYPE.

High Voltage.



RS. **347**. Facing Type (Cover Omitted).

These simple and efficient point operating machines are made to suit all requirements for either D.C. or A.C. operation.

DESCRIPTION.

The main mechanism consists of a reversing motor driving through a friction clutch, a worm gear and main shaft, the latter moving a cam which drives and holds the point tongues in either position.

Cranks with a link connection withdraw and replace the facing point bolt in the facing type machines.

Moving parts are few, and robust, and are designed with ample wearing surfaces, special attention having been paid to good lubrication and easy maintenance.

Operating data :

Facing Type 800 watt seconds.

Trailing Type 350 watt seconds.

Cat. No.	Description.	Length.	Width.	Depth.	Weight.
RS. 347	Point Machine, High Voltage.	ft. ins. 2 10	ft. ins. 1 9	ins. 11	lbs. 400

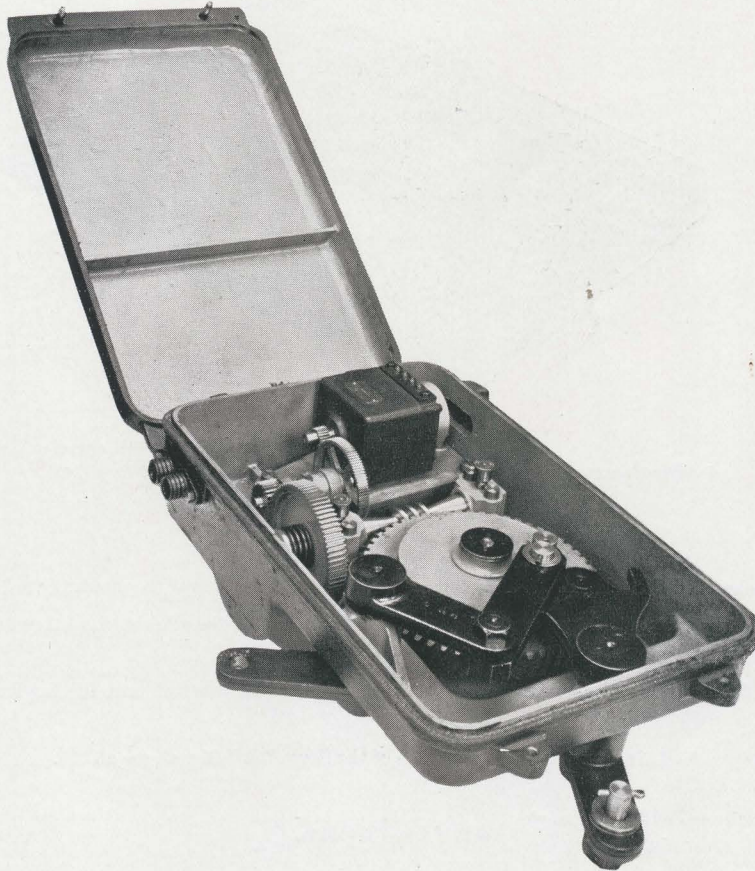
The Standard Voltages are : D.C. 120 volts. A.C. 100/110 volts.

Prices on application.

When ordering please specify : Whether Facing or Trailing Type required.

Operation on D.C. or A.C. Current and, if later, supply frequency.

The Point Detectors shown on pages 1342/3 are recommended for use with above machines.

POINT MACHINES.**SIEMENS TYPE.****Low Voltage.**

RS. 348. Facing Type.

DESCRIPTION.

The general details of the Low Voltage Siemens Type Point Machine are as described for the High Voltage Machine on opposite page, but the machine is designed for operation on 24 volts, an additional train of gear wheels being provided.

All mechanism totally enclosed in one weatherproof case.

Operating data :

Facing Type 800 watt seconds.
Trailing Type 350 watt seconds.

Cat. No.	Description.	Length.	Width.	Depth.	Weight.
RS. 348	Point Machine, Low Voltage.	ft. ins. 2 10	ft. ins. 1 9	ins. 11	lbs. 390

Standard Voltage 24 volts.

Prices on application.

When ordering please specify : Whether Facing or Trailing Type required.

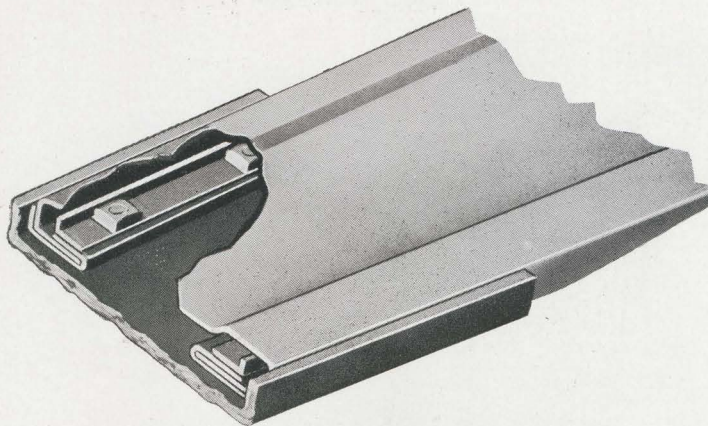
The Point Detectors shown on pages 1342/3 are recommended for use with above machines.

(RS.) 1320

SIGNAL BLADES.

SIGNAL BLADES.

“LAVAR”-ENAMELLED STEEL.



RS. 256.

Diagrammatic Illustration showing Blade fitted in Spectacle Frame.
Note the Locking Strips and Felt Pads.

The “Lavar” Enamelled Steel Signal Blade is formed complete in one piece with attachments forming an integral part.

The blade fits into the spectacle frame and has strengthening gussets at the sides which extend outwardly from the frame and along the blade.

Felt pads are provided between the blade and the spectacle to protect the enamel, and locking strips are used to prevent the bolts turning.

The appearance of the blade is shown in the illustration of the Style “L” Signal, page 1308.

ADVANTAGES.

This type of signal blade offers several important advantages over other patterns :

- All bolts, clamps and rivets are eliminated from the face of the blade.
- An uninterrupted colour throughout its entire length.
- Easier to clean, and requires less cleaning than any other type of blade.
- Eliminates repainting costs.
- Conforms to R.S.A. specifications.

The Signal Blades are made in three lengths, viz., 2ft. 6ins., 3ft. 6ins., and 4ft. 0ins.

The Dwarf Blade is made with end or centre clamps, as required.

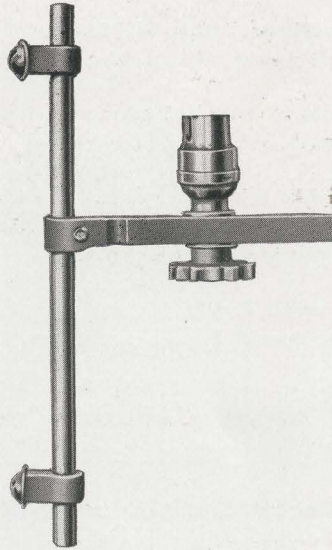
Cat. No.	Description.
RS. 256	Enamelled Steel Signal Blade, complete.
RS. 257	Enamelled Steel Dwarf Signal Blade.

Prices on application.

When ordering please specify : Type of blade (stop, distant, or automatic)
Colouring required
Length.

ADJUSTABLE LAMP BRACKET.

For fitting to new Lamps or conversion from Oil to Electric supply.



RS. 258.

This bracket provides a simple practical means for accurately focussing the filament, and enables any desired adjustment to be made. The vertical rod can be secured in any convenient location in the lamp.

The focussing is accomplished by locating the horizontal arm in a suitable position on the vertical rod and adjusting the socket to its correct position. The filament can be aligned by turning the socket.

A porcelain terminal block is recommended for use with this bracket.

The lamp can be erect or suspended, and two lamps can be fitted if desired.

Standard bayonet socket or small bayonet socket fitted.

Cat. No.	Description.	Weight.
RS. 258	Adjustable Lamp Bracket	lbs. 1½

Price on application.

LENSES AND
ROUNDELS.

CORNING SIGNAL LENSES & ROUNDELS.

Lenses of the following types can be supplied. They conform to R.S.A. High Transmission Colours specification.

Standard Optical Semaphore Lens. A design of lens which ensures that the greatest possible amount of light falling upon its surface is utilised. The lens directs this light so that the signal can be seen for a maximum distance whilst it has sufficient spread to ensure the signal being picked up at long range. They should not be employed at positions where the track curves sharply.

Inverted Lens with Cover Glass. Has a 35% increase of spread with only slight diminution in candle power when compared with the Standard lens. It presents two smooth surfaces for cleaning purposes.

Wide Angle Lens. Similar to the standard lens in appearance but designed to give a large spread at short range. Suitable for dwarf and shunting signals, and other requirements.

Spreadlite Lens. A compromise between the standard optical lens and the wide angle lens. Convex panels on the convex face produce an elongated spread of 35°. This is sufficient to cover a 3° curve at 2500 feet. This type of lens can be easily substituted for lenses now in service, where a wider spread may be advantageous.

Inverted Spreadlite Lens with Cover Glass. Has approximately 20% greater candle power than the ordinary spreadlite lens but has slightly less spread. It presents two smooth surfaces for cleaning purposes.

THE ABOVE LENSES ARE MADE IN THE FOLLOWING COLOURS AND SIZES:—

Red, Yellow, Green, Clear, Lunar White, Blue and Purple.

	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	
Diameter	3	3 $\frac{1}{3}$	3 $\frac{1}{2}$	3 $\frac{7}{8}$	4	4	4 $\frac{1}{8}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5 $\frac{3}{8}$	6	6 $\frac{3}{8}$	7	8	8 $\frac{3}{8}$	9	10	12	Diameter	
Focal lgth.	3	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{3}{4}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	7	Focal lgth.	

ROUNDELS, FLAT AND CONVEX.

MADE IN ALL COLOURS AND FOLLOWING SIZES:—

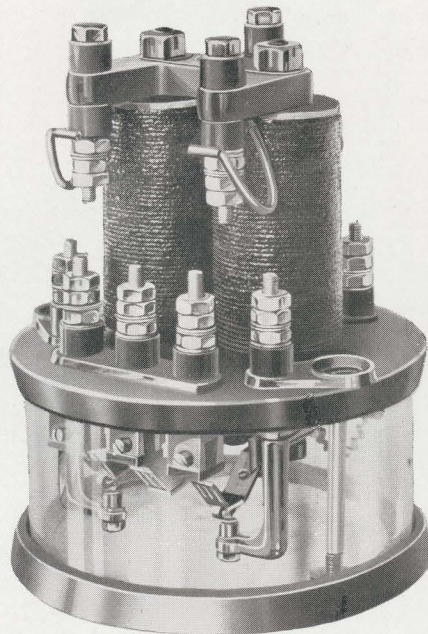
Flat Roundels.—3ins., 3 $\frac{1}{2}$ ins., 4ins., 4 $\frac{1}{2}$ ins., 5 $\frac{3}{8}$ ins., 6 $\frac{1}{2}$ ins., 7ins., 8 $\frac{3}{8}$ ins., Diameter.

Convex Roundels.—5ins., 5 $\frac{3}{8}$ ins., 6 $\frac{1}{2}$ ins., 8 $\frac{3}{8}$ ins., Diameter.

Prices on application.

RELAYS.
TRACK CIRCUIT TYPE.
DIRECT CURRENT - NEUTRAL.

Circular Shelf Pattern.



RS. 104.

SPECIFICATION.

Coils former wound, non-turnable and interchangeable.

Front contacts are silver to copper-graphite, back contacts silver to silver. Copper-graphite contacts are renewable and maintain constant low resistance. Back contacts are rigid and have micrometric adjustment.

Insulation employed is high-grade and non-hygroscopic.

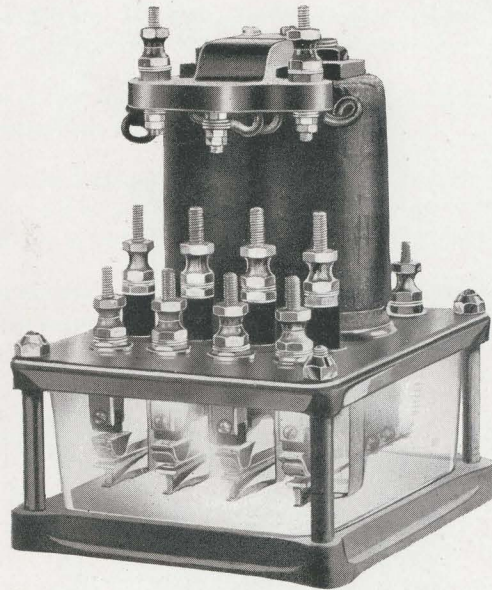
High percentage efficiency, release to pick up.

Cat. No.	Maximum Contacts		Dimensions			Weight
	Front	Back	Height	Width	Depth	
RS. 104	4	2	7 $\frac{1}{8}$	ins. 5 $\frac{3}{8}$	ins. 5 $\frac{3}{8}$	lbs. 7 $\frac{1}{2}$

Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

RELAYS.
TRACK CIRCUIT TYPE.
DIRECT CURRENT - NEUTRAL.
Shelf Pattern.



RS. 211.

SPECIFICATION.

All parts mounted on platform of high-grade non-hygroscopic insulation.

Coils former wound, non-turnable and interchangeable.

Front contacts are silver gauze to carbon, ensuring constant low resistance. Back contacts are silver to silver.

Terminals are non-turnable and so arranged that adjustment of contacts cannot be altered from the outside.

Conforms to R.S.A. Specifications.

High percentage efficiency, release to pick up.

Note :—

Carbon to Carbon contacts for high voltage can be supplied if specified.

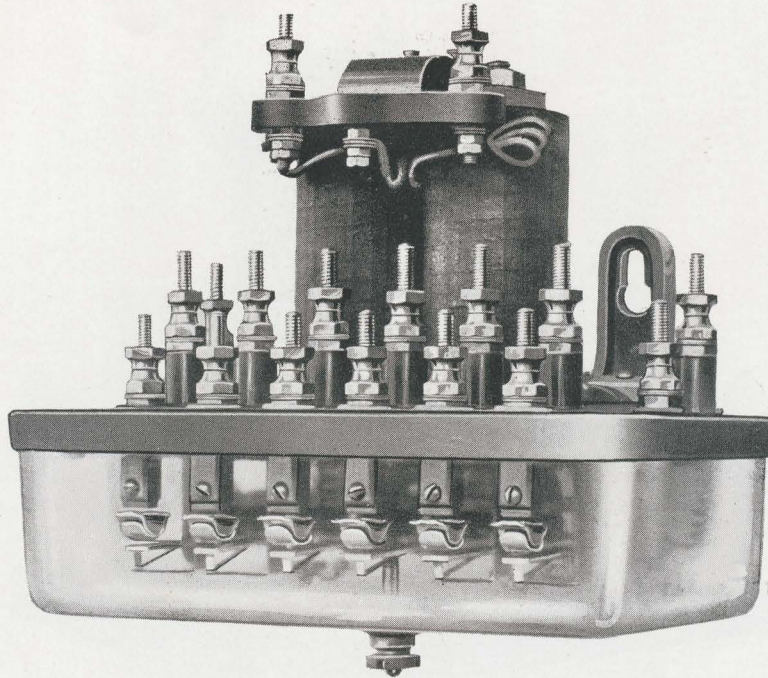
Cat. No.	Maximum Contacts.		Dimensions.			Weight.
	Front.	Back.	Height.	Width.	Depth.	
RS. 210	2	2	ins. $8\frac{5}{8}$	ins. $5\frac{7}{8}$	ins. 7	lbs. 8
RS. 211	4	4	$8\frac{5}{8}$	$5\frac{7}{8}$	7	$9\frac{1}{2}$
RS. 212	6	6	$8\frac{5}{8}$	$8\frac{1}{4}$	7	12
RS. 213	8	8	$8\frac{5}{8}$	$10\frac{1}{2}$	7	15

Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

RELAYS.
TRACK CIRCUIT TYPE.
DIRECT CURRENT - NEUTRAL.

Wall Pattern.



RS. 216.

SPECIFICATION.

All parts mounted on platform of high-grade non-hygroscopic insulation.

Coils former wound, non-turnable and interchangeable.

Front contacts are silver gauze to carbon, ensuring constant low resistance. Back contacts are silver to silver.

Terminals are non-turnable and so arranged that adjustment of contacts cannot be altered from the outside.

Conforms to R.S.A. Specifications.

High percentage efficiency, release to pick up.

Note :—

Carbon to Carbon contacts for high voltage can be supplied if specified.

Cat. No.	Maximum Contacts.		Dimensions.			Weight.
	Front.	Back.	Height.	Width.	Depth.	
RS. 214	2	2	ins. 9	ins. $6\frac{3}{8}$	ins. $5\frac{3}{4}$	lbs. 8
RS. 215	4	4	9	7	$5\frac{3}{4}$	10
RS. 216	6	4	9	$9\frac{1}{4}$	$5\frac{3}{4}$	12

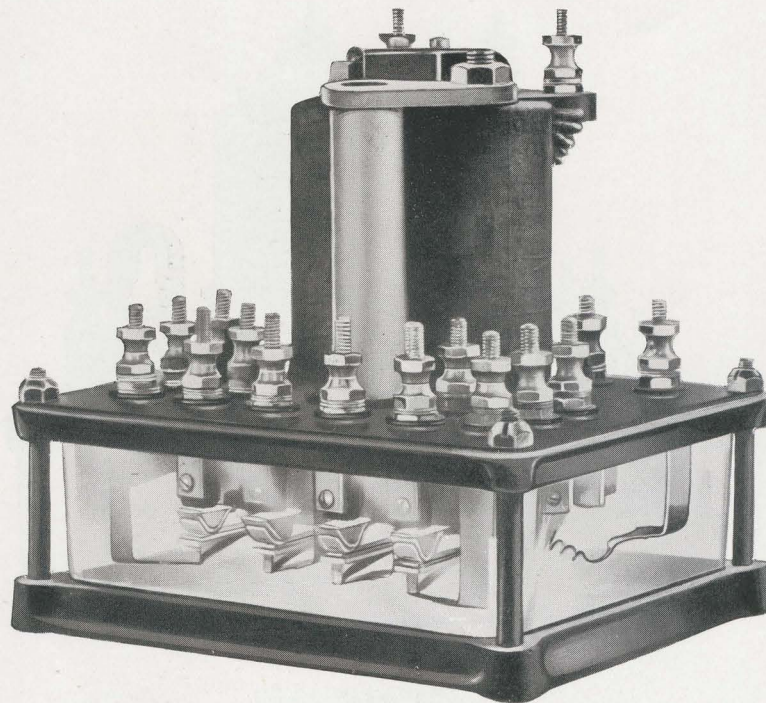
Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

(RS.) 1326

RELAYS.

RELAYS.
TRACK CIRCUIT TYPE.
DIRECT CURRENT - NEUTRAL POLAR.



RS. 217.

SPECIFICATION.

Similar in every respect to Shelf Pattern Relay Cat. No. RS. 211, but provided with a permanent magnet for polarising an additional armature which carries two negative and two positive silver gauze to carbon contacts, identical with the neutral contacts.

Polar and neutral magnetic circuits are independent in action and do not react upon each other.

