THE JOURNAL OF THE ELECTRICAL HOROLOGY SOCIETY

CHAPTER #78
NATIONAL ASSOCIATION OF WATCH & CLOCK COLLECTORS

VOLUME XXIV #1, MARCH 1998

Fellow Horologists:

A few words from your former editor. I'm on the road to recovery after having a total knee replacement which was followed by a fall which was responsible for a shattered hip which required 4 pins, a screw, and a metal plate to hold the whole mess together! (No batteries required.) Complete recovery is scheduled for no more than a year, that boils down to another 6 months or so from now. In the interim, George and Harvey will perform the editorial duties without benefit of my interference which will be to the benefit of the journal's content.

Credit to Frank De Felice for the article on 6 volt automobile clocks, and to Norman Heckenberg for the "Murday" catalog. Also please note the request for International Electric Time Recording System equipment from the Smithsonian National Museum of American History.

Our recent meeting at the home of Dr. Bruce and Maxine Levy was well attended and in addition to a very pleasant afternoon of socializing and partaking of the bountiful repast provided by our hosts, provided an opportunity for a business meeting at which time we discussed the matter of the proposed dues increase. After much discussion, it was decided to defer any action to the end of 1998, since we are using a new printer for the journal which results in a modest cost saving. The net difference will provide food for discussion at the year end, and guide us in the final dues decision. On the subject of dues, PLEASE BE AWARE THAT 1998 DUES IS NOW DUE, and if you haven't sent your $10.00 remittance, this is the last journal that you will receive!

The cards and calls from the membership offering good wishes for my speedy recovery are greatly appreciated and I thank all of you. I'm sure that they will have the desired effect, at least in encouraging me to continue my therapy and exercises. Hope to see you at an upcoming meeting soon.

Good reading ahead...

Martin Swetsky, FNAWCC, President.

HARVEY SCHMIDT, SECRETARY-TREASURER, 75-80 179th ST. FLUSHING NY 11366

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Mr. Martin Swetsky
2443 E 26th St.
Brooklyn, NY 11235

Dear Martin,

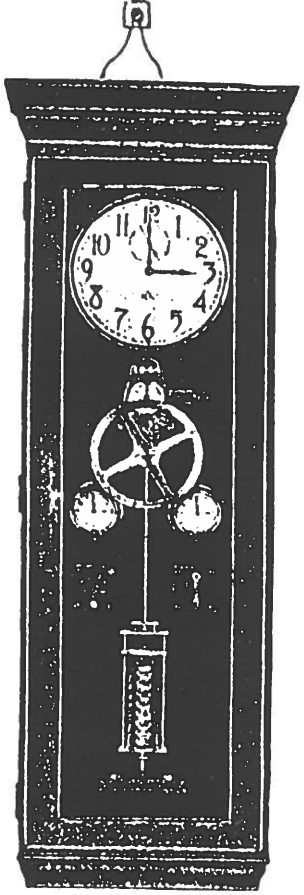
In my volunteer work for the Smithsonian, Carlene Stephens, Curator, has asked me to try to locate several pieces of the International Electric Time Recording System for the new exhibit being planned for Timekeeping Hall. The pieces she is looking for are circled in red on the enclosed sheet. She particularly needs the Electric Time Stamp and the Electric Gong. Do you know of any one who has any of these items and would be willing to donate/lend/sell them to the Smithsonian.

If you don't know of any of these items, can you suggest other NAWCC members I might contact to try to locate them.

Best regards,
Bob Edwards

INTERNATIONAL ELECTRIC TIME RECORDING DEVICES

Large Range of Styles and Models Forms Unsurpassed Line of Electrics



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The advantage of having your entire system of time keeping under the control of one central master clock with all of the subsidiary devices keeping the same time without the bother of constant winding, and the large range of possible applications made possible by the fact that your system can be moulded to your particular business, are features that International Electric Time Recording devices bring to every employer of labor. With these International electric time recording mechanisms, an accurate, elastic and complete time recording system can be had for any line or size of business.

The rapidly increasing value of time has emphasized to business the necessity of caring for time as carefully as for money. Time is recognized as the drive wheel of business and all of its various factors are recorded. The coming and going of employees, the movement of papers and packages, the time spent on jobs, the announcing of the time program and the checking of such important items as piece work rates, overhead, time of machine operation, etc., are all checked and measured by accurate time records in the efficient business of today.

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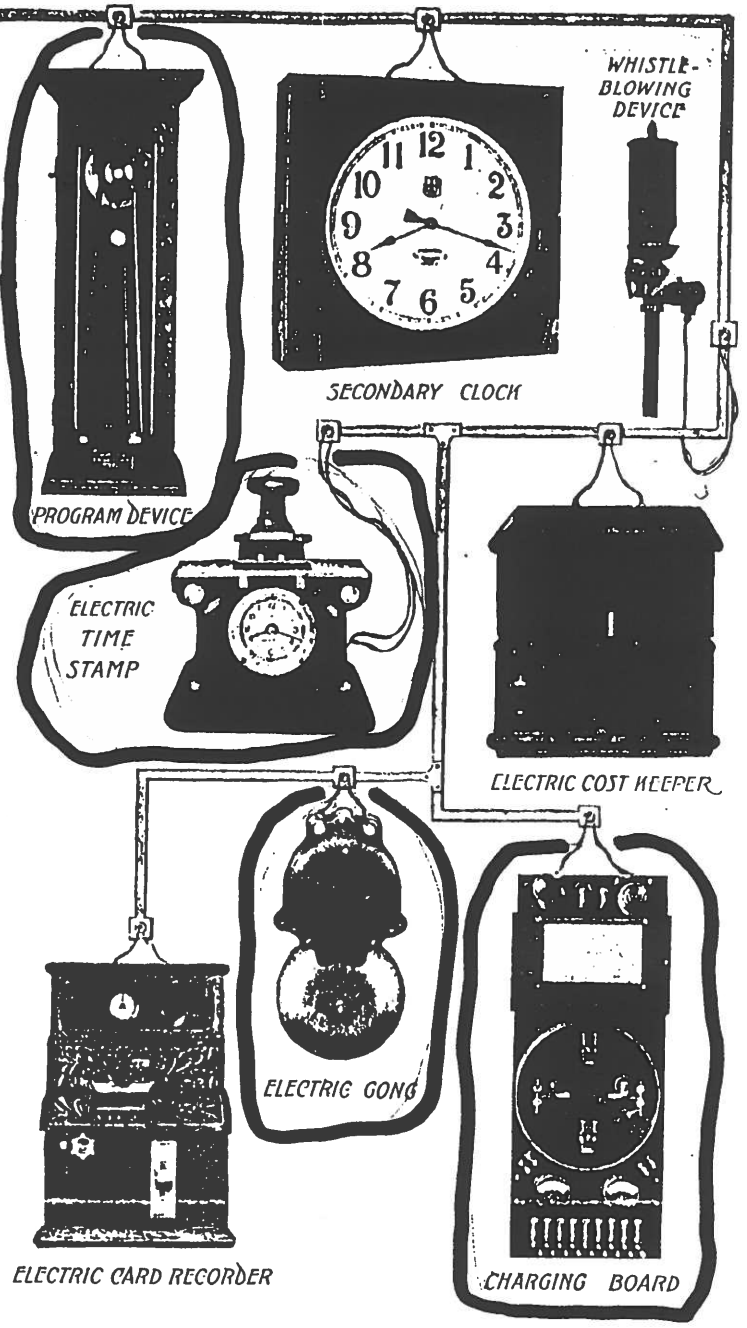
Every style of Internationals can be secured in an electric model. This large range of styles and sizes permits International electric time recording equipment to cover every possible demand that can be made of it. A system that is adaptable to any business, institution or school, and which will serve the user in question as a time system especially designed for his own needs. Factories, department stores, hotels, hospitals, schools, public buildings, etc., can all use International electrics more efficiently and more economically than any other system.



The AMERICAN HOROLOGIST

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THE AMERICAN HOROLOGIST

Published monthly by Roberts Publishing Company, Denver, Colorado, in the interest of Horological and Jewelry Industry. To inculcate the principles of Fraternal and Commercial Advancement; to promote the welfare and enhance the betterment of the industry; to cultivate good fellowship and a higher degree of knowledge in Horology and Jewelry industry.

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PRICE

25c per copy, $2.00 per year in United States and Canada. $2.50 per year in all foreign countries. Members of U. H. A. A. receive the paper as part of their membership benefits.

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Change of address must be made prior to 5th of month to effect the forthcoming issue of the magazine. Both old and new addresses must be given.

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ADVERTISING RATES UPON REQUEST

Contributions and advertising material must be received not later than the 25th of the month preceding publication.

THE AMERICAN HOROLOGIST

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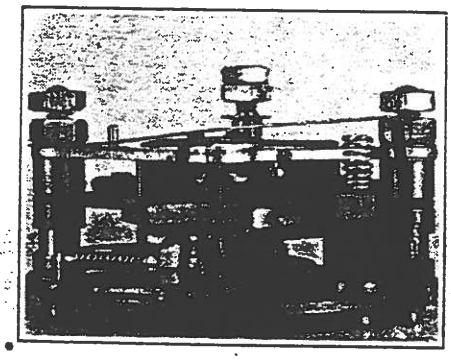
The 6-Volt Automobile Clock

BY J. E. COLEMAN

Member National Technical Board.

THE newest comer to the watchmakers' bench is the six volt Automobile clock; at present these are being supplied to the automobile industry by three manufacturers: The Westclox Division General Instruments Corp., Lasalle, Ill., The Jaeger Watch Co., 304 East 45th., St. New York, N. Y. and The Geo. W. Borg, Corp. Chicago, Ill.



The lack of technical data upon this particular type of timekeeper in horological books, trade journals, etc., results in horologist having practically nothing in their libraries to turn to for aid, and, we believe this is the first effort of any trade publication to fill this want. In so doing, we sincerely hope to be of real assistance to many who have written in requesting it and all who may be interested. The watchmaker of today is often asked to service and repair these clocks, many times by an old customer whom he has served for a number of years; invariably the job is accepted with misgivings caused by lack of technical knowledge, small or no profit in the job and various others. It is these first two we hope to eliminate by an accurate description of the construction and principles of this type of clock along with a few suggestions relative to handling them.

Since the Jaeger involves a wholly different principal from those usually encountered by the Horologist at the bench we shall take it up first:; The Jaeger is strictly an electric clock—not spring driven and electrically wound—it converts the six volt direct (D. C.) current of the automobile battery into electro-magnetic energy, driving the balance and the balance in turn drives the clock. One of the many questions you will be called upon to answer is, "Won't this clock run my battery down?" The Jaeger clock is rated at less than 1 milliampere (1/1,000 of an ampere) from this it will be seen that 2,000 of these clocks would consume less current than one horn. The following photos and sketches are intended

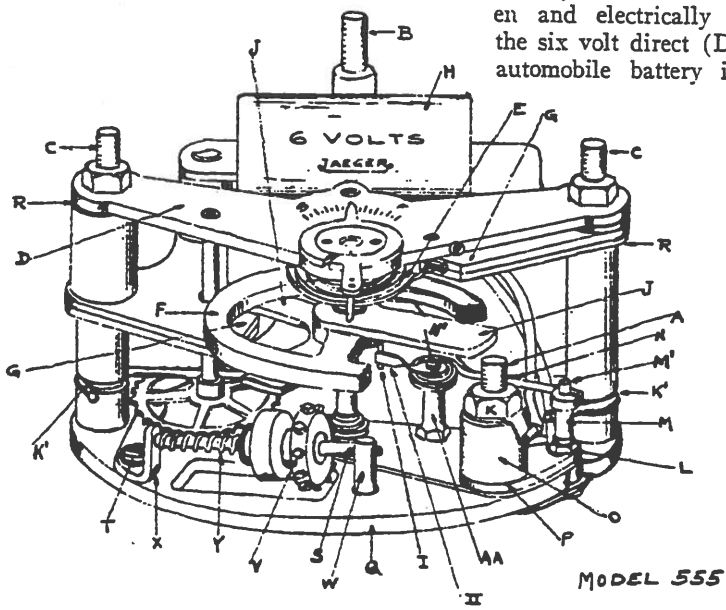


FIGURE 1

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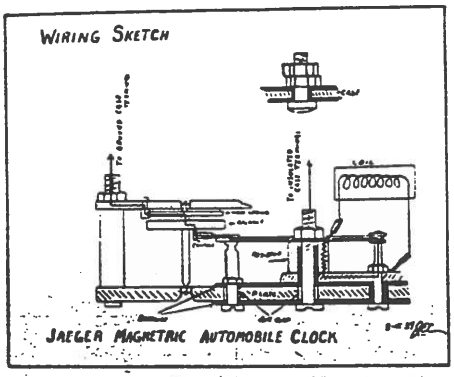
to convey a working knowledge of the movement, Fig. 1 is a general sketch of one of the earliest models, No. 555, but, since all later models are basically the same principal, this sketch will serve for general reference. Fig. 2 shows a general sketch of the electric circuit, it will be seen that the grounded side conducts the current thru the case into the pillars which protrude thru the case, into the balance bridge, then to the hairspring and into



the balance staff and the balance wheel. A contact pin of platinum iridium is ready to make contact with the finger (of same material) closing the circuit on this side. At this break (contact) the current continues thru the finger and its spring to a post, then conducted to lower end of resistor. The other side of the circuit begins over the resistor screw and is conducted thru a nut into a terminal on the end of the starting lead going into the coil. From the coil thru a finish lead connecting with reversed polarity. When contact is made (see Fig. 1) the coil H. is energized, magnetizing poles G. which magnetism attracts the pallets J. on the balance wheel (in later models the balance itself is made of iron) towards the poles G. In so doing, tension on the hairspring E. is being developed as the magnetic pull displaces the balance wheel position to a point where the contact breaks. The momentum of the wheel itself carries the wheel still further. When the momentum is spent or meets with the hairspring tension the balance reverses towards its starting point, contact is again made as the contact pin I, passes finger II, but this time the magnetic pull attracts the opposite ends of the armature (Balance). This action is identical with the roller jewel action of the watch you handle every day, it takes place 300 times per minute and therefore your finished job can be rated upon your rate recorder.

To prevent the contacts from burning and pitting with long continued service a specially developed resistor O, is placed across the circuit from K. to P., this is insulated from the screw A, except at the nut K, so contact is confined to the coppered ends only. This is a delicate carbon resistor and is easily cracked if handled roughly. Its resistance should never be less than 1,200 or more than 2,300 ohms. Avoid substitutes. Care must also be used in handling the coils, in it are thousands of windings of very fine copper wire and shorts can occur from too much pressure or puncture of the wrapping.

To insure starting, a shunt is built in the movement, Fig. 6, between the back end of center post and setting device, this,

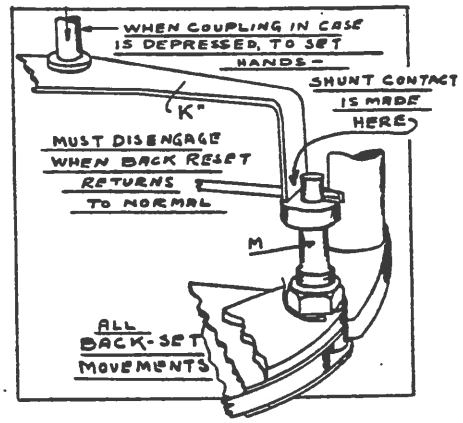


FIGURE 6

is a bronze flat spring K. which conducts the current around the contact directly into the coil lining up the balance in the magnetic path. Upon release the hairspring returns the balance towards its former position with force enough to make a snappy contact that starts the clock on

its way. For this reason setting the hands after the clock has been dead or stopped, automatically starts the clock. Since current consumption in this position is a little greater than during regular operation, it should not be left upon the starter, longer than necessary to set the hands.

Both the pin on the balance wheel and the flipping finger are made of a special platinum iridium alloy and no attempt should ever be made to use substitutes. These should NEVER be OILED. The relation of the contact finger and pin is very important. When the balance wheel

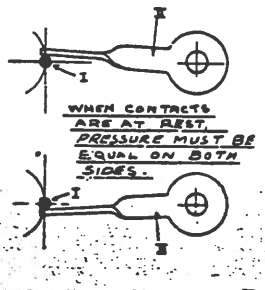


FIGURE 7

is at rest, the finger II, has a slight pressure against the contact pin I, on one side. This pressure should be equal on both sides of the contact pin, Fig. 7. To equalize this pressure the hairspring collet may be moved on the balance staff just as you put an ordinary watch in beat. In its rest position the contact finger must point

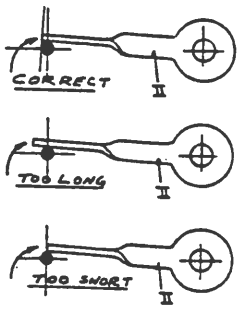


FIGURE 8

directly to the center of the balance staff. This adjustment is possible by moving the collet on the tail spring N. Fig. 1. The end of the contact finger should be flush with the inside of the pin as shown in Fig. 8. The contact pin I, must be absolutely straight and upright, and tightly staked in or it will give erratic performance. The finger pin II, must have a snappy return from both directions and its hinge pin straight. Be certain the hinge pin N, is pushed properly down to avoid excessive end play. It is necessary that the contact spring N, be true spirally, so coils do not rub each other and cause a buzz or singing sound under vibration of the flipping finger. OIL must be used SPARINGLY, if at all, on the hinge pin to prevent oil creeping to the contact points.

The balance jewels are practically identical with those you are accustomed to servicing therefore no instructions need be given here, in the early models end shake in the balance was controlled by altering the height of the balance bridge with washers placed under it. In the later models the jewel mountings are in screws and end shake is had in the same manner as many jeweled alarm clocks.

The escapement of this clock differs greatly from anything usually found in timekeepers and should be studied closely, see Figs. 1 and 12. The levee cam V. on the balance staff just below the balance wheel has two oppositely inclined planes that engage the diamond shaped teeth of the escape wheel. There are two relative positions of these important parts that must be checked from two directions, Fig. 12. In the view from the top A, can be seen how the escape wheel should line up with the balance staff pivot center when the balance is at rest. B, is a front view of the same position. The escape teeth should engage the levee discs, as deep as possible, preferably ¾ the depth (never less than ½). While the bracket X, and the post W, Fig. I should place this position right it may be found that some inexperienced person has bent one or the other so that they crowd and jam, or, are too far apart and do not mesh properly. This latter condition will cause the levee cams to strike the side of the escape teeth. This relation of the levee and the escape wheel could be considered the heart of the

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instrument and therefore is very important. Should escape wheel teeth become damaged as a result of deformed levee cams or other causes, wheel should be replaced with a new one for clock will not operate with damaged teeth even after levees are repaired. Good heavy tweezers are used to repair levee, for manipulation and proper adjustment see Fig 13. The space at A, Figs. 12 and 13 can become bent out of parallel, so that the teeth of the escape wheel stick between or outside this track, any attempt to correct this condition must not leave a kink in the levee discs, or loosen them in their seats. The vertical space or levee gap between the upturn end of cams is very important and is but .012 or less than 1-64 of an inch.

