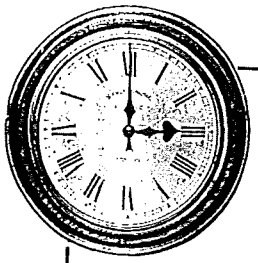
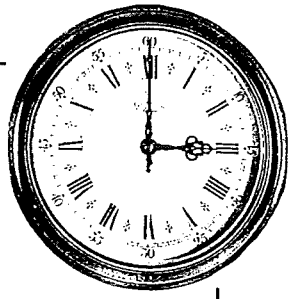
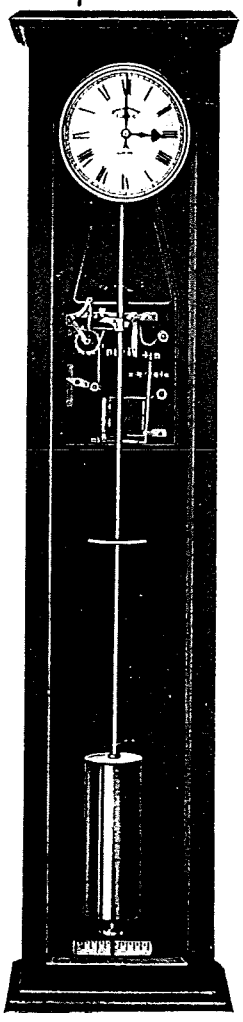
SYNCHRONOME ELECTRIC CLOCKS







The

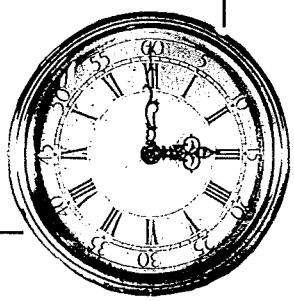
SYNCHRONOME System of Electrical Impulse Clocks

consists of

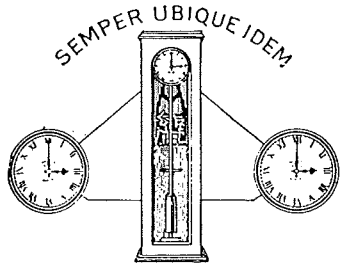
An Electrically-driven Pendulum which operates *any number of Dials.*

The Pendulum is combined with a simple switch, so that both the time-keeping and switching functions are performed automatically and in an ideally perfect manner.

Each dial has only a "one-wheel" movement behind it, yet this simple mechanism secures *uniform and accurate timekeeping* without winding or any other attention.



FIRST IN 1895



FOREMOST EVER SINCE

THE STANDARD CLOCKS
AT GREENWICH OBSERVATORY ARE
SYNCHRONOME FREE PENDULUMS

THE Synchronome System is the product of a long series of inventions, which began in 1895, by Mr. Hope-Jones, who enunciated and has developed the principles upon which the science and practice of Electric Time Service have been established.

There are systems offering to-day which are unprincipled. To apply this epithet to an individual would be to say the worst of him; yet what is true in the case of an individual is also true of electric clocks.

Principles. In a life-long effort to obtain reliable contacts from a clock, without detriment to its time-keeping, a group of fundamental laws has been established which are known to Horology as the Synchronome Principles. An unwavering adherence to these principles has carried the system right up to the top in Commerce and in Science; in Commerce by many thousands of installations giving uniform and accurate time; in Science by the Free Pendulum, which has broken all records for accuracy and has measured the time of the World at Greenwich since 1925.

It was our privilege to originate the Wireless Six Dot Seconds and to devise the instruments which transmit them and the Rugby time signals from Greenwich Observatory.

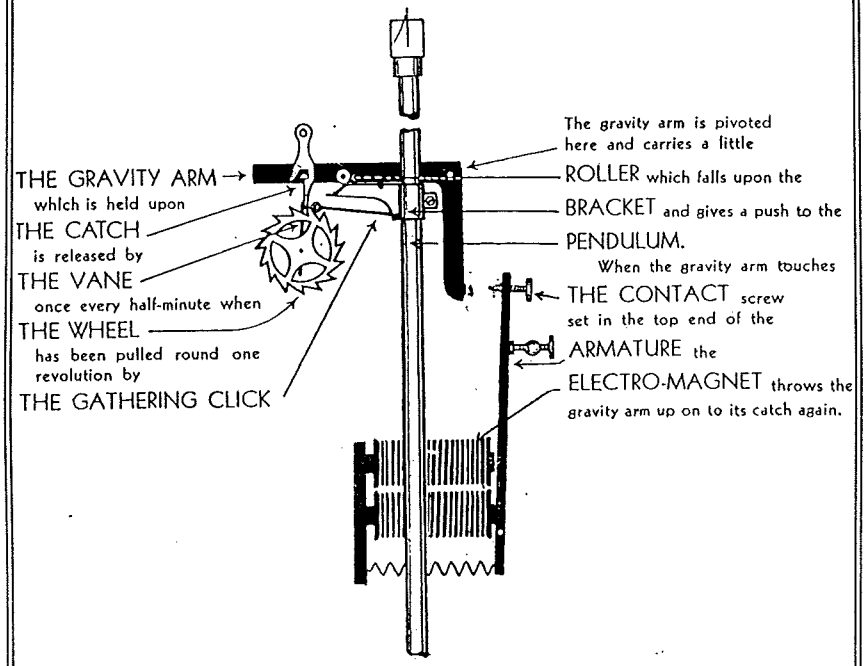
Controlling Pendulum. The Master Clock, or Controlling Pendulum, is, of course, the first essential of the System. Its extraordinary accuracy is due to the detached gravity escapement, constant in force and always applied to the pendulum at the centre of its path. The pendulum has very little work to do and that little is done when it is passing through the middle of its swing; otherwise it is altogether FREE. It is not called upon to make the electrical contact which propels the subsidiary clocks.

The pendulum rod is of Invar and is simply, but fully, compensated for fluctuations in temperature.

Variation of battery power cannot affect the time-keeping of the clock, neither the measurement of time by the pendulum, nor the synchronous propulsion of the dials.

The Synchronome Switch

The switch consists of two pivoted levers shown in black in our illustration, namely, the gravity arm and the armature.



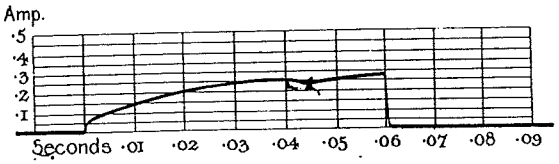
The Contact.

The gravity arm sails into contact with the armature at the speed of the moving pendulum, quickly enough to prevent preliminary sparking, but not quickly enough to cause a bounce. The first effect of the passage of current is to draw the armature into harder contact in the act of lifting the gravity arm.

The two moving members of the switch travel together until the armature comes up with a rush against the poles of the magnet and the gravity arm flies off by its momentum; thus each half-minute contact is perfectly clean and precise in the make and break.

All the energy derived from the electro-magnet in the first place and ultimately expended in swinging the pendulum is mechanically transmitted through the surfaces of the contact.

Here is a photograph of the electrical impulse which passes through all the dials every half-minute.



Uniformity of all Dials assured. Observe the clean "make" and precipitous "break." When the current has risen to ·25 amp.—and it takes ·04 of a second to reach it—all the dials operate and the little dent or depression shows they have done so. Not until the current has risen to a higher figure is the switch automatically thrown open. Thus the switch is bound to transmit sufficient electrical energy to operate every dial; it cannot work at all without doing so because the duration of the contact is dependent upon the dials' self-induction which is the electrical equivalent of Inertia. The Inertia of a body is the measure of the power required to move it. Each dial asks for and gets exactly the current it needs.