Note :—

Carbon to Carbon contacts for high voltage can be supplied if specified.

Cat. No.	Maximum Neutral Contacts.		Maximum Polar Contacts.		Dimensions.			Weight.
	Front.	Back.	Positive.	Negative.	Height.	Width.	Depth.	
RS. 217	4	4	2	2	ins. 8½	ins. 8	ins. 7¼	lbs. 26

Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

RELAYS.

DIRECT CURRENT - THREE POSITION. MOTOR TYPE.

A Polarised Relay operating on the motor principle providing three contact positions for track circuit work involving special polarity considerations, etc.



RS. **218.**

SPECIFICATION.

Terminals mounted on high-grade non-hygroscopic insulating contact platform.
Balanced armature running on ball bearings.
Front contacts are silver gauze or carbon to carbon as specified. Back contacts are carbon to carbon.
Terminals are non-turnable and so arranged that adjustment of contacts cannot be altered from the outside.
Brackets fitted for wall fixing.

Cat. No.	Maximum Contacts.		Dimensions.			Weight.
	Front.	Back.	Height.	Width.	Depth.	
RS. 218	4	4	ins 10	ins. 7	ins. 7 $\frac{1}{4}$	lbs. 32

Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

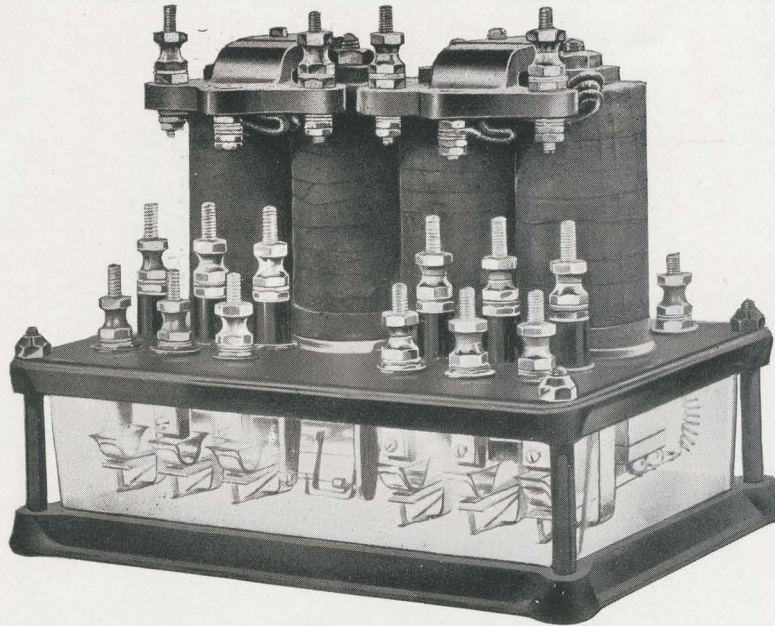
(RS.) 1328

RELAYS.

RELAYS.

DIRECT CURRENT - INTERLOCKING.

For Single Line Level Crossing Warning Systems, Etc.



RS. 219.

SPECIFICATION.

All parts mounted on platform of high grade, non-hygroscopic insulation.

Coils former wound, non-turnable and interchangeable.

Front contacts are silver gauze to carbon, ensuring constant low resistance. Back contacts are silver to silver.

Terminals are non-turnable and so arranged that adjustment of contacts cannot be altered from the outside.

Conforms to R.S.A. Specifications.

The interlocking mechanism is simple, accurate and effective. Either armature dropping prevents other armature completing back contact circuits.

Cat. No.	*Maximum Contacts.		Dimensions.			Weight.
	Front.	Back.	Height.	Width.	Depth.	
RS. 219	3	3	ins. 8 $\frac{3}{8}$	ins. 10	ins. 7	lbs. 20

*On either or both sides.

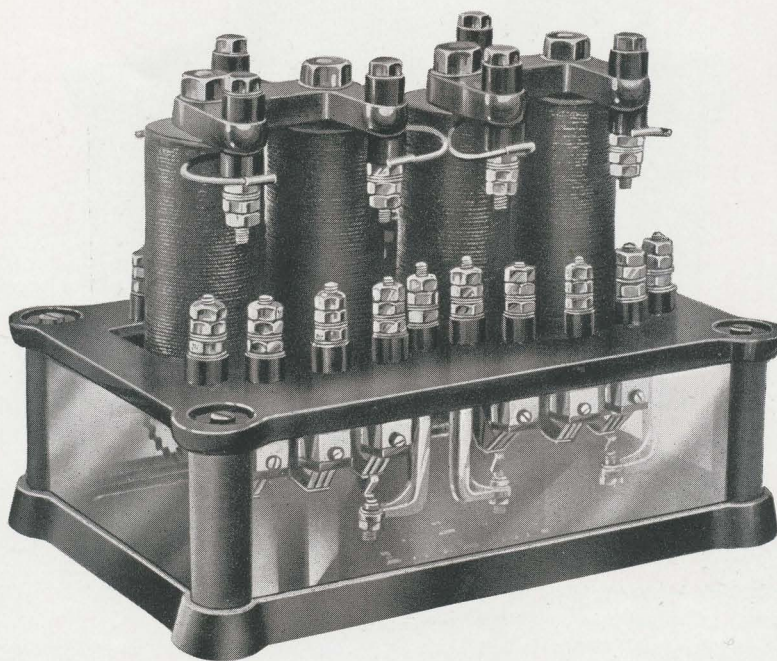
Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

RELAYS.

DIRECT CURRENT - INTERLOCKING.

For Point Detection.



RS. 220.

SPECIFICATION.

Coils former wound, non-turnable and interchangeable.

Front contacts are silver to copper-graphite; back contacts silver to silver.

Copper-graphite contacts are renewable and maintain constant low resistance. Back contacts are rigid and have micrometric adjustment.

The insulation employed is high-grade and non-hygroscopic.

Interlocking mechanism is simple, accurate and effective. Either armature picking up prevents other armature completing front contact circuits.

Cat. No.	*Maximum Contacts.		Dimensions			Weight.
	Front.	Back.	Height.	Width.	Depth.	
RS. 220	3	2	ins. 7½	ins. 9½	ins. 6½	lbs. 20

*On either or both sides.

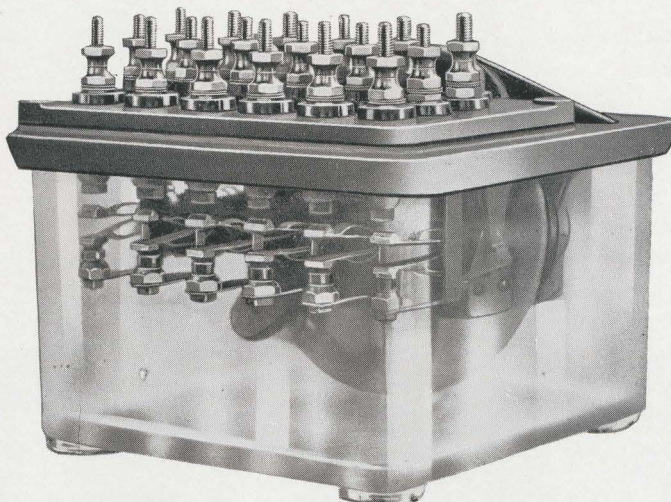
Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

RELAYS.

UNIVERSAL - ALTERNATING CURRENT. VANE TYPE.

(Patented).



RS. 202.

SPECIFICATION.

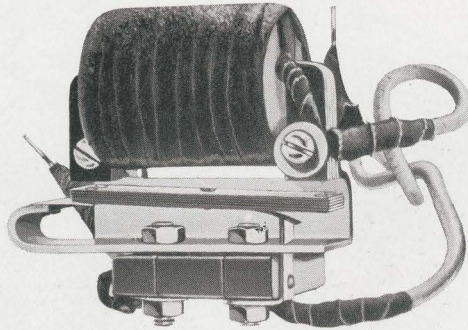
Supplied for operation on any commercial frequency and on any voltage up to 110 v.
 All parts are mounted on the relay cover and contained in a robust glass well.
 Contact equipment and non-turnable terminals mounted on a platform of high-grade non-hygroscopic insulation.
 Rotor disc of reinforced polished aluminium. Spindle revolves on ball bearings.
 Operating mechanism mounted in brass frame as separate unit.
 All windings are subject to a thorough impregnation.
 Waterproof and dust proof construction.
 Front and back contacts are carbon to carbon giving large opening and a rubbing contact.
 Gear wheels, where employed, are accurate machine cut phosphor bronze, of stub form.
 Single thumb nut to release cover from glass well.
 The novel method of construction employed enables perfect inspection of parts.
 All parts are interchangeable.
 All the above relays are identical in size and contact equipment and have a uniform appearance.
 The special arrangement of elements gives high efficiency values in operation.

Cat. No.	Maximum Contacts.		Description.	Weight.
	Front.	Back.		
RS. 200	6	6	Single Element. Two Position. Sector Acting.	} 18 lbs.
RS. 201	6	6	" " " " Quick "	
RS. 202	6	6	Double " " " " Sector "	
RS. 203	6	6	" " Three " " " "	
RS. 204	6	6	" " Two " " " Quick "	
RS. 205	6	6	" " Three " " " "	
RS. 206	4	4	" " Two " " " Time interval. Closing Type	} 23 lbs.
RS. 207	4	4	" " " " " " " " Opening Type.	

Dimensions :—Height, 7 $\frac{1}{4}$ ins., Width, 8 $\frac{3}{8}$ ins., Depth, 8 $\frac{1}{2}$ ins.

Prices on application.

When ordering please specify :—Operating Conditions, Frequency and Voltage.

RELAYS.**"CUT-IN" TYPE - A.C. OR D.C.**

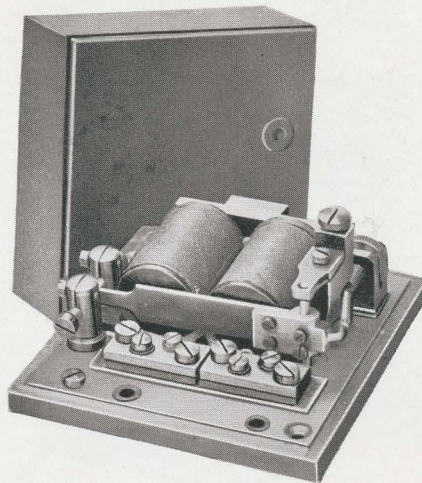
RS. 189.

A compact relay having a laminated magnetic circuit capable of successful operation on either A.C. or D.C. supply. For "cutting in" purposes only. A single back contact, silver to silver, is fitted. This relay is as used in Hall Colour Light Signal.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 189	"Cut-in" Type Relay, A.C. or D.C.	ins. 2½	ins. 2½	ins. 1½	lb. 1

Price on application.

When ordering please specify :—Operating Conditions.

TELEPHONE RELAY.

RS. 221.

A neutral relay of robust construction for use on telephone circuits and similar requirements. Weatherproof oxidised gunmetal base and cover. Contact equipment :—One front and back, or front only, silver to silver.

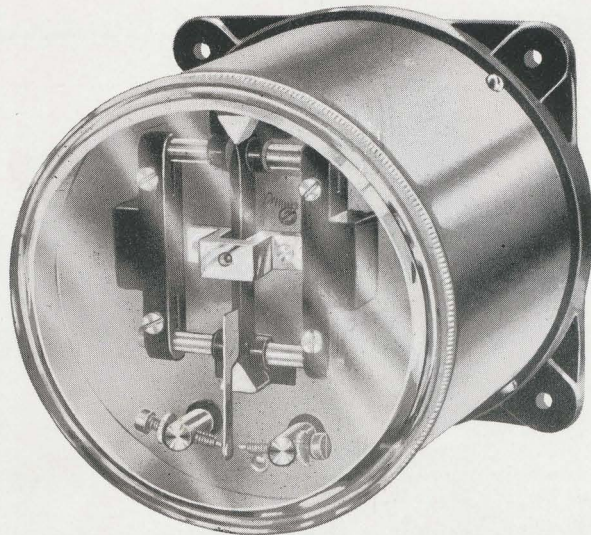
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 221	Telephone Relay	ins. 1½ 18	ins. 4	ins. 3¾	lbs. 2

Price on application.

When ordering please specify :—Resistance required.

RELAYS.

DIRECT CURRENT - POLARISED.

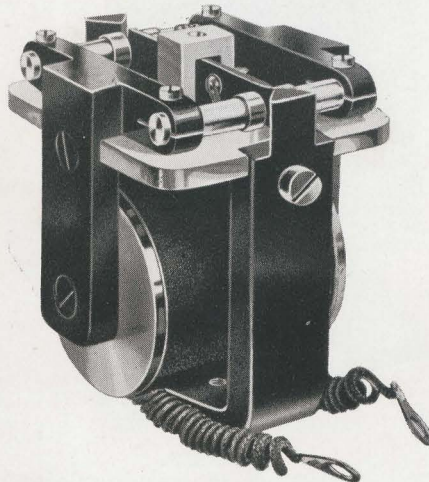
**RS. 130.**

Polarised Relay in brass case. Dust proof. Magnetic control. Visible operation. Adjustable poles. Inside terminals. Case provided with sealing arrangement.

Cat. No.	Description.	Maximum Contacts.		Dimensions.			Weight.
		Positive.	Negative.	Height.	Width.	Depth.	
RS. 130	Direct Current Polarised Relay	1	1	ins. $4\frac{1}{4}$	ins. $4\frac{1}{4}$	ins. $3\frac{3}{4}$	lbs. $4\frac{1}{2}$

Price on application.

When ordering please specify :—Resistance required.

**RS. 222.**

A polarised relay of convenient dimensions for fitting in block telegraph instruments, telephone exchange and similar purposes.

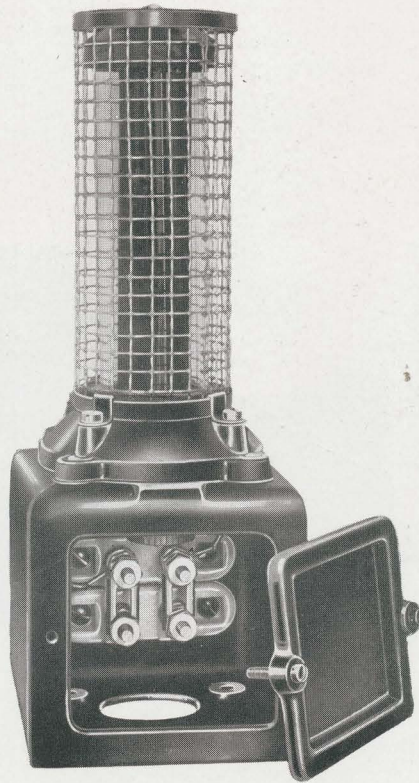
Magnetic Control, Visible Operation. Adjustable poles.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.	Maximum Contacts	
						Positive.	Negative.
RS. 222	Direct Current Polarised Relay Unmounted as shewn	ins. $2\frac{7}{8}$	ins. $2\frac{3}{4}$	ins. $2\frac{5}{8}$	lbs. $1\frac{1}{2}$	1	1
RS. 223	do. do. Mounted in Wood Case	ins. $4\frac{3}{4}$	ins. $4\frac{3}{4}$	ins. $3\frac{3}{4}$	lbs. $3\frac{1}{2}$	1	1

Price on application.

When ordering please specify :—Resistance and Contact Equipment required.

LIGHT RELAY.



RS. 239.

An efficient and simple device for automatically closing signal lighting circuits on the approach of darkness, and breaking circuit at dawn; and other purposes where an electrical circuit is required only at night time.

A vertical metallic cylinder, coated with lamp-black, is erected above a small cast iron case. Inside the cylinder a steel rod is fixed to the upper end and connected to a lever at the lower end. The effect of light on this couple is sufficient to actuate a contact making device. The cylinder is protected by a glass cylinder, dustproof and weatherproof, and this is further protected by a wire cage. This relay allows Edison Primary Cells to be used for Signal Lighting with economy.

SPECIFICATION.

Cast iron case, dust and weatherproof.

Contact, silver to silver.

Variable adjustment on contact lever.

Two RS. 272 Terminals fitted inside case.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 239	Light Relay.	ins. 13	ins. $4\frac{3}{4}$	ins. 5	lbs. $11\frac{1}{2}$

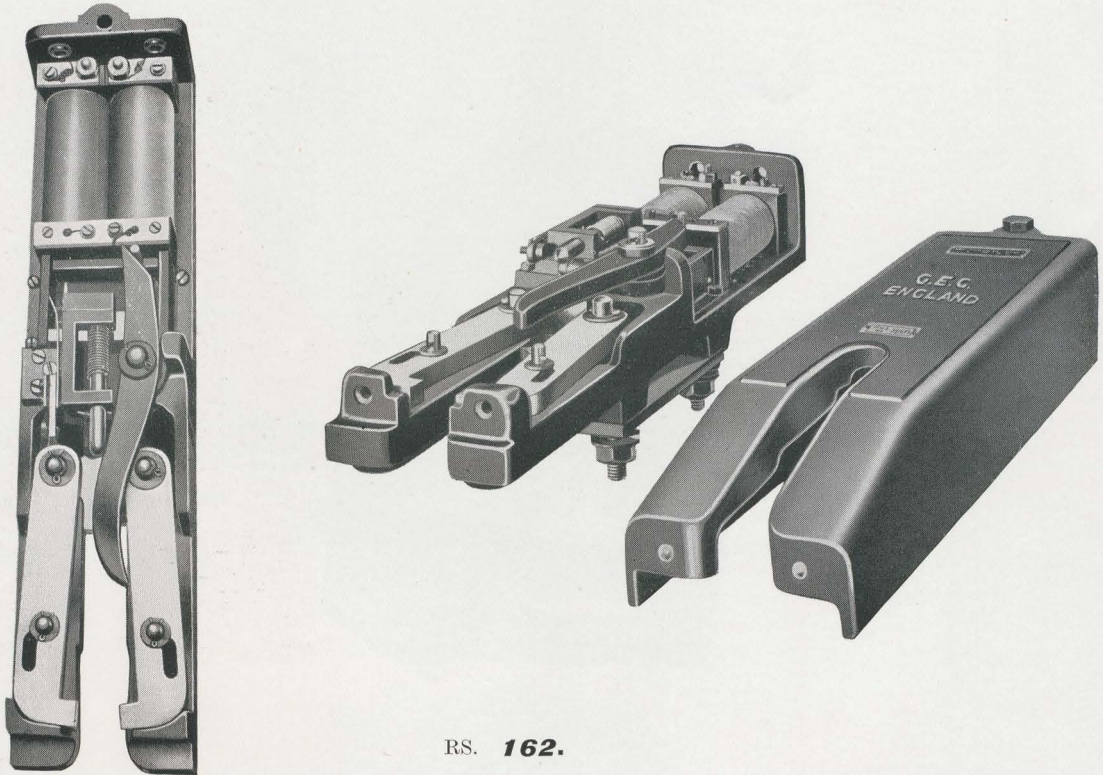
Price on application.

(RS.) 1334

LEVER LOCKS.

LEVER LOCKS. TYPE "N." DIRECT CURRENT.

(Patent No. 161694.)



