

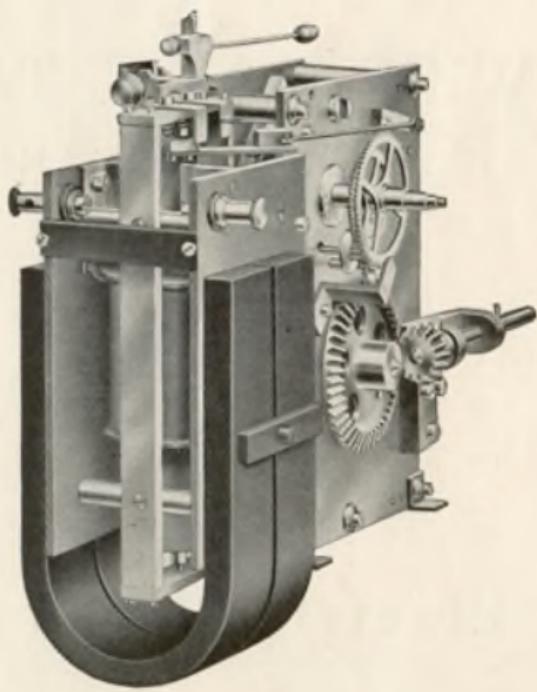
MAGNETA

THE MAGNETIC CLOCK CO.
12 JOHN STREET
NEW YORK

SWISS MAGNETA
ZUG (SWITZERLAND)

Electric Clocks

No batteries!
No moving contacts!

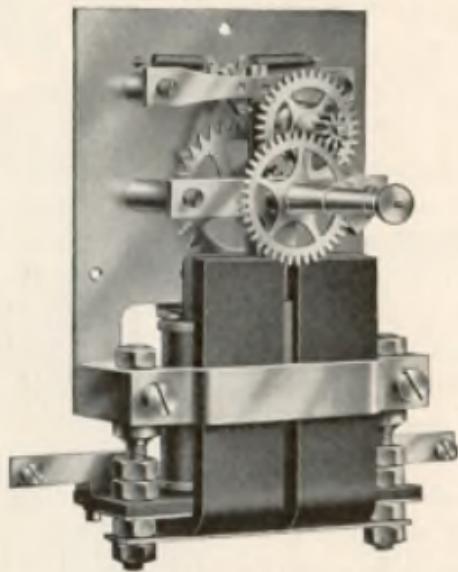


Magneta inductor element.

“Magneta” Electric clock installations.

THE advantages of an electric clock installation for railways, factories, banks, offices, schools, polytechnics, hotels, sanatoriums, hospitals etc. etc., are well known. The exact synchronism, the saving in price of the clock units over separate clocks of the same reliability and time-keeping quality, the absence of the need of rewinding each individual clock and the possibility of including signal devices in the installation, make it clear that for a clock installation of any size an electric master clock system will be the only one entering into consideration.

Granted, however, the advantages of an electric clock system, the choice of the system to be adopted requires great care. Here it may be mentioned that every system on the market falls into one of two classes. These two classes differ from one another in that in one the clock takes current from an outside

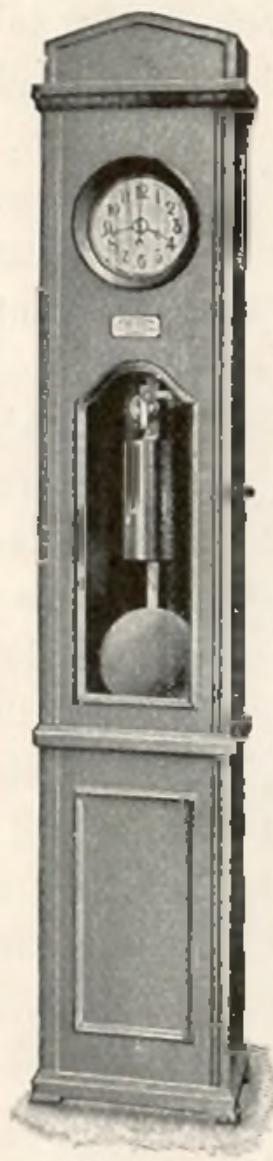


Magneta secondary clock movement.