This vital principle, unknown until the Synchronome invention was launched in 1895, remains the essential feature in *our* system and the best practice in modern electric time service is based upon it.

Battery Warning. Thereon depends the unique compensatory action by which the duration of the contact is increased with failing current. This condition of affairs is known as Battery Warning, which is quite automatic.

The consumption of current is negligible—so small in fact that it has no effect on the life of the battery—but a time will come when the magnet will be unable to throw up the gravity lever. When this happens, the pendulum, on its return to the left, will assist it and the increased duration of the contact which results is immediately noticeable on all the clocks, yet the installation will continue to work perfectly for some days in this battery warning condition.

If this attention-compelling battery warning is neglected and the pendulum allowed to stop, the battery is automatically disconnected.

Negligible Current Consumption. The area embraced by the oscillograph curve on page 4 is the measure of the current consumed; it means that one B.O.T. unit will run a circuit of 25 clocks for ten years. **This effectively disposes of the impression that battery driven clocks are costly to operate.**

Source of Current. Any source of electrical energy can be used, but if alternating, a rectifier is necessary. Small storage cells are recommended for very large time circuits but dry cells of good quality can be used with equal satisfaction and they require no attention whatever beyond renewal at the end of their useful life. We do not advocate the use of electric supply mains unless the service is absolutely continuous and free from interruption.

The Series Circuit. The wiring consists merely of the connection of each dial with its nearest neighbour in simple series circuit, preferably carried out by a single line of 3/.036" gauge, 600 megohm grade. Large buildings may be served by a separate loop through each floor or wing, the ends being brought back to a distribution board near the Master Clock which is customarily mounted upon a substantial wall on the ground floor of the building, the centre of the dial being approximately 6' 0" from the floor.

Universal application of the System. We can bring into synchronisation with our system, Employees' Time Recorders, and thus ensure **real** punctuality from the staff.

We can also operate Hooters or Bells to any desired programme by means of our Automatic Bell Controller. In Schools this instrument is used to announce class changes, etc., and in Factories the times of starting and stopping, or for timing processes.

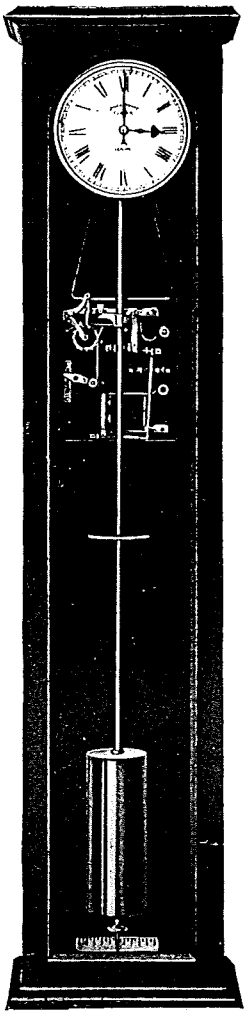
The flexibility of the Synchronome System enables it to be used for any and every special purpose in Science and Industry which demands the accurate measurement of time and the precise spacing of electrical contacts. The time spacing of the Synchronome contacts is accurate to a thousandth part of a second.

Turret Clocks. A Synchronome Turret Clock, or projecting Bracket Clock, forms a distinctive advertising medium, making the premises on which it is fixed a landmark. Its dependable accuracy inspires confidence and commands public attention where an ordinary sign would be passed by. Its compelling influence imparts to the premises an identity in a street of nonentities.

Before the advent of the Synchronome System turret clocks were made on a large engineering scale and special accommodation was necessary for the cumbersome mechanism and weights then used. Beyond reasonable access to the back centre of the dial no accommodation whatever is necessary in the case of a Synchronome Turret Clock, the hands of which are directly propelled by a simple one-wheel electrical impulse movement which merely pushes the hands half a minute at a time. The whole of the space behind the dials is therefore available for effective illumination.

Striking and Chiming. It has been seen that electricity offers overwhelming advantages in the distribution and indication of uniform and accurate **time;** it is also a convenient medium to employ for the automatic operation of bells for hourly striking, quarter chiming or carillon playing.

The Synchronome patent automatic striking and chiming gears solve the problem of providing this feature in association with the simple turret clocks described in the last paragraph.



The Controlling Pendulum
or
Master Clock

(Standard Type)

is a combination of a pendulum and a switch and will operate any number of subsidiary clocks of any size including Turret Clocks, thus ensuring uniform time throughout the premises without winding or other attention.

The pendulum has a rod of INVAR a nickel steel alloy having a negligible temperature coefficient.

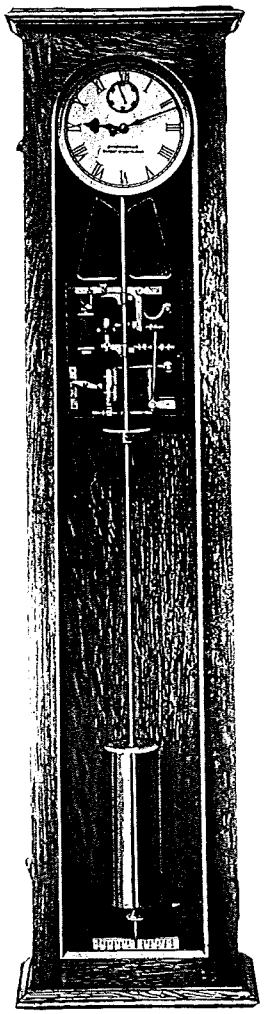
It has a free detached gravity escapment with impulse at zero, the time counting and releasing of the gravity lever being performed by a jewelled mechanical action.

Overall dimensions of case—51 inches long, 12½ inches wide, 6½ inches deep.

PRICE—Master Clock, as illustrated, complete with 7″ silvered engraved dial **£18 10s.**

Movement only for fitting into customers' own case
£12 7s. 6d.

The Controlling Pendulum
or
Master Clock
(Free Pendulum Type)



will operate any number of subsidiary clocks of any size including Turret Clocks, thus ensuring uniform time throughout the premises without winding or other attention.

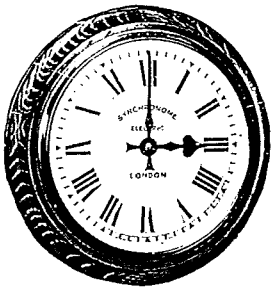
The coefficient of expansion of its INVAR pendulum rod is certified by the National Physical Laboratory and is accurately compensated for changes of temperature.

The fundamental principles of this instrument are identical with those of the SYNCHRONOME FREE PENDULUM which has broken the World's records at Greenwich and all principal observatories, the time counting and releasing of the gravity lever being performed electrically.

Overall dimensions of case—51 inches long, 12½ inches wide, 6½ inches deep.

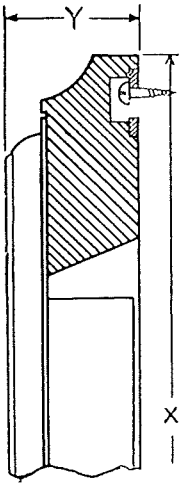
PRICE—Master Clock complete with 7″ silvered engraved dial with inset seconds circle - - - - - £22

STANDARD
ELECTRICAL IMPULSE DIALS



TYPE
A

With movement totally enclosed in metal box.