A completely self contained lever lock which does not require exterior connections such as tappets or rods. The locking is effected by means of a pair of jaws which embrace and retain the lever in the locked position. When the electro-magnet is energised, the lever can be pulled against the jaws, which will open and allow the lever to be withdrawn. On replacing the lever the jaws immediately assume the holding position. The lock is positive in action, "snatching" the lever out when in locked position being impossible.

A contact maker is fitted inside the lock which is operated by a catch-rod attachment supplied with it. The use of this device obviates the necessity of wiring to an exterior contact maker.

SPECIFICATION.

For "normal" position locking only.
Voltage, 6 v. Resistance, 15 ohms.
Impregnated coils

A clamping plate and four studs are provided for fixing above lever frame.
Cover fastened with one bolt only, which may be sealed.
Cast iron base and cover.

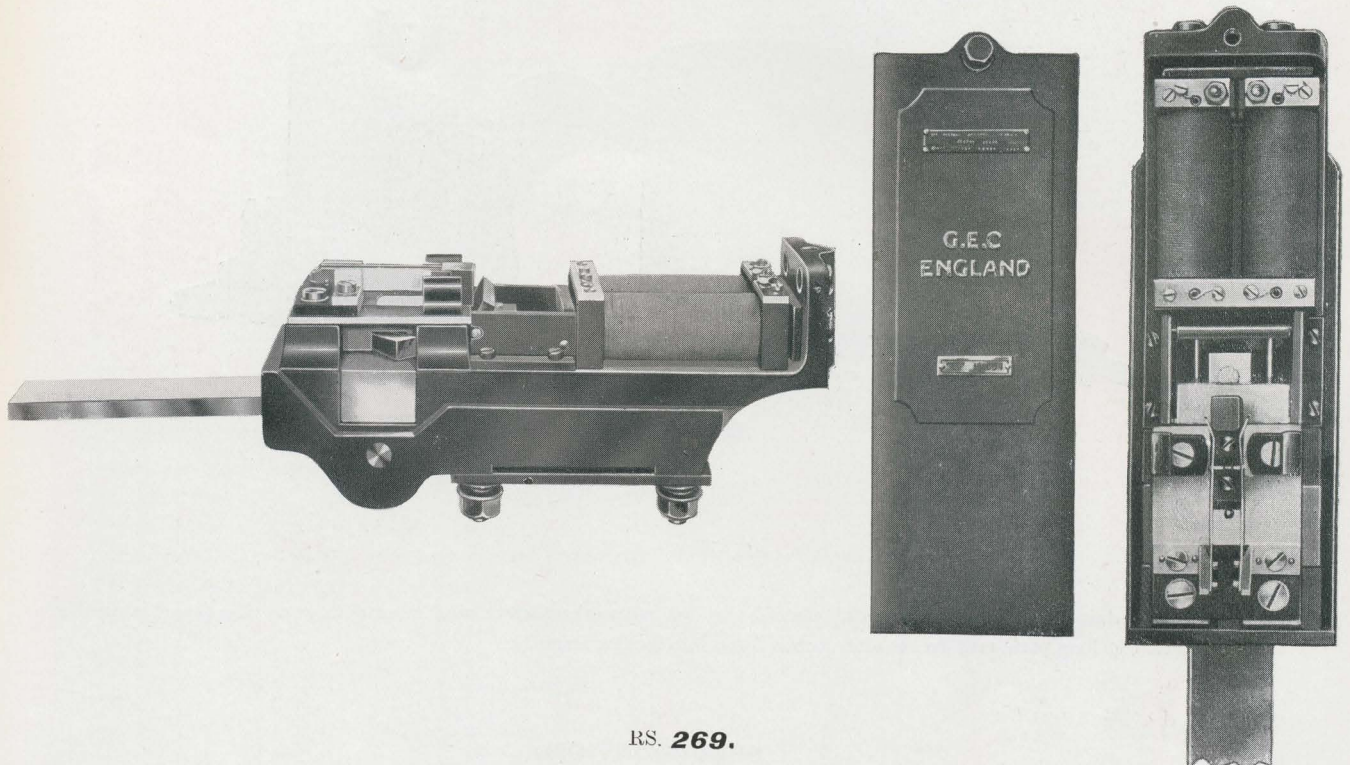
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 162	Lever Lock, Type "N"	ins. 4	ins. 3 $\frac{3}{4}$	ins. 15 $\frac{1}{2}$	lbs. 24 $\frac{1}{2}$

Price on application.

LEVER LOCKS.

TYPE "NR." DIRECT CURRENT.

(Patent applied for No. 13928/22).



RS. 269.

This is a tappet form of lock in which the locking pieces are forced into position by the movement of the lever and does not therefore depend on gravity.

The arrangement of coils, armature and locking piece is similar to Cat. No. RS. 162, but the locking is effected on a tappet by the engagement of a robust locking "dog" in a notch. It can therefore be used for locking a lever in any position. Repeating contacts are fitted.

SPECIFICATION.

Voltage, 6v. Resistance, 15 ohms.
Impregnated coils.

A clamping plate and four studs are provided for fixing.
Cover fastened with one bolt only which may be sealed.

Cast iron base and cover.

Cat. No.	Description.	Length.	Height.	Width.	Weight.
RS. 269	Lever Lock, Type "NR"	ins. 11	ins. 5 $\frac{3}{4}$	ins. 3 $\frac{3}{4}$	lbs. 16

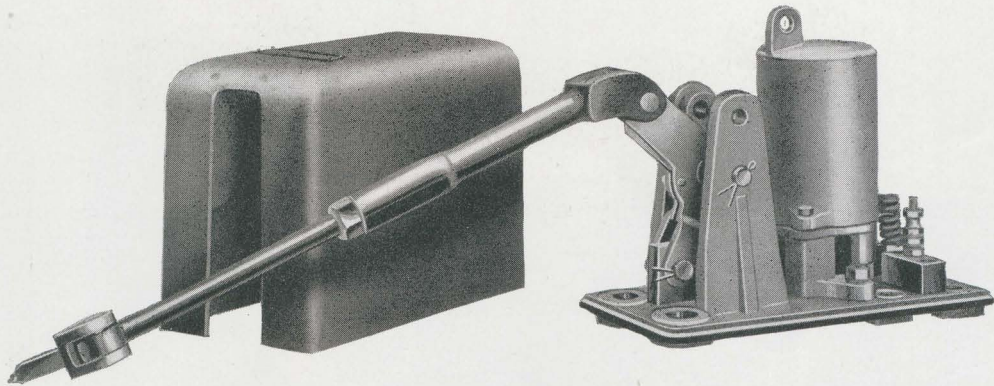
Price on application.

(RS.) 1336

LEVER LOCKS.

LEVER LOCKS.

UNIVERSAL PATTERN. DIRECT CURRENT.



RS. 260.

A self-contained lock, having a powerful solenoid operated bolt working into a small internal tappet. The tappet is supplied **un-cut** so that locking parts may be cut after lock is fitted into locking frame.

SPECIFICATION.

This lock is designed for use on Style A, Saxby and Farmer, Standard and other machines, either for mounting above the floor or below. It should be clearly stated where the lock is intended to be fixed, as variation is made in the operating crank according to requirements.

The illustration shows the lock with rod connection for fitting to a S. & F. machine above the floor. A pedestal is provided in this case.

Voltage, 10 volts. Resistance, 19.5 ohms.

Insulated terminal block with non-turnable terminals.

Former wound impregnated coil.

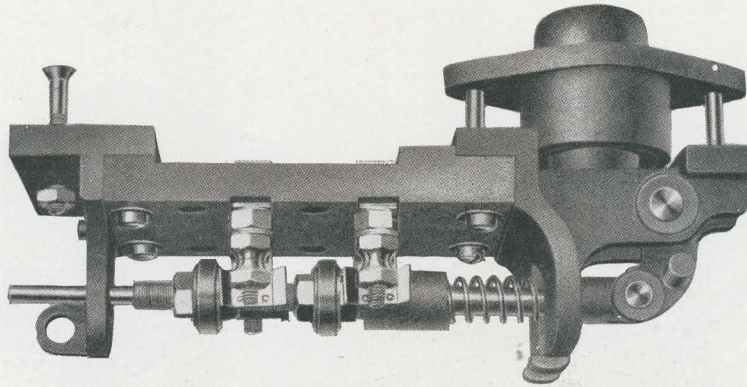
Cast iron base and cover.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 260	Lever Lock, Universal	ins. 8	ins. $4\frac{3}{4}$	ins. $9\frac{3}{8}$	lbs. 40

Price on application.

FOOT CONTACTS.

TWO-WAY FOOT OPERATED CONTACTS FOR WOOD OR CONCRETE FLOORS.



RS. 253. Foot Contact. (Wood Floor).

SPECIFICATION.

Cast iron plunger, barrel and brackets.

Pressed steel cover.

Powerful return spring of phosphor bronze.

Phosphor Bronze contacts with large contact surface, one or two-way as specified.

Micrometric adjustment of contact rings.

Cat. No.	Description.	Length.	Width.	Depth.	Weight.
RS. 253	Foot Contact (Wood Floor).	ins. 9½	ins. 3½	ins. 2⅞	lbs. 17
RS. 254	Foot Contact (Concrete Floor).	9½	3½	2⅞	26

Prices on application.

When ordering please specify thickness of floor.

SPECIFICATION.

Self-contained unit strongly constructed.

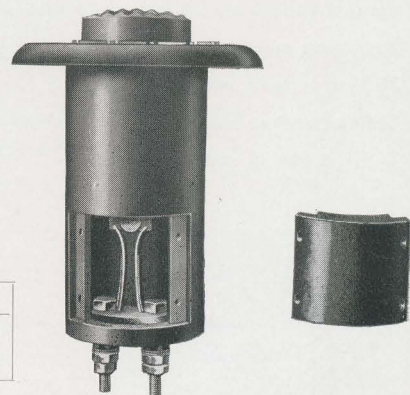
Cast iron body and plunger.

Powerful return spring of phosphor bronze.

Contacts one-way or two-way as specified.

Standard terminals.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 119	Foot Contact (Wood Floor).	ins. 6¾	ins. 3½	ins. 4¾	lbs. 5½



RS. 119. Foot Contact.

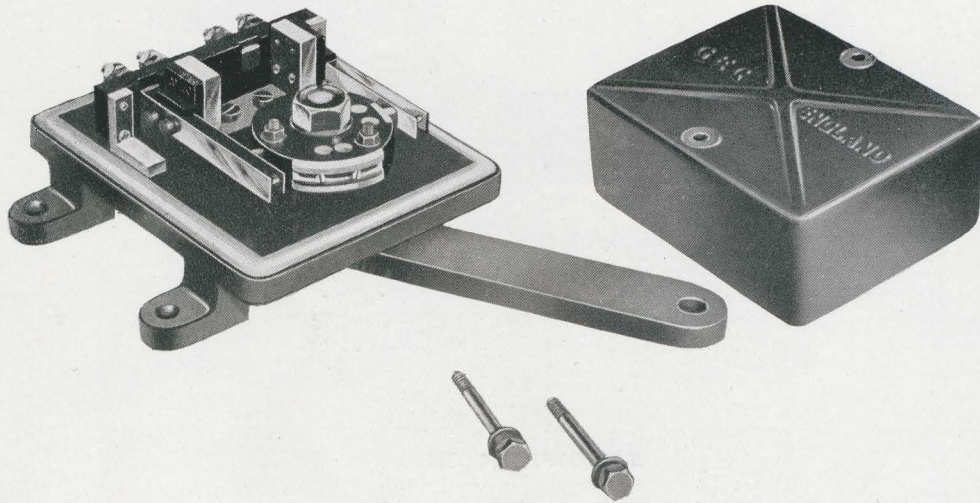
Price on application.

(RS.) 1338

CONTACT
MAKERS.

CONTACT MAKERS.

TYPE "A."



RS. **122**. Type A.1. Cover Removed.

A contact maker primarily designed for signal repeater commutation. It is adjustable to suit any type of semaphore having a working angle of between 30° and 90° for the "OFF" position in upper or lower quadrant.

The type A2 model, Cat. No. R.S. **123**, is suitable for three position signals and can be used in connection with signal repeater Cat. No. RS. **173** (Page 1347).

These contact-makers can, in addition to the above uses, be successfully employed for a variety of purposes common to signalling.

SPECIFICATION.

Rotating drum fitted to lever spindle, carrying fixed wiper and adjustable wiper. Wipers make and break pairs of contact springs.

Contact springs are German silver with rubbing silver to silver contacts.

Insulating materials are high-grade and non-hygroscopic

Moving parts do not carry current.

Strong cast iron base and cover, efficiently gasketed.

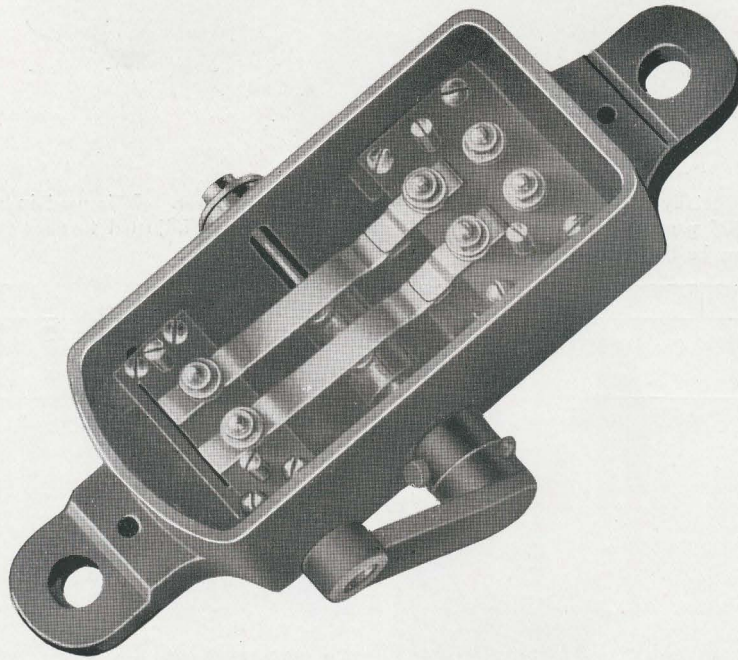
Lever is cast in malleable iron.

Cat. No.	Description.	Contact Equipment.		Height.	Width.	Depth.	Weight.
		Normal.	Reverse.				
RS. 122	Contact Maker, Type A1.	1	1	ins. 4 $\frac{5}{8}$	ins. 6 $\frac{7}{8}$	ins. 8	lbs. 14 $\frac{1}{2}$
RS. 123	do. Type A2.	2	2	ins. 4 $\frac{5}{8}$	ins. 6 $\frac{7}{8}$	ins. 8	lbs. 16

Price on application.

CONTACT MAKERS.

TYPE "B."



RS. 261.

An efficient form of contact maker which has been extensively used over a long period. The lever operates a spindle on which is mounted adjustable cams. The cams in turn force phosphor bronze springs upward to make rubbing contact with the top contacts. Normally the long springs are in contact with the bottom contacts.

SPECIFICATION.

Contacts silver to silver, two-way double Morse action. Moving parts do not carry current.

Strong cast iron case and cover, efficiently gasketed. Malleable iron lever, 4ins. radius.

Insulating materials are high-grade and non-hygroscopic.

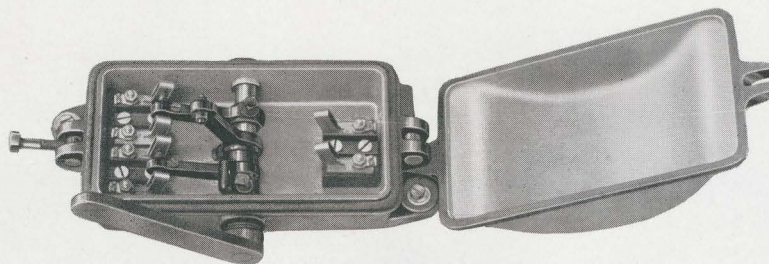
Cat. No.	Description.	Length.	Width.	Depth.	Weight.
RS. 261	Contact Maker Type B2.	ins. 14	ins. 7	ins. 4	lbs. 20

Price on application.

CONTACT
MAKERS.

CONTACT MAKERS.

TYPE C.



RS. 345.

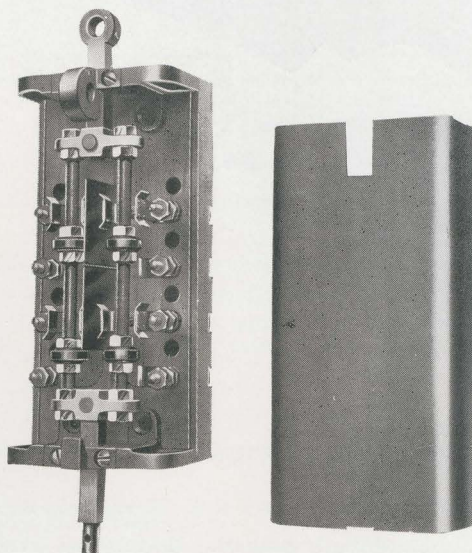
A contact maker specially suitable for attachment to signal arm or lever. It is used in conjunction with Signal Machine Cat. No. RS. 344 page 1310 as controller. The contact arms can be adjusted to meet general requirements, and one, two or three arms can be fitted as specified.

Cat. No.	Description.	Contacts.		Length.	Width.	Depth.	Weight.
		Normal.	Reverse	ins.	ins.	ins.	lbs.
RS. 345	Contact Maker, Type C 1	2	1	11	7	5	15
RS. 346	„ „ „ C 2	3	2	11	9	5	23

Additional contacts if specified.

Prices on application.

TYPE D.



R.S. 249.

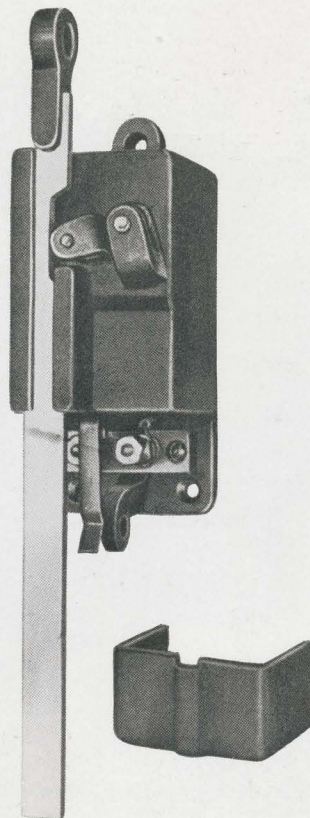
Multiple contact makers specially designed for attachment to signal lever tappets or tails. Each contact ring is adjustable to a fine degree giving good rubbing contact on phosphor-bronze springs. The construction allows two or more contact makers to be coupled together. For low tension circuits.

Cat. No.	Description.	Circuits.	Length.	Width.	Depth.	Weight.
			ins.	ins.	ins.	lbs.
RS. 249	Contact Maker, Type D 1	4 way	9 $\frac{5}{8}$	4 $\frac{7}{8}$	3 $\frac{11}{16}$	9
RS. 250	„ „ „ D 2	8 way	15 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{11}{16}$	15
RS. 251	„ „ „ D 3	10 way	18	4 $\frac{7}{8}$	3 $\frac{11}{16}$	18

Prices on application.