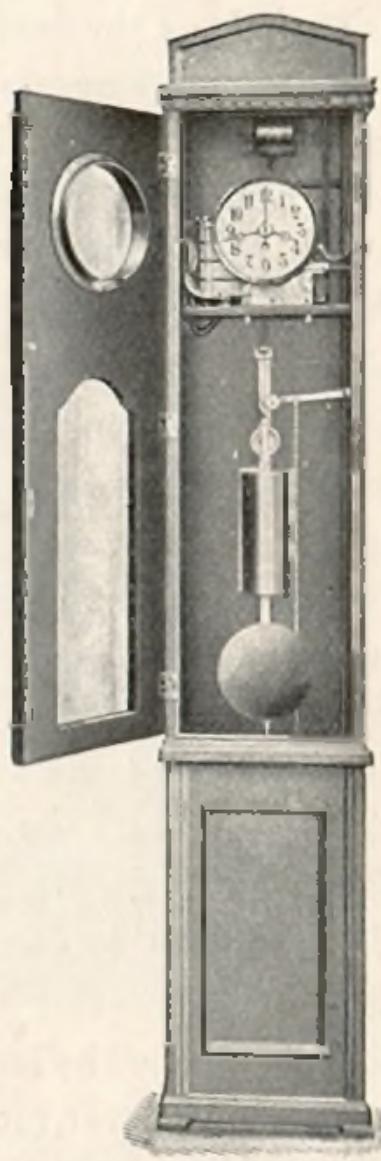
source to operate the secondary clocks, whilst in the other the impulses necessary to drive the secondary clocks are generated in the master clock itself.

If the outside source of current takes the form of a battery, the reliability of the entire installation will depend upon the state of the battery; the nature of the battery, whether galvanic or of the accumulator type, being immaterial. If, on the other hand, the current is taken from the lighting or power mains, the system will always be in danger of being temporarily put out of service by an interruption in the supply. Even if, as is generally the case, the interruption be of short duration, nevertheless the time-keeping quality of the installation will be unpleasantly affected, and continuous resetting will be necessary. Furthermore, in all systems taking current from an outside source to give the one-minute impulses for advancing the secondary clocks, this current is controlled by moving contacts in the master clock. Where, however, moving contacts are employed contact trouble must always be reckoned with.

In the Magneta system the impulses are generated in the master clock itself and this system is the only one of its kind. All other electric clock systems



closed

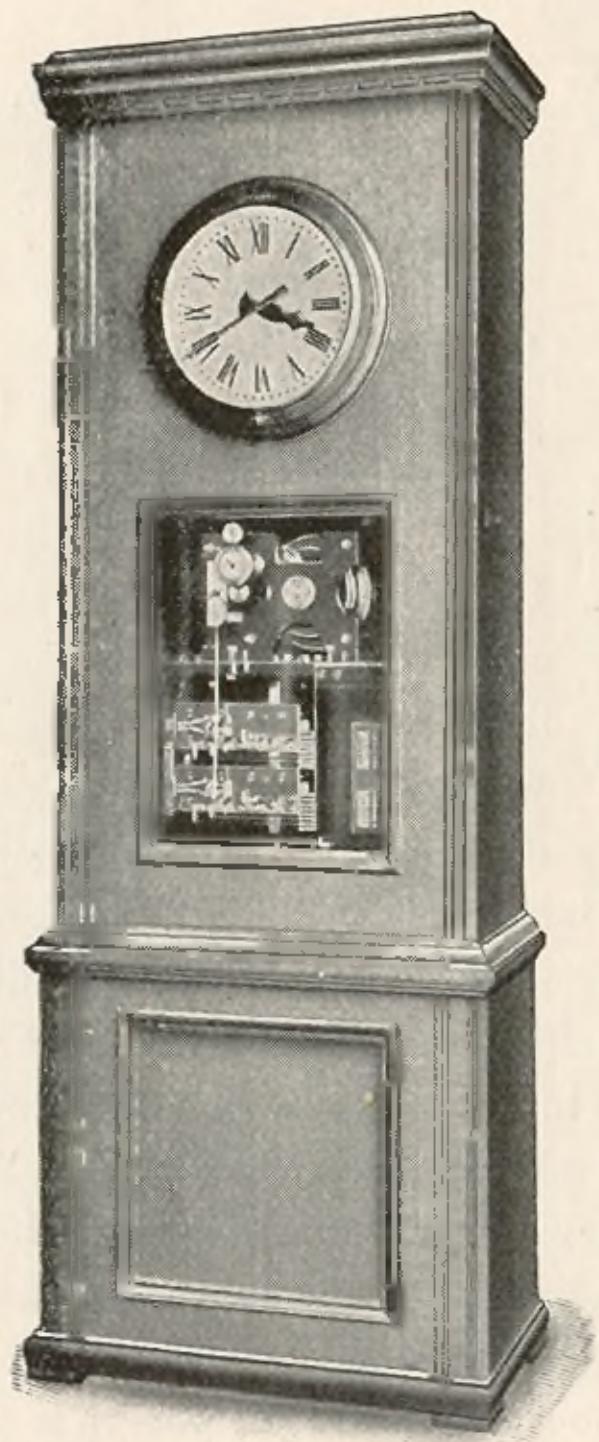


open

50-unit master clock.

belong to the first class; that is to say, they are all actuated by an outside source of supply. In the Magneta system troubles arising from a drop or a failure in the supply, or from bad contacts, cannot occur. This is because the current necessary to drive the secondary clocks is generated in the form of impulses in the master clock itself. To accomplish this the Magneta master clock is fitted with a magneto-inductor which is put into motion once a minute by the clockwork through a crank mechanism, and sends an impulse through the secondary clocks. Since the generation of the impulses is controlled positively by the master clock movement, so that they always take place at exactly the correct instant, there is no need for control or distributing contacts, these being superfluous, although in other makes they are essential in order to secure minute impulses.