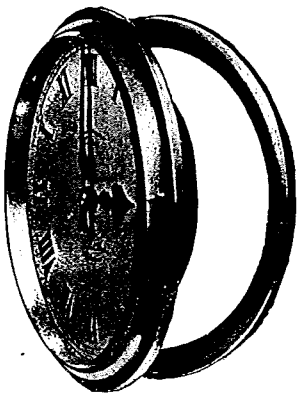
TYPE A.—For surface mounting flat against the wall, on single concealed hanging plate. Fitted with white enamelled dial, bronzed spun bezel, and sheet glass. Mounted upon whitewood frame built up of four pieces to prevent warping.

The frame can be stained and polished to any specified colour and finish.

Nominal Size.		Overall X.		Projection Y.		Price.			Extra for Hardwood Frame.		
Inches	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.	£	s.	d.
6	153	8·5	216	2·4	61	2	15	6			
7	178	9·4	238	2·4	61	2	16	6			
8	203	10·6	269	2·4	61	2	18	6		5	0
9	228	11·6	295	2·4	61	3	3	6			
10	254	13·0	330	2·4	61	3	5	6			
12	305	15·2	387	2·4	61	3	8	0			
14	355	17·3	440	2·6	66	4	0	0		6	6
16	406	20·0	508	2·7	67	4	19	6		7	6
18	457	22·2	565	2·8	71	5	18	6		10	0
20	508	24·5	620	3·0	76	7	15	6		15	6
24	609	28·5	725	3·2	81	9	4	6	1	5	0

STANDARD INSERTION PATTERN

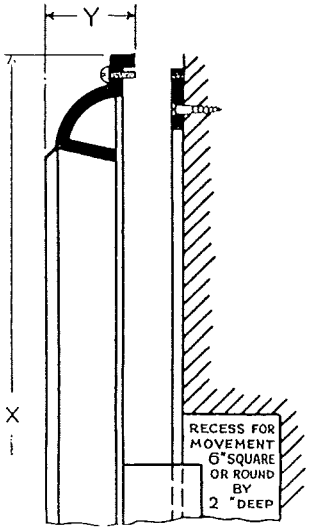
ELECTRICAL IMPULSE DIALS



TYPE

A/I

With movement totally enclosed in metal box.



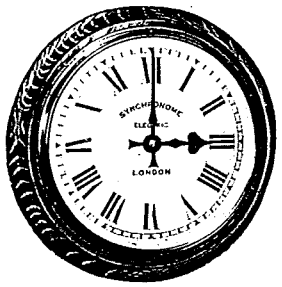
TYPE A I.—Similar to type A but for mounting flush with the surface of the wall. In place of spun bezel and wood frame, it is fitted with cast bezel which conceals circular metal fixing ring having slotted screw holes for levelling the dial when erecting. The bezel is attached to the ring by metal thread screws thus facilitating the removal of the clock for inspection. The sectional illustration shows the clock in the act of removing it from its fixing ring.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
*5	127	5·5	139	0·67	17	2	15	6
*6	153	6·6	168	0·71	18	2	15	6
7	178	7·5	191	0·78	20	2	16	6
8	203	8·5	216	0·83	21	2	18	6
9	228	9·7	246	0·87	22	3	3	6
10	254	11·0	280	0·87	22	3	5	6
12	305	12·7	323	0·9	23	3	8	0
14	355	15·0	382	1·06	27	4	0	0
16	406	17·4	442	1·06	27	4	19	6
18	457	19·4	492	1·1	28	5	18	6
20	508	21·7	555	1·18	30	7	15	6
24	609	25·5	648	1·57	40	9	4	6

*Size of recess for movement for these dials 4½ ins. diameter

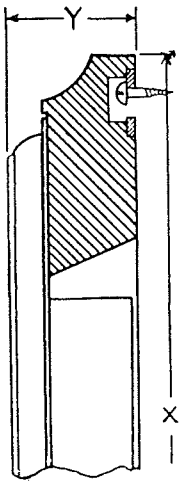
SUPERIOR PATTERN

ELECTRICAL IMPULSE DIALS



TYPE
B

With movement totally enclosed in metal box.

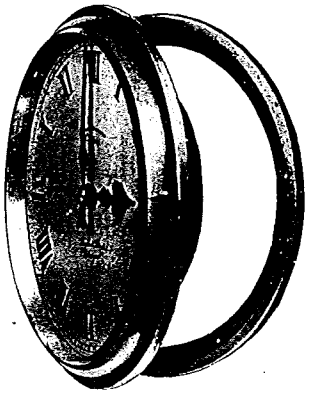


TYPE B.—For surface mounting flat against the wall, on single concealed hanging plate. Fitted with hand engraved and silvered brass dial, cast bezel and bevelled plate glass. Mounted upon hardwood frame built up of four pieces to prevent warping.

Nominal Size.		Overall X.		Projection Y.		Price.			Extra for Convex Dial and Glass.		
Inches	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.	£	s.	d.
6	153	8·5	216	2·5	64	3	10	6		7	6
7	178	9·4	238	2·5	64	3	15	0		7	6
8	203	10·6	269	2·5	64	4	0	0		10	0
9	228	11·6	295	2·5	64	4	12	6		10	0
10	254	13·0	330	2·5	64	4	18	6		10	0
12	305	15·2	387	2·5	64	5	10	0	1	0	0
14	355	17·3	440	2·6	66	7	2	6	1	0	0
16	406	20·0	508	2·8	71	8	12	6	1	0	0
18	457	22·2	565	3·0	76	9	12	6	1	10	0
20	508	24·5	620	3·2	81	13	5	0		—	
24	609	28·5	725	3·5	89	15	10	6		—	

SUPERIOR INSERTION PATTERN

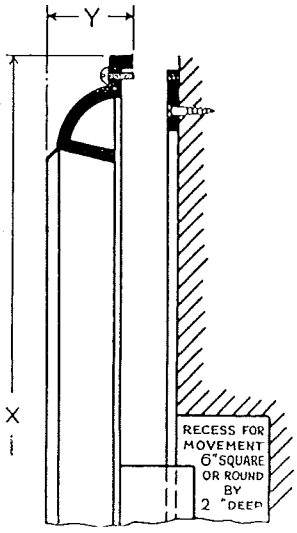
ELECTRICAL IMPULSE DIALS



TYPE

B/I

With movement totally enclosed in metal box.



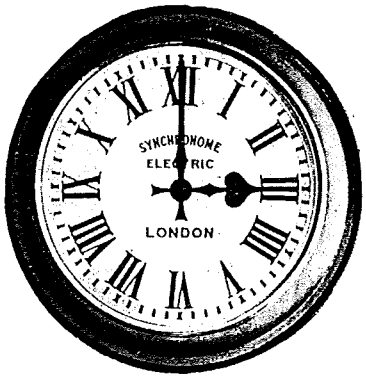
TYPE B/I.—Similar to type B but for mounting flush with the surface of the wall. In place of wood frame, it is fitted with cast bezel which conceals circular metal fixing ring having slotted screw holes for levelling the dial when erecting. The bezel is attached to the ring by metal thread screws thus facilitating the removal of the clock for inspection. The sectional illustration shows the clock in the act of removing it from its fixing ring.