TIME RELEASES.

MECHANICAL, HAND AND CLOCKWORK.

RS. **248**. Mechanical Release.

Time releases are emergency appliances to enable signalmen to release electric locks on signal and point levers. The fact that the action of releasing a lock by this means is a somewhat protracted arrangement, causes the operator to think before resorting to it; furthermore its use locks up automatically all the levers affected until it is returned to the normal position.

The Clockwork Time Release is put into action by winding up a clockwork movement; the Hand Screw Release by operating two train of gears; and the Mechanical Release is a small mechanism designed to prevent a replaced lever being again operated within a time interval of 15 seconds or other desired period.

When the operation is completed the contacts are closed and the necessary circuits are made. The Clockwork and Hand Screw Types each have three sets of contacts and the Mechanical Type, one.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 246	Clockwork Release	ins. $7\frac{5}{8}$	ins. 5	ins. $12\frac{7}{8}$	lbs. 31
RS. 247	Hand Screw Release	$7\frac{5}{8}$	5	14	31
RS. 248	Mechanical Release	14	4	3	6

Prices on application.

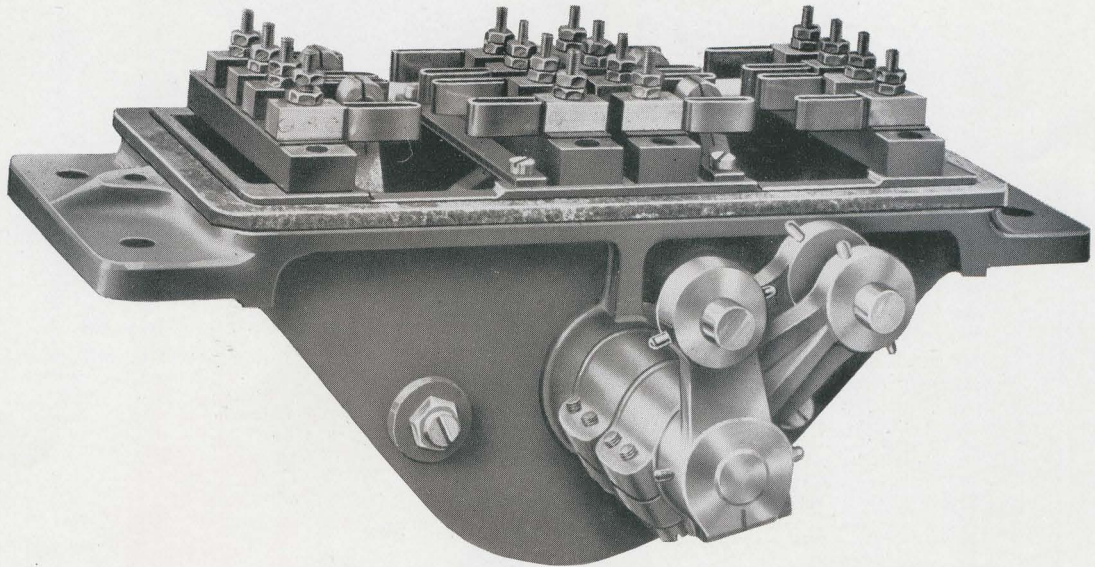
(RS.) 1342

POINT
DETECTORS.

ELECTRIC POINT DETECTORS.

FOR FACING OR TRAILING POINTS.

(Siemens Patent).



RS. 342. Facing Type (Cover Removed).

This is a specially compact and efficient detector suitable for electrically or manually operated points.

The contacts are controlled by means of cams and multiplying levers which are operated by the cranks connected to the point tongue or the plunger bolt.

Adjustment allows of fine or coarse detection on either or both point tongues and is suitable for any range of tongue opening.

The trailing type only has two cranks, the third one shown being for attachment to plunger bolt.

SPECIFICATION.

Contacts nickel to phosphor bronze giving good rubbing contact.

Shaft arms malleable iron.

High-grade insulations for contact bases.

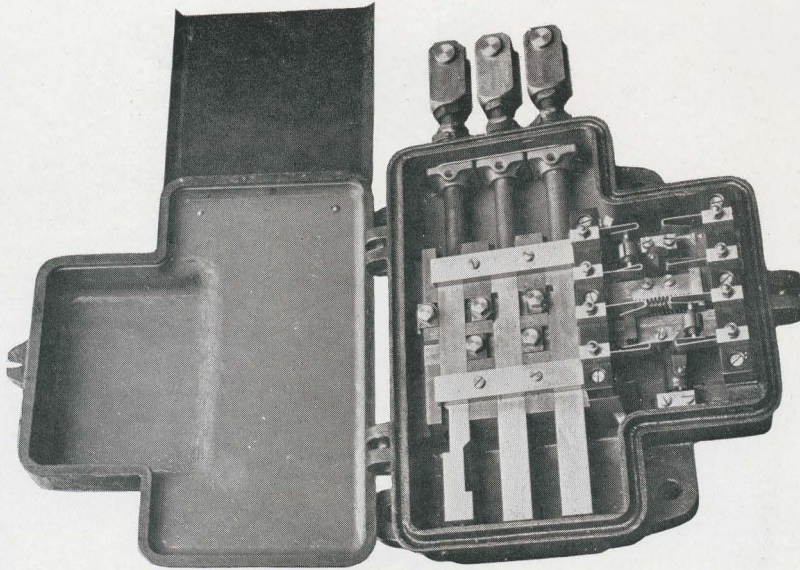
Oil bath and arrangement for self-lubrication of wearing surfaces.

Nozzle fitted for attaching flexible piping for wires.

Watertight case.

Cat. No.	Description.	Contacts.		Length.	Width.	Depth.	Weight.
		Normal.	Reverse.				
RS. 342	Point Detector, Facing Type.	4	4	ins. 16	ins. 10	ins. 9	lbs. 55
RS. 343	Point Detector, Trailing Type.	4	4	16	9	9	52

Prices on application.

ELECTRIC POINT DETECTORS.**FOR FACING OR TRAILING POINTS.***(Siemens Patent).*RS. **353.** Facing Type.

This detector has been specially designed for heavy duty on electrically operated points.

It operates on the tappet locking principle, the plungers, which are connected to the point tongues or plunger bolt, moving a transverse tappet. The latter through a multiplying lever moves the contact between two sets of contact springs.

Adjustment allows of fine or coarse detection on either or both point tongues. The plunger slides can be cut to cater for any tongue opening, left or right hand styles can be supplied in Facing or Trailing types. The Trailing types require two plungers.

SPECIFICATION.

Contacts nickel to phosphor bronze giving good rubbing contact.

High-grade insulation for contact bases.

Special glands for plungers giving good lubrication and excluding entry of grit.

Sheet iron extensions for protecting couplings.

Watertight case.

Cat. No.	Description.	Contacts.		Length.	Width.	Depth.	Weight.
		Normal.	Reverse.				
RS. 353	Point Detector, Facing Type.	2	2	ins. 26	ins. 16	ins. 6	lbs. 115
RS. 354	Point Detector, Trailing Type.	2	2	26	14	6	95

Prices on application.

(RS.) 1344

POINT
DETECTOR.

POINT DETECTOR.

FOR CONNECTION TO ONE POINT TONGUE.



R.S. 252.

This type of detector is suitable for controlling signal circuits. It is operated by a crank from the point tongue. The spindle carries four independent and adjustable cams each operating Morse contacts. The cams are easily adjustable to the finest required setting.

SPECIFICATION.

Heavy weatherproof cast iron base and cover.

Front and back contacts are silver to silver.

Contact springs are laminated to ensure return to back contacts.

Terminals are non-turnable and mounted in a separate compartment on a vertical platform of high-grade non-hygroscopic insulation.

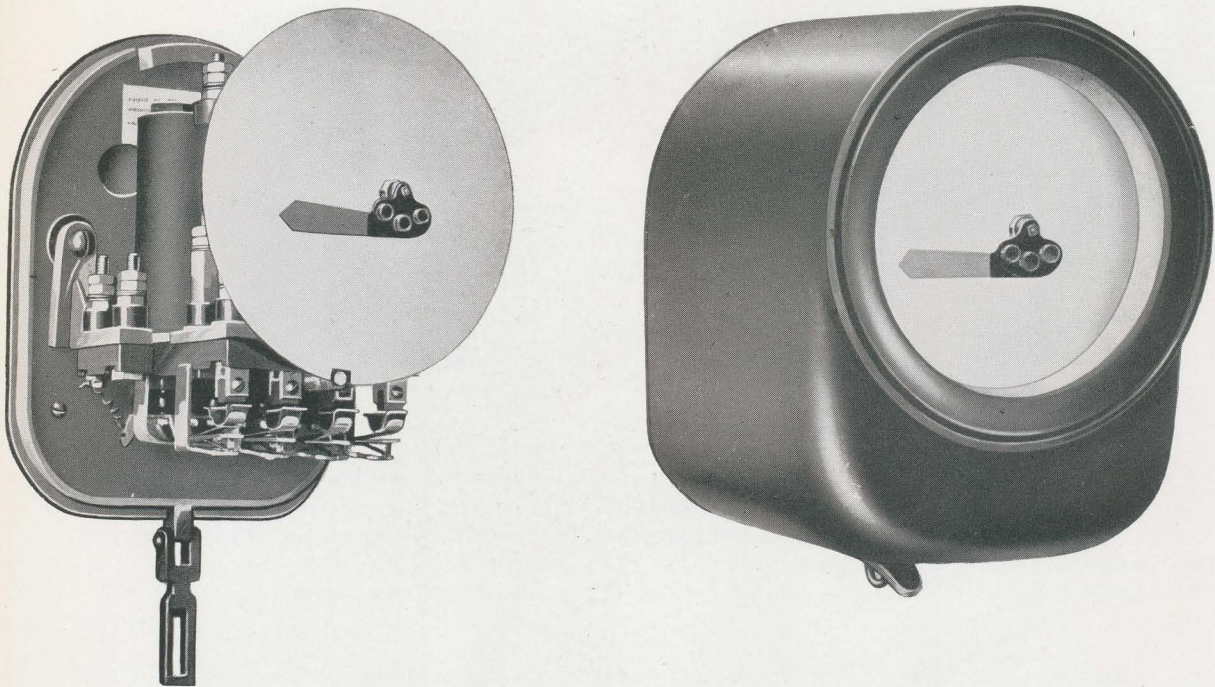
Moving parts do not carry current.

Cat. No.	Description.	Contact Equipment.		Height.	Length.	Width.	Weight.
		Normal.	Reverse.				
RS. 252	Point Detector	4	4	ins. 7	ins. 17	ins. 11	lbs. 48

Price on application.

INDICATORS.

TRACK CIRCUIT INDICATING RELAY.



RS. 267.

This instrument combines a line relay and track indicator and offers in certain cases advantages over the separate instruments generally in use. The arm can be made to move to 45° or 90° upper quadrant positions as specified.

SPECIFICATION.

Weatherproof cast-iron back and cover.

Plate glass panel with deep brass bezel.

Coils former wound, non-turnable and interchangeable.

Front contacts are silver gauze to carbon ensuring constant low resistance.

Back contacts are silver to silver.

Conforms to R.S.A. specifications.

Cat. No.	Description.	Maximum Contacts.		Dimensions.			Weight.
		Front.	Back.	Height.	Width.	Depth.	
RS. 267	Track Circuit Indicating Relay	4	4	ins. 10	ins. 7 $\frac{5}{8}$	ins. 7 $\frac{5}{8}$	lbs. 24

Price on application.

When ordering please specify:—Resistance, Contact Equipment, and style of arm required.

INDICATORS. TRACK CIRCUIT TYPE.



RS. 102.

De-energised indication. When energised the banner moves to 45° position covering word OCCUPIED and exposing word CLEAR.



RS. 270.

De-energised indication. When energised the red disc moves behind the screen, exposing word CLEAR.

Standard brass case pattern for fixing to front of signal box shelf or on top of the block instrument. Effected by the track circuit.

The movement is the standard Spagnoletti type. the coils being wound to high resistance, generally 3,000 ohms, the current then required being one milli-ampere only.

SPECIFICATION.

Heavy brass dustproof case.

Fitted with three plate serrated lightning arrester.

Milled front ring with bevel glass spun in.

Efficient and economical operation.

Jewelled bearings.

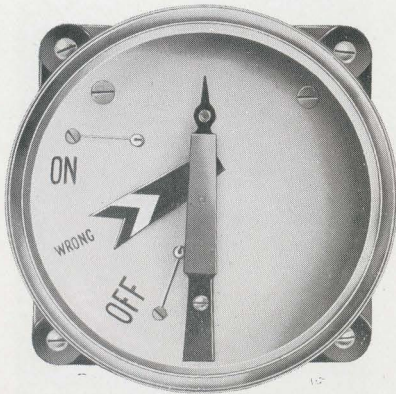
Cat. No.	Description.	Diam.	Depth.	Weight.
RS. 102	Track Circuit Indicator, Banner Type	ins. 4 $\frac{1}{4}$	ins. 2 $\frac{3}{8}$	lbs. 3 $\frac{1}{4}$
RS. 270	Track Circuit Indicator, Disc Type	ins. 4 $\frac{1}{4}$	ins. 2 $\frac{3}{8}$	lbs. 3 $\frac{1}{4}$

Prices on application.

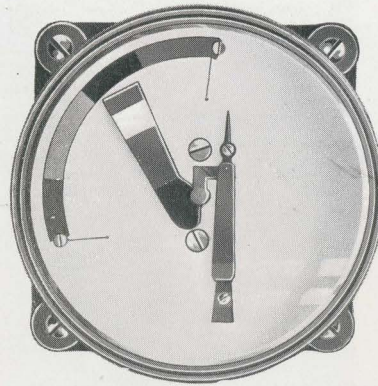
When ordering please specify:—Resistance required.

INDICATORS.

ARM REPEATERS FOR TWO OR THREE POSITION SIGNALS.



RS. 118.



RS. 173.

These repeaters for two-position signals are of the polarised armature type, working on one Leclanchè cell for each position on a single line wire. The movement gives positive "ON" and "OFF" positions, and a current failure gives a third position "WRONG." This position is also given if the arm fails to go to required angle for "OFF," or fails to assume correct "ON" position.

Repeaters for three-position signals have an adapted Spagnoletti movement giving four indications on a single line wire. The movement gives three positive indications, "STOP," "CAUTION" and "PROCEED" and current failure results in the arm assuming a fourth position "WRONG."

SPECIFICATION.

Heavy brass dustproof case.

Fitted with three plate serrated lightning arrester.

Milled front ring with bevel glass spun in.

Efficient and economical operation.

Resistance, 300 ohms.

Cat. No.	Description.	Quadrant.	Diameter.	Depth.	Weight.
			ins.	ins.	lbs.
RS. 118	Repeater for Two-position Signal	Lower Left Hand	4 $\frac{1}{4}$	2 $\frac{3}{8}$	3 $\frac{1}{4}$
RS. 173	Repeater for Three-position Signal	Upper Left Hand	4 $\frac{1}{4}$	2 $\frac{3}{8}$	3 $\frac{1}{4}$

Prices on application.

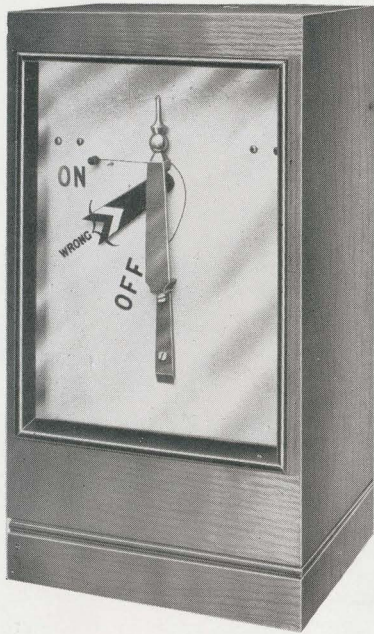
When ordering please specify whether Stop, Distant, or Automatic type arm required.

For CONTACT MAKERS, see pages 1338-1340.

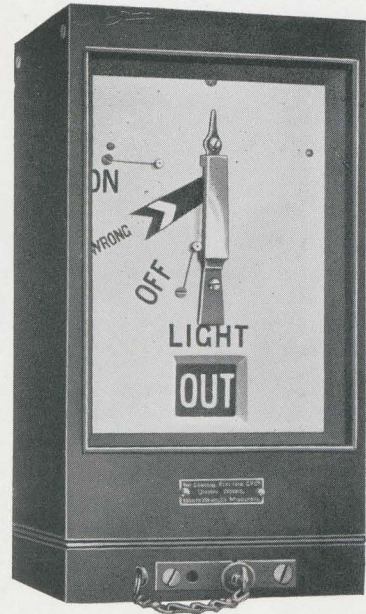
For CARSAK LECLANCHE CELLS, see Catalogue section L. (1).

INDICATORS.

ARM REPEATERS FOR TWO POSITION SIGNALS.



RS. 105.



RS. 155.

Note plug switch for disconnecting bell circuit.

SPECIFICATION.

Polished teak case with glass front.

Serrated Lightning Arrester fitted internally.

Efficient and economical operation.

Movements { Arm Repeater, polarised armature, resistance, 300 ohms.
 { Light Indicator, "Z" armature, resistance, 200 ohms.

Contact on "light" movement in conjunction with plug switch.

Cat. No. R.S. 155 can be supplied with 3in. circular enclosed bell fitted on back of instrument if specified, for audible warning in the event of light failing.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 105	Signal Repeater	ins. 8 $\frac{1}{8}$	ins. 4 $\frac{3}{8}$	ins. 3 $\frac{3}{8}$	lbs. 3 $\frac{1}{2}$
RS. 155	Signal Repeater and Light Indicator	ins. 8 $\frac{1}{8}$	ins. 4 $\frac{3}{8}$	ins. 3 $\frac{3}{8}$	lbs. 4 $\frac{1}{2}$

Prices on application.

When ordering please specify whether Stop, Distant, or Automatic type arm required.

For CONTACT MAKERS, see pages 1338-1340.

For CARSAK LECLANCHE CELLS, see Catalogue section L. (1.)

INDICATORS. FOR VARIOUS REQUIREMENTS.



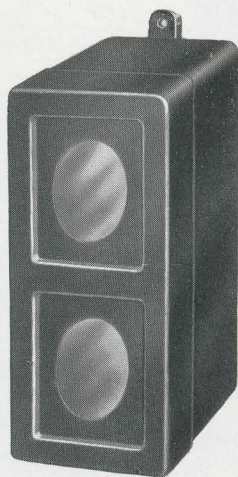
RS. 161.

Suitable for Ground Frame Indications, Signal Repeaters, etc.
Polarised armature movement 300 ohms resistance.
Serrated lightning arrester fitted at back.

Cat. No.	Description.	Dia.	Depth.	Weight.
RS. 161	Pointer Indicator	ins. $4\frac{1}{4}$	ins. $2\frac{3}{8}$	lbs. $3\frac{1}{4}$

Price on application.

When ordering please specify lettering on dial required, if any.



RS. 271.



RS. 301.

For signal cabins where power secondary battery supply available.