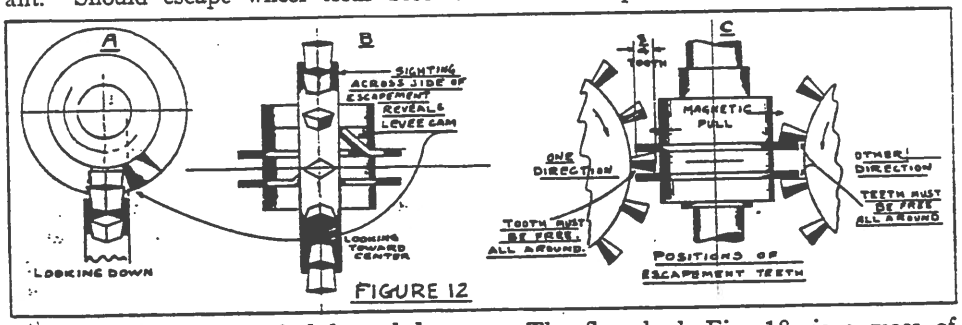

FIGURE 12

The hairspring in this clock is very much like the usual run of such springs you are accustomed to handling—must be true in both the flat and round—it has been designed especially for this clock of a material that compensates for the temperature errors, so do not replace with commercial springs.

The fly wheel, Fig. 18, is a mass of weight intended to function as inertia to hold the escapement steady, and is mounted beside the escape wheel. It must be free and allowed to float at will as the clock runs. Do NOT oil it. The highly polished wire worm Y, is not an ordinary steel spring, but a carefully pitched, one-tooth spiral made to mesh with the special tooth of center wheel Z. The bracket X is made to support this work properly, and is adjustable.

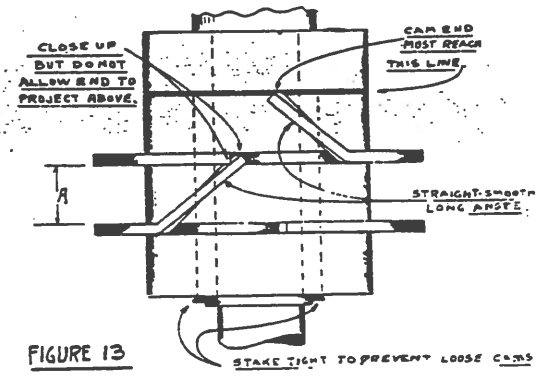

FIGURE 13

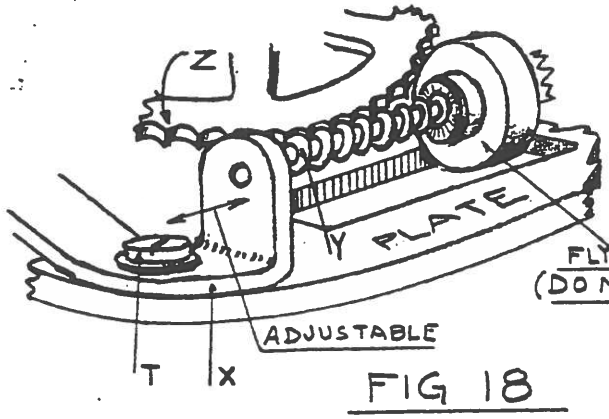

FIG 18

One of the first things to look for in a clock giving trouble is short circuits, a shorted movement can happen. Discoloration of parts, indicating heat, burned hairsprings or burned contact springs, or the contact pin on balance wheel, are clues that sug-

gest a short circuit. Check the screw A, Figs. 1 and 2, its only contact must be with the nut K. Inside the resistor O is a fiber tube that should extend through the upper plate insulating the screw from it. The two bakelite strips on each side of the main plate insulate it from the main plate. A cracked or damaged resistor will cause the contact points to burn quickly and should be replaced. The insulation construction is the same for all models of movements—the contact finger post AA must be insulated from the main plate, this is by air gap. If the holes in the bakelite strips do not coincide with the larger hole in the main plate, this post could touch the plate or foreign metal particles get into the air gap and cause a short.

The tail screw M, has a "spaghetti" tube insulator around the portion that protrudes thru the plate, the last two are not really shorts, but, shunts. These set up the same condition as described in starting, a real short will heat or flash, a safe rule is to trace the current with a meter like a continuity meter.

Noisy operation may be overbanking of the balance by improperly located levee gap, causing a one-sided pound against the escapement, or can be caused by friction due to improperly assembled or adjusted parts, no end shake, etc. If your clock fails to start the trouble may be with the contact spring mentioned as the starter, it may not contact on the tail screw collet of the contact spring when the hand set crown is pushed down. There may be a short circuit, or contacts may not meet equally on both sides under pressure. The reset coupling may be stuck and failing to return to its normal out position. Terminals may be loose, or connections poor. Contacts may be oxidized from operating with a defective resistor. The flexible reset used on some models may not be working properly.

When in doubt or you have a clock that you can't seem to get in perfect order REMEMBER that the company has special factory representatives in most large cities—one might be near you—or, you can always send the clock direct to the manufacturer. Any six volt storage battery is sufficient to time the clock for a period long enough to regulate it; if you expect to handle much of this type of work we suggest that you equip yourself with a good battery and a charger to keep it up, the Jaeger clock is so designed that it will operate equally correct at voltage variations of about 50% more or less than the six volts it is built to operate upon. When regulating you will find that one division of the regulator scale may vary the clock as much as two or three minutes in 24 hours. Your repair job should be timed in your shop to within thirty seconds per day before releasing it to the owner.

We have purposely omitted comments upon cleaning, oiling, manipulating the hairspring, etc., for the reason that the principles involved are already familiar to the horologist at the bench, we sincerely hope that these few pointers together with the sketches will enable you to, first, handle these jobs as they should be; second, give your customer a satisfactory job, thereby preserving his confidence in you as a repairman and the product he has bought. Last but not least, enable you to turn out a satisfactory repair job with a dispatch and promptness that will bear some profit.

(More articles on the 6-volt automobile clock, will be presented in later issues.—Editor.)

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THE NEW

Balance Wheel Electric Clock

(MURDAY'S PATENT).

THE REASON MANUFACTURING CO. LTD. TRADE MARK REG°

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10

REASON MANUFACTURING COMPANY, LTD.,

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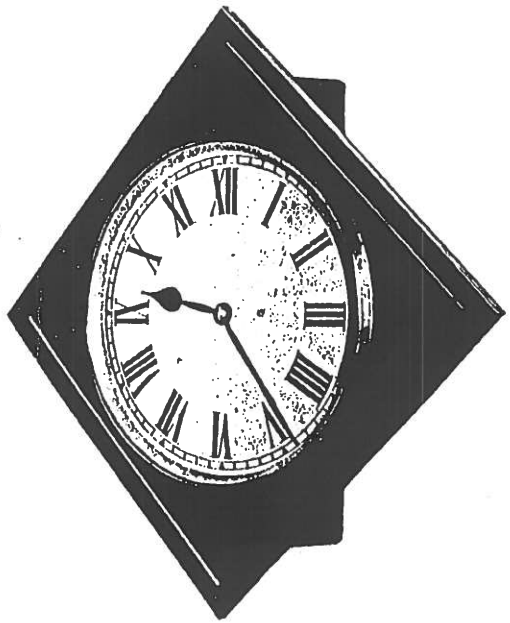
Electric Pendulum Clock.

No. 5.



Diagonal frame, in fumed oak, with 12in. dial, fitted with half-seconds pendulum movement, as shown in figs. 1 and 2, suitable for Workrooms, Offices, Schools, &c.

PRICE—**£2 12s. 6d.** each.

REASON MANUFACTURING COMPANY, LTD.,
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THE NEW

Balance Wheel Electric Clock

(Murday's Patent).

THIS consists of a large and heavy balance wheel electrically operated on a somewhat similar principle to the pendulum in our other electric clocks. The balance wheel drives the wheel train, not vice-versa, as in a spring-driven clock or watch.

When the arc of oscillation falls to a certain fixed minimum, the electric circuit is automatically closed and fresh energy is imparted to the balance wheel, by the action of an electro-magnet and armature, sufficient to keep it vibrating for an interval of about two minutes—more or less—according to the condition and strength of the battery.

As with the pendulum operated on this intermittent method, the time-keeping is practically independent of variation in battery power.

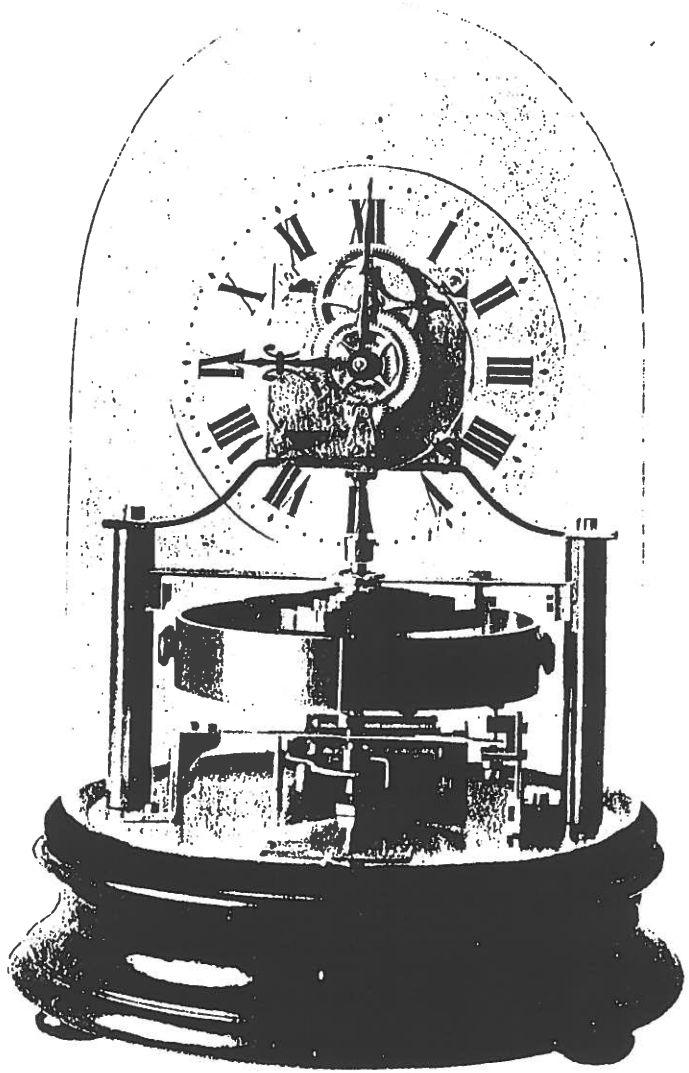
The balance wheel is made of a special nickel steel alloy which is unaffected by changes of temperature and thus does away with the complicated construction of a compensated wheel rim. The hardened steel pivots of the balance wheel staff or arbor are running in large sapphire cups, the friction being almost nil.

A regulator arm is provided which acts on the giant controlling hairspring exactly as in a watch.

By means of a roller attached to the upper part of the staff a lever is made to operate the wheel train at every oscillation of the balance wheel. This action is particularly safe and almost silent.

The illustration shows the balance wheel clock mounted on a solid, turned and polished base, containing the two driving cells, and protected by a glass shade 12 inches high. The total height over all is about 15 inches by 10 inches dia. base.

The dial is a glass circle 5½ inches dia. with figures enamelled on in black, white, silver or gold as preferred, and in Roman or Arabic design—white figures show up best.



Price - **£4 4s.** each.

the fork of the crutch, after which an impulse given to the pendulum by hand will start the clock going without further trouble.

All the various designs are fitted with movements of a construction similar to the foregoing description and illustrations Figs. 1 and 2; the difference in price being due to the style of case.

Instructions for setting up Self-Contained Pendulum Clocks.

The platform to which the movement, dial and battery are fixed must be drawn out of the case and the packing removed. The string holding the crutch should be undone, and the pendulum carefully hooked on the suspension spring which is fixed in the top of case, the opening in the hook being kept towards the front.

Using the pendulum as a plumb bob, level the case by means of the adjustable balls attached to the feet until the iron armature on the lower end of the pendulum rod hangs truly over the magnet poles. It is very important that this adjustment be carefully made, and that the case is steady and does not rock.

When replacing the movement platform, see that the pendulum rod passes between the tangs of the crutch fork. The pendulum should be set swinging through a good arc, and it will afterwards continue to swing of its own accord.

If the clock is to be moved temporarily at any time, it will be found best to secure the pendulum by springing it into the brass hook provided for this purpose at the left-hand side of the case.

When packing for transit the pendulum must be removed from the case and packed separately, while the crutch should be tied up to the left and paper packing placed between the cells as when sent out.

Regulation is accomplished as in other pendulum clocks by means of the thumb screw beneath the bob. Raising the bob will make the clock go faster, while lowering it will have a slowing effect. One turn of the screw will make a difference of about half-a-minute per day.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Self-Contained Electric Pendulum Clocks

(Murday's Patents).

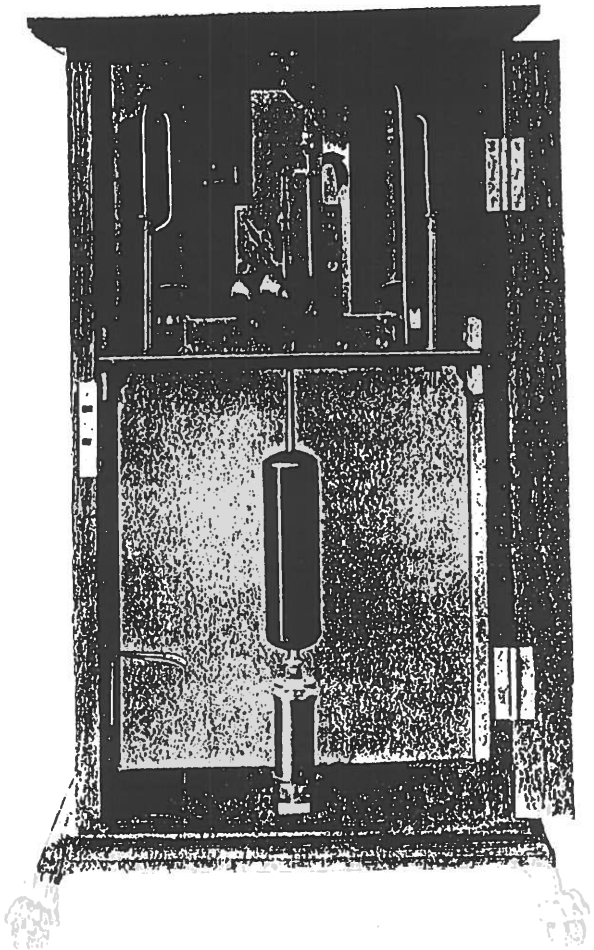


Fig. 1.

GENERAL DESCRIPTION.

Fig. 1 shows a general view of the mechanism of a half-seconds pendulum clock with the dial removed. It will be observed that the wheel train is extremely simple, and

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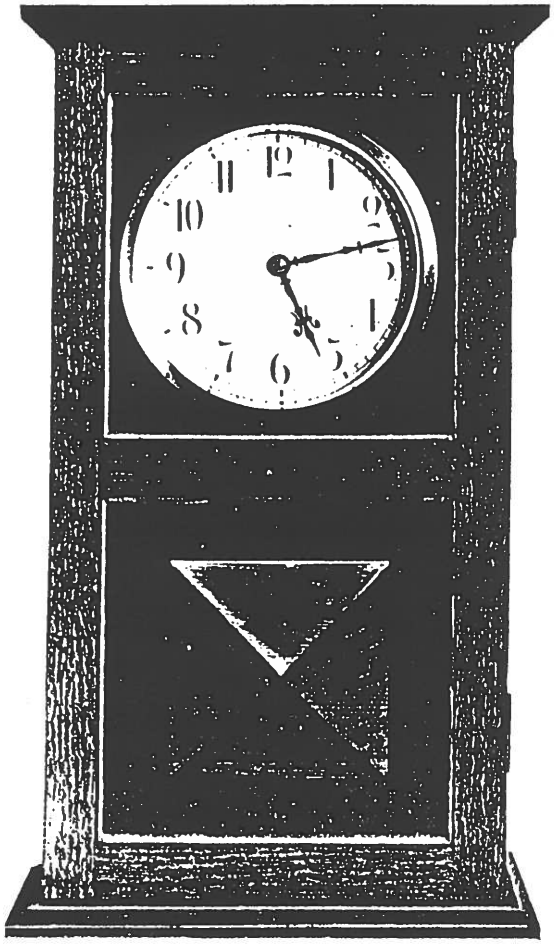
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock.

No. 1.



Fumed oak case with panelled door, best quality enamelled dial 6 inches dia., bevelled plate glass, mounted in solid brass bezel. Size of case, 18 in. high, by 10 in. by 6 in.

PRICE—**£2 2s.** each.

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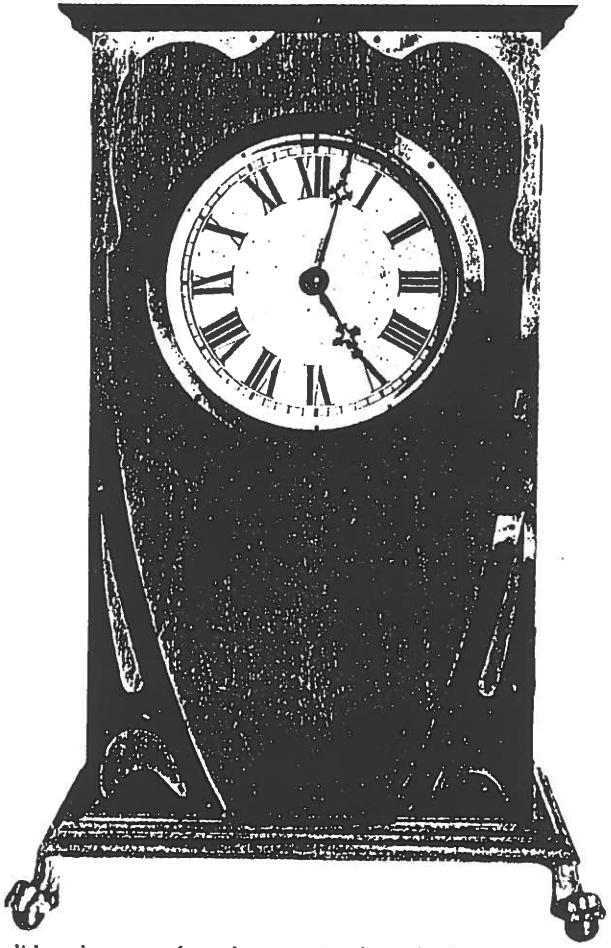
Electric Pendulum Clock.

No. 2.



Solid oak case, fumed or stained, with brass or copper mountings.

PRICE—**£3** each.

Highly polished mahogany case, with brass or copper mountings.

PRICE—**£3 3s.** each.