Magneta master clocks may be supplied for hand winding alone or with a small motor for automatic electric winding in addition to the hand winding which is always retained in case of emergency. In addition a liberal mechanical reserve is provided for clocks with electric winding to take care of the running should an interruption occur in the supply



**600-unit master clock
with single distribution circuit.**

mains to which the winding motor is connected. This reserve is amply sufficient to carry the clock over any outage likely to be met with in practice. In cases such as strikes, accidents, etc., when it can at once be seen that the interruption in service is likely to last for hours or even days, the Magneta clocks may be wound by hand without any trouble.

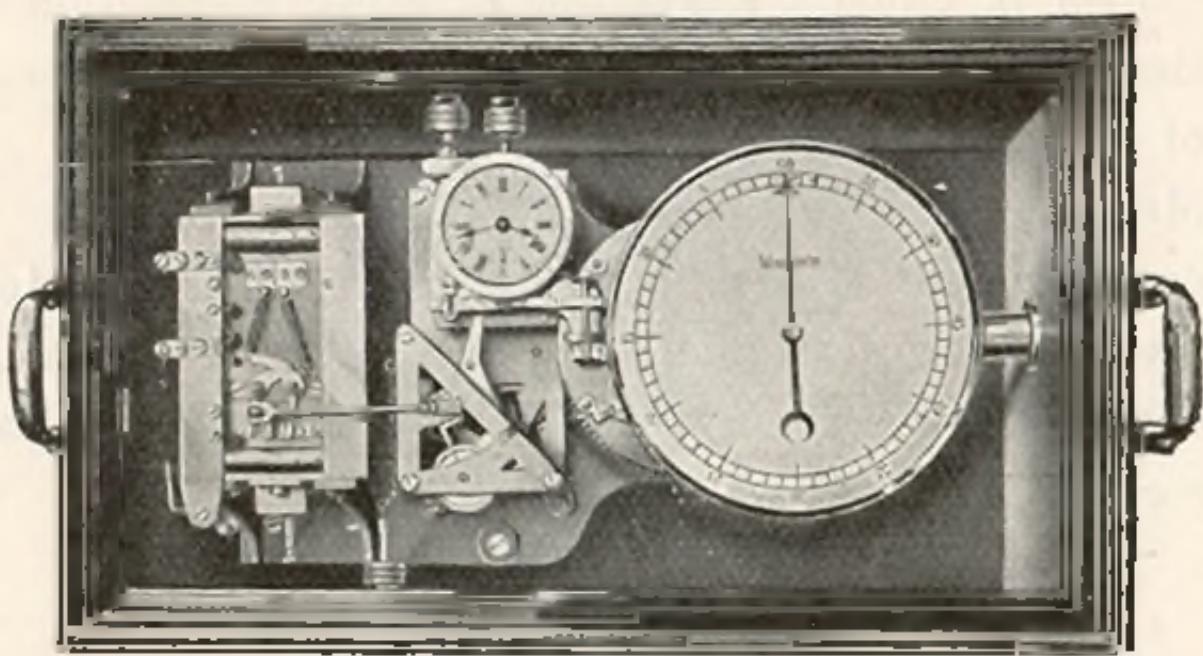
As will have been gathered from the foregoing remarks the Magneta system gives the maximum possible reliability with the minimum of upkeep costs. Contact repairs are very seldom necessary even after many years of service; as will be proved by hundreds of Magneta installations already delivered. Running costs for energy are entirely absent when the clocks are hand-wound, and are extremely low when an electric winding motor is fitted. It will be obvious that the expenses always present in other systems for the overhaul and maintenance of the battery, and for the charging of same, or the renewal of units in the case of dry cells, do not appear in the case of the Magneta system.

In cases where an expert and thorough surveillance cannot be kept over the clocks, as for example in Banks, Schools, Hotels, etc., the Magneta system in



600-unit master clock
with 4 separate circuits.