Cat. No. RS. 271 is suitable for repeating movements of two position signals, points, etc., or for use as Track Circuit Indicator.

Cat. No. RS. 301 has one light and one lens for repeating three position signals, giving three colour indications, and a fourth for the "wrong" indication. Specially suitable for use with Hall Colour Light Signal.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 271	Colour Light Indicator, Two Lights.	ins. 3	ins. $1\frac{1}{2}$	ins. 2	lbs. $\frac{3}{4}$
RS. 301	" " " One Light.	$4\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{3}{4}$	4

Prices on application.

(RS.) 1350

INDICATORS.

INDICATORS. LEVEL CROSSING.



RS. 147.

A robust all-weather indicator for indoor or outdoor use. The movement is a specially designed two position device giving "TRAIN APPROACHING" and "CLEAR" indications with lettering 1in. high. The movement closes a local contact when de-energised ("TRAIN APPROACHING" Indication).

SPECIFICATION.

Strong weatherproof, ventilated enamelled teak case, fitted with lock.
Roof protected with zinc sheeting.
Non-turnable terminals.

Contacts silver to silver, giving good rubbing contact.
Any required resistance.

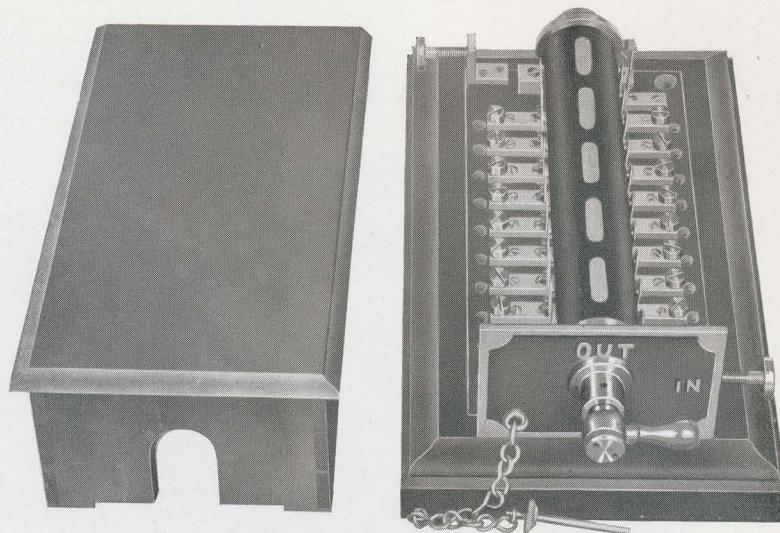
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 147	Level Crossing Indicator	ins. 21	ins. 11½	ins. 9½	lbs. 30

Price on application.

For ENCLOSED BELL FOR CROSSINGS, see page 1352.

BLOCK SWITCHES.

ROLLER TYPE.

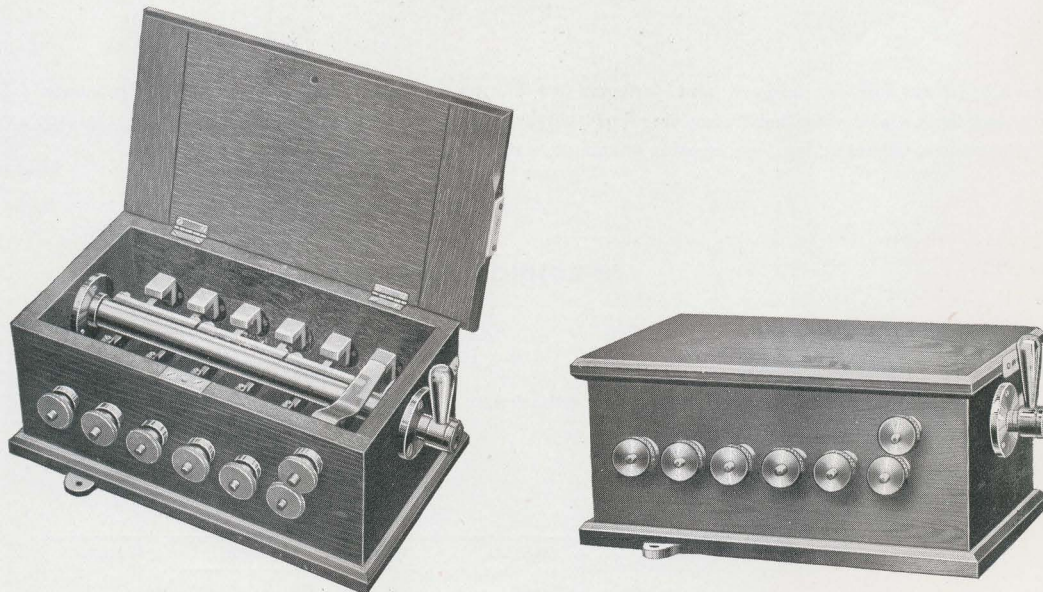
RS. **289.**

Polished hardwood case. High-grade insulation. Made for two or more circuits as specified.

Cat. No.	Description.	Height.	Width.
		ins.	ins.
RS. 289	Block Switch, Roller Type	5 $\frac{1}{4}$	6 $\frac{3}{4}$

Price on application.

BAR TYPE.

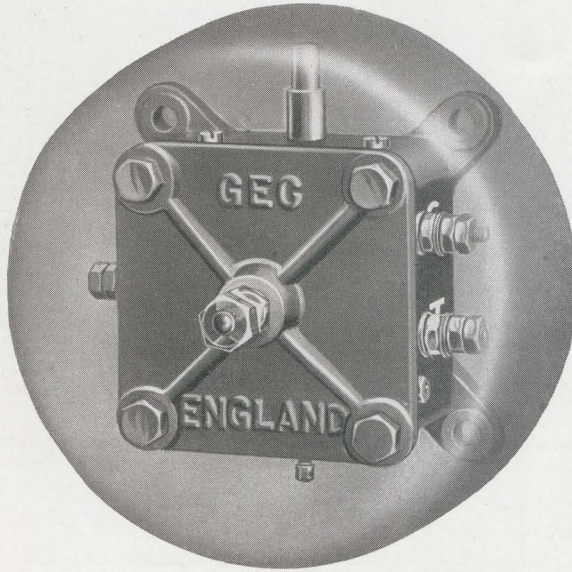
RS. **290.**

Polished hardwood case. Silver to silver contacts. Made for three or more circuits as specified. Earth terminal fitted.

Cat. No.	Description.	Height.	Width.
		ins.	ins.
RS. 290	Block Switch, Bar Type	5 $\frac{1}{2}$	5 $\frac{1}{2}$

Price on application.

BELLS. TYPE "A."



RS. **111.**

This all-enclosed bell was designed and perfected for locomotive cab work and general requirements. It is fitted with double terminals, making it either "trembling" or "single" stroke, as required. It is especially loud in tone and is recommended for locomotive cab signalling, level crossing warning systems, shunting yards and stations.

SPECIFICATION.

Dust-proof gunmetal case surmounted by gong.

Standard, non-turnable terminals.

Efficient striker action immune from extraneous vibration.

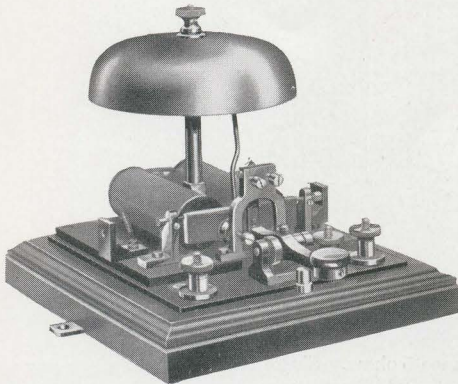
Set screw provided for external adjustment.

Coils, non-turnable and former wound.

Resistance 4 ohms (unless otherwise specified.)

Cat. No.	Description.	Height.	Width.	Depth.	Weight.	
		ins.	ins.	ins.	lbs.	ozs.
RS. 111	Type A Bell. 7in. Gong	7	7	3 $\frac{5}{8}$	7	6
RS. 238	Type A Bell. 9in. Gong	9	9	4 $\frac{3}{8}$	12	14

Prices on application.

BLOCK BELLS.RS. **116.** Cover Removed.RS. **116.** With Cover.

These are standard bells for block signalling, and can be supplied with or without key.
The gong can be supplied in any required shape, and a relay fitted if specified.

SPECIFICATION.

Polished teak base and cover.

Contacts are silver to silver.

Covered coils wound to 50 ohms, unless otherwise specified.

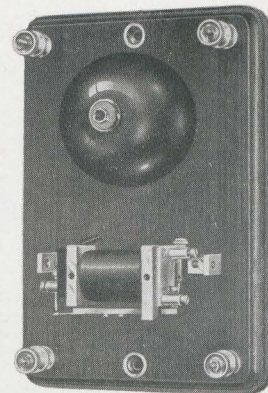
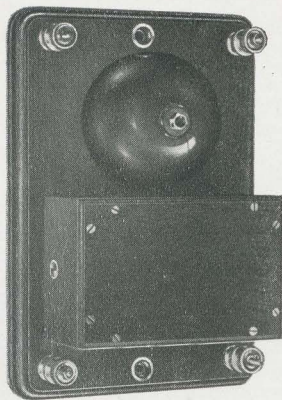
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
		ins.	ins.	ins.	lbs.
RS. 116	Block Bell, with key	‡8½	9	11	14
RS. 117	Block Bell, without key	‡8½	9	11	13½

‡ according to Gong required.

Prices on application.

When ordering please specify type of gong required.

RELAY BELLS.



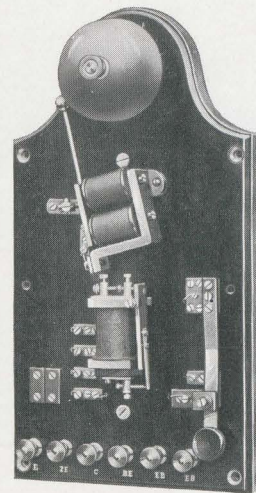
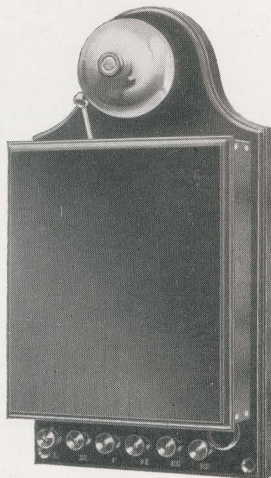
RS. 133.

For various purposes where bell is required to operate at any distance away. The use of the relay saves one line wire, an earth return being sufficient. Relay Bells are made in two types, a simple form for general utility and a higher grade instrument with answering key, for level crossing cabins and similar requirements.

Polished teak base and relay cover. 3in. self-contained bell, resistance 5 ohms. Single coil relay wound to any specified resistance.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 133	Relay Bell	ins. 8½	ins. 5¾	ins. 2¾	lbs. 2¾

Price on application.



RS. 266.

Polished teak base and cover. High grade bell movement wound to any desired resistance.

Gong supplied in any desired shape. Serrated plate lightning arrester fitted. Relay can be wound to any specified resistance. Answering key and extension bell terminals fitted.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 266	Relay Bell with key	ins. 14	ins. 7¾	ins. 3½	lbs. 6

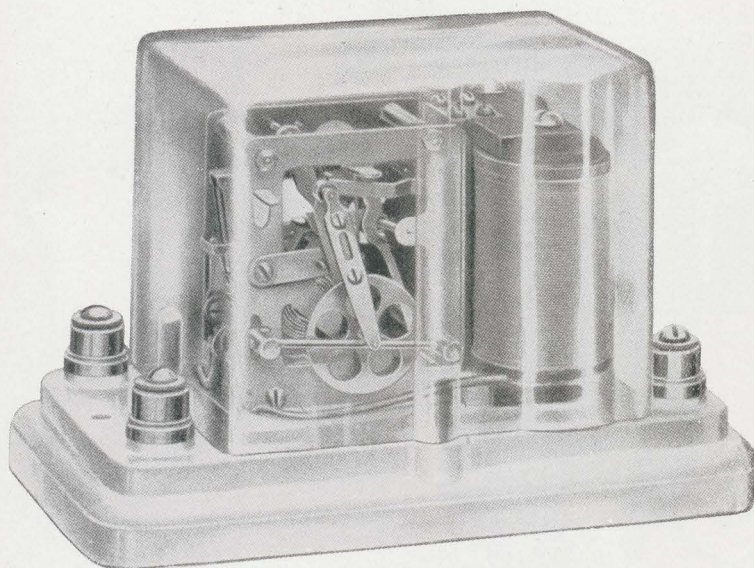
Price on application.

TELEGRAPH & TELEPHONE SELECTORS.**GILL SELECTOR.**

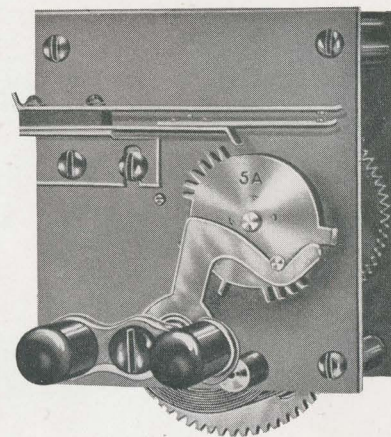
For Telephone or Telegraph Lines.

GILL CALLING KEY.

For Telephone or Telegraph Lines.



RS. 284/5.

RS. 286/7.
(Cover Removed).

The Gill Selector is an electro-mechanical instrument which enables any one of a number of audible or visual signals associated with a telephone, telegraph or other line, to be controlled from some distant point without calling other stations on the same line.

This selector is reliable and constant in its operation, free from mechanical or electrical troubles, protected from moisture and dust, economical in current consumption, and has a wide range of operation in working current. An "answer back signal" indicates the called apparatus is functioning, and can be given to the sending station.

The operation of a selector is occasioned by a sequence of impulses, of a predetermined order, being sent to line, either by the use of a special calling key or by a morse key. The time taken to call averages 7 seconds. The selector is non-polarised and may be usefully employed as a line saving device for many requirements on railways.

SPECIFICATION.

GILL SELECTOR. Massive porcelain base with hermetically sealed glass cover. Single electro-magnet. Coils wound to 4,500 ohms, operating from 6 to 25 milli-amperes without change of adjustment. Single silver to silver contact. No passing contacts. All working parts of non-magnetic metal.

GILL CALLING KEY. This instrument is used along with the selector, a separate key being used for each. The illustration of the key with the cover removed, clearly shows the toothed wheel which gives the necessary impulses to operate the selector. Keys can be supplied in groups or singly in hardwood cases.

FURTHER PARTICULARS ON APPLICATION.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.	
		ins.	ins.	ins.	lbs.	ozs.
RS. 284	Gill Selector, Telegraph Pattern	4	6	4	4	
RS. 285	Gill Selector, Telephone Pattern	4	6	4	4	
RS. 286	Gill Calling Key, Telegraph Pattern	5	4½	4	1	10
RS. 287	Gill Calling Key, Telephone Pattern	5	4½	4	1	10

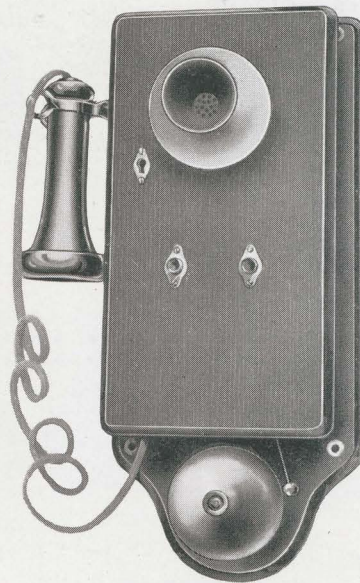
Prices on application.

(RS.) 1356

TELEPHONE.

TELEPHONE.

LONG DISTANCE - BATTERY RINGING.



RS. 281.

This is a specially made instrument to meet the demand of many Railway Companies desiring a long distance battery ringing telephone for signal cabin use and other duties.

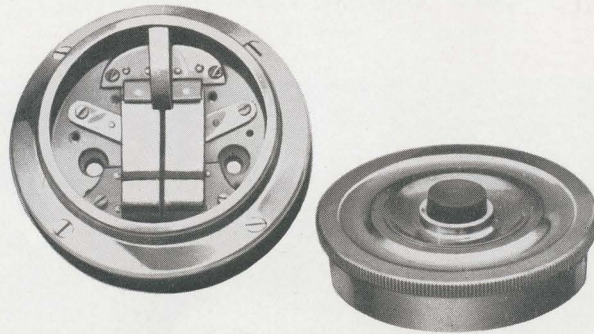
SPECIFICATION.

Well seasoned polished teak case with lock.
Standard pattern solid back transmitter.
Best quality skeleton bell movement wound to 5 ohms resistance. 3in. dia. gong.
Bell relay wound to 3,000 ohms resistance.
Fitted with two double pole Morse ringing keys if necessary.
Standard pattern receiver, switch hook, induction coil, lightning arrester, etc.
All brass parts nickel plated.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 281	Long Distance Telephone ..	ins. 15	ins. 7	ins. 4 $\frac{1}{4}$	lbs. 8

Price on application.

MORSE PUSHES.



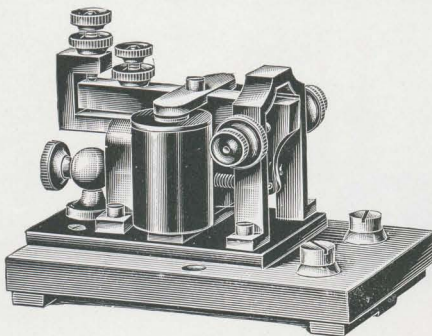
RS. 279/80.

Standard, single or double circuit Morse pushes for general duties. They are robust in construction and built for continuous work. Oxydised brass body and cover with knurled edge for easy removal. Contacts are silver to silver. German silver springs, Ebonite push.

Cat. No.	Description.	Dia.	Depth.
RS. 279	Morse Push, Double.	ins. $2\frac{7}{8}$	ins. $1\frac{1}{4}$
RS. 280	„ „ Single.	ins. $2\frac{7}{8}$	ins. $1\frac{1}{4}$

Prices on application.

TELEGRAPH APPARATUS.

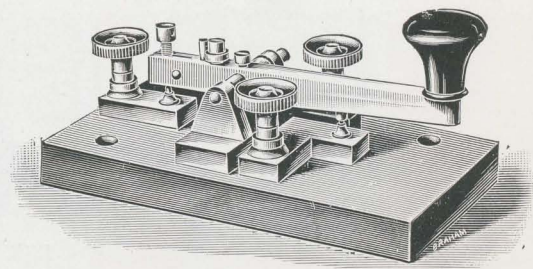


RS. 282.

Standard pattern to G.P.O. specification. Coils wound to 21 ohms and shunted with 440 ohms and winding. Total res. 20 ohms. Polished teak base with brass feet.

Cat. No.	Description.
RS. 282	Pony Sounder, G.P.O. Standard.

Length $5\frac{1}{4}$ ins. Height $4\frac{1}{4}$ ins. Depth $3\frac{3}{8}$ ins. Weight $2\frac{1}{2}$ lbs.



RS. 283.

Standard pattern to G.P.O. Specification. Polished teak base. Cocus handle.