Nominal Size.		Overall X.		Projection Y.		Price.			Extra for Convex Dial and Glass.		
Inches	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.	£	s.	d.
*5	127	5·5	139	0·67	17	3	10	6		7	6
*6	153	6·6	168	0·71	18	3	10	6		7	6
7	178	7·5	191	0·78	20	3	15	0		7	6
8	203	8·5	216	0·83	21	4	0	0		10	0
9	228	9·7	246	0·87	22	4	12	6		10	0
10	254	11·0	280	0·87	22	4	18	6		10	0
12	305	12·7	323	0·9	23	5	10	0	1	0	0
14	355	15·0	382	1·06	27	7	2	6	1	0	0
16	406	17·4	442	1·06	27	8	12	6	1	0	0
18	457	19·4	492	1·1	28	9	12	6	1	10	0
20	508	21·7	555	1·18	30	13	5	0	—		
24	609	25·5	648	1·57	40	15	10	6	—		

*Size of recess for movement for these dials 4¼ ins. diameter.

WORKSHOP PATTERN

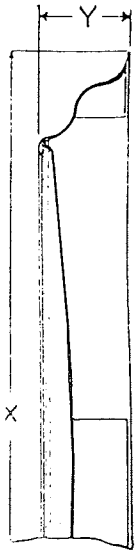
ELECTRICAL IMPULSE DIALS



TYPE

C

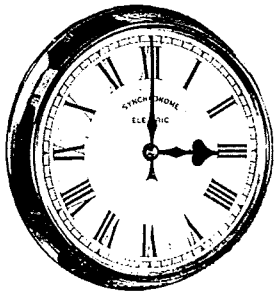
(Hermetically Sealed)



TYPE C.—Watertight, dust, weather and steamproof, for use in corrosive atmospheres or in the open. The frame and dial consisting of a single sheet steel stamping high temperature vitreous enamelled, the hands being protected by glass and the movement being enclosed in cast iron box (drilled and tapped $\frac{3}{4}$ in. electric thread for conduit entry or cable gland) the whole instrument is thus hermetically sealed.

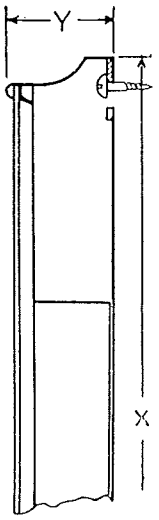
Nominal size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
12	305	16·8	427	2·5	64	3	5	0
18	457	23·0	585	3·3	84	4	17	6
24	609	29·5	750	2·8	71	7	2	6
30	760	37·5	952	3·8	97	12	5	0

STANDARD
ELECTRICAL IMPULSE DIALS



TYPE
D

With movement totally enclosed in metal box.

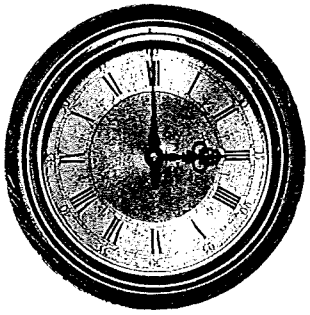


TYPE D.—For surface mounting flat against the wall, on single concealed hanging plate. Fitted with white enamelled dial in bronzed metal frame. There is no separate bezel, the glass being carried by the frame itself. This type is of attractive appearance and is suitable for general interior use and since its profile presents no ridges or crevices for the lodgment of dust, this dial will be found very appropriate for hospital use.

Nominal Size.		Overall X.		Projection Y.		Price.
Inches.	mm.	Inches.	mm.	Inches.	mm.	£ s. d.
8	203	9·0	228	2·2	56	2 8 6
12	305	14·0	356	2·2	56	2 14 0

TOMPION PATTERN

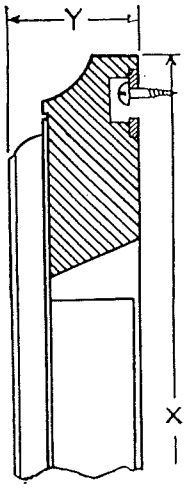
ELECTRICAL IMPULSE DIALS



TYPE

G

With movement totally enclosed in metal box.

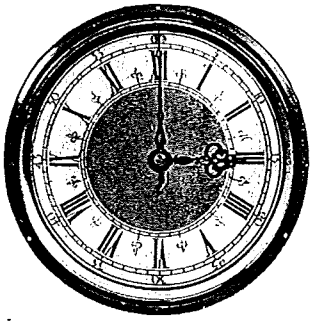


TYPE G.—For surface mounting flat against the wall, on single concealed hanging plate. Fitted with heavy brass dial of period design with Roman chapters hand engraved on a silvered ring raised upon a matt gold ground. Provided with hands of appropriate design, cast bezel and bevelled plate glass. Mounted upon hardwood frame built up of four pieces to prevent warping.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
6	153	8·5	216	2·5	64	4	6	6
7	178	9·4	238	2·5	64	4	10	0
8	203	10·6	269	2·5	64	5	7	6
9	228	11·6	295	2·5	64	5	13	6
10	254	13·0	330	2·5	64	6	8	6
12	305	15·2	387	2·5	64	7	5	0
14	355	17·3	440	2·6	66	9	12	6
16	406	20·0	508	2·8	71	11	15	0
18	457	22·2	565	3·0	76	14	0	0
20	508	24·5	620	3·2	81	18	7	6
24	609	28·5	725	3·5	89	20	17	6

TOMPION PATTERN INSERTION TYPE

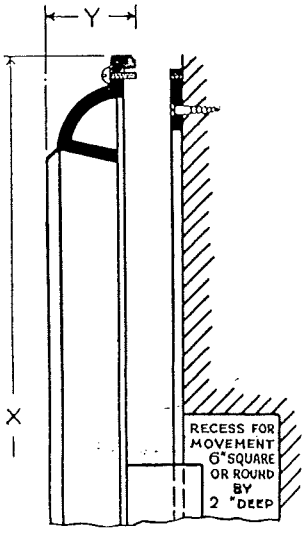
ELECTRICAL IMPULSE DIALS



TYPE

G/I

With movement totally enclosed in metal box.



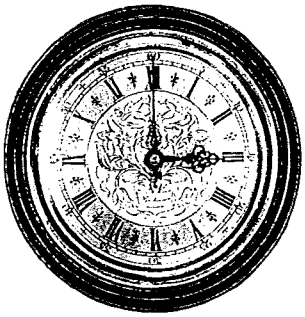
TYPE G/I.—Similar to type G but for mounting flush with the surface of the wall. In place of wood frame, it is fitted with cast bezel which conceals circular metal fixing ring having slotted screw holes for levelling the dial when erecting. The bezel is attached to the ring by metal thread screws thus facilitating the removal of the clock for inspection. The sectional illustration shows the clock in the act of removing it from its fixing ring.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
5	127	5·5	139	0·67	17	4	6	6
6	153	6·6	168	0·71	18	4	6	6
7	178	7·5	191	0·78	20	4	10	0
8	203	8·5	216	0·83	21	5	7	6
9	228	9·7	246	0·87	22	5	13	6
10	254	11·0	280	0·87	22	6	8	6
12	305	12·7	323	0·9	23	7	5	0
14	355	15·0	382	1·06	27	9	12	6
16	406	17·4	442	1·06	27	11	15	0
18	457	19·4	492	1·1	28	14	0	0
20	508	21·7	555	1·18	30	18	7	6
24	609	25·5	648	1·57	40	20	17	6

*Size of recess for movement for these dials 4½ ins. diameter.