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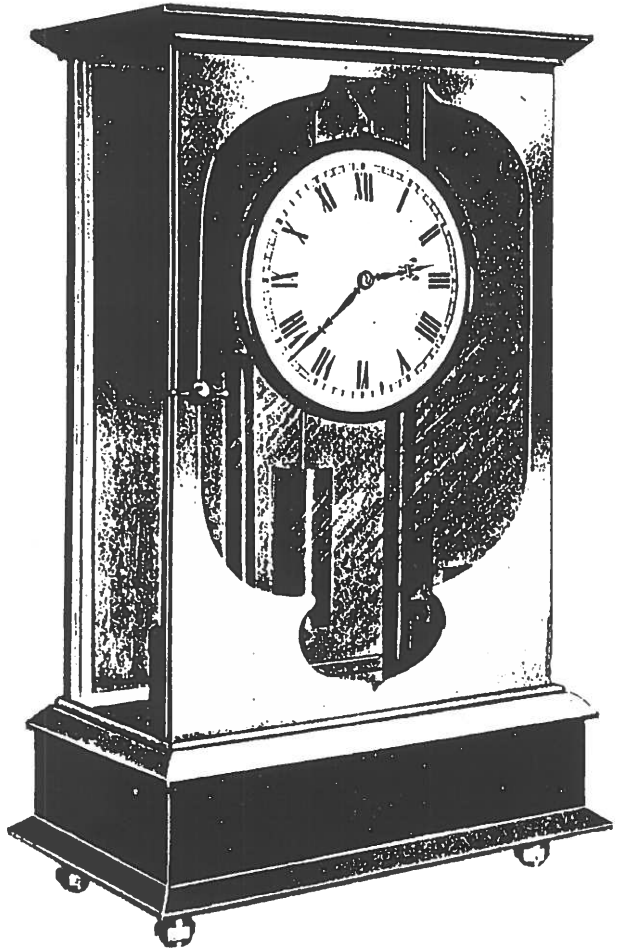
Electric Pendulum Clock.

No. 4.



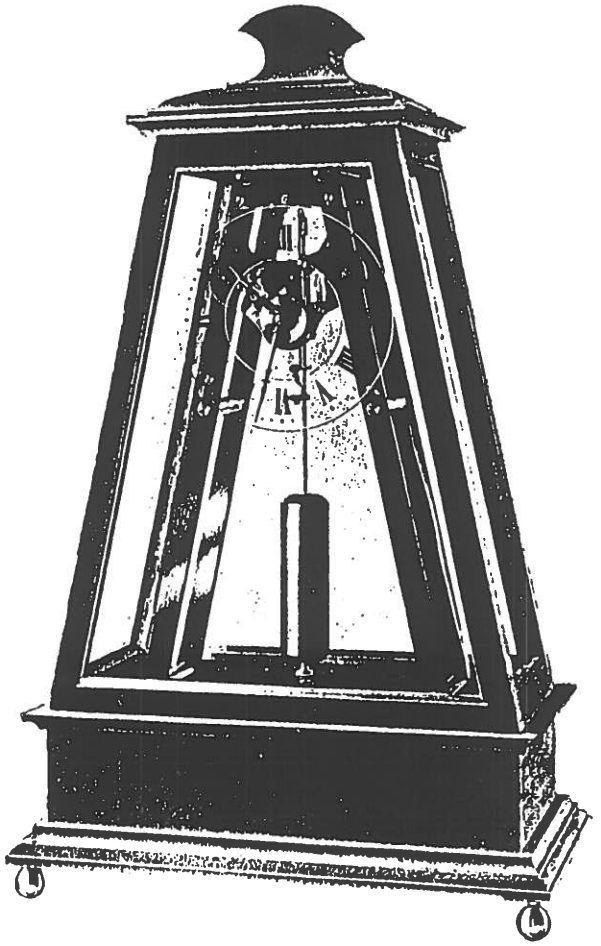
A handsome case consisting of solid brass pillars with heavy bevelled brass base and top, glazed with best quality plate glass, hinged brass and glass door, the whole mounted on polished mahogany base containing the cells.

PRICE—**£4 4s.** each.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock.

No. 3.



"A" design. A novel form of case, in highly-polished mahogany and glass, showing all working parts. The dial is a glass circle, 5½ in. diameter, with figures (Roman or Arabic) painted in white, silver or gold as desired. The battery of two cells is contained in the base.

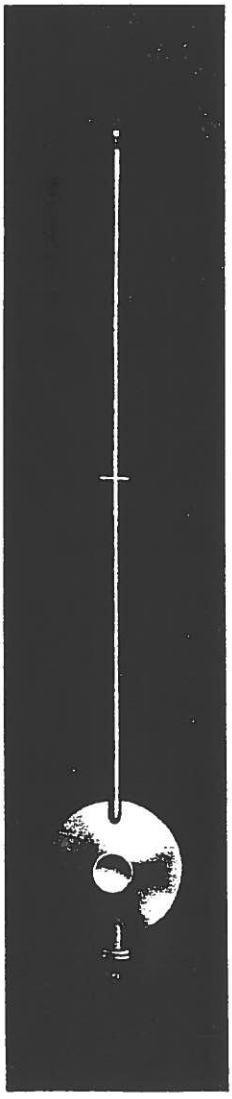
PRICE **£3 3s.** each.

CLEMENS RIEFLER
FABRIK MATHEMATISCHER INSTRUMENTE
8964 NESSELWANG / Bayern

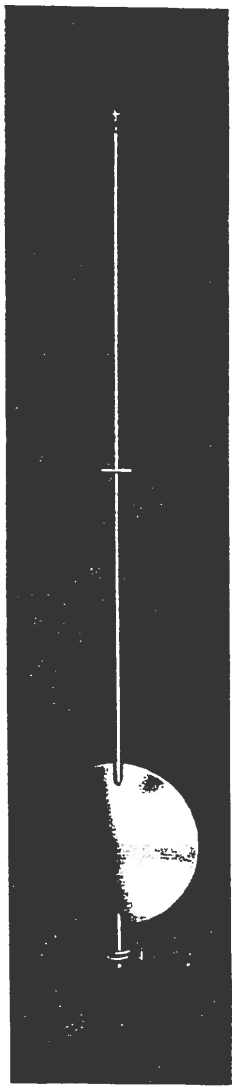
RIEFLER

Nickelstahl-Kompensations-Sekundenpendel

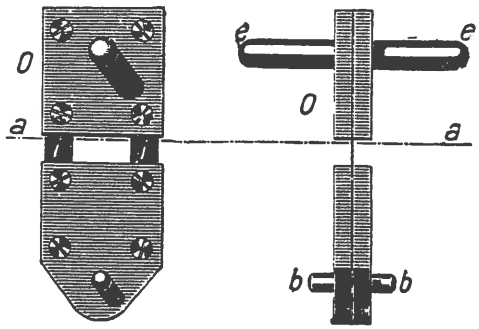
Nickel steel compensation seconds pendulums



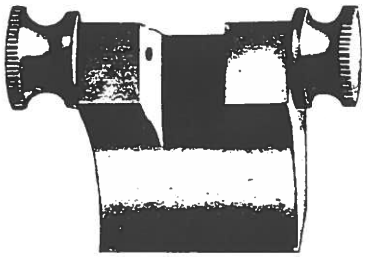
Nr. 121
Sekundenpendel
Type J



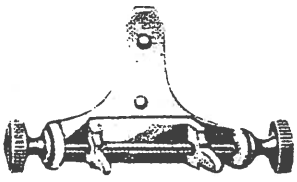
Nr. 124
Sekundenpendel
Type K



Nr. 132 Pendelfeder für
Sekundenpendel



Nr. 135 Pendelfederbock für
Sekundenpendel



Nr. 137 Pendelführungsgabel mit
Mikrometerschraube

RIEFLER

RIEFLER

Nickelstahl-Kompensations-Sekundenpendel

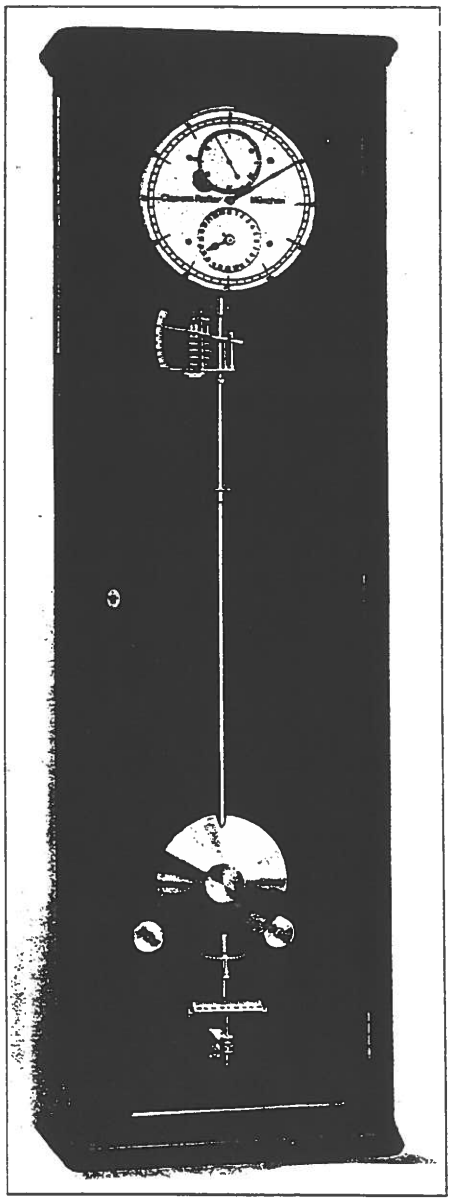
Nickel steel compensation seconds pendulums

Nr. 121	Type J	Nickelstahl-Kompensations-Sekundenpendel mit 14mm starkem Pendelstab Kompensationsfehler: ± 0.005 Sec/°C Nickel steel compensation seconds pendulum 14mm pendulum bar diameter compensation error ± 0.005 Sec/°C
Nr. 124	Type K	Nickelstahl-Kompensations-Sekundenpendel mit 10mm starkem Pendelstab Kompensationsfehler: ± 0.02 Sec/°C Nickel steel compensation seconds pendulum 10mm pendulum bar diameter compensation error ± 0.02 Sec/°C
Nr. 125	Type L	Nickelstahl-Kompensationspendel für 80 Schwingungen mit 10mm starkem Pendelstab Kompensationsfehler: ± 0.02 Sec/°C Nickel steel compensation pendulum for 80 oscillations 10mm pendulum bar diameter compensation error ± 0.02 Sec/°C

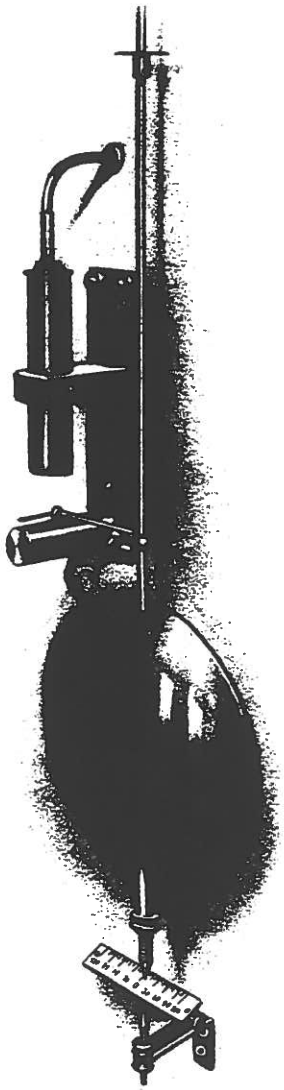
Zubehör - Accessories

Nr. 132	Type O	Pendelfeder für J und K Pendel Pendulum suspension spring for J and K Pendulums
Nr. 135	Type P	Pendelfederbock für J und K Pendel Pendulum suspension bracket for J and K Pendulums
Nr. 134	Type Q	Pendelfeder für 80 Schläger-Pendel Pendulum suspension spring for L Pendulum
Nr. 136	Type R	Pendelfederbock für 80 Schläger-Pendel Pendulum suspension bracket for L Pendulum
Nr. 137	Type S1	Pendelführungsgabel mit Mikrometerschraube Pendulum crutch with micrometer screw

Präzisions-Sekunden-Pendeluhren
Precision Seconds-Pendulum Clocks



Type A 3



Elektrische Lichtkontakt-Einrichtung

Photo-electric contact-device for time-recording

Nr. 106 Type A 3 **Sekundenpendeluhr** in staubdichtem Holzgehäuse, mit Schwerkraft-Hemmung, Nickelstahl-Kompensationspendel Type K, elektrischem Aufzug, elektrischem Sekundenkontakt, mechanischer Einstellvorrichtung zur Korrektion des Uhrstandes, 3 Trockenelementen und Schieberwiderstand für den elektrischen Aufzug, mittl. tägliche Gangvariation: 0,05 - 0,08 Sekunden

Zusatzeinrichtungen:

Elektrische Lichtkontakteinrichtung
bestehend aus: Photozelle - Beleuchtung - Verstärker. Genauigkeit: ± 0,001 Sekunde

Nr. 141 **Luftdruckkompensation**
mit Hebelübersetzung und Zeiger zum Ablesen des Barometerstandes

Nr. 141a **Luftdruckkompensation**
ohne Hebelübersetzung, ohne Ablesezeiger

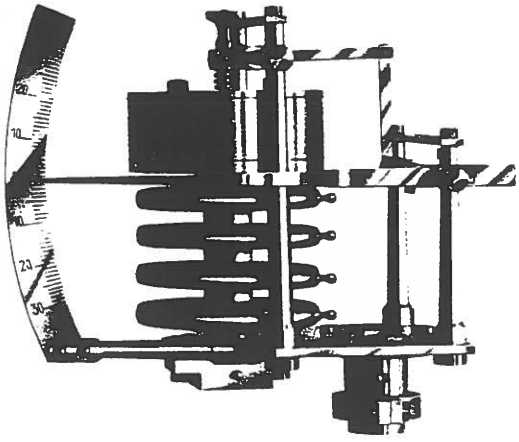
Nr. 106 Type A 3 **Seconds pendulum clock**
in dust-tight wooden case, with gravity escapement. nickel-steel compensation pendulum type K, electric winding, electric secondscontact, arrangement for regulating the clock mechanically, 3 dry elements and sliding rheostat for the electric winding
Daily variation of rate of the clock type A 3: 0.05-0.08 seconds

Additional equipment:

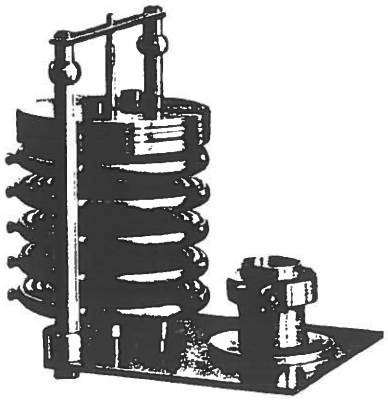
Photo-electric contact-device
for time-recording consisting of: photo-electric cell - lamp - amplifier
accuracy of measurement: ± 0.001 second

Nr. 141 **Air pressure compensation**
with lever transmission and pointer for reading the height of the barometer

Nr. 141a **Air pressure compensation**
without transmission and pointer



Nr. 141



Nr. 141 a

PRICES

October 2, 1970

1 No: 106 Type A.3 PRECISION SECONDS PENDULUM CLOCK

in dust-tight wooden case
with gravity escapement
Nickel-steel Compensation Pendulum Type K
electric winding
electric seconds contact
arrangement for regulating the clock mechanically
3 dry elements
sliding rheostat for the electric winding

daily variation of rate of the clock : 0.05 - 0.08 seconds

..... DM 7.530.--

1 Photo-electric contact device

for time-recording - consisting of :
photo-electric cell - lamp - amplifier
accuracy of measurement : ± 0.001 seconds
.....DM 1.250.--

1 No: 141 a Air pressure compensation

standard type , without transmission and pointer
.....DM 410.--

Delivery time :	within about 4 - 6 months upon receipt of final order
Prices :	the indicated prices are net prices, without any further deduction
terms :	ex works packing charges will be invoiced ..... DM 250.-- packing is seaworthy in double wooden case
Shipment :	by boat (via Hamburg or Bremen port)
Payment :	is requested by irrevocable letter of credit on our export bank the Bankhaus H. Aufhäuser, Munich/Germany together with your order - or by payment of 50 % together with your firm order rest upon presentation of documents.

20

CLEMENS RIEFLER
Fabrik mathem. Instrumente
NESSELWANG / Germany

OPERATING INSTRUCTIONS

for

TIME CONTROL DEVICE UG.1

In this Time Control Device UG.1 all the secondary instruments and parts of the Master Clock, as mentioned below, are joined to one instrument :-

a) Pips Generator, 1000 cycles, with Amplifier and Signal Release

b) Controller SG.008

c) Seconds Relay No: 410 001/4

d) Current Supply Device for a) to c) as well as for the Slave Clocks

1.) The Pips Generator furnishes a 1000 cyclès voltage which is amplified by an amplifier to an output voltage of 1.5 Volts. Among the generator and the amplifier there are connected the clock contacts of the Master Clock for the release of 6 signals in intervals of 1 second at full hour and 3 signals in intervals of 1 second at half hour. The exact duration of the pips of 0.2 seconds is electronically determined in the generator amplifier.
The generator is fully transistorized.

2.) The Controller SG.008 comprises, in addition to the contact spark quenching, a high-sensitive relay, which protects the seconds contact of the Master Clock against damages which might occur at too high current. Furthermore, this relay is used for transferring the normal working contact of the Master Clock to a pole-changing contact, which is required for the operation of the Slave Clocks.

3.) The Seconds Relay Nr. 410 001/4 is a sturdy pole-changing relay for the simultaneous drive of 20 to 30 Slave Clocks. The relay contacts are protected by a fine-wire fuse of 0.8 amperes. At short-circuits in the feeding-wires of the Slave Clocks this fuse is melted and must be interchanged. The seconds relay with the pertaining fuse and the neutralizing condensers is protected by a removable cap.

4.) The Current Supply Device is designed for the operation at 220 Volts alternating current supply. The line-voltage of 220 Volts can be controlled by a volt-meter at the front-plate of the instrument. The line-voltage shall not fall under 200 Volts, as otherwise the current-supply for the Slave Clocks and the relay, the amplifier, etc. would be too low.
The alternating voltage will be transformed, rectified smoothed and specially stabilized for the pips generator with amplifier.
The rectified working voltage for the Slave Clocks is indicated by another volt-meter on the front-plate, and it shall not be under 12 Volts and not over 18 Volts.

The current supply is switched-on by a main-switch on the front-plate. Near to this switch there is the main-fuse 0.3 amperes. The current-supply is sufficient for the operation of 30 Slave Clocks.

In completion of the Time Control Device UG.1 we can furnish a separate additional device to maintain the operation of the clock plant at line-voltage failures. Without this additional device there will be no current feed to the UG.1 instrument, in case of line-voltage failures. The additional device and the pertaining line-voltage-failure battery are connected to a plug connection on the front-plate of the UG.1 instrument. At operation without this additional line-voltage-failure device this plug connection is closed by a plug which may not be removed, as otherwise the current is interrupted.

5.) Connection of the Time Control Device UG.1. This device shall be placed near to the Master Clock, so that the length of the connection cable of 2 meters will be sufficient.
First, please take the 7-pole cable-plug at the clock-work of the Master Clock and connect it to the plug-connection inside the clock-casing.
Then connect the cable of the Master Clock to the 5-pole plug-connection on the front-plate of the UG.1 device, and

5.) contd.

then the Slave Clocks will have to be connected to the right plug connection of the front-plate (pole 1.3 = Clock voltage 12 Volts).
All Slave Clocks must be parallel-connected. The polarity of these clocks is not important. But it is possible, by switching-over the connection plug and therefore by changing the poles at the single Slave Clocks, to attain a simultaneous seconds indication of all the Slave Clocks. The minutes- and seconds- indication of the Slave Clocks can be adjusted by two small knurled nuts at the rear of the slave-clock-works.