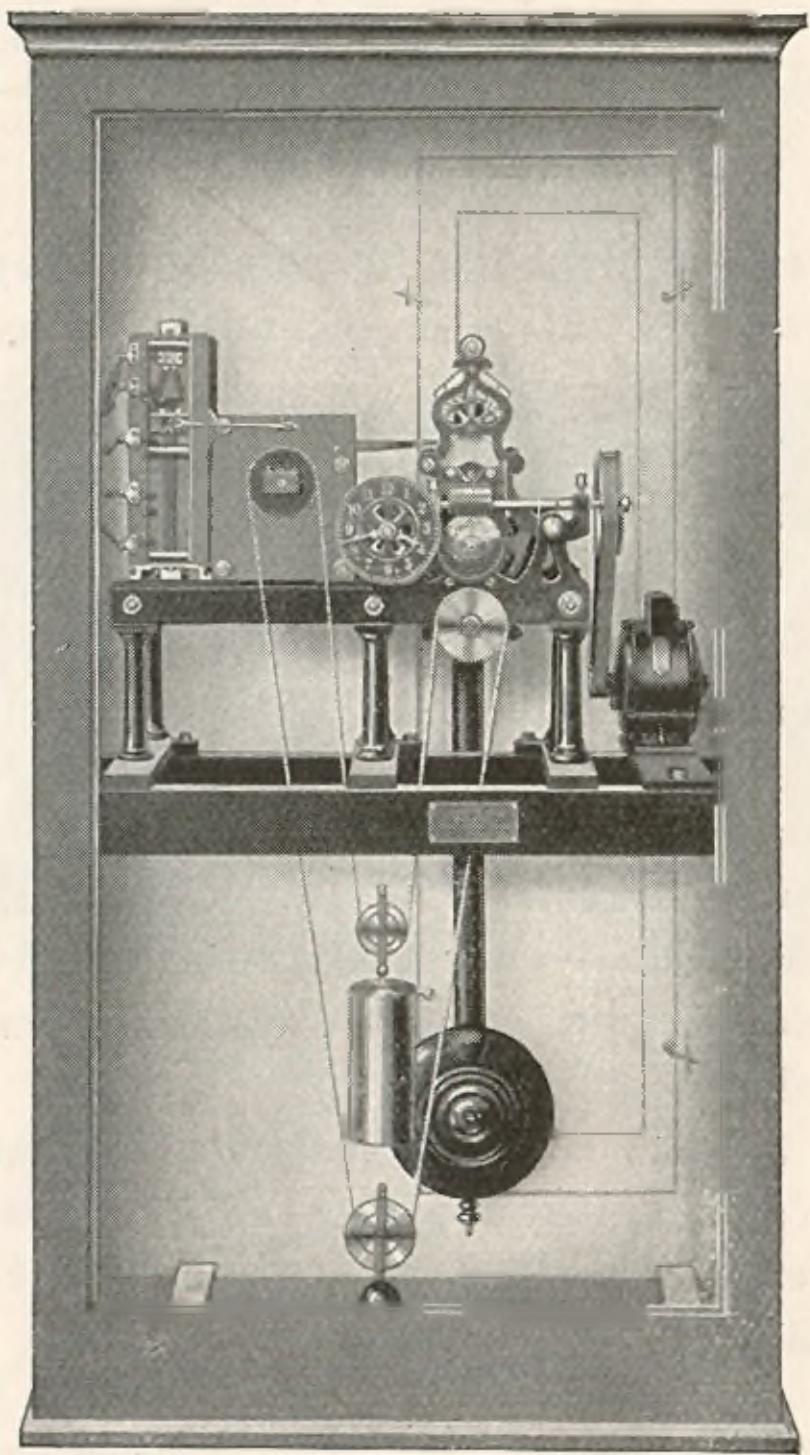
particularly suitable. Even where there is a technical staff capable of correctly maintaining the clocks, as for example in Factories, Railways and such, the advantages to be gained by the installation of a Magneta system are not to be ignored. The Magneta system is equally adaptable to large installations, since it is only necessary to fit the requisite number of inductors in the master clock case. In this way Magneta clocks can be built to take care of a very great number of secondary clocks, and it is easy to divide such an installation into a number of sections, each working independently of the others, this meaning still greater reliability.



Marine type master clock.

Advantages of the Magneta Clock System.

1. The master clock itself generates the impulses necessary to drive the secondary clocks. The system is therefore independent of public or private electric supply undertakings, as also of cells and batteries.
2. Both master clock and secondary clocks work without moving contacts.
3. Absence of continual expense for current.
4. The possibility of adding to the number of secondary clocks in the installation, if the master clocks has been judiciously chosen.
5. The combination of time-recorders and signal apparatus with the clock system is perfectly simple.
6. The initial cost of the Magneta installation is soon paid off by the absence of expense for current, attendance, overhauling and contact repairs.



Magneta tower clock.

Construction of Magneta Electric Clocks.