Cat. No.	Description.
RS. 283	Single Current Key G.P.O. Standard.

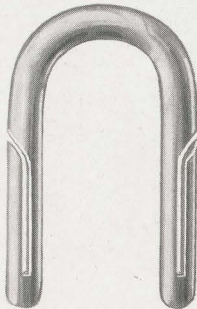
Length 6 ins. Width 3 ins. Depth 3 ins. Weight $1\frac{1}{4}$ lbs.

Prices on application.

(RS.) 1358

"U" LINKS,
SOCKETS, ETC.

"U" LINKS, SOCKETS AND PLUGS.



RSB. 87.

Best quality nickel plated brass
links. 1in. centres.

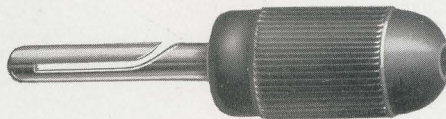
Diameter, $\frac{1}{4}$ -in.



RSB. 88.

Best quality brass sockets.
Standard dimensions.

Takes $\frac{1}{4}$ -in. Diameter "U" links or plugs.



RSB. 86.

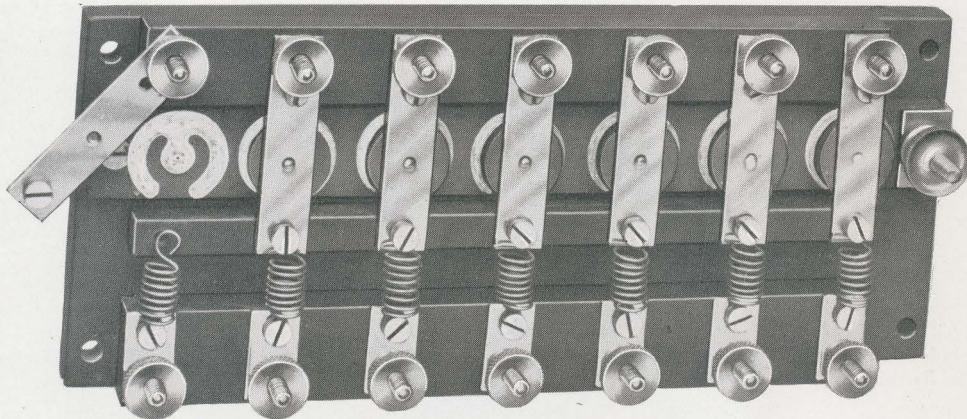
Testing plug for "U" Link Sockets with insulated
handle. Best quality nickel plated brass plug.

Diameter of plug, $\frac{1}{4}$ -in.

Prices on application.

LIGHTNING ARRESTERS.**MULTIPLE CIRCUIT TYPE.**

(REGISTERED DESIGN No. 671943.)

**RS. 101.**

For fixing at testing points, etc. Carbon discs on carbon plate separated by a specially shaped mica insulation, which ensures protection from dislodged carbon particles.

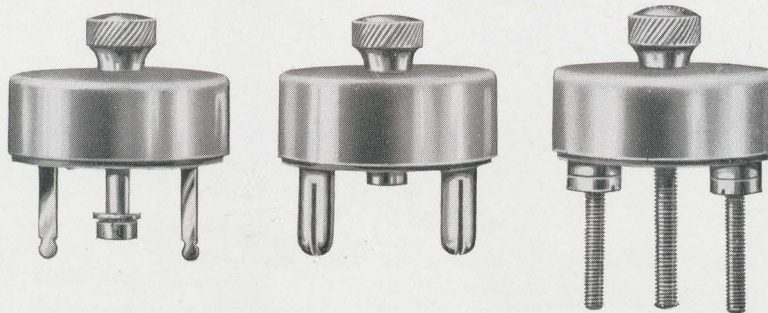
Choke coil fixed between the discharge and "instrument side" terminal.

Slate base. All brass fittings nickel plated.

Cat. No.	Description.	Height.	Depth.
RS. 101	Lightning Arrester, 2, 4, 7, 12 way.	ins. 4	ins. 2 $\frac{1}{4}$

Weight of 7 way, 3 $\frac{3}{4}$ lbs.

Prices on application.

CIRCULAR CARBON TYPES.**RS. 229.****RS. 230.****RS. 231.**

Pressed nickel plated cover. Milled thumb-nut. Carbon electrode and brass plates insulated by perforated mica disc. Best quality fibre base.

Two "line" terminals, one for each circuit, and common earth in centre.

RS. **229** is fixed with a screw, which acts at the same time as earth connection.

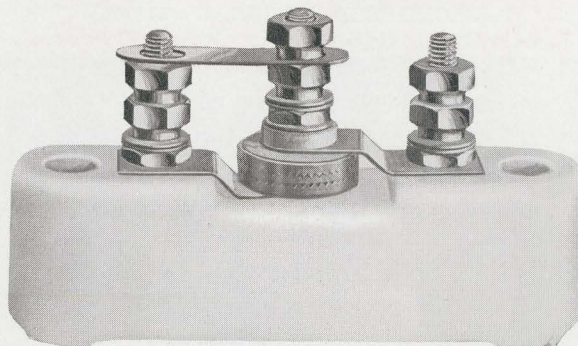
RS. **230** is fitted with plug type fixing for pushing into "U" Link Sockets. See page 1358.

RS. **231** has screw stems for fixing and connections.

Cat. No.	Description.	Weight.
RS. 229	Lightning Arrester, Circular Carbon, Tag Type, lin. centres.	ozs.
RS. 230	" " " " Plug " "	2
RS. 231	" " " " Screw " "	

Prices on application.

LIGHTNING ARRESTERS. "HYSTATIC" IMPEDANCE TYPE.



RS. 241.

High insulation resistance is maintained by carborundum, which is broken down by lightning discharge. These arresters can be fixed in rows and the earth terminals strapped together.

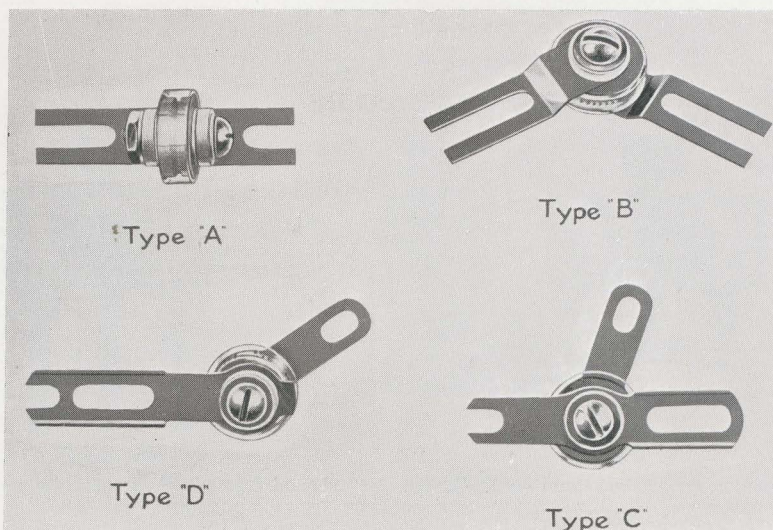
SPECIFICATION.

Carborundum and serrated copper arrester protected from dust accumulation by a tight fitting glass sleeve. Non-turnable terminals. Vitreous porcelain base, fixing screws supplied. Impedance coil sealed in underside of base.

Cat. No.	Description.	Height.	Length.	Width.	Weight.
RS. 241	Hystatic Impedance Arrester.	ins. 2 $\frac{3}{4}$	ins. 4 $\frac{3}{4}$	ins. 1 $\frac{1}{4}$	lb. $\frac{1}{2}$

Price on application.

"HYSTATIC" SHUNTS.



These are simple shunts for instrument protection. The arrester portion is carborundum and serrated copper, protected by a glass sleeve. The use of carborundum in these arresters maintains high insulation after discharge.

Cat. No.	Description.	Type.	Suitable for :—
RS. 242	Hystatic Shunt.	A	Terminals RS. 273 and 275.
RS. 243	" "	B	Relay line terminals, etc.
RS. 244	" "	C	Terminals RS. 273, 275, etc.
RS. 245	" "	D	Terminals RS. 272 and 274.

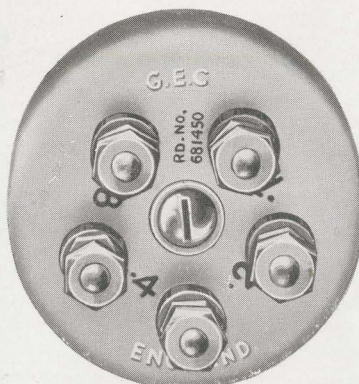
Prices on application.

RESISTANCE UNITS.

ADJUSTABLE.

Specially designed for Track Circuits.

(Registered Design No. 681450).



RS. **121.**

Vitreous porcelain body. Standard Terminals. Special grade resistance wire thoroughly insulated. Fixing screw and washer supplied.

Made in three standard ranges No. 1—.1 ohm to 1.5 ohms in .1 ohm steps.

No. 2—.5 ohm to 7.5 ohms in .5 ohm steps.

No. 3—1 ohm to 15 ohms in 1 ohm steps.

Other ranges to order.

For gravity and soda cells No. 1 range is recommended.

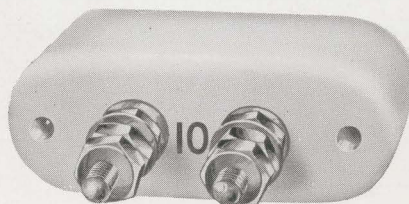
For secondary batteries No. 2 or No. 3 range is suitable according to length of track.

If required a value less than that of the lowest coil can be obtained by placing the lowest coils in parallel.

Cat. No.	Description.	Dia.	Height.	Weight.
RS. 121	Resistance Unit, Adjustable.	ins. 2 $\frac{7}{8}$	ins. 2	lb. $\frac{1}{2}$

Price on application.

FIXED.



RS. **131.**

Vitreous porcelain body. Standard Terminals. Special grade resistance wire thoroughly insulated. Fixing screws provided.

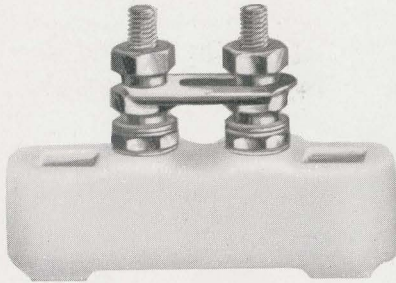
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 131	Resistance Unit, Fixed.	ins. 2	ins. 2 $\frac{7}{8}$	ins. 1 $\frac{1}{8}$	lb. $\frac{1}{4}$

Price on application.

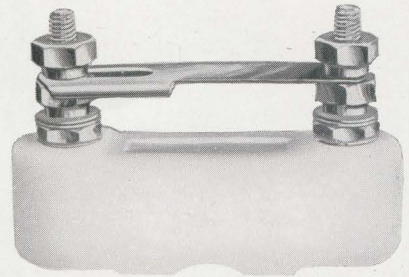
TERMINALS.

TERMINALS.

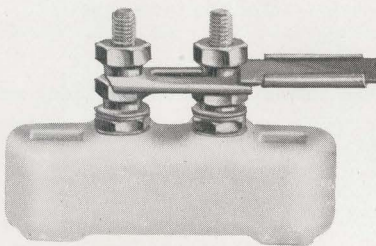
The following terminals are an essential for all work in connection with signalling circuits. They can be supplied in four distinct types to R.S.A. specification. Used singly or in multiples they make a neat and efficient form of termination and test point.



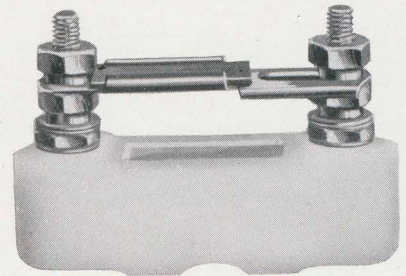
RS. 272.



RS 273.



RS. 274.



RS. 275.

The upper illustrations show terminals with plain copper connector, whilst the lower views are of similar terminals fitted with a special copper connector, having a black fibre tag for embossing circuit nomenclature.

Note the flanged edges of the copper connectors. These terminals are usually mounted vertically so that when the connector is loosened for testing or other purposes, there would be a liability for it to turn and cause an improper circuit with an adjacent terminal. To prevent this flanges are formed on the edges of the connector which bed on to the terminal nuts and efficiently check any tendency to turn.

By slackening the top nuts the connector can be moved so as to disconnect the circuit without removal, for this purpose one end of the connector being slotted.

Cat. No.	Description.			Weight.
RS. 272	R.S.A. Porcelain Terminal.	1in. centres.	Plain Connector.	} 6 ozs.
RS. 273	" " "	2 $\frac{3}{8}$ in. "	" "	
RS. 274	" " "	1in. "	Tag "	
RS. 275	" " "	2 $\frac{3}{8}$ in. "	" "	

Prices on application.

WHITE FILLER.

Specially prepared white compound for filling in engraved and embossed characters on above tag terminals and other similar requirements. This is a permanent filling which does not fall away or crumble and is impervious to weather.

Cat. No.	Description.
Cat. No. RS. 276	White Filler. 2oz. sticks.

Price on application.

TRACK CIRCUITING SUNDRIES.

CHANNEL PINS.

For Track Circuit Rail Bonds.



RS. 277.

Standard pattern, tinned or coppered as specified

Cat. No.	Description.
RS. 277	Single Channel Pin.

Price on application.



RS. 278.

Standard pattern, tinned or coppered as specified. One pin for two bond wires.

By the use of this pin, labour costs for drilling are almost halved as only two holes per double bond are required.

Cat. No.	Description.
RS. 278	Duplex Channel Pin.

Price on application.

CHANNEL PIN PUNCHES AND SETS.

Special tools for driving single and duplex channel pins into and out of position.

Cat. No.	Description.	Cat. No.	Description.	Cat. No.	Description.	Cat. No.	Description.
RS. 233	Single Channel Pin Set.	RS. 234	Duplex Channel Pin Set.	RS. 235	Single Channel Pin Punch.	RS. 236	Duplex Channel Pin Punch.

Prices on application.

BOND WIRES.

Galvanised iron bond wires can be supplied in any required lengths.

"Copperweld" bond wires can be supplied in any length and grade.

These bonds combine greater conductivity with strength than galvanised iron, do not rust and having a steel core are not liable to theft.

Three grades of Copperweld bond wire can be supplied :

viz. "40% conductivity" } of that of solid copper wires of equal size.
 "30% conductivity." }

"Aristos D.C.," which has approximately twice the conductivity of G.I. wire of equal size.

Prices on application.

DUPLEX BONDS.

Duplex bonds are made of two No. 6 B. & S. Aristos Copperweld wires which are twisted together throughout their entire length except for two inches at each end which is formed straight for fastening to the rail with duplex channel pins.

The wire employed has double the conductivity of the galvanised iron wire, does not rust and having a steel core is not liable to theft.

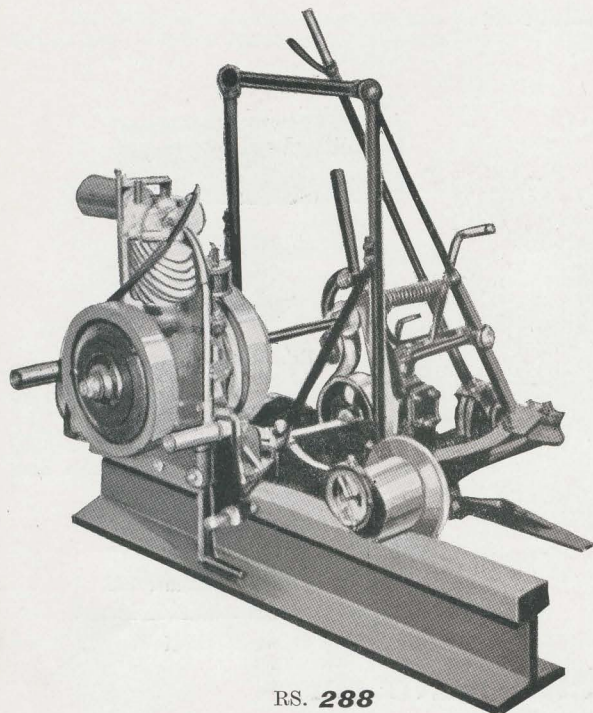
Cat. No.	Description.
RS. 237	Duplex Bond. Twisted No. 6 B. & S. Aristos Copperweld.

Prices on application.

When ordering please specify: Length of bond required.

POWER DRILLING MACHINE.

THE "EVERETT."



RS. 288

Power rail drilling is a logical and important development. With this machine one man can drill as many holes as five or six men using hand power machines. The saving in labour and drill consumption pays for the machine in a very short time.

This machine is easily handled and operated by one man and is quite safe to use under any traffic conditions, as it is never clamped to the rail except when operator is drilling. Immediately the operator releases his hold on the feed lever, the drill is automatically withdrawn and on removing his foot from a treadle, the clamp on rail is immediately released.

The machine is normally free from the rail and can be readily tipped off or rolled along to the next location.

The engine is a four cycle, air-cooled, petrol motor generating $\frac{1}{2}$ to 1 B.H.P. It has overhead valves, splash and sight feed lubrication, and simple starting gear.

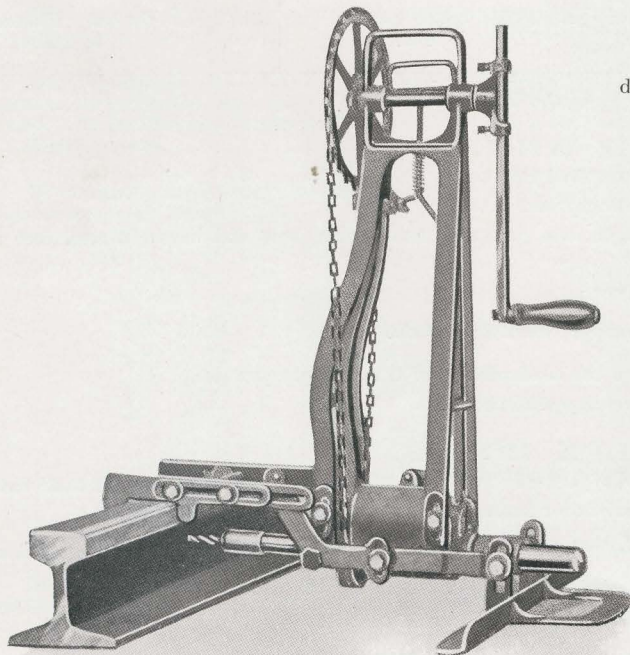
The complete machine is of high-class machine tool construction and is built for hard and continuous service. The frame castings are of malleable iron. All shafts, levers, and moving parts are carefully and accurately machined. All parts are interchangeable and renewable.

Cat. No.	Description.	Weight.
RS. 288	Power Drilling Machine.	lbs. 150

Price on application.

HAND DRILLING MACHINE.

(Cook's Patent).



RS. 232. Hook Type Drilling Machine.

This is an improved form of hand drilling machine designed to hold to the rail by adjustable hooks.