Below the center of the front-plate of the UG.1 device, there is a plug connection for the 1000 cycles time-signals (pole 1.3 = 1000 cycles, pole 2 = earth). At each full hour 6 signals, and at each half hour 3 signals will be released, of 0.2 seconds duration each, in intervals of 1 second. The beginning of the last 0.2 seconds-pips is simultan with the beginning of the full hour, respectively the half hour. The output voltage is 1.5 Volts at a load-resistance of $\geqslant$ 200 Ohms and is designed and sufficient for the modulation of an amplifier for a radio transmitter and similar purposes.

The UG.1 device is connected to the 220 Volts alternating current line-voltage by a fixed cable with plug.

The Time Control Device UG.1 is operated by switching-on the main-switch on the front-plate.

Plastic Alarm Dial Plate for **SETH THOMAS** 120 v. el. alarm clock, Model POISE E-861-000.
Richard McCahan, P.O. Box 1296,Center Harbor, NH 03226. (603) 253-4110

SYNCHRONOME MOVEMENT. Henry Weiland, 8946 W. Grantosa Dr., Milwaukee, WI 53225

REPAIR: ALL EARLY BATTERY CLOCKS Specializing in **BULLE** using orig. parts.
Martin C. Feldman, FNAWCC, 6 Stewart Pl., Spring Valley, NY 10977

FOR SALE: **SWCC** Western Union, 15-1/2" convex "glass". Actually it is plastic, but it beats a naked dial. $20.00 (I'll pay UPS up to $5.00) Paul M. Hopkins, 2717 Millwood Rd., Birmingham, AL 35243 (205) 967-1237

BULLE Electric Gallery Clock w/ 12" dial, 17" square overall, walnut wood case w/ pendulum. **BARR** Electric Mantle Clock w/ Glass Dome. **SWCC** Dials and other electric dials and movements.
BARR Electric mantle clk. w/ glass dome. 14" **SWCC** Dials nice, other Dials, Mvts. 60 beat clks, 4 each.
George Frederickson Sr., 1716 West 100th Place, Chicago IL 60643 (773) 238-3294-evenings or 445-5381

Replacement Field Coils for **SESSIONS** and **HAMMOND** synchronous clock movements.
Wining's Clock Service, 2910 Farmdale Rd., Akron, OH 44312 (216) 628-1654

Glass Domes for the **Tiffany Never Wind** and other early electrical & battery clocks. If I don't have it in stock I'll try to get it. Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax. www.glassdomes.com

PUL-SYN-ETIC (pg. 93, 150 Yrs. E. H.) excellent condition, all original & runs $750 **CHROMATIC** (very similar) dirty case, no pend. $250. **MAGNETA** (pg. 89, 150 Yrs. E. H.) case needs refinishing, Howard motion works $450. All 3 for $1200 + shipping
John Perrigo, 5431 Crestview Dr. Hixson, TN 37343, (423) 875-0453 late evenings.

Requests for reprints of previously published material should be directed to the Chapter Historian:
Dr. George Feinstein 75-19 195th Street Flushing, NY 11366

— MART —

All MART Ads are FREE, Send copy to the attention of the Editor:
Harvey Schmidt, 75-80 179th St., Flushing, NY 11366. Limit 3 lines.

WANTED: **HOROLOGICAL LITERATURE**, Repair info, Catalogs, etc. for the Journal
PORTESCAP Secticon Clock or Movement. Antique Watch & Clockmaker's Tools & Machinery.
(718) 969-0847 Harvey Schmidt, 75-80 179th St., Flushing, NY 11366

Junker **EARLY BATTERY CLOCKS**, Movements, Parts, etc, send details.
Martin C. Feldman, 6 Stewart Pl., Spring Valley, NY 10977

BANGHOR Electric, or **NEW ENGLAND Electric,** or a **CONTINUOUS Electric** wall clock. Also want a nice wooden case **TELECHRON** wall model. Phone: (817) 267-9851, Fax: (817) 267-0387
Steve Cunningham, 3200 Ashland Drive, Bedford TX 76021. Email: cunning@cyberramp.net

ITR, STROMBERG, STANDARD, & SWCC Movements and Parts for Master Clocks. Also Wood Cased Slaves. Call or send photo (914) 997-5670 Mitch Janoff, 3 Stratford Ave., White Plains, NY 10605

ELECTRO-MECHANICAL Clocks, Fancy & Simple Cased. Unusual Clocks, Movements. Books.
Elliot B.Siegel, #2 Oakwood Drive, Lloyd Harbor NY 11743, Day or Night (516) 541-2400 or 351-5869

HANDS for a 13 inch Chapter Ring. (312) 238-3294 - evenings or 445-5381.
G. Frederickson Sr. 1716 W. 100th Pl. Chicago IL 60643

SIMPLEX Movement for Timerecorder, 16 ½" Pendulum. Also wanted **BRILLIE,** Type 1578, 1595, or 1592. Repairable condition, Price. Kenneth Erlenbusch, 124 North Avena, Lodi, CA 95240 (209) 369-5833

Milliammeter from the 1920's, working condition.
Kenneth Erlenbusch, 124 North Avena Ave., Lodi CA 95240, (209) 369-5833 after 4 PM PST.

TIFFANY NEVER WIND Suspension Unit and Pendulum; Clocks and Parts, any condition. Clocks made by **The American Clock Co.** or the **No Key Clock Co.** Working or not
Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax.

Dead Coil Assemblies for **KUNDO's**, Single or Dual Coils, for Possible Rewinding Project. Also "B" **TELECHRON** Rotor, 1 rpm, 50 (fifty) Hz. John R. Seeley, 7541 Meridian St., Miramar FL 33023-4770 (954) 963-7456.

Movement for a **HAMMOND** Clock: the required movement has a FRONT ENTERING motor starting knob, mounted just below the hour post. I am advised that this may have been a **SESSIONS** movement with a **HAMMOND** motor. The dial has the legend: "HAMMOND MOTORED". Movement for a **SANGAMO** BANJO CLOCK: the desired movement is electric motor-powered spring wound, with front mounted escapement. The regulator on the escapement is bent at a right-angle so that it extends through the dial. The dial has an opening that is marked: "S-F". If your movement escapement doesn't have the right-angle bend, I think I could adapt it. Mel Kaye, Box 682, Short Hills NJ 07078 (973) 912-0038 FAX (973) 912-8092

Electric Clocks by **HAMMOND, WHITEHALL-HAMMOND,** and **HERMAN MILLER.** Also advertisements, catalogs, etc. on same. Collector will pay fair prices. Jack Shelton, 7975 N. Hayden Rd. #C-100, Scottsdale, AZ 85258. (800) 488-1818 x7106. E-mail: a1017@amug.org

THE ELECTRICAL HOROLOGY SOCIETY

CHAPTER #78
NATIONAL ASSOCIATION OF WATCH & CLOCK COLLECTORS

VOLUME XXIV #2, JUNE 1998

Fellow Horologists:

A word or two to provide an update on my present physical condition in reply to the many requests from our members. My knee has pretty much recovered after the joint replacement surgery, but my hip is responding more slowly, a conservative estimate was for a year 'till complete return to normal! Many thanks to all who have communicated their good wishes and sent cards and letters. It is truly heartwarming to be the recipient of so many good-will wishes.

On a sadder note... We have lost a valued member who has provided us with many articles and items for publication in the past years... CHARLES K. AKED passed away in April of this year leaving a void that cannot be filled. We'll miss you Charles. (A note of condolence was sent to Mrs. Aked in the name of the chapter.)

An additional word of thanks is due to Harvey Schmidt and George Feinstein for their efforts in taking over the main responsibilities of preparing the journal in addition to their other chapter duties. Your efforts are appreciated, and a big thank you to both of you.

This issue contains the start of an catalog describing the SOHM electric clock system, a continuation of the REIFLER clock material, and set-up information for the ENGLISH CLOCK SYSTEMS clocks. Thanks to Steve Berger for the Sohm material. Steve has contributed material for publication many times in the past, and we don't always remember to thank him, so this one covers the times we missed. Steve, we are in your debt once again. Perhaps this will act as a stimulus to other members to follow suit and submit articles for future journals. Original material is equally welcome.

Good reading ahead...

Martin Swetsky, FNAWCC, President (Now and again)

HARVEY SCHMIDT, FNAWCC, Secretary-Treasurer, 75-80 179th ST. FLUSHING NY 11366

SOHM SYSTEM

Catalog

Sohm Electric Clock Company
Chicago Illinois

Sohm Electric Clock Company

PATENTEES AND MANUFACTURERS OF

ELECTRIC SELF-WINDING CLOCKS

MASTER CLOCKS AND REGULATORS

FOR ELECTRICALLY OPERATING
AND CONTROLLING

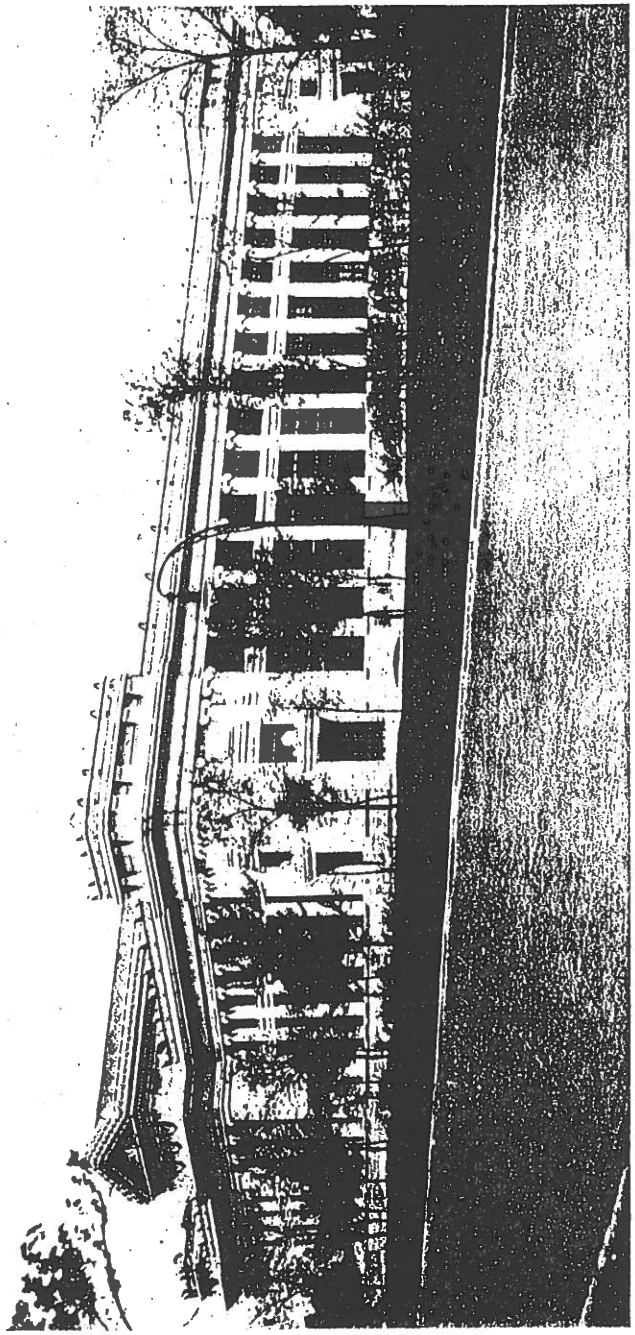
SECONDARY CLOCKS,
TOWER AND STREET CLOCKS, TIME STAMPS,
EMPLOYEES' TIME RECORDERS,
COST FINDING DEVICES,
PROGRAM MACHINES WITH
BELLS, GONGS, ETC.,

FOR USE IN

SCHOOLS, COLLEGES, FACTORIES, BANKS, ETC.

SYNCHRONIZERS OF ALL KINDS

Main Office and Factory
841-845 Blue Island Avenue
CHICAGO, ILLINOIS



CARTER H. HARRISON TECHNICAL HIGH SCHOOL—CHICAGO, ILLINOIS

This school has the finest time system in America, consisting of one Sohm self-winding master clock operating and controlling 137 Sohm secondary clocks and a Sohm 8-circuit 18-hour program machine Erected in 1913 at a cost of $3,000,000.

FRANK L. MORSE, Principal. JAMES J. SPAIN, Chief Engineer.

Foreword

We manufacture and distribute complete electric time systems for banks, business houses, stores, factories, shops of every kind, industrial plants of every description, schools, colleges, libraries, hotels, garages, public buildings and all places where accurate time control and time recording is desired.

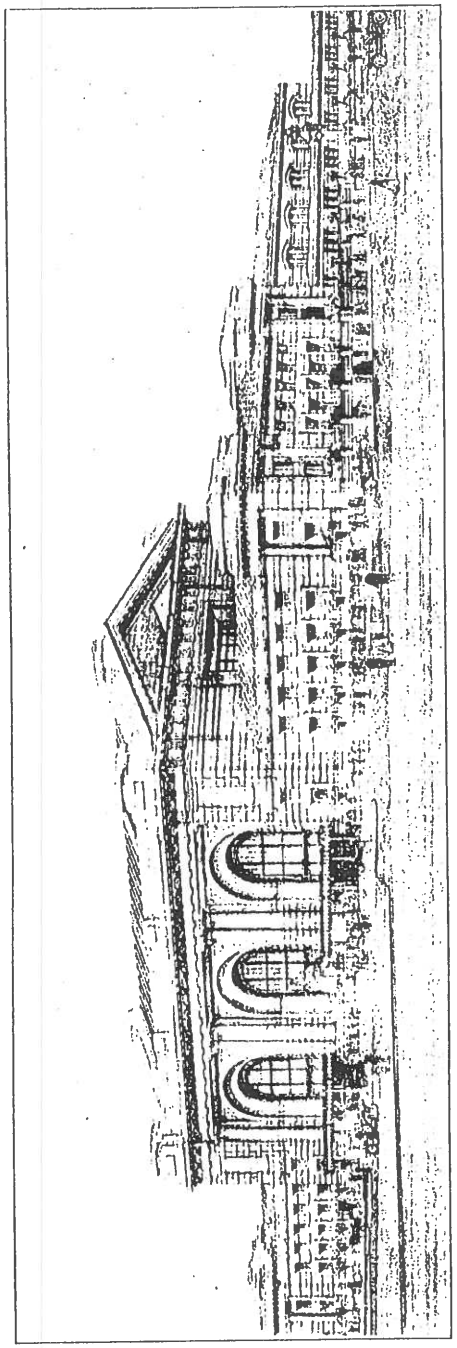
The **SOHM SYSTEM** consists of a highly accurate time keeping **Master Clock,** operated by electricity. The **Master Clock** is fitted with our patented **Lock up Synchronizer** which will operate and synchronize as many Secondary Clocks, Time Stamps, Employes Time Recorders, Cost Finding Machines and Program Machines as may be desired.

The Synchronizer prevents the Secondary Units from moving forward more than one minute at a time, regardless of the number of impulses the **Master Clock** may make, **thus insuring absolute synchronism with the Master Clock at all times.**

SOHM SYSTEMS are fully guaranteed by us and recommended by some of the largest institutions in America who have been using them for years. All systems are thoroughly tested before leaving the factory. They are dependable, accurate, simple in construction, economical in cost and in the use of operating power.

Complete installation and operating directions accompany each system. No technical knowledge is required. The master clock is hung as other clocks and wires connected as indicated.

Samples and references furnished on request.



KANSAS CITY TERMINAL—KANSAS CITY, MISSOURI

Fully equipped with Sohm Electric Time System. Some of the secondary clocks in this installation are seven miles distant from the master clock and yet are accurately controlled by synchronizers.

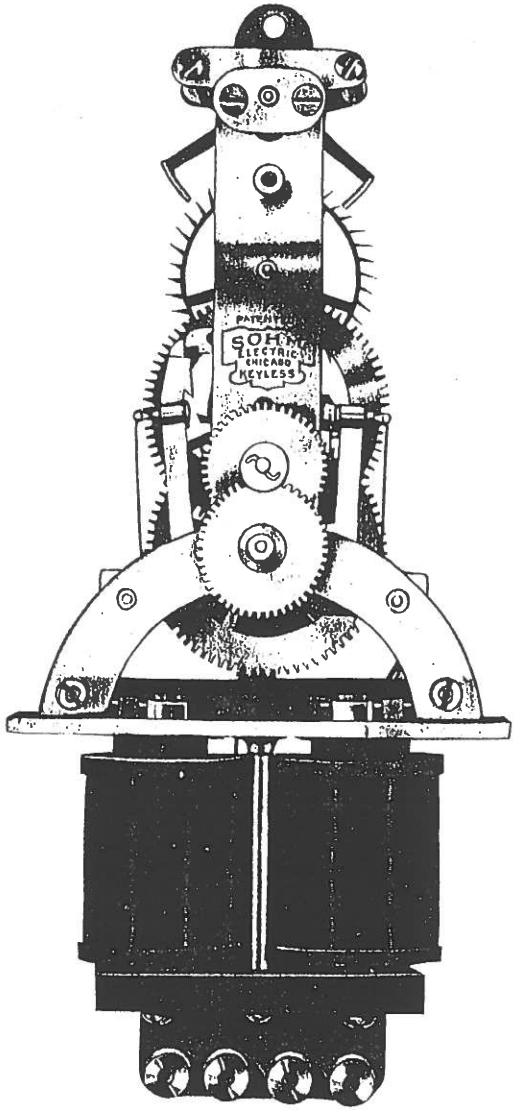
THE SOHM SELF WINDING MASTER CLOCK

The Sohm Self Winding **Master Clock** is made in 60 and 80 beat movements and contains an ordinary straight line time train from center to verge. We have eliminated the delicate contact springs that have been a source of trouble in electric clocks caused by their sensitiveness to expansion and contraction through heat and cold and the liability to injury or misadjustment when they are cleaned.

Mounted on the center arbor is a contact wheel with eight contact points spaced to make a contact every minute. As this contact wheel revolves the contact points slowly sweep across a wiping device which removes all dirt or other foreign substances from the contact points, after which they are automatically polished by another device, thus insuring an absolute clean contact at all times, and permitting the free flow of current. These contact points are not affected by extremes of temperature.

On the minute arbor is a spring barrel containing a finely tempered main spring. This main spring is automatically wound every minute and by thus maintaining the same even tension on it at all times we obtain very close regulation. The mechanism is so arranged that this main spring cannot be overwound. It is always on the forward tension, back lash being impossible.

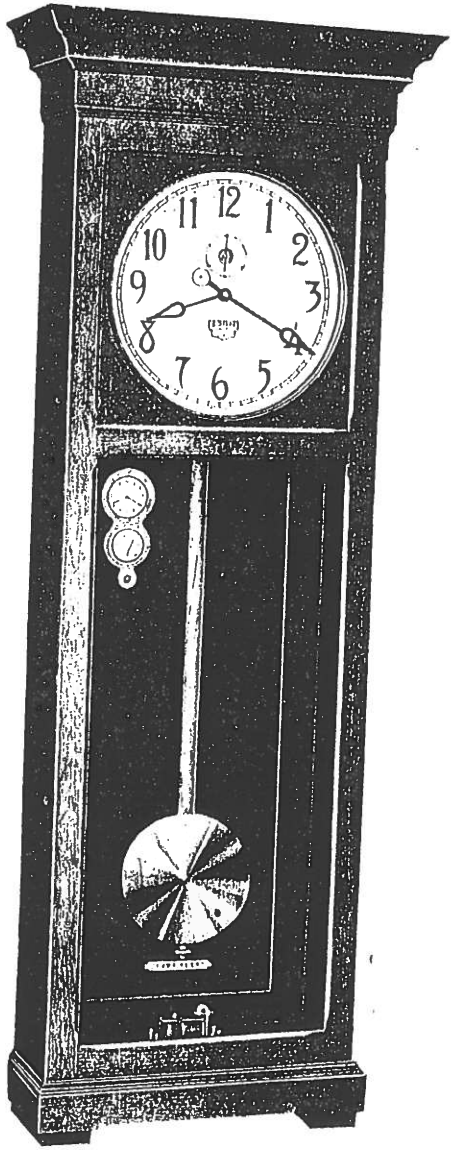
All Sohm **Master Clocks** are made in dust-proof, hand finished, selected wood cases. They are made in many different styles and finished to match the wood work of the room in which they are to be located. The exterior appearance is rich and substantial.