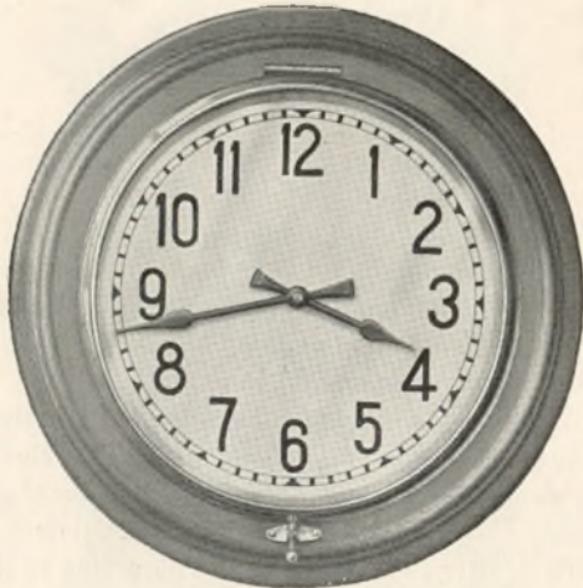
1. Master Clocks.

THE master clocks are fitted with accurate 60-beat pendulum movement. The case is of the upright pattern and is tastefully designed in polished oak or walnut, either dark or light in shade.

All clocks are fitted with hand-winding sufficient for 50 days at one wind. On special request the clocks may also be fitted with automatic winding, the clock weight in this case being raised by a small electric motor.

The master clocks differ in size according to the number and size of the inductors, and to the size of the clockwork movement actuating same.

The capacity of the master clock is based on the number of secondary clocks it has to control. The smallest size of master clock will drive 50 small or medium sized secondary units (20—30 cms. dial). The load taken by such a secondary clock constitutes a unit. In other words, a 50-unit master



Secondary clock
in
wooden case (dark or light shade)

Standard model
for use in dry rooms.

clock is one which is capable of controlling 50 secondary clocks with 20—30 cms. dials. For larger clocks proportionately more units are required. Thus, for example, a 50 cms. dial secondary clock takes 3 units, and therefore a 600-unit master clock could drive 200 such secondary clocks. It will be seen that when calculating the necessary size of the master clock it is not only the number of secondary clocks to be controlled which enters into consideration but also the size of each individual clock.

The type significations for the master clocks are: ME for master clocks with electric winding, and MH for master clocks with hand-winding only.

In order to determine the size of the clocks, the number of units for which the master clocks are designed is added to the above root letters. Normally the following sizes are supplied:-

ME 50 and MH 50
ME 100 " MH 100
ME 150 " MH 150
ME 200
ME 300
ME 450
ME 600



Secondary clock
in
Grey painted metal case

Standard model
for Outdoor work
and for use in damp rooms.

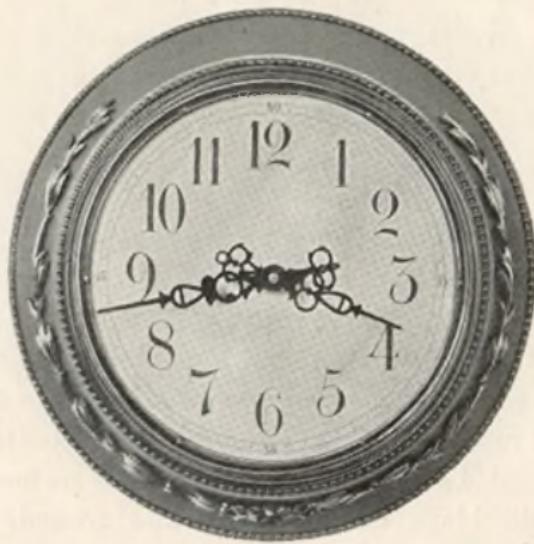
The 200, 300, 450 and 600-unit clocks are fitted with electric winding as standard. Upon special request the larger size clocks may have their capacity distributed over two, three, or four separate circuits.

Details as to the construction of Magneta clocks for towers, ships etc., etc., will be supplied upon request.

2. Secondary Clocks.

Secondary clocks may be supplied in any type and size desired. For interior work secondary clocks are generally supplied in round cases in light or dark wood according to taste, but for outdoor work and in cases where the clocks are to be mounted in damp or dusty rooms the clocks are supplied in round metal cases, painted grey. In both cases the dials are marked with bold black figures on a white ground. The figures may be either in Roman characters I-XII or in Arabic numerals 1—12, and upon request the figures 13—24 may be marked in red. Black hands and a stout glass are fitted as standard. The following are the standard dial sizes: 20, 25, 30, 40 and 50 cms. in diameter.

The driving powers required by the various clocks are as follows.



Secondary clock
in
Ornamental Bronze Case.

For clocks with 20, 25 and 30 cms. dial 1 unit.