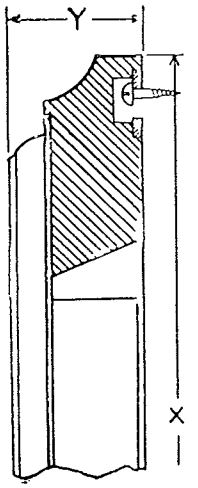
ENGRAVED CENTRE

ELECTRICAL IMPULSE DIALS



TYPE J

With movement totally enclosed in metal box.

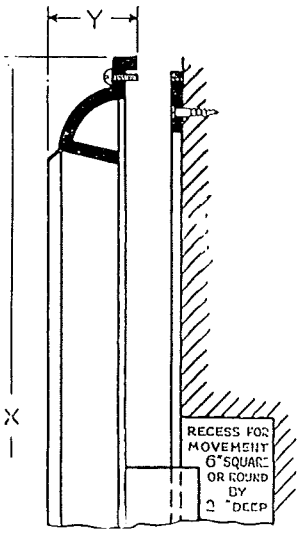


TYPE J.—For surface mounting flat against the wall on single concealed hanging plate. Fitted with heavy brass dial, hand engraved and silvered, the centre being enriched with floral design. Provided with hands of choice pattern, cast bezel and bevelled plate glass. Mounted upon hardwood frame built up of four pieces to prevent warping.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
6	153	8·5	216	2·5	64	5	2	6
7	178	9·4	238	2·5	64	5	14	6
8	203	10·6	269	2·5	64	6	9	6
9	228	11·6	295	2·5	64	7	12	6
10	254	13·0	330	2·5	64	8	7	6
12	305	15·2	387	2·5	64	9	3	6
14	355	17·3	440	2·6	66	12	15	0
16	406	20·0	508	2·8	71	15	18	6
18	457	22·2	565	3·0	76	19	10	0
20	508	24·5	620	3·2	81	24	10	0
24	609	28·5	725	3·5	89	27	15	0

ENGRAVED CENTRE INSERTION PATTERN
ELECTRICAL IMPULSE DIALS

TYPE
J/I
With movement totally enclosed in metal box.



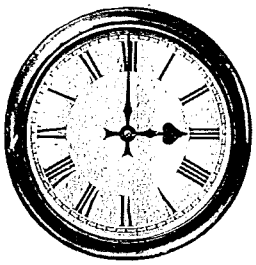
TYPE J I.—Similar to type J but for mounting flush with the surface of the wall. In place of wood frame, it is fitted with cast bezel which conceals circular metal fixing ring having slotted screw holes for levelling the dial when erecting. The bezel is attached to the ring by metal thread screws thus facilitating the removal of the clock for inspection. The sectional illustration shows the clock in the act of removing it from its fixing ring.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
*5	127	5·5	139	0·67	17	5	2	6
*6	153	6·6	168	0·71	18	5	2	6
7	178	7·5	191	0·78	20	5	14	6
8	203	8·5	216	0·83	21	6	9	6
9	228	9·7	246	0·87	22	7	12	6
10	254	11·0	280	0·87	22	8	7	6
12	305	12·7	323	0·9	23	9	3	6
14	355	15·0	382	1·06	27	12	15	0
16	406	17·4	442	1·06	27	15	18	6
18	457	19·4	492	1·1	28	19	10	0
20	508	21·7	555	1·18	30	24	10	0
24	609	25·5	648	1·57	40	27	15	0

*Size of recess for movement for these dials 4½ ins. diameter.

HOSPITAL PATTERN

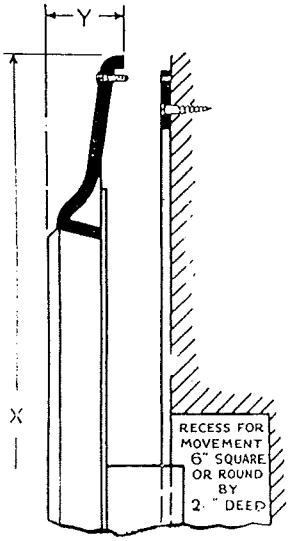
ELECTRICAL IMPULSE DIALS



TYPE

N/I

with movement totally enclosed in metal box.



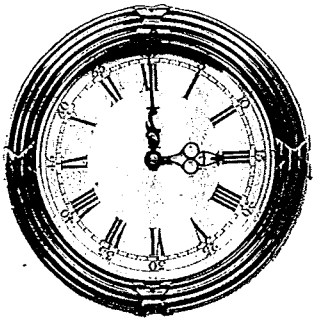
TYPE N/I.—For mounting flush with the surface of the wall. This dial is provided with cast bezel with wide flange and is fitted with bevelled plate glass. It is so designed that it may present no ridges or crevices in which dust can lodge. It has for many years been adopted for hospital use where a superior type of dial is required. The bezel is provided with a circular metal fixing ring having slotted screw holes for levelling the dial when erecting. The ring is concealed by the bezel, which is retained in position by metal thread screws thus facilitating access to the movement The sectional illustration shows the clock in the act of removing it from its fixing ring.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
*6	153	8·5	216	0·75	19	3	10	6
7	178	9·4	238	0·75	19	3	15	0
8	203	10·0	254	0·75	19	4	0	0
9	228	11·0	280	0·83	21	4	12	6
10	254	12·0	305	0·83	21	4	18	6
12	305	14·0	355	1·0	25	5	10	0
14	355	16·0	407	1·0	25	7	5	0

*Size of recess for movement for this dial 4½ in. diameter.

REED & RIBBON PATTERN

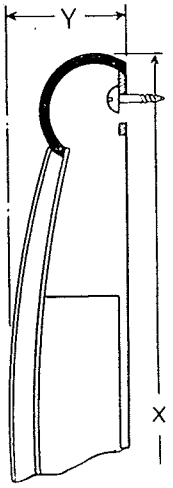
ELECTRICAL IMPULSE DIALS



TYPE

R

With movement totally enclosed in metal box.



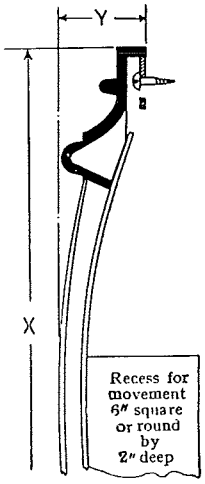
TYPE R.—For surface mounting flat against the wall on single concealed hanging plate. This pattern consists of a cast brass frame of reed and ribbon design, of rich bronze colour or other selected finish. The dial is convex, hand engraved to any of the designs shown in this catalogue or to customers' special taste. The hands are of appropriate pattern and are protected by convex glass carried by the frame.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
6	153	8·5	216	2·5	64	4	16	6
7	178	9·4	238	2·5	64	5	5	0
8	203	10·6	269	2·5	64	5	17	6
9	228	11·6	295	2·5	64	6	7	6
10	254	13·0	330	2·5	64	7	10	6
12	305	15·2	387	2·5	64	8	5	0
14	355	17·3	440	2·6	66	10	15	0

ORNAMENTAL
ELECTRICAL IMPULSE DIALS

TYPE U/I

with movement totally enclosed in metal box.