SOHM MASTER MOVEMENT

Simple—Rugged—Accurate

Every wheel is hand mill cut—not stamped. Spring is always on the forward tension, making back lash impossible. Note absence of contact springs.

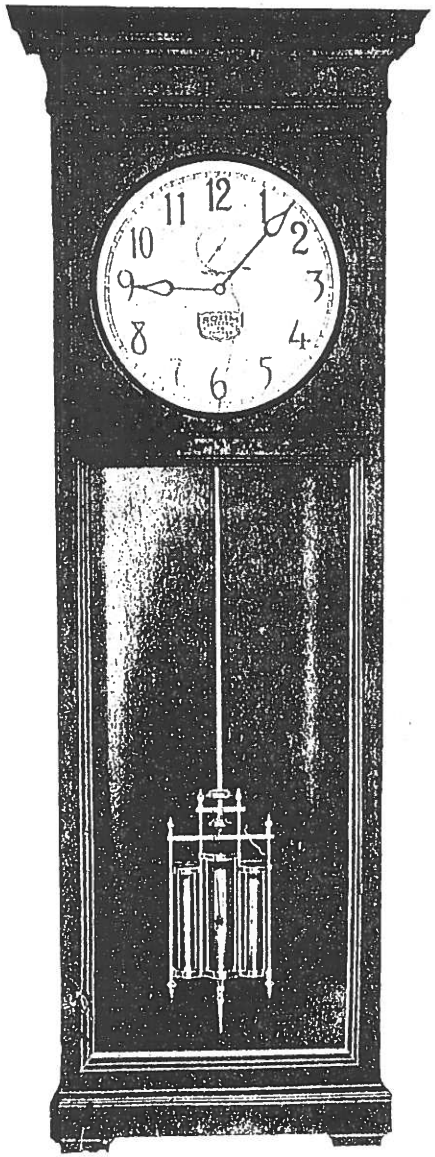


No. 353

60-BEAT MASTER CLOCK

Will not vary more than ten seconds per month.

Extreme dimensions: 65" high, 24" wide, 8" deep. 14" silver etched dial. Secondary pilot clock shows how all secondary units compare with master clock. Volt meter shows power in battery. With step-up button all secondary units can be moved forward manually by pressing button once for each minute.



No. 356

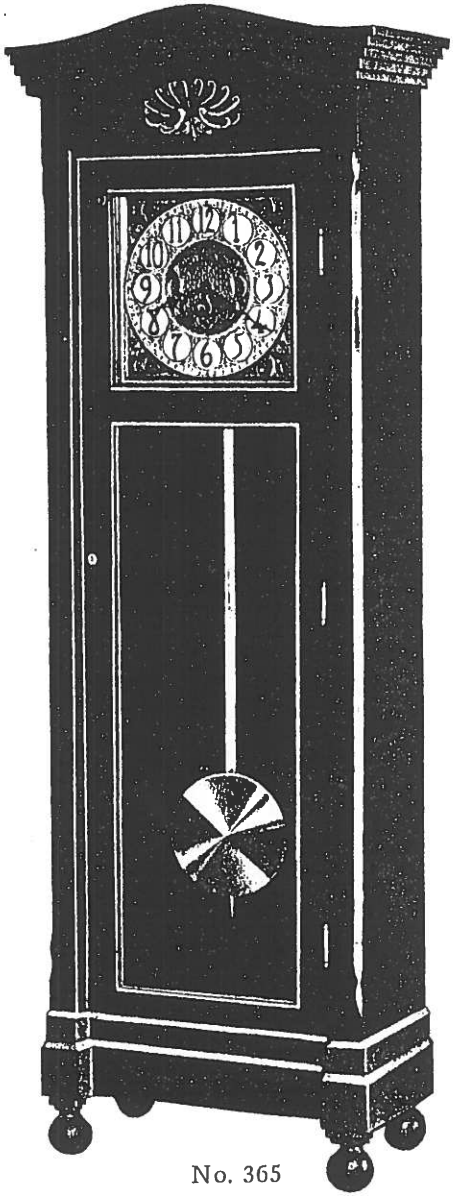
60-BEAT MASTER CLOCK

Mercurial pendulum. 14″ silver etched dial.

Extreme dimensions: 65″ high, 24″ wide, 8″ deep.

This clock, when properly hung, will not vary more than ten seconds per month.

Secondary pilot clock, and voltmeter may be had as shown in No. 353.

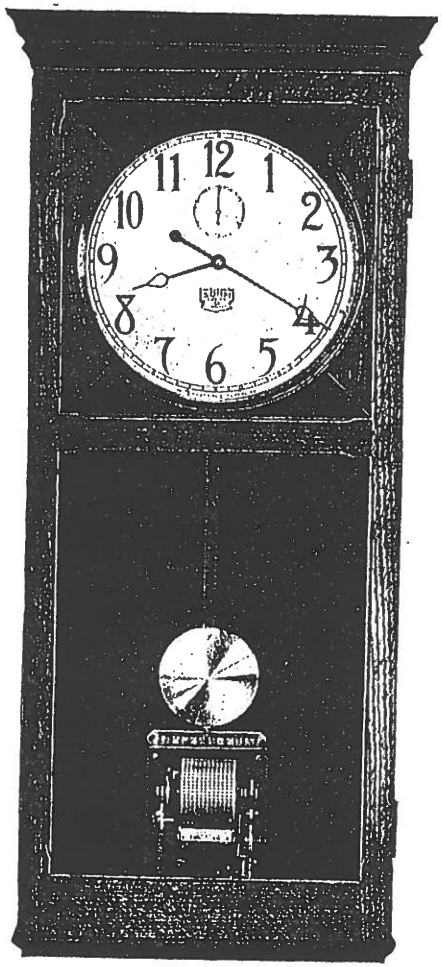


No. 365

60-BEAT FLOOR TYPE MASTER CLOCK

14″ silver etched dial in three colors with raised numerals. Made in piano finish, dust-proof, solid mahogany or quarter-sawed oak case as desired.

Extreme dimensions: 76¼″ high, 25″ wide, 14″ deep.



No. 205

80-BEAT MASTER CLOCK MOVEMENT WITH SINGLE CIRCUIT TWELVE-HOUR PROGRAM MACHINE COMBINED

This clock, if properly hung, will not vary more than 30 seconds per month.

THE CLOCK OF A MYRIAD USES

This type clock combines all the advantages of the Sohm Master Movement, which shows the correct time visually and also announces the correct time audibly by automatically ringing bells, gongs or other signal devices.

SOME OF THE MANY THINGS THIS CLOCK WILL DO

It will automatically sound the starting and dismissing signals for Morning in, Noon out, Noon in, Evening out, or any other periods. Particularly adapted for shops, factories, department stores, or anywhere where labor is employed in large or small numbers.

In factories where steam whistles are used for signals this clock acts as an automatic reminder to the engineer or other employe in charge of signal duty. It can be adjusted to ring a bell in the engine room, or any other room of the building. Another signal is given exactly on the hour notifying him to pull the whistle-cord.

Or in foundries, or brick kilns where automatic signals are desired to fire furnaces at stated periods or for any other work of this nature.

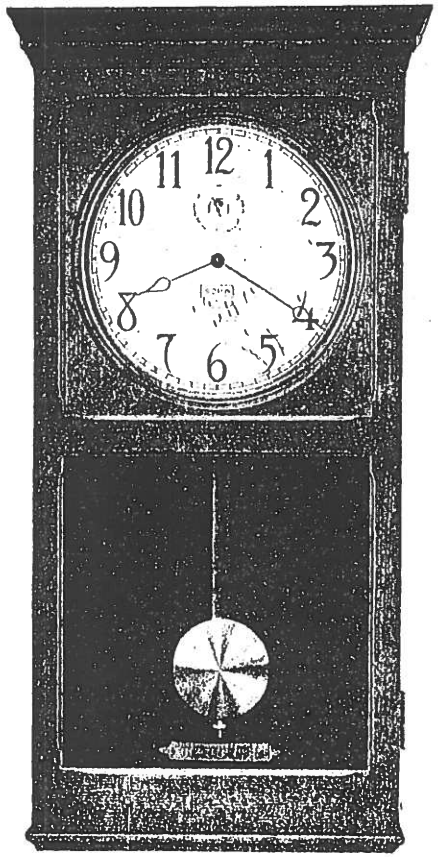
By the use of this reliable clock, employes become accustomed to a feeling of contentment, knowing that the accuracy of this machine will remove all cause of irritation they may have experienced in the past from a feeling of injustice done them through the inaccuracy and irregularity of the old-fashioned hand operated signals. Satisfied that the hours of employment are accurately measured, they will not be tempted to waste the employer's time, comparing watches or looking for clocks or discontinuing work prematurely.

School management will find this clock a valuable instrument in accurately and automatically ringing the starting, recess and dismissal signals.

When it is fully realized what valuable service this machine will render, it becomes an economical and profitable investment.

Extreme dimensions: 41½" long, 18½" wide, 7¼" deep. Diameter of lithograph dial 12".

Approximate shipping weight, 80 lbs.

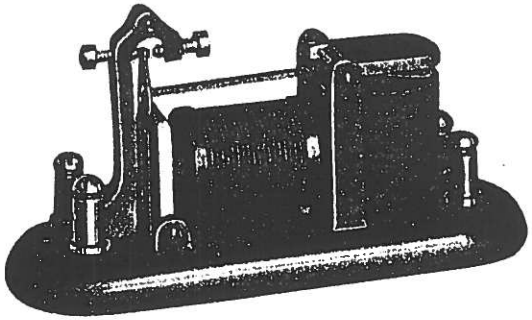


No. 229

80 BEAT MASTER CLOCK MOVEMENT

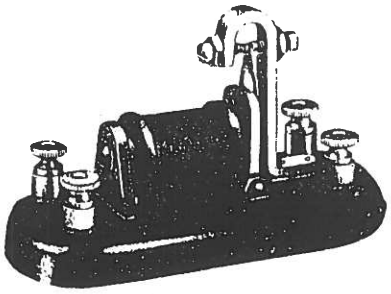
12″ dial, 34⅝″ long, 17½″ wide and 7¾″ deep. This clock, if properly hung, will not vary more than 30 seconds per month. It will operate secondary units to the same number as our 60 beat movements, and is suitable for all places where an inexpensive **Master Clock** is desired.

Made with 10″ dial also.



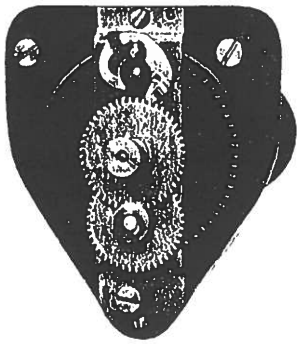
LOCK UP SYNCHRONIZER

This relay locks up mechanically on the make of our master clock and releases on the break thereby preventing scattering of clocks, irrespective of the numerous contacts made each minute by the master clock.

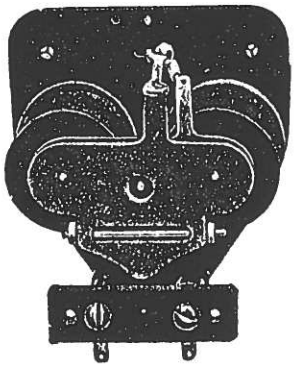


Our pony line relay with Tungsten point wiping contacts. Sufficient carrying capacity for ten amperes. Substantially built, cast iron base and large binding posts for clock and bell line relay.

SOHM SECONDARY CLOCK



FRONT VIEW



REAR VIEW

NOTE SIMPLICITY OF MECHANISM

The **Sohm Secondary Clock Movement** is a positive step by step mechanism. It is locked in every position and impossible to make more than one minute advance on each contact impulse.

It is very simple and rugged in construction, positive in operation, and automatically locks itself against false operation.

It contains no pawls, racks, cams, pinions, or gears (except those on dial train which operate the hands).

It requires no oiling or cleaning or any attention whatever, after it is hung in place. The working parts automatically clean themselves as they operate.

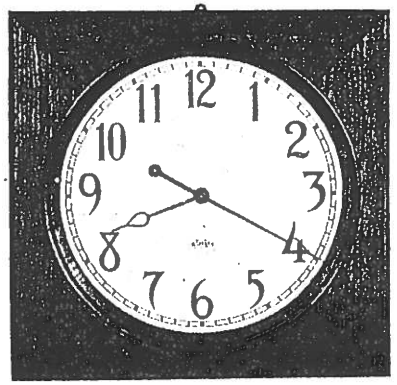
All working parts are made of the finest grade tool steel and are hardened in oil to prevent rust.

The **Sohm Secondary Clock Movement** will operate accurately in any position, regardless of distance from master clock. It is not affected by heat or cold, and can also be used in the most inaccessible places, such as coal or salt mines, boiler rooms, lumber, flour or steel mills, chemical laboratories and outdoor purposes where the ordinary key-wound clock cannot be used.

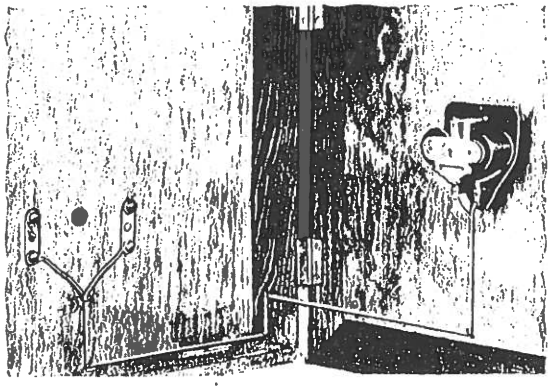
This movement will operate accurately any size dial from two inches to three feet in diameter. Movements may be had for larger dials.

As they will not freeze in the most extreme weather they are practical for street, bracket, or tower clocks.

We have secondary clocks operating accurately seven miles distant from the **Master Clock.**



No. 500



Opened, Showing Simplicity

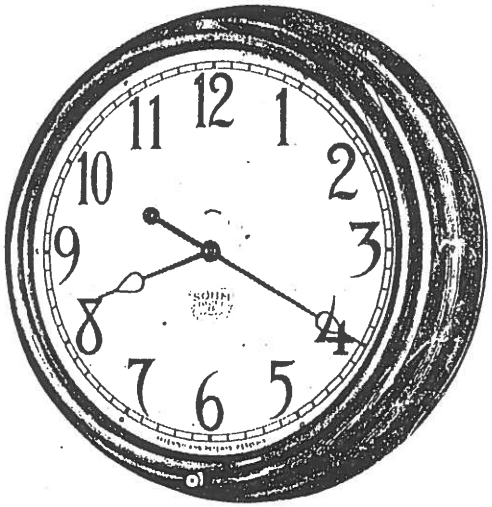
THESE CUTS SHOW OUR SQUARE TYPE SECONDARY CLOCK

Cases are of selected wood, hand finished and dust-proof. All cases are strongly built and have an attractive appearance. Note the simplicity of the movement.

Carried in stock in plain oak, quarter-sawed oak, birch mahogany and white enamel with 12″, 15″ and 18″ dial. Special sizes and designs to order.

Dimensions:

12″ dial.....16″ x 16″ x 3½″
15″ dial.....20½″ x 20½″ x 3½″
18″ dial.....24½″ x 24½″ x 3½″



No. 515

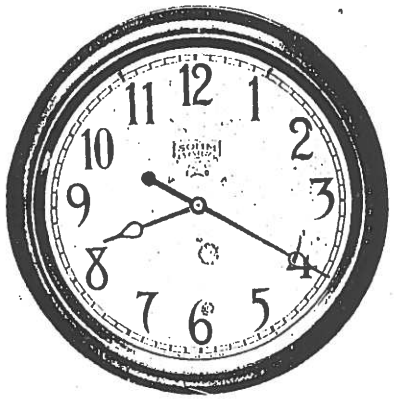
ILLUSTRATING OUR ROUND SPUN METAL CASE SECONDARY CLOCKS

Cases are Sanitary and Water-Proof

These clocks are attractive in appearance and are suitable for all places where a round type clock is desired. They will not rust or corrode and may be used in laboratories, boiler rooms or other exposed places.

Finish is baked enamel. Carried in stock in natural oak, natural mahogany, or white enamel in the following sizes:

8″ dial.....1½″ deep
12″ dial.....3½″ deep
15″ dial.....3½″ deep
18″ dial.....3½″ deep



No. 530
12″ Dial

Side view

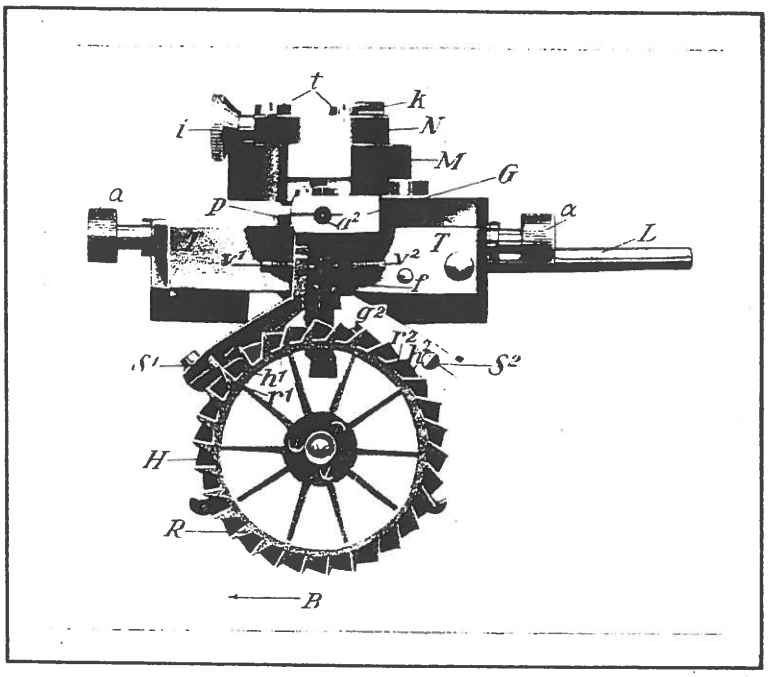
ROUND FLUSH TYPE SPUN METAL CASE, SECONDARY CLOCK

The movement sets into the wall encased in a metal, dust-proof cap. The dial is flush with the wall surface.