" " " 40 and 50 " " 3 units.

The power required for clocks with still larger diameter dial will be given upon request.

In addition to the above mentioned round cases in wood and metal, the secondary clocks may be supplied in carved wood cases of various patterns, also in plain or ornamented bronze, and with embossed or etched dial. We also supply secondary clocks for outdoor use, for mounting on pillars, pedestals, lamp and tram standards, and also for letting into walls, towers, etc. They may be of the three or four dial type, with or without electric illumination of the dial. Secondary clocks with transparent dials can only be supplied in pressed metal cases with dials from 40 cms. diameter upwards.

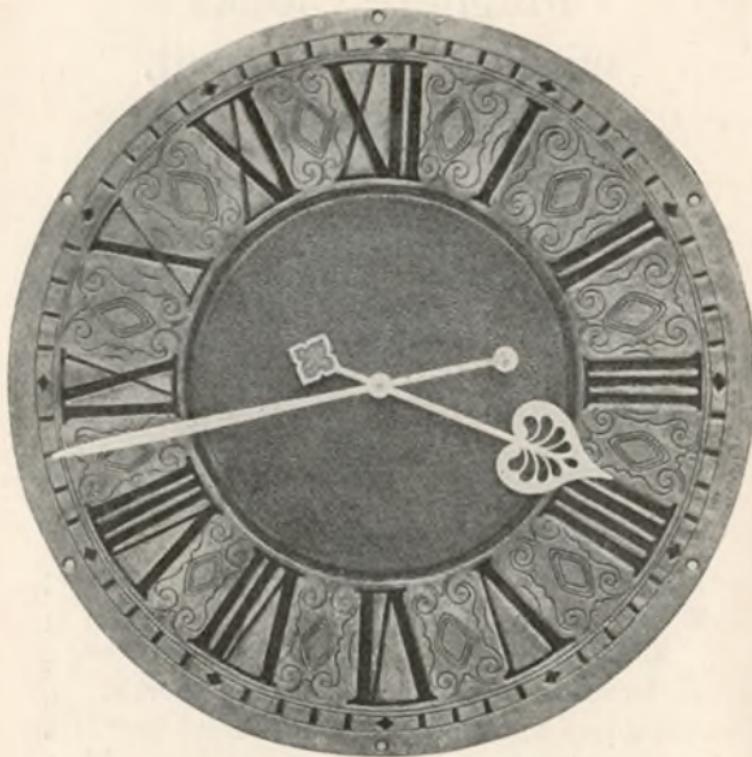


Arabic dial
Ornamental Embossed Pattern.

Magneta Clocks with Signal Circuit.

AS has already been mentioned an electric clock installation may with advantage be fitted with a signal circuit, and this is also the case with Magneta installations. The signal circuit will in this case be absolutely independent of the clock circuit for the following reasons.

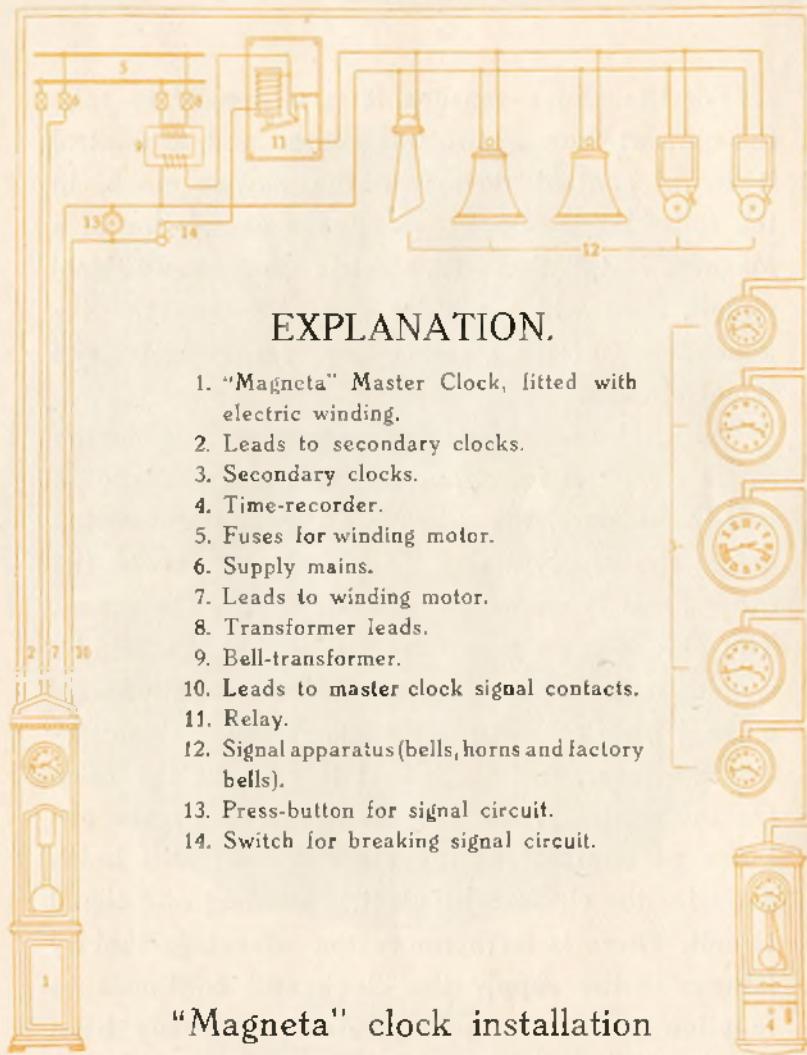
The impulses sent out by the master clock will operate secondary clocks, time-recorders, card stamping machines and similar apparatus, but they are of too short duration for signal purposes. An electric bell, for example, would only make one short stroke when driven by such current impulses. It is essential, however, that acoustic signals should last at least one second if they are to be heard, and in the case of visual signals this period must often be much longer.