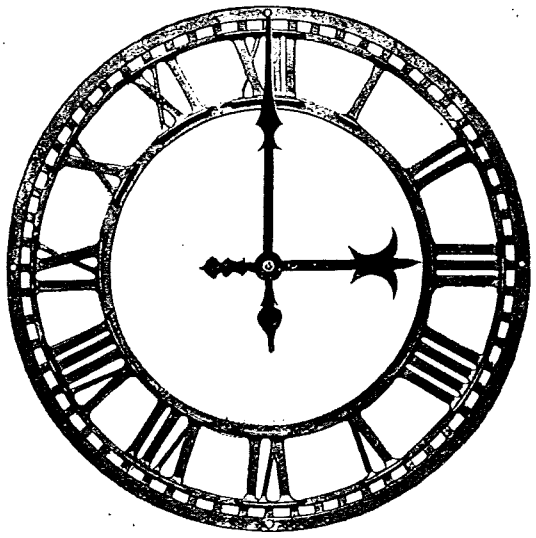


TYPE U/I.—For mounting flush with the surface of panel or wall on single concealed hanging plate. This dial is provided with wide flange cast bezel of ornamental design customarily finished oxydised silver and is of handsome and pleasing appearance. The glass and dial are convex, the latter being hand engraved with Arabic figures and silvered.

Nominal Size.		Overall X.		Projection Y.		Price.		
Inches.	mm.	Inches.	mm.	Inches.	mm.	£	s.	d.
*6	153	8·5	216	1·0	25	4	3	0
7	178	9·4	238	1·0	25	4	10	6
8	203	10·6	269	1·0	25	4	16	6
9	228	11·6	295	1·25	32	5	5	0
10	254	13·0	330	1·25	32	5	18	6
12	305	15·2	387	1·5	38	6	10	0
14	355	17·5	445	1·75	45	8	19	6

*Size of recess for movement for this dial 4½ ins. diameter.

SKELETON DIALS FOR INTERIOR USE



TYPE

TS

TYPE TS.—The dial consists of a casting of brass or bronze with raised Roman chapters superimposed upon three concentric rings, minute marks being arranged between the two outer circles.

The dial casting is intended to be fixed directly to the surface of the wall which should be coloured to form the greatest possible contrast with the dial itself.

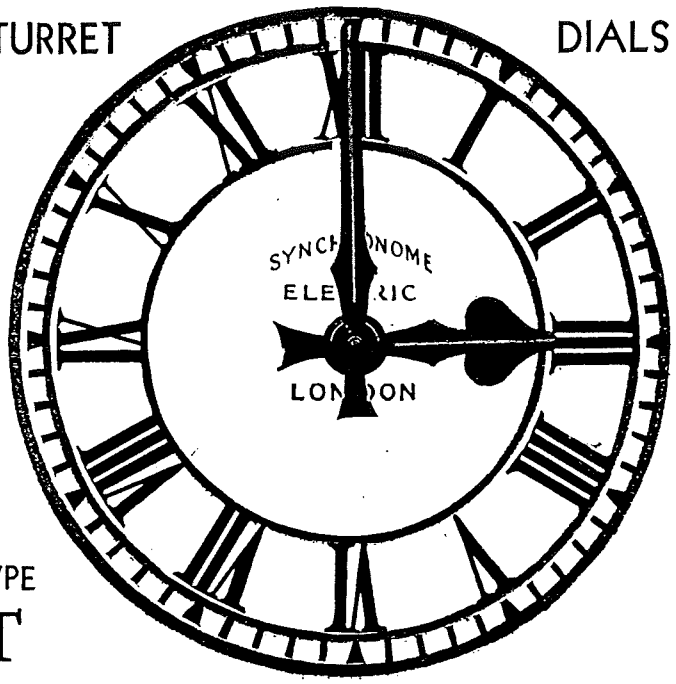
Hands of appropriate design are operated by a standard electrical impulse movement enclosed in a dustproof metal box mounted as a unit upon a circular metal plate fixed separately to the wall, which should be coloured to match the background.

A recess is required for the accommodation of the movement 6 inches round or square, by 2 inches deep which is normally concealed by the plate. Access to the movement is obtained by removing the plate from the wall.

	Brass finished bronze if desired.	Real bronze metal.
12 inches diameter ...	£4 18 6	£5 12 6
15 inches diameter ...	6 2 6	6 18 0
18 inches diameter ...	7 10 0	8 5 0
24 inches diameter ...	9 5 0	9 17 6
27 inches diameter ...	12 0 0	13 0 0
30 inches diameter ...	16 10 0	18 0 0

Patterns exist for the above sizes, but prices for dials of other sizes can be supplied on request.

TURRET DIALS



TYPE T

TYPE T.—Translucent dials for illumination from behind, complete with shadowless movement enclosed in metal box and fitted with balanced aluminium hands. Suitable for erection in glazed opening provided by the customer.

Nominal Size.		Size of suitable glazed opening.		Description.	Price.		
Inches.	mm.	Inches.	mm.		£	s.	d.
18	458	19	483	Single sheet opal set in iron ring. Figures and minute marks etched, filled in black and stoved.	6	5	0
24	610	25	635		8	12	6
30	762	31·5	800		13	5	0
36	915	37·5	952		18	15	0
42	1069	43·5	1110		23	0	0
48	1220	49·5	1260		27	10	0
54	1370	55·5	1418	Cast skeleton iron panelled with opal.	30	0	0
60	1528	62·0	1580		33	10	0
66	1675	68·0	1730		35	5	0
72	1810	74·0	1889		37	0	0

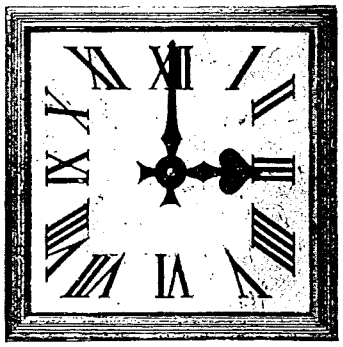
For groups of dials in one turret, special terms on application.

EXISTING TURRET CLOCKS may also be synchronised by a simple application to their pendulums, or they may be controlled by the substitution of an electro-magnetic release for the pendulum and escapement. Most turret clocks lend themselves to this treatment, and either method can be applied for the sum of .. £12 7 6

TRANSLUCENT DIALS FOR ILLUMINATION

Special form for use in
Cinematograph Theatres, etc.

TYPE
TC



TYPE TC.—These dials have been designed to meet the demand for an illuminated electric clock suitable for inclusion in the scheme of decoration of modern Cinematograph Theatres.

The standard type includes a translucent dial of opal glass with the figures etched into the surface and filled with black or coloured pigment. The clock has remarkable legibility whilst the lighting (from the rear) is unobtrusive.

An alternative type can be supplied with dial of Vividek glass of the Glasscraft Co.'s production, wherein the figures are composed of minute crystal beads of pure colour held in place between two sheets of clear plate glass. This method lends itself readily to the expression of almost any design and colour scheme, whilst a true chromatic effect is preserved when the dial is illuminated and even diffusion is secured over the whole area.

The dial itself is mounted in a glazed hardwood moulding provided with strong concealed hinges for attachment to the wall, the movement being accessible by opening the moulding like a door. Hands of appropriate design are operated by an enclosed electrical impulse movement set back from the dial in order that no shadow is cast by it. Tubular lamps, of low wattage, suitably placed in a recess in the wall, are recommended in order to secure maximum diffusion.

The only accommodation required for the clock is a recess 6 to 8 inches deep, preferably lined with a wood frame to one side of which the hinges of the moulding may be attached.

Standard type 24 inches square with dial of opal as illustrated, complete with hands and shadowless movement, the whole unit ready for attaching to suitable accommodation provided by the customer as described.