Important features embodied :—

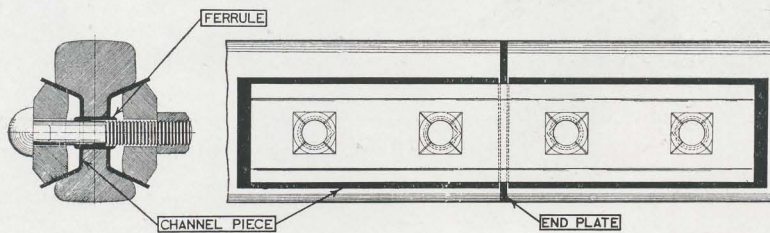
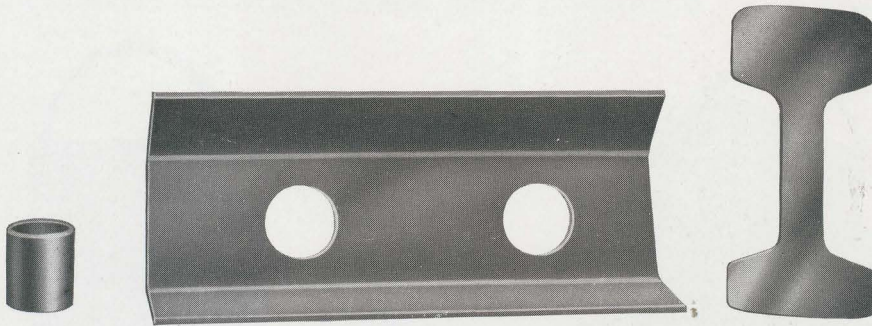
- Rigid High Frame.
- All wearing parts hardened.
- Roller bearings.
- Ball bearing thrust.
- Spindle and gears fully encased.
- Feed nut extra large.
- Adjustable hooks and foot plate.

Cat. No.	Description.	Weight.
RS. 232	Hand Drilling Machine	lbs. 40

Rail clamp type can also be supplied.

Price on application.

RAIL JOINT INSULATIONS.



With the installation of Track Circuits, fibre insulation has become a considerable item in equipment and maintenance. Results of severe tests conducted over a long period, have established the fibre employed for G.E.C. Rail Joint Insulations as one of the most reliable and long-lived insulations at present obtainable.

The fibre is pressed into the required shape, thoroughly seasoned and finished by treatment with a special solution, if required.

G.E.C. Rail Joint Insulations are made to suit every rail section. Insulating bushes for fish bolts are made in all standard sizes, and insulation can also be supplied for point-rodding, sole plates, plunger and lock bars, etc., together with necessary bushings.

The chief points of recommendation for this material are—

Low initial cost.

Readiness with which it may be bent or punched to shape desired.

Ability to withstand excessive pressure and vibration.

Toughness and density ensures durability under all climatic conditions.

Insulating properties.

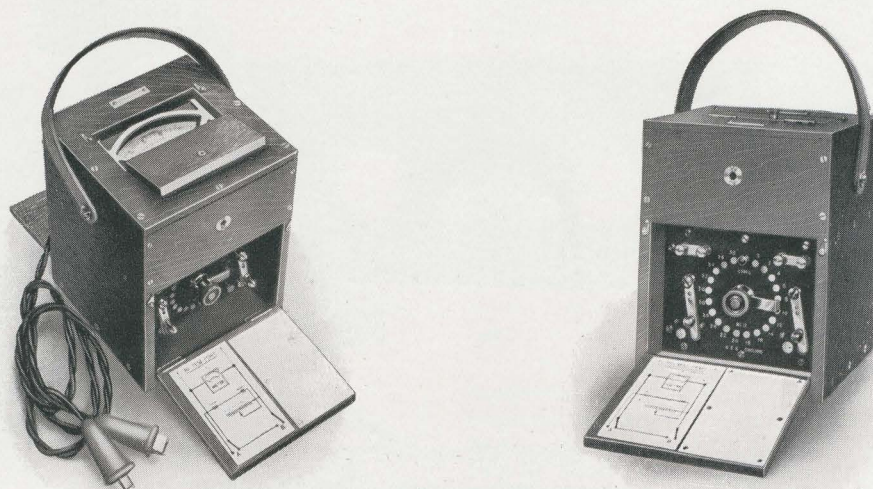
Price on application.

Enquiries should be accompanied with sketch of rail section and give fish-bolt centres, and specify if fibre is to be treated with preparation for protection from moisture.

(RS.) 1366

PORTABLE
TESTING SETS.

PORTABLE TRACK CIRCUIT TESTING SET.



RS. 113.

This set is specially designed for readily checking adjustment values of track circuit relays without disconnection or interference with permanent wiring. Train shunt values are obtained simultaneously and these tests can be carried out satisfactorily with semi-skilled labour. Its use, however, is not confined to tests on track relays, and it can also be conveniently employed in making tests on track circuit and block batteries; signal machines, locks, etc.

SPECIFICATION.

Case of well-seasoned polished teak. Robust construction, leather carrying strap and rubber feet.

Meter has four ranges, two for voltage and two for current tests.

Rheostat, of radial arm pattern, with 20 contact studs giving resistance steps of $\cdot 2$ ohms from zero to 3.8 ohms.

Connecting links allow train shunt resistance to be increased from 3.8 ohms to 15.8 ohms by steps of $\cdot 2$ ohms.

Short-circuiting switches are of simple construction, radial arm type.

Test leads provided with "Universal" clips.

Ivory note tablet fixed on front door of case.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 113	Track Circuit Test Set, Type B	ins. $8\frac{1}{8}$	ins. $6\frac{1}{4}$	ins. $6\frac{1}{4}$	lbs. $7\frac{1}{2}$

Price on application.

TRANSFORMERS.**SPECIAL TYPE FOR HALL COLOUR-LIGHT SIGNALS.****Also suitable for ordinary signal lighting where A.C. supply is available.**

RS. 259.

Suitable for transforming from 200 or 100 volts to tapings for $7\frac{1}{2}$, 8, $8\frac{1}{2}$ and 9 volts with additional 6 volt terminals for marker light where used.

SPECIFICATION.

Cast iron base arranged for vertical or horizontal mounting. Platform of high-grade non-hygroscopic insulation.
Coil thoroughly impregnated. Standard terminals.

Laminations are made from best quality sheet iron varnished.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 259	Transformer, Signal	ins. $5\frac{1}{4}$	ins. $4\frac{1}{2}$	ins. $3\frac{1}{4}$	lbs. 10

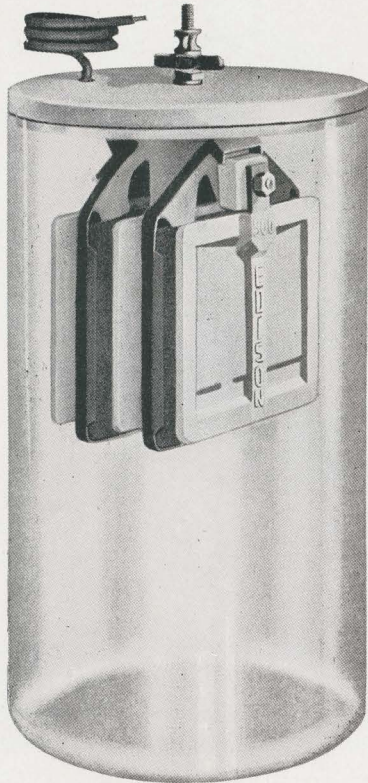
Price on application.

(RS.) 1368

EDISON
PRIMARY CELLS.

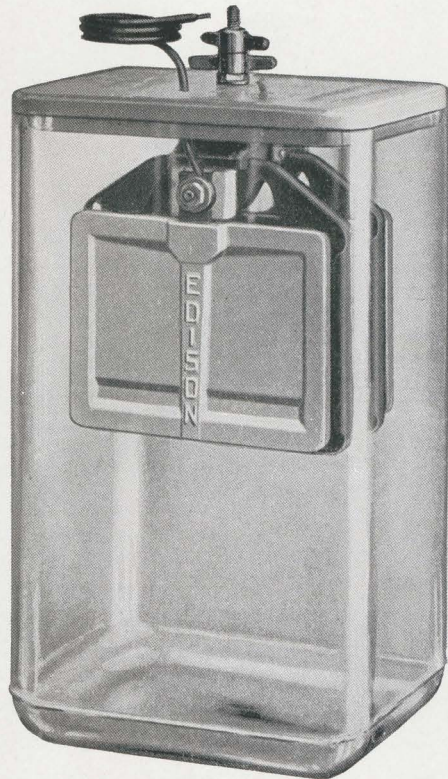
EDISON PRIMARY CELLS.

THE MOST EFFICIENT FORM OF CAUSTIC SODA CELL.



RS. 361.

Edison Type M 501.



RS. 362.

Edison Type M 502.

This type of cell has already proved its reliability and suitability for many requirements in railway signalling systems ; in particular for track circuits, signals, and subsidiary apparatus. Under all conditions the full rated ampere hour capacity is obtained WITH A UNIFORM VOLTAGE which can be taken as approximately .65 volt on closed circuit. No deterioration whatever takes place when the cell is idle. By using the heat resisting glass jars there is no risk of breakage due to extremes of heat and cold and further the state of the element can readily be seen at a glance due to a feature which is explained later.

A complete Edison Primary Cell consists of the following components :

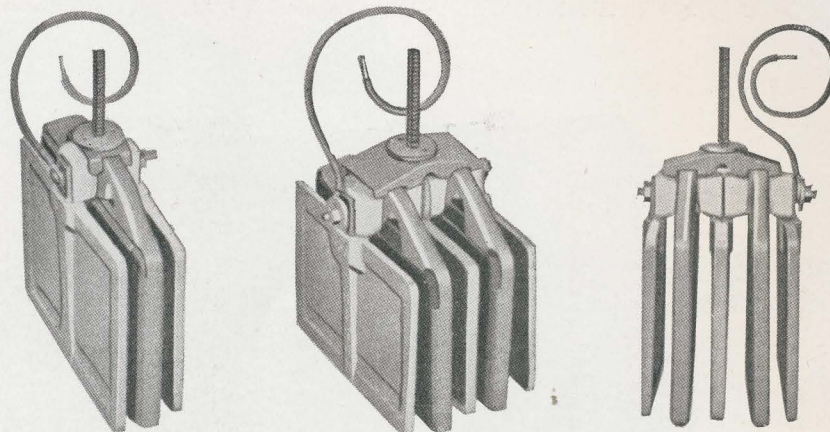
- (a) The element in which are combined zinc and copper oxide plates.
- (b) Tin of caustic soda of special purity.
- (c) Heat-Resisting Glass Jar.
- (d) Porcelain cover.
- (e) Bottle of specially prepared oil.
- (f) Set of nuts and washers forming suspension bolt-fixing to cover and terminal.

A complete Renewal for Edison Primary Cells consists of items (a), (b), and (e).

Above illustrations show two types of the 500 ampere-hour cell, fitted with the multiple element. The special design of element and jar allows the chemical action to function with the maximum efficiency.

Prices on application.

EDISON PRIMARY CELLS—(continued.)



Type S.

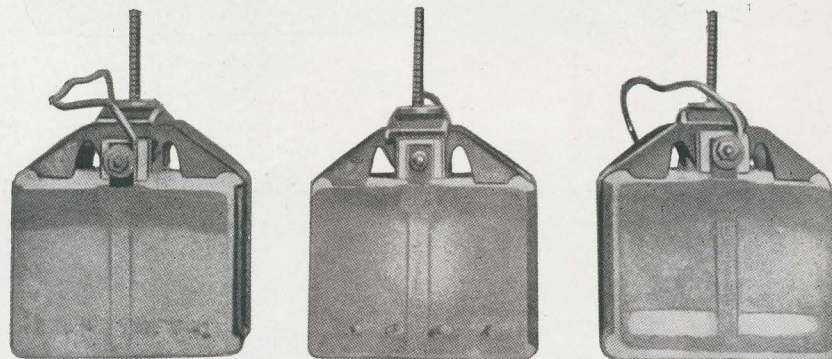
Type M.

Edison Primary Cell Elements.

Elements.

In certain types of Edison Primary Cell the elements are made in two styles as shown above, the single plate, S; and the multiple plate, M. In the S type the element is composed of one copper oxide plate assembled with two zinc plates. The M type has two copper oxide plates assembled with three zinc plates.

The multiple type is designed for heavy work, and ensures a uniform voltage with a heavy current output.



An exclusive feature of these cells is that the zinc plates are moulded with slight depressions near the bottom of the plate to act as indicators of approaching exhaustion. The illustrations above are from untouched photographs shewing the gradual exhaustion of the cell as indicated by the panels. The left hand view shews the first signs of approaching exhaustion; the centre view, a more advanced stage and the right hand view, element ready for renewal.

Note that the surface area of the zinc plate is not lessened even when cell is exhausted.

The following list of Edison Primary Cells is recommended as covering most requirements:—

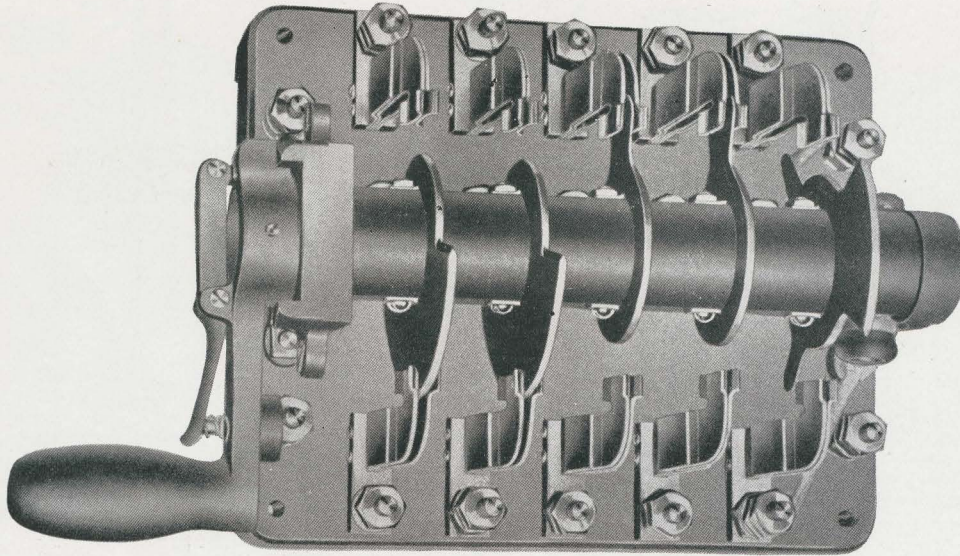
Cat. No.	Edison Type No.	Capacity. Amp-hour s.	Jar.	Shape.	Overall Dimensions.	Type of Renewal.
RS. 355	S 202	200	Heat Resisting Glass	Rectangular	11 $\frac{1}{4}$ ins. high, 6 ins. wide, 3 $\frac{1}{2}$ ins. deep	S 200
RS. 356	S 302	300	" " "	"	12 " " 6 " " 3 $\frac{1}{2}$ " "	} S 300
RS. 357	S 305	300	" " "	Circular	10 $\frac{1}{4}$ " " 6 $\frac{3}{8}$ " diameter	
RS. 358	S 501	500	" " "	"	12 $\frac{3}{4}$ " " 6 $\frac{1}{2}$ " "	} S 500
RS. 359	S 502	500	" " "	Rectangular	12 $\frac{1}{4}$ " " 6 $\frac{1}{2}$ " wide, 5 $\frac{1}{2}$ ins. deep	
RS. 360	S 504	500	" " "	Barrel	11 $\frac{1}{2}$ " " 7 $\frac{1}{8}$ " diameter	} M 500
RS. 361	M 501	500	" " "	Circular	12 $\frac{3}{4}$ " " 6 $\frac{1}{2}$ " "	
RS. 362	M 502	500	" " "	Rectangular	12 $\frac{1}{4}$ " " 6 $\frac{1}{2}$ " wide, 5 $\frac{1}{2}$ ins. deep	} M 500
RS. 363	M 504	500	" " "	Barrel	11 $\frac{1}{2}$ " " 7 $\frac{1}{8}$ " diameter	
RS. 364	M 1001	1000	" " "	Circular	13 $\frac{7}{8}$ " " 8 $\frac{1}{8}$ " "	} M 1000
RS. 365	M 1002	1000	" " "	Rectangular	14 " " 8 $\frac{3}{8}$ " wide, 6 $\frac{1}{2}$ ins deep	

Further information and instruction for making up these cells on request.

(RS.) 1370

CHARGING
SWITCH.

CHARGING SWITCH.



RS. 255.

A switch provided for simple and efficient connection of storage batteries in series with charging and discharging circuits permitting the batteries to be switched on or off the line without opening the charging circuit.

During the manipulation of the switch, short circuiting of the battery is avoided by automatically inserting a resistance during the interval that the battery would otherwise be on short circuit, which resistance is again cut out as soon as that point is passed.

Manipulation of the switch is simple, the four different positions of the switch controlling the batteries being as follows :—

1. Battery A discharging. Battery B charging.
2. „ A „ „ B open.
3. „ A open „ B discharging.
4. „ A charging „ B „

The switch is compact and substantial in design and always permits easy inspection. The knives are mounted on high-grade non-hygroscopic insulation and make efficient contact with the springs, being so designed to take care of the heavy currents likely, without heating.

The resistance is a Ward-Leonard 10 ohm standard unit.