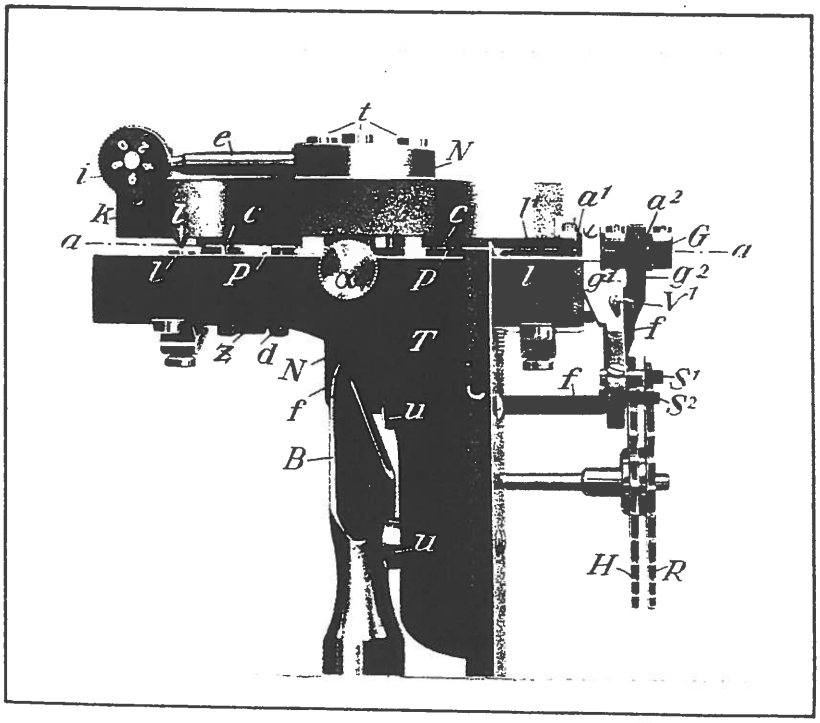
Cases may be had in our standard finish or any color scheme to harmonize with the decoration.

Carried in stock in natural oak natural mahogany, white or black enamel in dial sizes as follows: 8″, 12″, 15″ and 18″.

Clemens Riefler
Nesselwang / Bayern



Pendulum escapement



C L E M E N S R I E F L E R N E S S E L W A N G

Free Gravity Escapement with Pendulum Swing about a Knife-edge.

It is, we believe, generally acknowledged that the free elastic escapement (D.R.P.No.50739) has brought about a considerable progress in the field of Precision Clock Construction. According to the reports received from numerous observatories and other scientific institutes, the astronomical pendulum clocks provided with this escapement have given excellent results of rate and within a period of many years they have shown most rarely any disturbance in the rate of the clockwork. If, nevertheless, such isolated cases have occurred, this is due partly to an insufficient accuracy of the erection which requires a certain professional knowledge and skill not available everywhere, but on the other hand it is chiefly due to the fact that the place where the clocks are erected is frequently exposed to vibrations. Such troubles have an unfavourable influence especially on the pendulum spring and may cause the anchor to be moved out of its correct position, so that the reversal of the name and thus the pendulum drive is no more accurate, whereby the clock may even come to a stop.

The purpose of the present is to describe a new free gravity escapement (D.R.P.No. 272119), which as compared with the elastic escapement distinguishes itself by a simpler mechanism, a reduced sensibility to outside influence and a greater stability.

In this gravity escapement the pendulum swings about a knife-edge and the pendulum spring is abolished entirely. The pendulum drive is effected by the own weight of two weight levers independent from one another, the plane of oscillation of which is parallel with that of the pendulum and the axes of rotation of which coincide with the extended axis of oscillation of the pendulum.

Fig. 1 shows the front view, Fig.2 the side view of the

escapement and Fig. 3 the view of the same from above in natural size, such as it is executed for astronomical clocks.

T is a strong support of metal cast secured by 4 screws ü u to the rear works plate of the clock, in which support the two agate planes PP are fixed. Each one of these rests with its brass mountings on 3 pressure screws d, which have their threads in the support T and they are held fast by the tension screws Z. The agate planes are so adjusted that their surfaces form one and the same plane.

In this plane lies the axis of oscillation a-a of the pendulum B. It is formed by the knife-edges of the two steel prisms cc.

These steel prisms c c are mounted in a strong metal piece, the pendulum support M. Through this support M passes the pendulum pivot N, which is of nickel steel and at the lower end of which the pendulum is suspended. This pivot is provided at the top with a flangs, by means of which it rests on the pendulum support M, where it is secured by 3 screws t.

In the same mathematical axis a - a as the knife-edges, about which the pendulum swings, are also the rotation axes a_1 and a_2 of the two weight levers.

At the lower end of said pendulum pivot the guide pin f is screwed on, on the parallel surfaces of which will rest in front the two weight levers g_1 and g_2 by means of their stop-screws v_1 and v_2. This guide-pin must take along the weight lever g_2 on the right when the pendulum swings from the middle position towards the right, and the weight lever g_1 when the pendulum swings towards the left, whilst in the backward movement it is supported by each one of these two levers through the gravity of the same, thus transmitting the driv-ing power of the levers to the pendulum.

For preventing the knife-edges c c of the pendulum support from being damaged during transport of the clock through the friction on the agate planes PP, a stopping devices similar tothat in my free elastic escapement has been provided for. It

consists of the stopping lever L, whose axis of rotation possesses an eccentric by which the steel cylinders l l provided with pan-bearings are lifted somewhat when the lever L is moved upward from the horisontal into the vertical direction. In that way the two pointed screws l_1 l_1, which have their threads in the pendulum support, will rest in the pan-bearings of the steel cylinders and thus also the pendulum support is lifted, so that there will be a small space between the knife-edge and the agate planes.

When the stopping is released by the reversal of the lever L into the horizontal position, the steel cylinders will recede downward and the knife-edge will rest again on the agate planes PP. At the same time the guide-pin f will receive the direction and position required for the stop of the two screws v_1 and v_2 of the weight levers.

For the transport of the clock, after the stopping, also the pendulum pivot N is clamped by the two lateral screws aa.

For regulating the pendulum swing, the pendulum support M is provided with the following arrangement. A pin e rigidly connected to the pendulum pivot N ends in a tongue enganging into a groove of the swing adjusting screw i. This adjusting screw i has its threads in a bridge k screwed on the pendulum support M and its head is provided with a graduation for accurate adjustment. When this adjusting screw i is slightly turned, a small rotary movement of the pivot N in the pendulum support M will result and thus also a lateral movement of the guide-pin f, on which rest the two weight levers. To allow the pivot N to turn, there is sufficient play in the perforation of its flangs for the 3 screws t, by which it is screwed on the support M, and the screws are tightened only slightly.

The weight levers g_1 and g_2, of which each one weighs about 4 grammes, are bedded with their two axles a_1 and a_2 in the metal piece G, which is secured by screws on the support TT. At their lower end the levers are provided with the agate plates S_1 and S_2, which are cylindrical and flattened at their front end. By means of the two stop-screws v_1 and v_2 the extent of the engagement of the pallets into the scape-

wheel and thus the pendulum drive is adjusted.

The scape-wheel is a double wheel and consists of the lifting wheel H and the locking wheel R. The teeth h of the first-named effect with their bevelled surfaces the lifting, the teeth r of the latter with their radial surfaces the rest.

The lifting wheel acts on the cylindrical surfaces, the tooth points of the locking wheel on the even surface of the pallets.

After its release, the tooth of the lifting wheel displaces the pallet owing to the turning of the wheels and lifts it together with the weight lever until the tooth lying on top thereof of the locking wheel falls on the even surfaces of the pallet, thus interrupting the turning of the wheels.

The play of the escapement is as follows : Fig.1 shows how the pendulum in its movement towards the left swings at the top thuugh the middle position and (on the left) the tooth r_1 of the locking wheel R rests on the even surfaces of the pallet S_1 of the weight lever g_1, whilst the weight lever g_2 (on the right) with its stop-screw v_2 presses upon the guide-pin f.

When the pendulum continues to swing in the direction of the arrow towards the left, the weight lever g_2 takes part in its oscillation to the left during that time and gives the impulse to the pendulum until the guide-pin f touches the stop-screw v_1 and thus pushes the weight lever g_1 to the left until the wheel tooth r_1 resting on the surface of its pallet S_1 is freed. Now the wheels are turning, the pallet S_2 of the weight lever g_2 is pushed back by the lifting wheel tooth h_2 and thereby the weight lever g_2 is lifted until the locking wheel tooth r_2 falls on the even surface of its pallet S_2, thus interrupting the turning of the wheels, whilst the pendulum continues in its oscillation towards the left, in which the weight lever g_1 takes part.

When the pendulum returns towards the right, after having passed the middle position the guide-pin f takes along the weight lever g_2, whreby the wheel tooth r_2 resting on S_2 is freed and a new lifting on the other side takes place owing to the turning of the wheels, the weight lever g_1, which has just given the impulse to the pendulum, being lifted through the lifting tooth h_1.

In such a complete swing the height of fall A-C (Fig.4) of the weight lever (e.g. of the lever g_2) is, however, only useful in its lower part B - C for the pendulum drive, because the weight lever is lifted only to the height C - B by the wheel tooth of the lifting wheel, thus through the driving force of the clockwork. To the height B - A the pendulum must lift the lever, for release, but thereby the action of fall A - B is suppressed.

Thus, the pendulum drive and the release take place in that moment in which the pendulum swings through the middle position and therefore possesses the greatest kinetic energy.

The lifting of the weight levers through the lifting wheel is only performed by the driving force of the clockwork and the weight lever concerned is in no connection whatever with the pendulum.

The drive takes always place with the same force, as both weight levers are of the same weight and their effective height of fall is exactly limited by the 2 stop-screws and the scape-wheel.

Therefore, also the arc of oscillation is nearly constant. A change of the same resulting from outside influence has no influence on the uniformity and the amplitude of the pendulum drive.

Theresistance, which acts on the pendulum through the connection of the pendulum with the clockwork, consists only in the release resistance. Owing to the fact that the surfaces of rest of the pallets are not placed radially, but form with the radius of the locking wheel an angle of about

12°, this release resistance is nearly nil, as this angle corresponds to the size of the friction angle between agate and brass.

In spite of this position of the pallets the danger of an untimely release is excluded, as each one of the two weight levers has an own axle and its pallet is pressed to the teeth of the lifting wheel by the own weight of the lever.

At the point of contact of the stop-screws with the guide-pin there is, though the levers take part in the pendulum swing, no frictional resistance, as the axis of oscillation of the pendulum and the axes of rotation of the levers form the same mathematical axis.

The axial friction of the pendulum support with its 2 steel knife-edges on the perfectly even, very hard agate planes is extremely small and of a very constant value.

The annexed graphical table of rates shows the rate of a clock provided with the free gravity ascapement. The test was made with clockwork Type D 561 and nickel-steel pendulum Type J sch No. 3122.

Fig.1

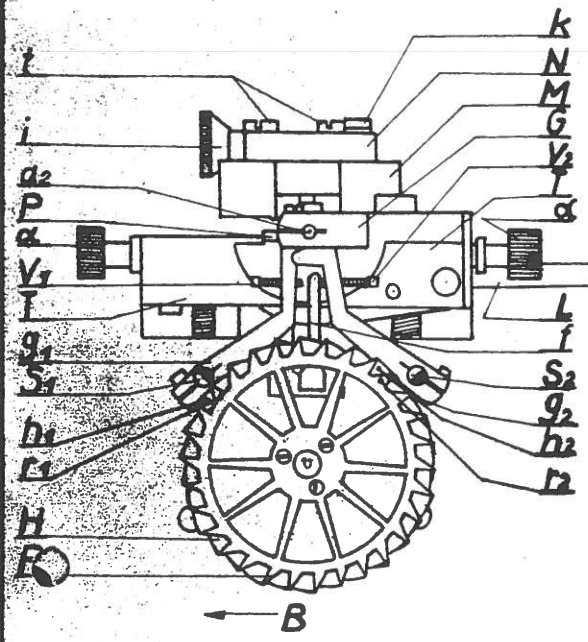


Fig.2

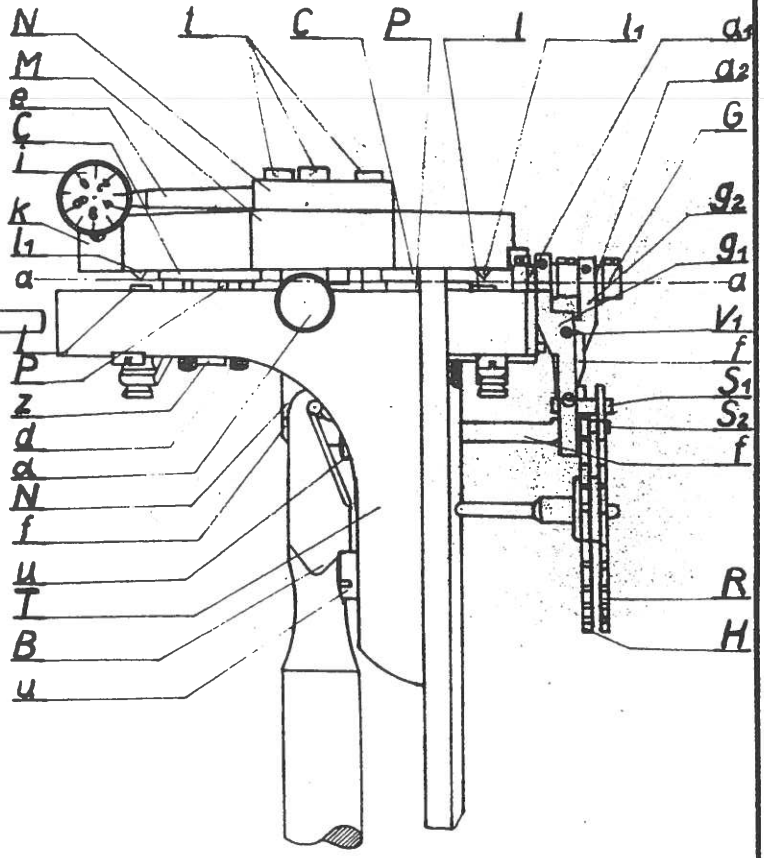


Fig.3

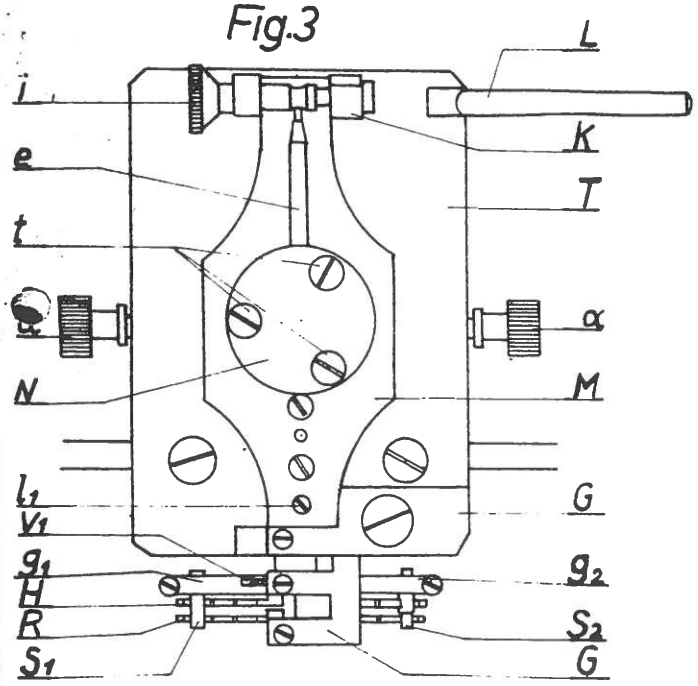
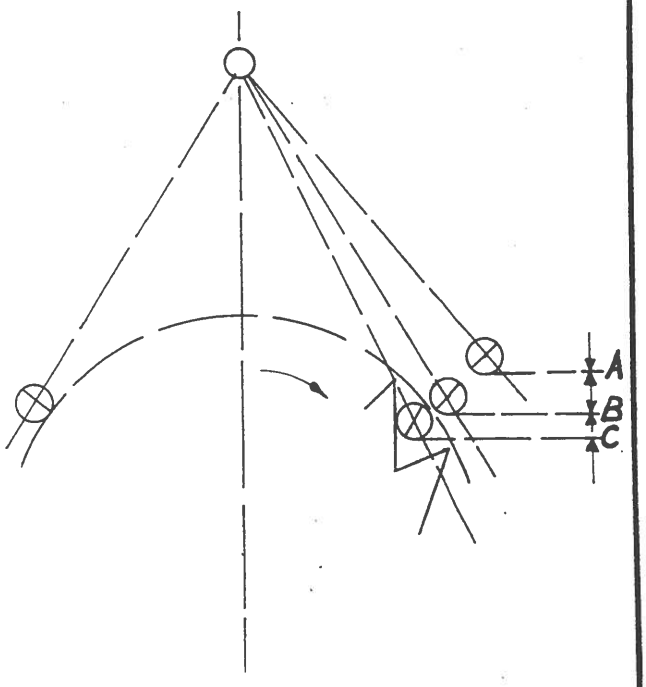
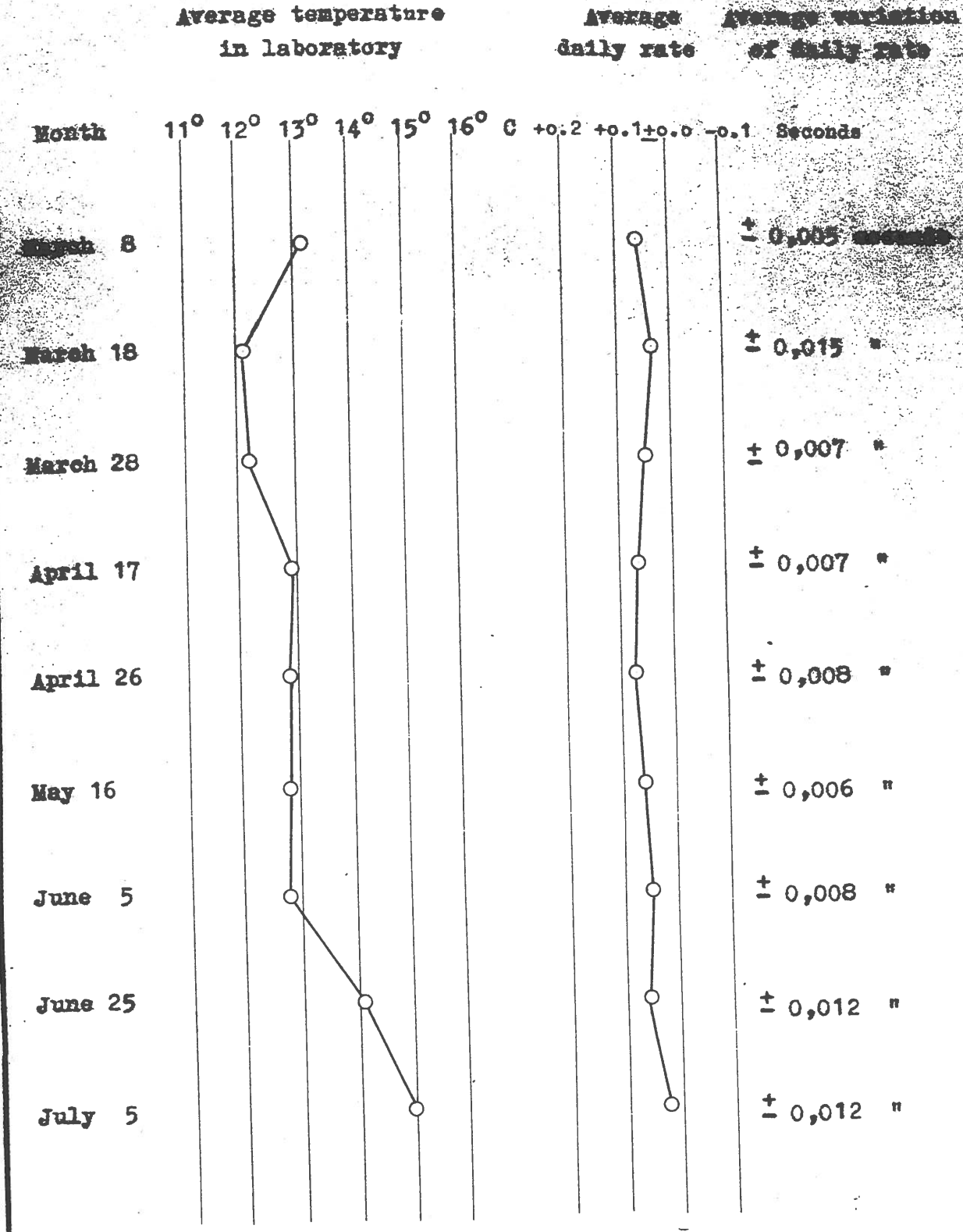


Fig.4



Graph of the average daily rate of the clock
Type D Nr. 561 with gravity escapement.
Pendulum J1 sch. 3122



ENGLISH CLOCK SYSTEMS ADJUSTMENTS TO MASTER CLOCK (DOUBLE CONTACT)

1. Disconnect Slave clock circuit from Master clock.

2. Ensure that the pendulum is hung squarely across the case and that it is neither too far forward so that the click jewel S and jewel securing wire rub on the back of the Escape (Count) Wheel nor too far backward so that the click jewel S and jewel securing wire rub on the Lever F.