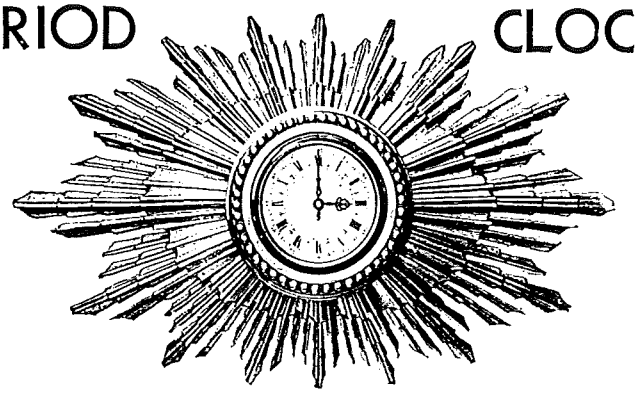
Price, £12 : 17 : 6.

Special type 24 inches square with Vividek Glasscraft dial and hands of appropriate design, otherwise as above.

Price, £16 : 10 : 0.

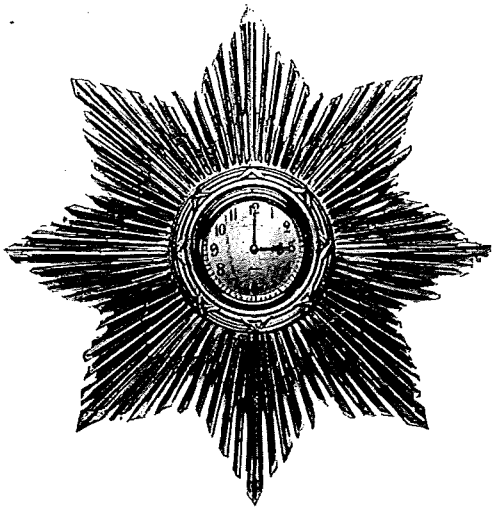
Prices of other sizes or of dials to customers special design *on application*.

PERIOD CLOCKS



We are fortunate in our inheritance of the beautiful designs which have come down to us from the hands of such masters as Tompion, Joseph Knibb, and the incomparable artists of the gorgeous courts of the French Renaissance.

Undoubtedly one of the most pleasing of these designs is that known as the Sunray Clock.



Almost every one of the insertion type dials listed in these pages is appropriate for mounting upon a Sunray frame but since conditions vary so widely, it is left to the individual taste of the customer to choose a suitable type.

We therefore list below a series of prices of the Sunray frames only, to which must be added the price of the particular dial selected.

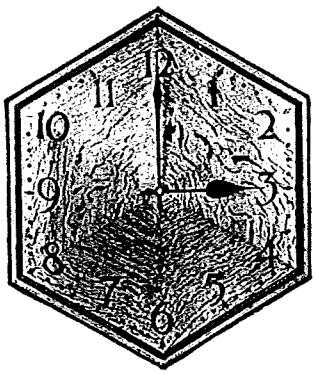
OVAL PATTERN (frame only)

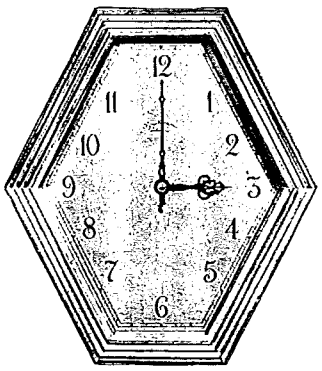
20 in. × 15 in. overall to suit dial 5 in. diameter	£5 5 0
24 in. × 18 in. overall to suit dial 5 in. or 6 in. diameter	£6 10 0
32 in. × 24 in. overall to suit dial 6 in., 8 in. or 10 in. diameter ...	£7 17 6

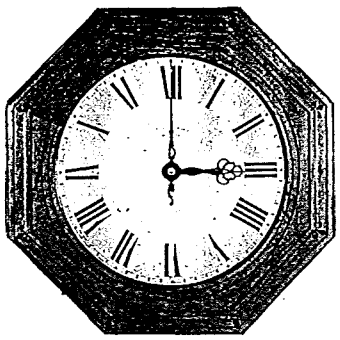
CIRCULAR PATTERN (frame only)

20 in. diameter to suit dial 5 in. or 6 in. diameter	£5 10 6
24 in. diameter to suit dial 6 in. or 8 in. diameter	£6 10 0
28 in. diameter to suit dial 6 in., 8 in. or 10 in. diameter	£7 17 6

MODERN ART







The trend of modern thought in architecture and internal decoration demands fresh ideas with regard to clocks, and it is perhaps a fact that no article has been produced in so many different and original ways. The nature of the instrument lends itself to almost any kind of expression.

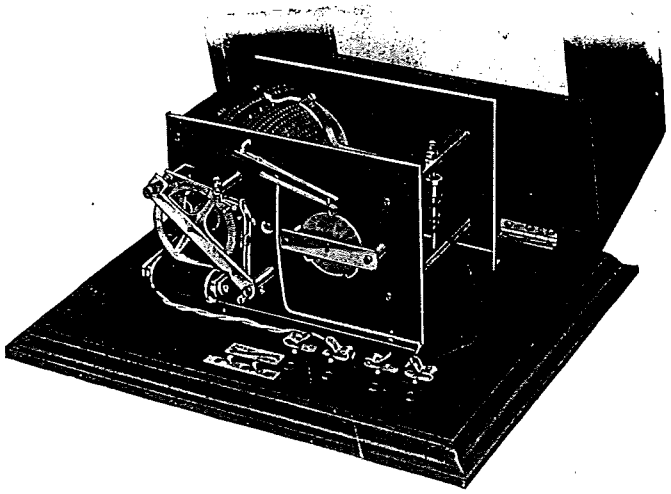
The above illustrations depict styles which have been produced to blend harmoniously with special surroundings.

Dials of the above types, having faces approximately equivalent in area to that of a 12″ circular dial can be supplied.

Price - - **£8 12s. 6d.**

Prices of other sizes or for special designs on application.

SYNCHRONOME
Automatic Bell Controllers



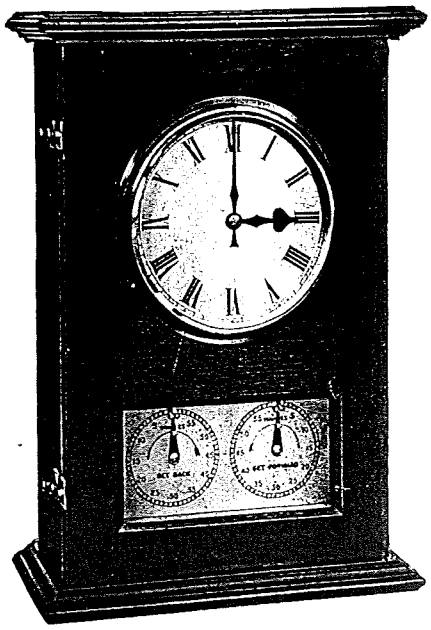
For operating Electric Bells, Hooters, Syrens and all other forms of warning Signals according to a pre-arranged programme and in exact synchronism with the clocks in the premises, an Automatic Bell Controller forms a valuable addition to the SYNCHRONOME system in Schools, Factories, Business Establishments, etc., where punctuality is so necessary.

One of these instruments may be included anywhere in a circuit of electrical impulse dials to control an independent circuit comprising any number of electric bells or other sound producing devices.