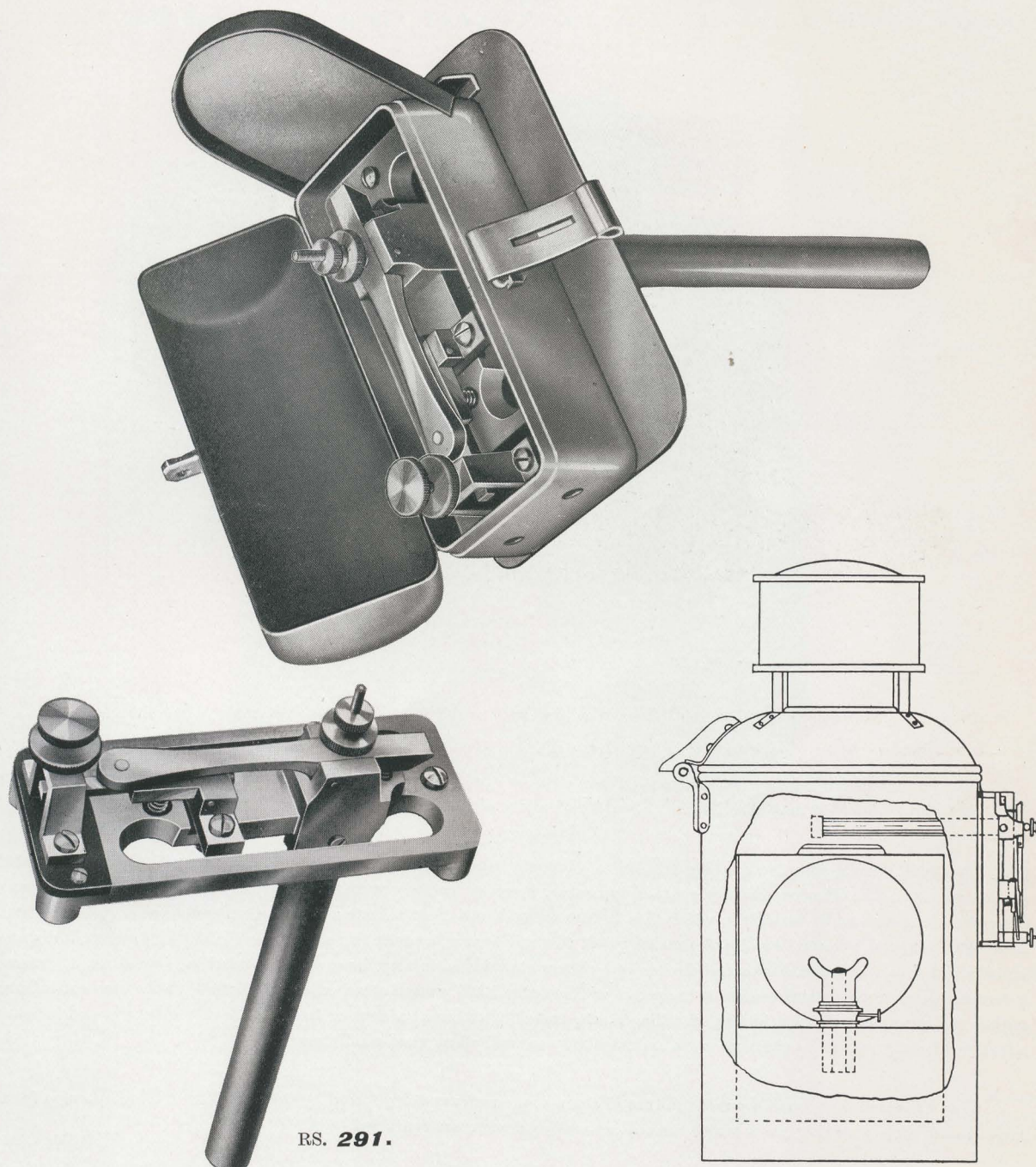
Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 255	Charging Switch	ins. 5 $\frac{3}{8}$	ins. 6 $\frac{3}{16}$	ins. 10 $\frac{7}{8}$	lbs. 14

Price on application.

1371 (RS.)

EXPANSION
BARS.

EXPANSION BARS.



RS. **291.**

Standard pattern expansion bar for fitting to signal lamps, for use with Light Indicator, page 1348.
Enamelled copper cover for exterior protection.
Platinum contacts. Adjustable tension. Line drawing shows method of fixing,

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 291	Expansion Bar	ins. 9	ins. 5½	ins. 3½	lbs. 2

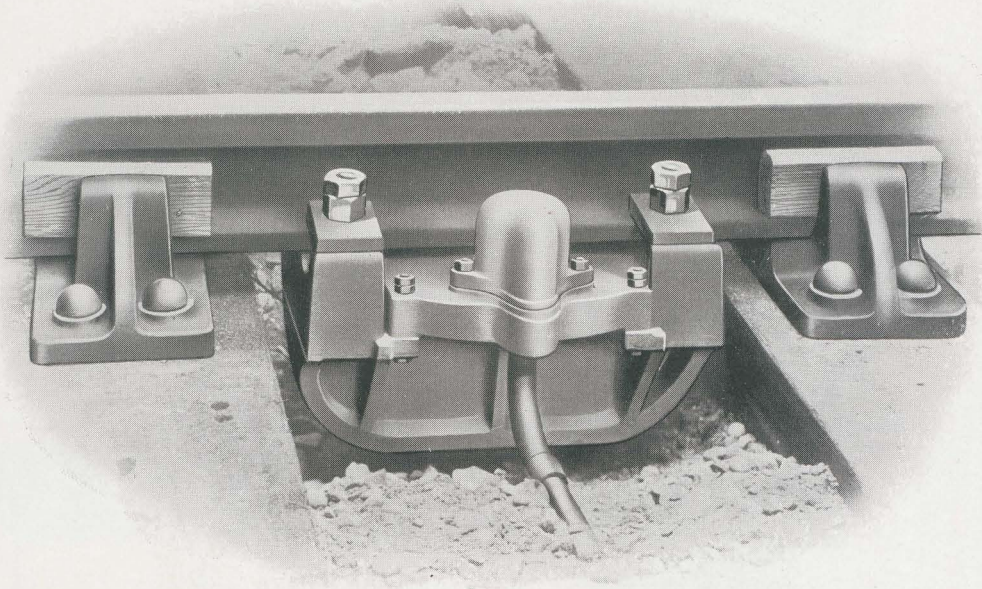
Price on application.

(RS.) 1372

MERCURY CONTACT
TREADLE.

MERCURY CONTACT TREADLE.

(Patented)



RS. 339.

View shewing treadle fixed in position on track.

The purpose of this apparatus is automatically to close or open an electrical circuit by the passage of a train at a desired point on a railway line. It may therefore be utilised for a variety of train signalling purposes.

As is well known, railway signalling treadles are brought into action by the flexure of the rails due to the weight of the passing wheels. The Siemens mercury contact apparatus, however, entirely overcomes the many disabilities and objectionable characteristics possessed by treadles in which this flexure is made use of to actuate a more or less complicated system of levers. Although the mercury contact treadle also makes use of this rail flexure between two contiguous chairs, nevertheless, it dispenses entirely with levers or other mechanical devices and, as now constructed in accordance with patented improvements, it possesses a degree of sensitiveness which enables it to operate with equal reliability when attached to the lightest or the heaviest rails and during the passage of all descriptions of rolling stock, travelling either at a slow or fast speed. Its extensive and increasing adoption has fully proved its practical value and its ability to fulfil all required conditions.

The action of the treadle is similar to that of a pump, the mercury being forced by the deflection of the diaphragm from a large chamber into a smaller one in which the contact-making devices are contained.

Cat. No.	Description.	Height.	Length.	Width.	Weight.
RS. 339	Siemens Mercury Contact Treadle.	ins. 11	ins. 16	ins. 16	lbs. 112

This treadle is supplied to either make the circuit (Type WM), or break the circuit (Type WB), as required, and the type desired should be specified.

Price on application.

1373 (RS.)

PORTABLE
WARNING SET.

PORTABLE WARNING SET. FOR RE-LAYING AND MAINTENANCE GANG PROTECTION.



RS. 125.

The annual loss of life and limb amongst permanent way workers is considerable and the urgent necessity of providing suitable means of reducing the loss is readily realized.

Any apparatus designed to assist in this reduction must be portable and capable of being quickly installed. The portable warnings shown below can be used by persons having no technical knowledge whatever. It is put forward as an auxiliary to the "look out" man and as a means of making him less fallible.

The set consists of a sleeper contact, an interlocking relay movement, battery, special stop key and an RS 111 bell, mounted in a polished teak case.

The set is carried out to the site of operations, the sleeper contact being removed and screwed to a suitable sleeper at some distance from where the "look-out" is posted. The contact terminals are then connected to the large terminals on the set by means of a twin-cable.

When the train reaches the sleeper contact the bell will ring until the push is de-pressed.

Wire is not included with the set unless specified.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 125	Portable Warning Set	ins. 15½	ins. 12	ins. 7¾	lbs. 38

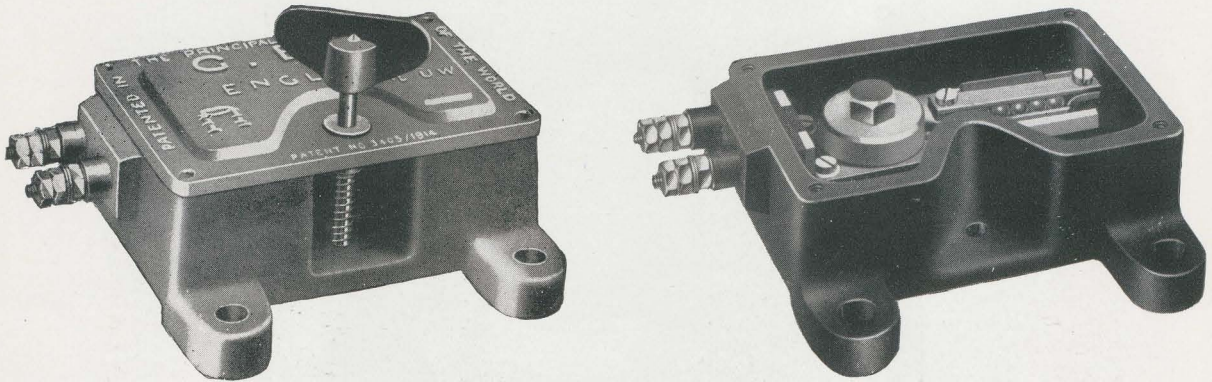
Price on application.

(RS.) 1374

SLEEPER
CONTACT.

VEHICLE OPERATED CIRCUIT BREAKERS. THE SLEEPER CONTACT.

(Patent No. 3405/1914.)



RS. 103.

The Sleeper Contact consists of a normally "made" circuit interrupter designed to screw or bolt down to a sleeper, a thumbscrew being provided for temporary fixing. The circuit is maintained through the instrument *via* a pair of insulated and separate reeds which are bridged electrically by a number of small carbon spheres which rest on carbon faces.

The approach of a train or vehicle causes the reeds to vibrate, which has the effect of throwing the spheres away from the contact face and thereby breaking the electrical circuit.

The whole instrument is very compact, simple in design and reliable in operation. No attention is required after fixing, gravity ensures the circuit being made when contact is quiescent.

The more important uses to which this contact may be satisfactorily put are as follows:—

1. To warn the approach of trains at level crossings and to men on the line, in which case the signals can be started and stopped automatically or stopped manually as desired, an interlocking relay RS. 177 being used for this purpose.
2. For operation in conjunction with signal replacers, etc., etc.

Robust weatherproof cast iron case with brass cover finished grey.

All brass fittings nickel plated. High-grade insulation throughout.

Non-turnable terminals. All parts interchangeable and replaceable.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 103	Sleeper Contact.	ins. 2½	ins. 6	ins. 4	lbs. 6¾

Price on application.

LEVEL CROSSING SCHEMES.

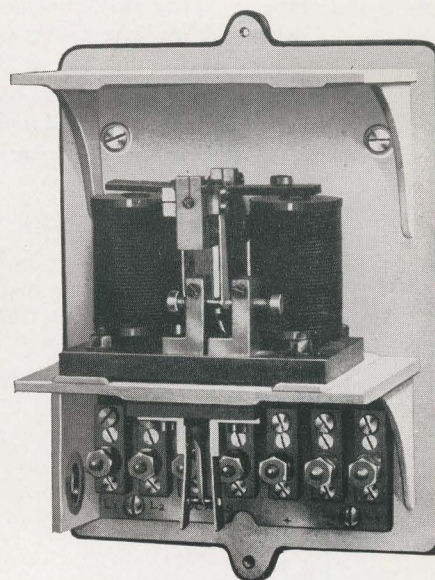
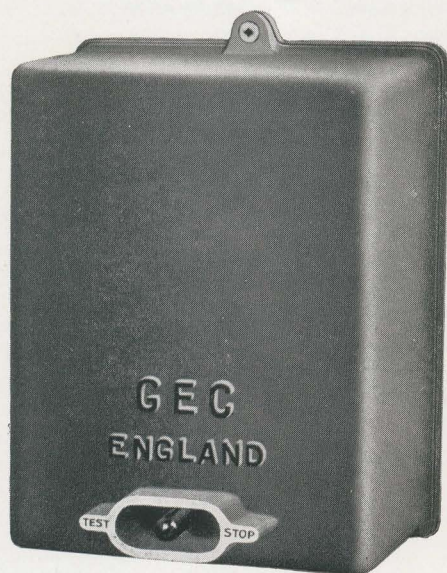
A complete audible and visible warning at level crossings on single lines using but one line wire with earth return, can be arranged at a low installation cost and negligible maintenance, employing the above contacts and subsidiary apparatus.

1375 (RS.)

INTERLOCKING
RELAY.

INTERLOCKING RELAY.

Electrically Interlocked Relay for use with the Sleeper Contact
or similar requirements.



R.S. 177

A well-designed relay built into a substantial aluminium case having a double magnetic circuit with a common armature. The armature is biased to cause it to "make" the local contact should the current fail. The relay was specially designed for level crossing work in conjunction with sleeper contacts, but is suitable for many similar duties.

A test key is fitted for testing the circuit and also for breaking the local circuit after the passage of a train.

SPECIFICATION.

Case, aluminium, weatherproof and dustproof.

Standard resistance, 500 ohms.

Standard terminals, non-turnable.

Contacts silver to silver, giving good contact surface.

Coils are bobbin wound, impregnated and cord covered.

Insulation is high-grade varnished fibre.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
		ins.	ins.	ins.	lbs.
RS. 177	Interlocking Relay (Controller Type "G")	9 $\frac{1}{4}$	6 $\frac{5}{8}$	5 $\frac{1}{2}$	9

Price on application.

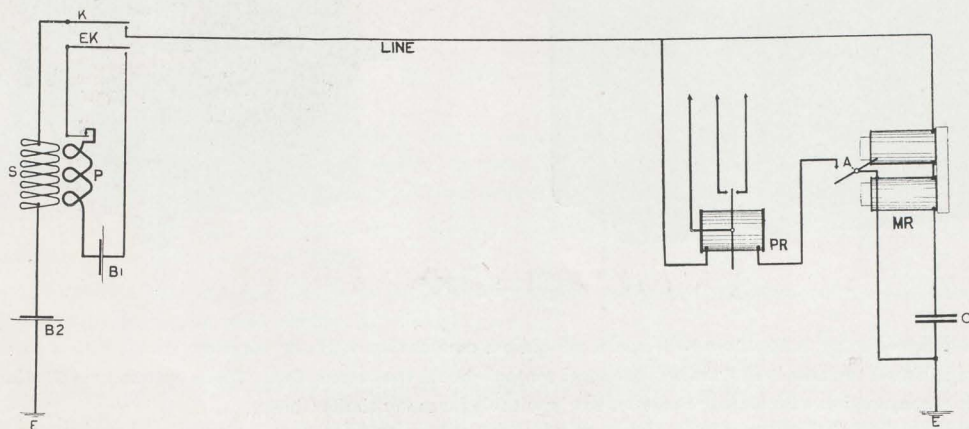
Further particulars on application.

PROTECTION OF DIRECT CURRENT SIGNALLING INSTRUMENTS FROM EXTRANEANOUS OR UNAUTHORISED CURRENTS.

(Patent No. 6900/1913).

Block signalling instruments and similar apparatus are always liable to operation by extraneous currents, either by magnetic storms or the accidental crossing of line wires, or other causes. In certain cases this risk may be found to be a common source of danger, necessitating considerable care in protecting electrical connections to such instruments.

The apparatus shown on the opposite page has been designed and perfected to give the protection required. The principle employed consists of a method for transmitting and receiving a simultaneous current over the line wire connecting an instrument with the operating source, the receiving apparatus being so designed that both such currents are required to operate the instrument.



Referring to the diagram above, K is the ordinary transmitting key for the circuit, EK being an extra contact made when the key is depressed. A condenser C is placed in series with a special relay MR, making it impossible to send direct current to line until armature A closing makes a path through to earth E. To operate relay MR, an alternating current is sent to line at the same time as the direct current; the alternating current being obtained by the use of an induction coil in the key circuit. A polarised relay PR or other polarised instrument is, in this manner, only operated in conjunction with an alternating current being transmitted to line at the same time as the direct current.

The induction coil and relay may generally be accommodated inside the instrument case and for most cases nothing is required extra, other than a contact fitted to the key.

The relay has a hollow armature containing a globule of mercury. On current passing through the coils the armature turns into the field, the mercury running down to close a contact fitted internally, thus providing a path for the direct current from line.

The relay has a removable stop pin to enable the instrument to be used in the vertical or horizontal position as desired.

If desired the relay can be made to "break" circuit on "picking-up," to suit special requirements.

For instruments for use with above system see opposite page.

PROTECTION OF DIRECT CURRENT SIGNALLING INSTRUMENTS FROM EXTRANEOUS OR UNAUTHORISED CURRENTS.

RELAY.

A robust quick action instrument designed specially for this duty. The relay is mounted on a base of high-grade insulation, on which are also fixed the necessary terminal plates.

Coils are former wound and impregnated.

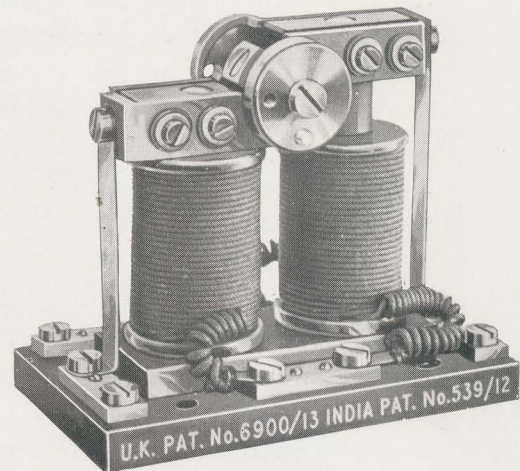
Resistance 360 ohms.

Specify whether armature is required to "make" or "break" the circuit, on operation.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 124	Relay, Type M.	ins. $4\frac{1}{8}$	ins. $3\frac{1}{2}$	ins. $2\frac{1}{2}$	lbs. $1\frac{1}{2}$

Price on application.

Note:—The capacity of the condenser placed in series with this relay should be .25 microfad.

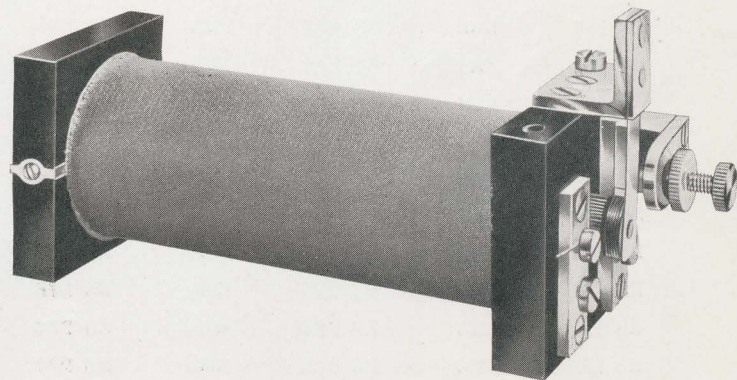


RS. **124.**

INDUCTION COIL.

A robust and efficient induction coil, specially designed for the system described on the opposite page. The core is not laminated as this has been found to be unnecessary, a high grade Swedish iron proving satisfactory for the work.

The cheeks are of high-grade fibre driven on to the core. "Make" and "break" contact points are platinum.



RS. **265.**

Primary .5 ohms. Secondary 150 ohms.

Operating voltage, 6 to 8 volts on the primary.

A condenser of about 2 microfads capacity or a non-inductive resistance of about 500 ohms, should be placed across the interrupter.

Cat. No.	Description.	Height.	Width.	Depth.	Weight.
RS. 265	Induction Coil.	ins. $2\frac{1}{4}$	ins. 7	ins. $2\frac{1}{4}$	lbs. 4

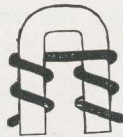
Price on application.

(RS.) 1378

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