Roman dial
Ornamental Etched Pattern.

For the above reasons it is necessary to take the current from an outside source and to control it by a contact device in the master clock. In the following paragraph we give a description of a Magneta installation with electric winding and signal circuit, from which will at once be seen the independence of the clock circuit from the motor and signal circuits.

As will be seen from the diagram on page 26 the signal circuit is fed from the secondary side of a bell-transformer, the primary of which is connected across the supply mains. The winding motor on the other hand is connected directly across the mains. The objection may now be raised that it would be simpler if the master clock itself were supplied with current from an outside source. A moment's reflection, however, will show that this is not the case. On the contrary, the advantage gained by the absence of contacts in the clock circuit still holds good for the clocks with electric winding and signal circuit. There is furthermore the advantage that by failures in the supply the clock still continues to function perfectly regularly. As has already been mentioned the reserve is sufficient for any interruption

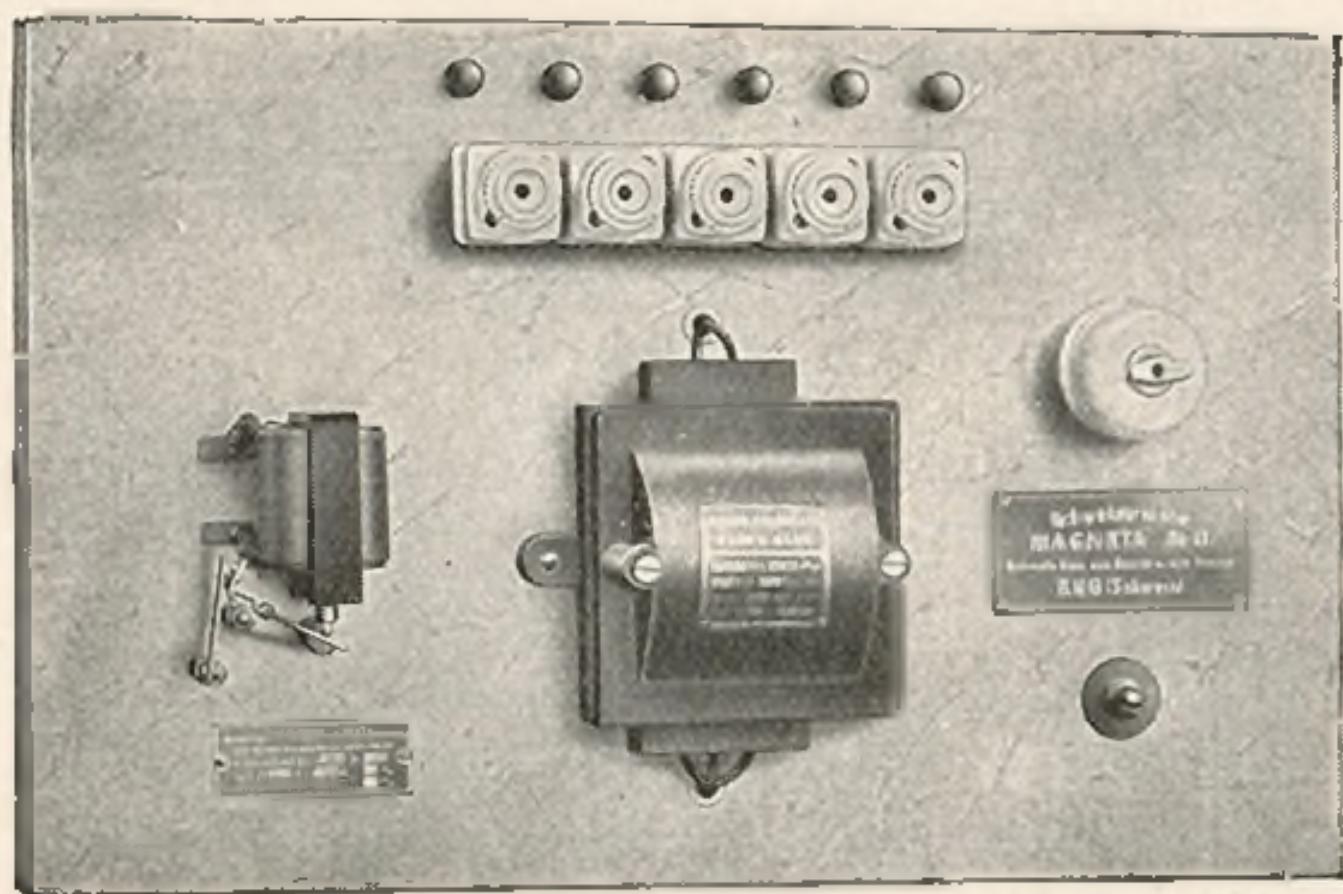


EXPLANATION.

1. "Magneta" Master Clock, fitted with electric winding.
2. Leads to secondary clocks.
3. Secondary clocks.
4. Time-recorder.
5. Fuses for winding motor.
6. Supply mains.
7. Leads to winding motor.
8. Transformer leads.
9. Bell-transformer.
10. Leads to master clock signal contacts.
11. Relay.
12. Signal apparatus (bells, horns and factory bells).
13. Press-button for signal circuit.
14. Switch for breaking signal circuit.

"Magneta" clock installation
with signal circuit.

encountered in practice, and will render the clock movement itself unaffected, this not being possible in designs in which the clock movement is itself supplied with current from the mains. Again, if the outage is of serious duration (several days or weeks) there is no difficulty in winding the master clock at regular intervals by hand, whereas if the clock were dependent on the mains for supply it would be entirely out of action. In the Magneta system, therefore, it is only during the actual failure of supply that the signal devices, etc., are out of commission, whilst the complete clock system remains unaffected. In any other system, when it is a question of outages of one or more minutes duration, as will not infrequently occur in most supply nets, the interruption will be sufficient to put the clocks back and necessitate the resetting of the entire system. Again, false signals must then be reckoned with unless the interruption is at once observed and remedied. The exact opposite is the rule with the Magneta system which is the only one on the market whose accuracy remains unaffected by outages. Should a signal circuit connected to the supply mains be interrupted due to a failure in the supply there will be no serious results, unless