3. When in correct position, the Impulse Plate C when swinging should run exactly in line with the Gravity Lever roller D. In other words the roller or Impulse Plate should not over-lap each other. If necessary, the Impulse Plate can be moved round the pendulum by slackening the securing screw.

   Tighten the pendulum trunnion clamp wing nuts.

4. Ensure that with the pendulum stationary, the shoulder of the Impulse Plate is exactly in line with the pivot of the roller D, as shown in drawing.

   To obtain this setting the pendulum can be moved to the left or right along the trunnion. The gap between roller D and Impulse Plate C should be .005".

5. With the pendulum stationary the click jewel S should be midway between two teeth of the escape wheel as shown in drawing.

   If the jewel is closer to one tooth than the other, the back stop wire L can be adjusted for length so that the back stop B moves the escape wheel in a clockwise or anti-clockwise direction. Keep the escape wheel lightly pressed to the back stop when making this adjustment.

6. The jewel S should be adjusted by turning the click wire A pivot bush in the Impulse plate. The bush should be adjusted for depth of engagement so that the jewel moves the escape wheel just sufficiently to allow the back-stop to drop behind each tooth of the escape wheel with the minimum amount of backlash. Move the pendulum slowly by hand to check this.

7. The release wire R.L. should be almost touching the catch G prior to releasing the catch, as shown in drawing, the wire can be bent to obtain this position.

   The length of the release wire is adjustable and it should be set so that it moves lever G just sufficiently to unlatch the Gravity Lever H.

8. With the Gravity Lever H held up to the felt buffer the distance between the Gravity Lever suspension spring R and stop on Catch G should be 1/16". Adjust buffer (above) gravity lever suspension spring, to obtain this adjustment.

9. Ensure that the armature flat spring, securing contacts T and screwed to armature J is perfectly straight.

   Turn Contact break screw N so that the head of the screw is well away from the armature flat spring when the armature is held up by the Gravity Lever.

Contd ...

10. Unlock the two Pillar Contact nuts P and turn the front Pillar Contact O up several turns. Hold armature J up to Gravity Lever H and turn back Pillar Contact O up or down so that the Pillar Contact only just touches the contact plate T. Tighten locknut P. Adjust the front contact likewise.

11. Reconnect the Slave clock circuit. Connect milliampere meter to Pillar Contact Screws O and adjust line current to .32 amperes (320 milliamps) by moving the lower clip of the resistance in the top left hand corner of the Master Clock Case. Disconnect meter after setting line current.

12. Set control lever E over to position A (advance) and set the pendulum swinging. When the Plate Contacts T touch the Pillar Contacts Screw O, the circuit should be made and the Gravity Lever replaced on the catch G. If the Gravity Lever is not replaced on the catch it will be because the front Pillar Contact screw requires turning up or down until a contact is made, this is just a rough adjustment. To finally adjust the contacts, carefully carry out the following:

    Keep pendulum swinging. Turn front Pillar Contact screw upwards slowly until Gravity arm H fails to return to step on catch G without assistance from the pendulum.

    Note position of Pillar Contact screw.

    Now turn the screw downwards until once again the Gravity arm H fails to return to the step on catch G without assistance from the pendulum. Again note position of Pillar Contact screw O.

    Turn screw O up again to midway position i.e. midway between the high position when the clock failed and the low position when the clock failed. Hold Pillar contact screw in this position and tighten locknut P. Return Lever E to N position.

13. It should now only be necessary to check for contact break adjustment. To do this release catch G and Lower Gravity arm H slowly with the left hand and move the pendulum to the right with right hand. When Contacts M are made, hold pendulum in this position and allow Gravity arm H to rise slowly until contacts M are broken. The position of the Gravity arm suspension spring R relative to the step on catch G should then be noted. The gap is set at 3/32" to 1/8" - alter screw to obtain this adjustment.

14. Set all Slave clocks and Master Clock pilot dial to same time.

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184 Corporation Street, Birmingham, 4.

York House, 12, York Street, Manchester, 2.

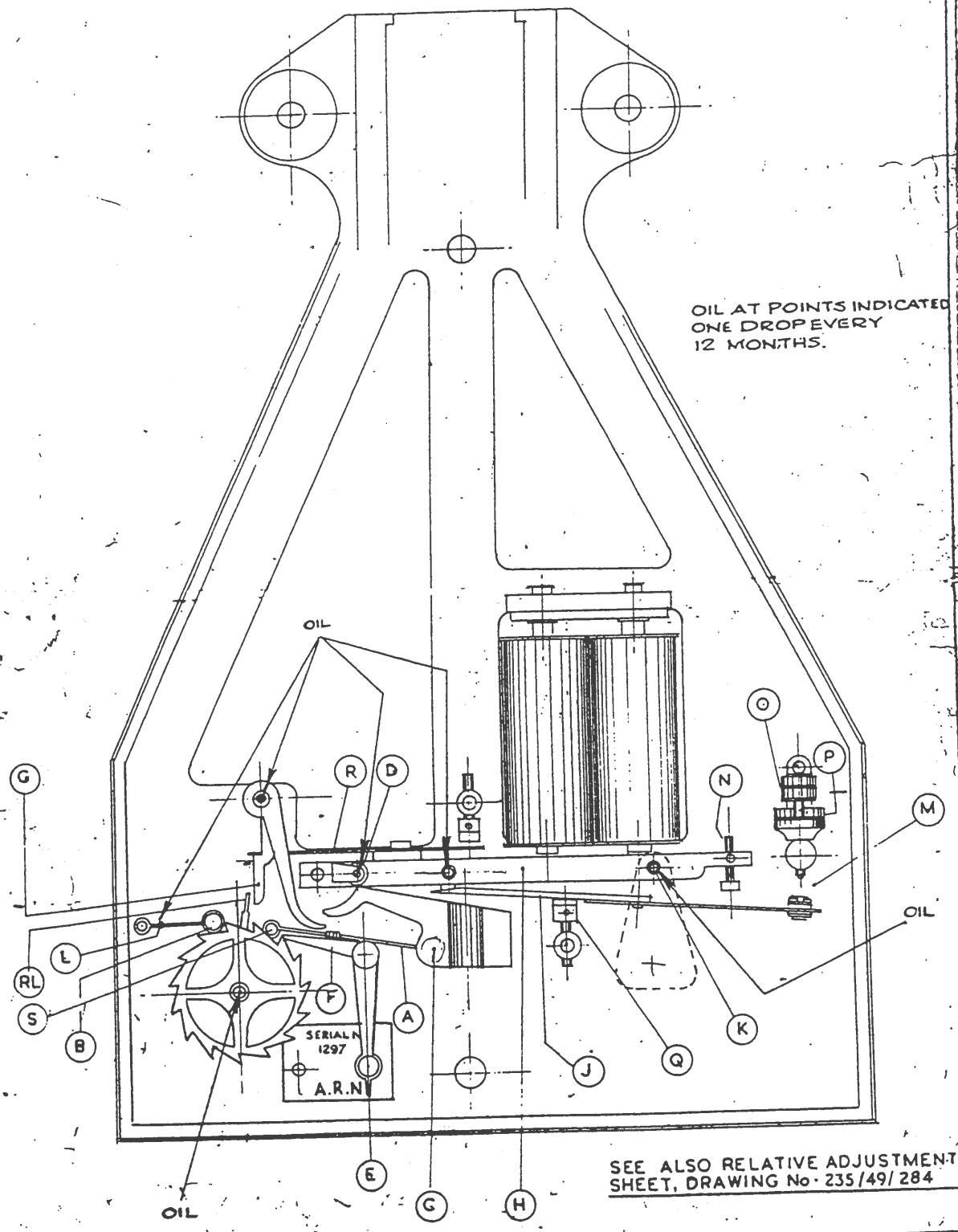
Permanent House, The Headrow, Leeds, 1.

123 - 145 North Street, Glasgow, C.3.

DR	1	9:0:49.
	2	
CH	3	
	4	

MASTER CLOCK MOVEMENT

DRAWING No.
98/49/316



SEE ALSO RELATIVE ADJUSTMENT SHEET, DRAWING No. 235/49/284

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SIMPLEX Movement for Timerecorder, 16 ½" Pendulum. Also wanted **BRILLIE,** Type 1578, 1595, or 1592. Repairable condition, Price. Kenneth Erlenbusch, 124 North Avena, Lodi, CA 95240 (209) 369-5833

Milliammeter from the 1920's, working condition.
Kenneth Erlenbusch, 124 North Avena Ave., Lodi CA 95240, (209) 369-5833 after 4 PM PST.

TIFFANY NEVER WIND Suspension Unit and Pendulum; Clocks and Parts, any condition. Clocks made by **The American Clock Co.** or the **No Key Clock Co.** Working or not
Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax.

Dead Coil Assemblies for **KUNDO's**, Single or Dual Coils, for Possible Rewinding Project. Also "B" **TELECHRON** Rotor, 1 rpm, 50 (fifty) Hz. John R. Seeley, 7541 Meridian St., Miramar FL 33023-4770 (954) 963-7456.

Movement for a **HAMMOND** Clock: the required movement has a FRONT ENTERING motor starting knob, mounted just below the hour post. I am advised that this may have been a **SESSIONS** movement with a **HAMMOND** motor. The dial has the legend: "HAMMOND MOTORED". Movement for a **SANGAMO** BANJO CLOCK: the desired movement is electric motor-powered spring wound, with front mounted escapement. The regulator on the escapement is bent at a right-angle so that it extends through the dial. The dial has an opening that is marked: "S-F". If your movement escapement doesn't have the right-angle bend, I think I could adapt it. Mel Kaye, Box 682, Short Hills NJ 07078 (973) 912-0038 FAX (973) 912-8092

Electric Clocks by **HAMMOND, WHITEHALL-HAMMOND,** and **HERMAN MILLER.** Also advertisements, catalogs, etc. on same. Collector will pay fair prices. Jack Shelton, 7975 N. Hayden Rd. #C-100, Scottsdale, AZ 85258. (800) 488-1818 x7106. E-mail: a1017@amug.org

Plastic Alarm Dial Plate for **SETH THOMAS** 120 v. el. alarm clock, Model POISE E-861-000.
Richard McCahan, P.O. Box 1296, Center Harbor, NH 03226. (603) 253-4110

SYNCHRONOME MOVEMENT. Henry Weiland, 8946 W. Grantosa Dr., Milwaukee, WI 53225

SWCC 11 1/4" chapter ring w/ lg. sec. Bit opening for program clock. Roman Num. preferred. Nice model 9-A, w/ Merc. Pend. Or 18-A, w/ Brass Pend. (618) 632 8135, E-mail @: parkerma@apci.net
Larry Leiper, 3713 Boatman's Point, Belleville, IL, 62221

Synchronome, PUL-SYN-ETIC, or other master clock. Also Brillie wall clock. Need help finding following parts: rate adjustment potentiometer & a 1/2" dial for a Bulle. Jerry Hahn (800) 733-3298 M-F 9am-5pm

REPAIR: ALL EARLY BATTERY CLOCKS Specializing in **BULLE** using orig. parts.
Martin C. Feldman, FNAWCC, 6 Stewart Pl., Spring Valley, NY 10977

FOR SALE: **SWCC** Western Union, 15-1/2" convex "glass". Actually it is plastic, but it beats a naked dial. $20.00 (I'll pay UPS up to $5.00) Paul M. Hopkins, 2717 Millwood Rd., Birmingham, AL 35243 (205) 967-1237

BULLE Electric Gallery Clock w/ 12" dial, 17" square overall, walnut wood case w/ pendulum. **BARR** Electric Mantle Clock w/ Glass Dome. **SWCC** Dials and other electric dials and movements.
BARR Electric mantle clk. w/ glass dome. 14" **SWCC** Dials nice, other Dials, Mvts. 60 beat clks, 4 each.
George Frederickson Sr., 1716 West 100th Place, Chicago IL 60643 (773) 238-3294-evenings or 445-5381

Replacement Field Coils for **SESSIONS** and **HAMMOND** synchronous clock movements.
Wining's Clock Service, 2910 Farmdale Rd., Akron, OH 44312 (216) 628-1654

Glass Domes for the **Tiffany Never Wind** and other early electrical & battery clocks. If I don't have it in stock I'll try to get it. Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax. www.glassdomes.com

PUL-SYN-ETIC (pg. 93, 150 Yrs. E. H.) excellent condition, all original & runs $750 **CHROMATIC** (very similar) dirty case, no pend. $250. **MAGNETA** (pg. 89, 150 Yrs. E. H.) case needs refinishing, Howard motion works $450. All 3 for $1200 + shipping
John Perrigo, 5431 Crestview Dr. Hixson, TN 37343, (423) 875-0453 late evenings.

Several battery clocks, including **ATO, Barr, Bulle, Never Wind, Poole, SW,** etc. Send SASE for list.
Henry R. Cramer, 509 Windward Way, Greer, SC 29650

Requests for reprints of previously published material should be directed to the Chapter Historian:
Dr. George Feinstein 75-19 195th Street Flushing, NY 11366

THE ELECTRICAL HOROLOGY SOCIETY

CHAPTER #78
NATIONAL ASSOCIATION OF WATCH & CLOCK COLLECTORS

VOLUME XXIV #3, SEPTEMBER 1998

Fellow Horologists:

This journal issue contains continuations of the material started in the previous journal issue: the Sohm Electric Clock Co., English Clock System, and the ongoing Riefler Clock series. In addition, we have a copy of an invoice showing the sale of a Self Winding Clock Co. Style 18 oak clock with movement for the grand sum of $10.00 plus a federal tax of of $1.00, totaling $11.00! This clock was leased in 1928 with the time service until 1960 at which time the sale took place, contrary to the general impression that Self-Winding clocks were only available on a lease basis. This material was provided by Chapter 78 member John Perrigo, to whom we are indebted.

It appears that a host of information exists in the files of our membership, and all that's necessary to bring it to light is a little encouragement, so come on and let's hear from you and share the wealth with your brother members.

Our chapter received a nice compliment from Paul Hefner, manager of the "Answer Box". Paul says that the reason we see so little in the line of electric clock questions is because we have educated the NAWCC membership with our answers to inquiries sent to various members and through journal information, providing answers to many questions. Thanks for your kind words, Paul.

Enjoy this issue...good reading ahead.

Martin Swetsky, FNAWCC, President (Now and again)

HARVEY SCHMIDT, FNAWCC, Secretary-Treasurer, 75-80 179th ST. FLUSHING NY 11366

F-37A-P

INVOICE

W.C. Hendricks
San Antonio Tex

SELF WINDING CLOCK COMPANY, INC.
2 75 VARICK STREET
NEW YORK 13, NEW YORK
Telephone: CAnal 6-6800

DATE April 29, 1960
INVOICE NO. 3054-1
OUR ORDER NO. 7746

SOLD TO

G.J. Davis
285 Post Ave.
San Antonio, Tex.

SHIPPED TO

no shipment

Your Order No.	Your Reqn. No.	Your Contract No.	FOB	Shipped Via	Date Shipped	Terms
W.U. letter 4/4/60			Brooklyn N. Y.			Net 30 Days

QUANTITY	DESCRIPTION	AMOUNT	TOTAL
1	Style 18 Oak min clock with mvt. #53485	10.00	
	10% federal tax	1.00	$11.00
1	#11 brass name plate		
	TRANSFER FROM RENTAL TO SALES		

Return of merchandise accepted only on written authorization.

NO REPRESENTATIVE OF THIS COMPANY IS AUTHORIZED TO RECEIVE PAYMENTS OR COLLECT ACCOUNTS EXCEPT ON OUR WRITTEN ORDER.
THE ONLY CLOCKS USED IN THE WESTERN UNION TELEGRAPH COMPANY'S TIME SERVICE.

This copy was in a book I recently bought - The ephemera shows the SWCC did sell some clocks - I heard they never did sell any. The members may be interested.

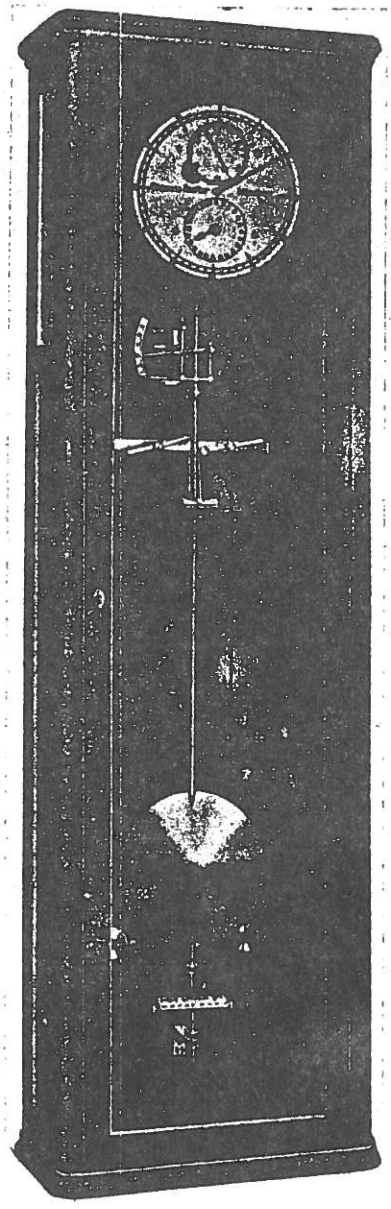
G.J. Davis was in charge of the San Antonio water & the clock hung there from 1928 until he retired. - It is completely original - needless to say I paid a lot more than the $11 -

CLEMENS RIEFLER

FABRIK MATHEMATISCHER INSTRUMENTE

NESSELWANG U. MÜNCHEN

BAYERN



Type A3

Sekunden-Pendel-Uhr mit Schwerkrafthemmung

D.R.P. Nr. 272119

Mittlere tägliche Gangvariation ± 0.05 — 0,08 S

PRÄZISIONS-SEKUNDEN-PENDELUHREN

Type A3

Präzisions - Sekundenpendeluhr

in staubdichtem Holzgehäuse

mit freier Schwerkrafthemmung D.R.P. Nr. 272119
„ Nickelstahl-Kompensationspendel Type K, D.R.P. Nr. 100870
„ elektrischem Aufzug D.R.P. Nr. 151710
„ intermittierendem Sekundenkontakt mit Markierung der Sekunde „0"
„ mechanischer Einstellvorrichtung zur Korrektion des Uhrstandes
„ 3 Trockenelementen und Schieberrheostat für elektrischen Aufzug
„ Schwingungsmaß, 1 Satz Zulagegewichte sowie Zubehörteile.