A variety of programmes can be performed according to the type of instrument selected, ranging from the simplest which will give rings at any desired half-hour,to the most elaborate which will enable any minute to be selected.

Four general types are available which are fully described and illustrated in the separate pamphlet entitled "Synchronome Automatic Bell Controllers" which will be sent post free on request.

MARINE INSTALLATIONS FOR OCEAN LINERS



The Synchronome Marine type Master Clock which was first in 1895 and has been foremost ever since, has consistently led the field for 35 years.

The latest standard Marine Controller is a handsome instrument supplied in polished teak case of simple but pleasing lines and is customarily fitted to a wall in the Chart Room.

The time is measured by a compensated balance, with lever escapement fully jewelled, which, in conjunction with a special form of the Synchronome switch, transmits impulses to any number of electrical impulse dials throughout the ship. Any of the dials illustrated in this catalogue may be employed for this purpose, but we recommend the Insertion type as being more convenient for fitting to panelling.

The facilities for daily alteration necessitated by changes of longitude are the keynote of this latest Master Clock, the simplicity of operation of which should appeal at once to the engineer. There is simply nothing to go wrong.

Two small dials as illustrated below the Main Pilot Dial, are provided with pointers fitted with handles for manual operation.

The dial on the left is clearly engraved "set back" and that on the right "set forward" and they are arranged to be rotated anti-clockwise and clockwise respectively The direction of motion thus comes naturally to mind coincident with the operation to be performed.

Price of Marine Controller as illustrated £48 10 0

If fitted with duplicate movement for standby use as occasionally demanded by some Shipping Companies £68 10 0,

Further particulars of our in Marine Master Clocks, are given in a separate pamphlet entitled "Synchronome Electrical Impulse Clocks for Ships," which can be had on application.

EMPLOYEES' TIME RECORDERS

Time recording machines of any make can be synchronised with the System, the method employed being the substitution of the pendulum and escapement by the Synchronome electro-magnetic release.

Both the clock and printing mechanism are held firmly in control and operated by the Master Clock. It follows that the Time Recorders thus lose their individuality, and by so doing ensure uniformity of time throughout the premises as there is only one pendulum (that of the Master Clock) to measure time for the complete installation.

Price of Electro-Magnetic Release - **£5 : 5 : 0**

Alternatively machines may be *driven* by substituting an electrical impulse movement for the clockworks thus dispensing with weekly winding.

Since the type wheels of modern time recorders print progressive *minutes*, we have devised a simple method of submerging every alternate impulse, which is far superior to relays or freakish mechanical contrivances in which the discerning engineer will place no faith.

Price of Electrical Impulse Movement fitted to time recorder, including impulse Submerger **£6 : 15 : 0**

As an alternative to either of the above methods, Time Recorders may be controlled by the application of our Hit-and-Miss Synchroniser to their pendulums. This can be provided if required at a cost of £5 : 5 : 0 but many years of experience has proved that the method of ELECTRICAL RELEASE carries the balance of practical advantage.

BATTERY WARNING INDICATORS

On page 5 under the heading "Battery Warning," attention is drawn to an important feature which is inherent in the Synchronome system whereby in the event of failing battery the Master Clock automatically draws attention to the fact by its prolonged duration of contact.

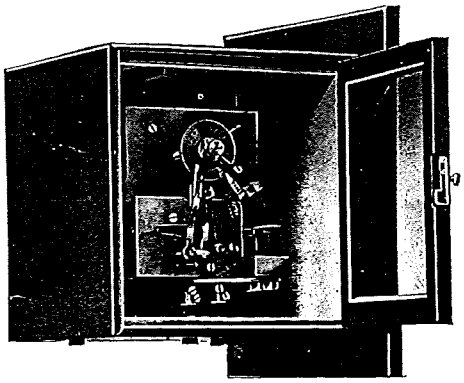
This unique feature is usually considered amply sufficient warning that the battery needs attention but for those who prefer a special piece of apparatus devoted to this purpose, a **Battery Warning Lamp** can be supplied.

Price £1 : 1 : 0

AUTOMATIC TIME SWITCHES

These instruments may be connected anywhere in the series time circuit in the same manner as ordinary dials. Their function is automatically to control secondary circuits such as the lighting of Bracket Clocks etc. at pre-arranged times.

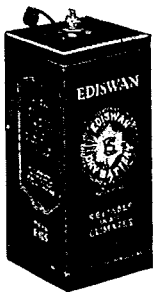
The contacts are substantial and adequately insulated to deal directly with current on public supply up to 250 volts.



The instrument is available in four different forms :—

To switch OFF only	£ 7 : 10 : 0
To switch ON & OFF	£ 9 : 15 : 0
To switch ON & OFF twice in 24 hours	£11 : 10 : 0
To switch ON & OFF with calendar movement which automatically alters its time of operation in accordance with sunrise and sunset	£17 : 10 : 0

CURRENT SUPPLY FOR SYNCHRONOME CLOCKS

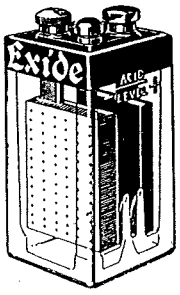


The consumption of current being negligible, a battery of good quality dry cells provides the simplest and most economical method of operation. We can supply dry cells which have an estimated life of from two and a half to three years. These cells are specially made for us by one of the leading manufacturers and we always carry a stock. Since the life of a cell is largely its "shelf life" it is desirable to use the above type and not the ordinary kind.

Dimensions: 4 inches × 4 inches × 8 inches high.
102 mm. × 102 mm. × 204 mm. high.

The above measurements allow for an air space between each cell, and a shelf in a cool place close to the Master Clock should be provided. Approximate nett weight: 6 lbs; E.M.F. per cell, 1.5 volts.

Catalogue number BO 138. Price, 4s. 6d. each cell.



For large time circuits and in buildings where charging facilities exist, we recommend the use of a storage battery, preferably in duplicate, so that during re-charging the time circuit is entirely isolated from the supply mains. EXIDE Mass type cells are specially designed for intermittent discharge and are particularly serviceable in cases where re-charging is not desirable at too frequent intervals.

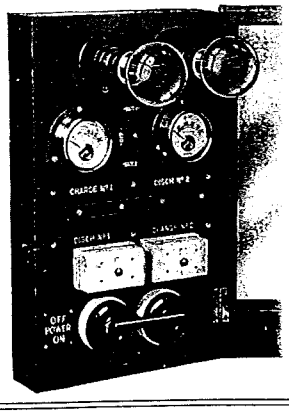
Dimensions 3 ins. × 3 ins × 6 ins. high overall.
75 mm. × 75 mm. × 150 mm.

Approximate weight, including acid 3.75 lbs; E.M.F. per cell 2 volts.

Catalogue No. D.T.G. 220, Price 5s. 0d. each cell,

including acid and one inter-cell lead connecting strip; discharge rate (intermittent) 20 ampere-hours.

If a D.C. supply is available, it will be found advantageous to instal a small charging panel. The panel illustrated is arranged to control batteries in duplicate and is fitted with four pole change over battery switch, double pole mains switch, volt and ammeters and holders for lamp resistances, also input and output fuses. The switching is so arranged that it is impossible to connect the supply mains with the clock circuit wiring.



Price of charging panel as illustrated, £7 10s. 0d.

Where the supply service is A.C. it is necessary to incorporate a rectifier in the charging equipment. We shall be pleased to quote on receipt of the necessary particulars as to voltage, periodicity, etc.