Signal panel.

it so happens that the interruption occurs at the moment at which the signals are timed to take place. Even should this happen the harm done would be much less than in the case of other designs where a fault in the clock circuit automatically upsets the timing of the signal circuit.

Information to be given when asking for quotations and when placing orders.

In order to prevent mistakes and delays the following questions should always be answered :-

1. Where is the clock to be mounted ?
2. Is the master clock to be fitted with hand winding only, or with additional electric winding ?
3. What are the nature and pressure of the supply to which the winding motor would be connected ?
4. Is this supply subject to interruptions ? If so, are they regular, and what is their usual duration ?
5. Is the clock equipment to include a signal circuit ?
6. If so, how many circuits are required ?
7. Must the signals be changed automatically on Saturdays and not operate at all on Sundays ?
8. What is the nature of the supply to which the signal circuit would be connected ?
9. How many, and what size of secondary clocks are to be installed ?
10. How many, and what type of signal devices are to be employed ?

Additional Remarks.

- No. 1. Here it should be mentioned whether the installation is for a private house, in which case the number of floors is to be given, or whether it is intended for a block of buildings. If it is a question of a large installation it is advisable to attach a plan of the site.
- No. 3. If the winding motor is to be connected to a three-phase supply it is advisable to choose a three-phase motor, since this type has many advantages over the single-phase pattern.
- No. 4. This point is of particular importance when the use of current is limited to certain hours, since it affects the design of the mechanical reserve with which the winding gear is fitted.
- No. 6. As a general rule not more than four signal circuits are fitted. In circuits where the times of the signals are to be changed, or are to stop altogether on certain days, only two circuits will, as a rule, be fitted.
- No. 9. Here the following information is necessary: diameter of dial, type of case required, nature of the conditions where the clocks are to be

mounted (whether dry or damp, or outdoor situation) and whether an illuminated dial is desired. In the last mentioned case the voltage of the lighting supply must also be given.

No. 10. The type of signal apparatus to be employed must be indicated, e. g. horns, sirens, bells etc., and further, how many of each type are to be included in each circuit.

In the case of tower clocks special information must be given, details of which will be supplied upon request.