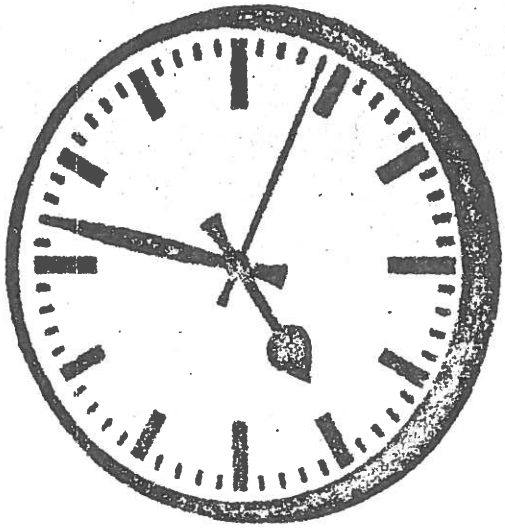
Sondereinrichtungen:

Elektrischer intermittierender Sekundenkontakt (für Relais usw.)
„ Einsekundenkontakt
„ Zweisekundenkontakt
„ Pendelkontakt
„ Sekundenkontakt für Polwechsel zum Betriebe von Sekundenspringern
„ Kontakt für Polwechsel zum Betriebe von Halbminuten- und Minutenspringern
„ Minutenkontakt und Stundenkontakt zur Auslösung von Signalen usw.

Luftdruck-Kompensationseinrichtung für das Pendel.

Ausrüstung der Type A3 mit dem Pendel Type J, welches einen Kompensationsfehler von $\leqq \pm$ 0.005 s per 1° C besitzt, an Stelle des Pendels Type K, dessen Kompensationsfehler $\leqq \pm$ 0.02 s pro 1° C beträgt.

CLEMENS RIEFLER
Fabrik math. Instrumente
8964-NESSELWANG/Germany



Slave Clock

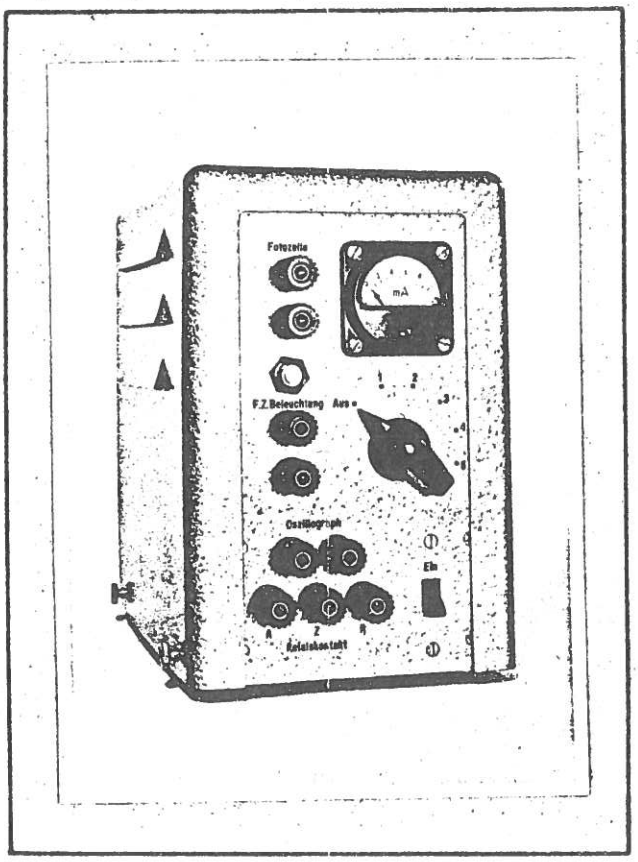
1/1 Seconds, 12 " dial, completely silent in operation, full length centre second hand, to be mounted on the wall, also with arabic numbers available -

in metal casing	-	order No:	431 01/1/21
in plastic casing	-	order No:	431 01/21

Working Voltage	12 Volts direct current
Current	12 milli-amperes

6 CLEMENS RIEFLER
Fabrik mathematischer Instrumente
NESSELWANG / Bavaria

Description
of the Photo-electric Contact Device
for Precision Clocks Type D



Design of the Photo-electric Contact-device.

Our precision pendulum clocks are provided with a seconds-gear contact (intermittent or one-seconds contact) by which chronographs, oscillographs or relays can be operated.

The contact starting, respectively the contact release follows here over a contact lever which slides over the teeth of the contact gear. Though the herewith caused friction resistance is extraordinarily small there might appear mistakes of some hundredth seconds during operation of the contact. For most of the time determinations this accuracy will be sufficient.

But in case a higher accuracy of the contact signs is required it is advisable to provide the pendulum clocks additionally with a photo-electric contact-device. The contact release follows here directly by the pendulum. A fine light beam is projected to the photo-electric cell and puts herewith this cell under current. During the center position of the pendulum at each pendulum swing this light beam is interrupted and released again by a diaphragm which is mounted to the pendulum. The photo-electric cell controls herewith an amplifier with a connected relay. The accuracy of this frictionless acting photo-electric cell amounts to o.oo3 - o.oo5 seconds and will be sufficient for all measurements. The photo-electric contact device is composed of: the lighting installation 'R'; 2 collecting lenses 'B' and 'E'; diaphragm 'b'; photo-electric cell 'F'; and the amplifier.

In the lighting installation 'R' there is a filament lamp which is connected to the corresponding terminals of the amplifier. The light-beam of this filament lamp falls through the glass-bell of lense 'B' which is mounted to the clock-work-frame. In the focus of lense 'B' there is the diaphragm 'b'. The light beam is interrupted by lense 'B' at the first second of each pendulum swing and is released again during the next second and is projected through lense 'E' to photo-electric cell 'F'. The small photo-electric currents released by the light-beam are lead to an amplifier and are amplified thus that the inbuilt contact-relay can be controlled. To this relay now oscillographs, chronographs or other time-control apparatus may be connected.

Mounting of the photo-electric contact-device.

The collecting lenses 'B' and 'E' are already fixed to the clock-work-frame in their correct position; also the pendulum diaphragm clamp 'K' is mounted to the pendulum.

After having mounted the clock work and hung up the pendulum, according to the mounting instructions, whereby due to No.6 of these instructions the two set screws 'aa' are not yet unscrewed and the stopping lever 'L' rests in the vertical position according to No.9, the diaphragm 'b' will be slid from below into clamp 'K' and will be clamped by the lower screw 'a'. Hereupon the stopping-

lever 'L' (No.9) will be turned from the vertical into the horizontal position, whereby we have first to loosen the set screws 'aa' in the pendulum support 'TT' (No.6).

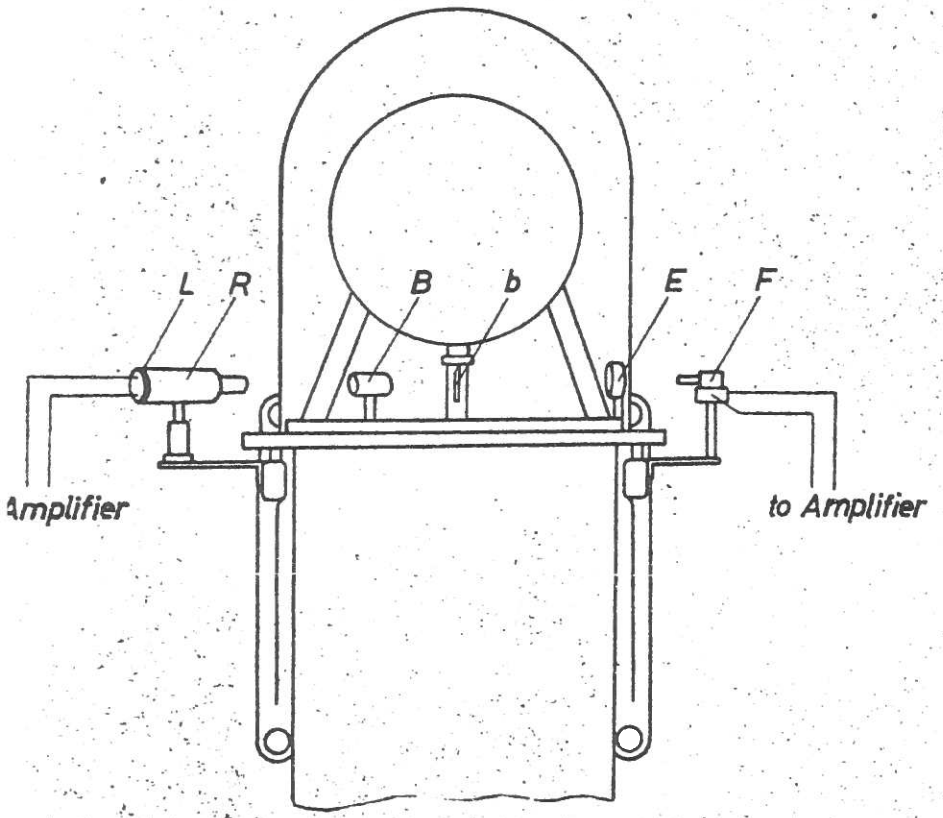
The lighting installation 'R' will be clamped to the console and photo-electric cell 'F' will be fixed to the clamp. The lighting installation 'R' and the photo-electric cell 'F' are to be connected to the corresponding clamps of the amplifier. At connection of the photo-electric cell to the amplifier we have to take especially into consideration that the poles plus and minus will not be interchanged erroneously. Now we have to switch on the amplifier, here it is necessary to remember that after the amplifier is switched on the valves will need about 15 minutes until they are heated.

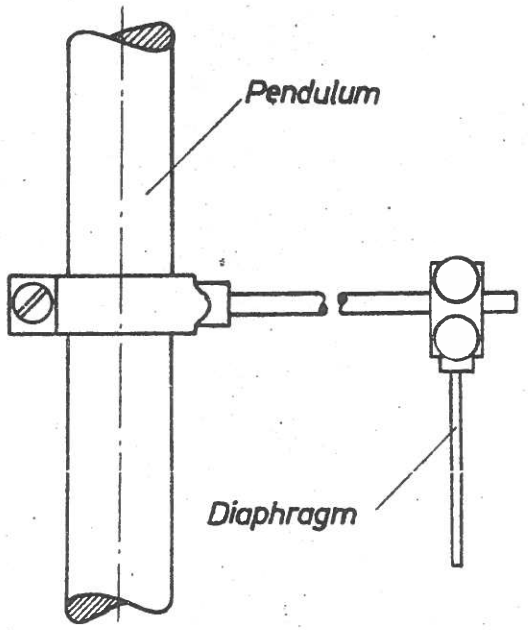
We have now to adjust the lighting installation according to its position by turning and shifting it up and down. The light-beam has to strike as exactly as possible the center of lense 'B', and during the rest position of the pendulum the light must appear as a very fine stripe at the edge 'C' of diaphragm 'b'. Now we can bring the pendulum under oscillation. Then photo-electric cell 'F' will be shifted and turned upwards and downwards thus that the light-beam falls into the center of the photo-electric cell. It is the best to switch on the amplifier, during the adjustment. The measurement instrument of the amplifier must be set at 0 (zero) when the light-beam falls on to the photo-electric cell. At a covered light beam the measurement instrument shall indicate a closed circuit of 5 - 7 milliamperes. This closed circuit is dependent on the data of the photo-electric cell, the place where the clock is mounted, and of the luminous intensity of the surrounding room. At setting under operation the closed circuit must be once set at 5 - 7 milliamperes with the resistance which is under the clamps of the photo-electric cells of the amplifier.

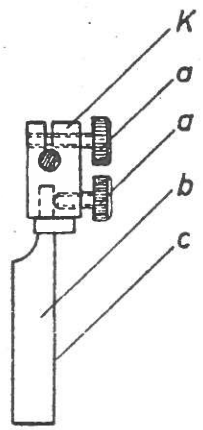
The measurement instrument of the amplifier fluctuates in the seconds rhythm between 0 and about 6 milliamperes. The luminous intensity of the filament lamp can be adjusted by a multiple contact switch at the amplifier. The luminous intensity must be reduced thus that the measurement instrument is just still going back to 0. In general this can be attained at position 2 - 3.

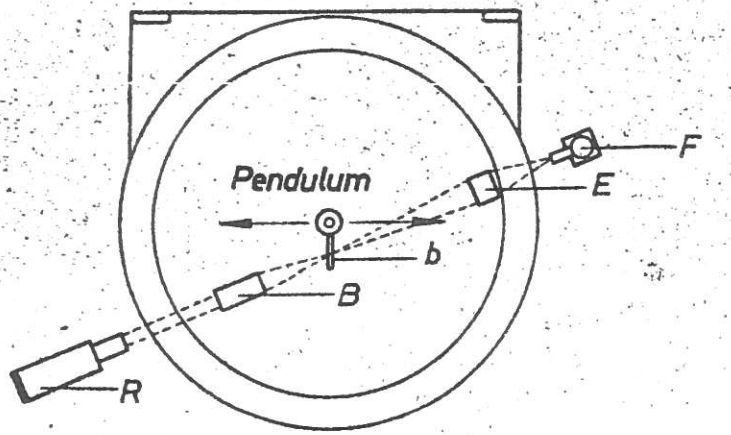
The times between the interchanging seconds-contacts should all if possible be of the same length, i.e. the photo-electric cell shall be set under light as long as it is darkened. Generally this is to be estimated at the deflection of the amplifier measurement instrument. By means of chronographs or oscillographs this can be determinated exactly. The exact fine-adjustment is attained by sliding lighting installation 'R' in horizontal direction, by means of the herefore provided adjusting screw.

If in the run of time the lighting lamp will become defective and must be interchanged the ring 'K' at the lighting installation 'R' and then the socket must be taken off. After placing the new lamp the socket has to be fixed and turned thus that the coils of the lamp are in a vertical position. This may easily be determined if a white sheet of paper is held before the lighting-lamp so that the coils of the light are visible.









6

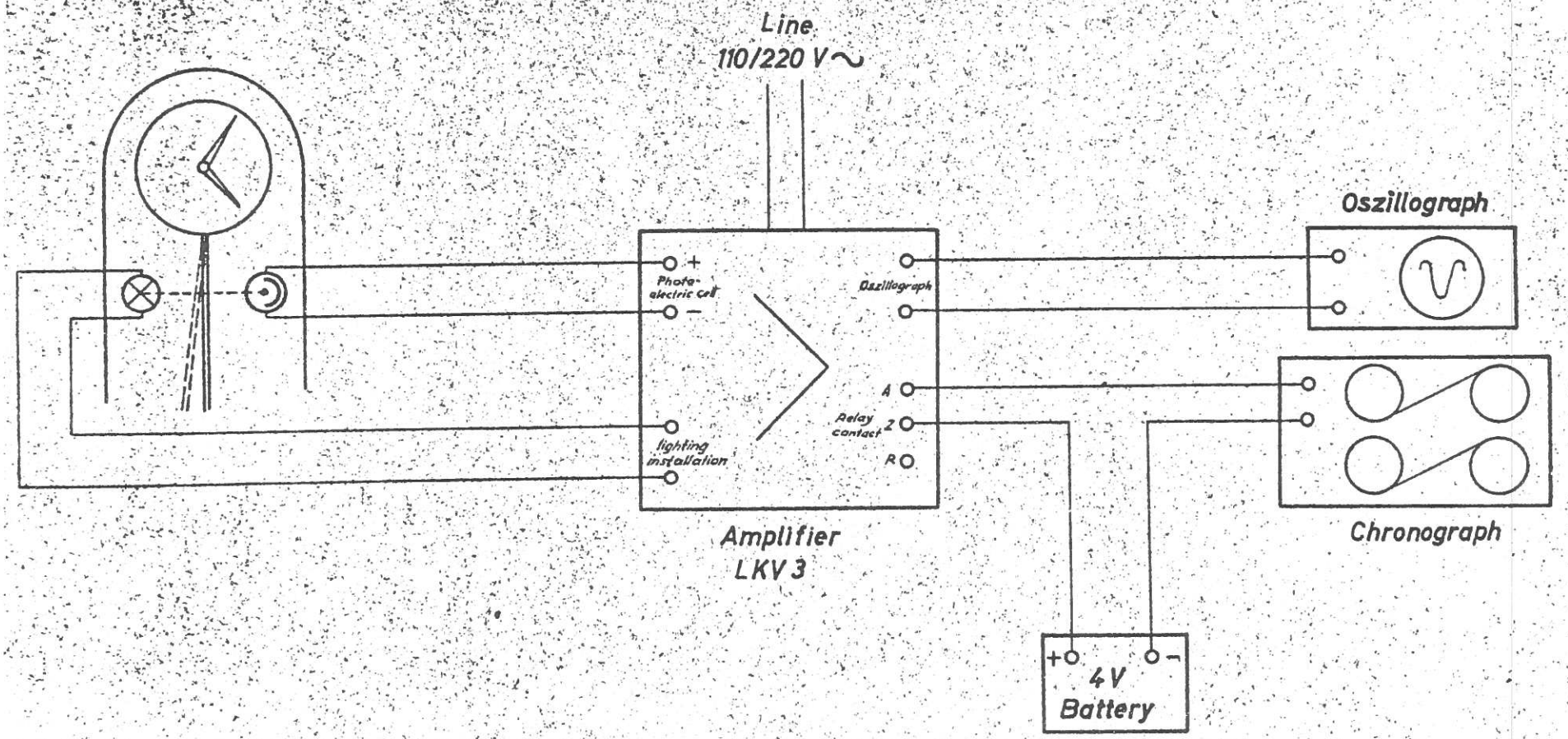
Änd.-Buchst.	Buchstabe kommt vor	Änderungen	Tag	Name

Werkstoff	~ kratzen		Tag	Name
	▽ schrupp.	gezeichnet	17. 1. 56	Vogel
	▽▽ schlicht.	geprüft		
	▽▽▽ schleifen	gesehen		

C. Riefler
Fabrik math. Instrumente
Nesselwang

Maßstab	Bezeichnung:	Zeichnung Nr.
	Mounting of the photo-electric contact-device for Clock Type D	U-E-717

Paßmaß	Abmaße



Änd.-Buchst.	Buchstabe kommt vor	Änderungen	Tag	Name

Werkstoff	~ kratzen		Tag	Name
	▽ schrupp.	gezeichnet	17. 1. 56	Vogel
	▽▽ schlicht:	geprüft		
	▽▽▽ schleifen	gesehen		
Paßmaß / Abmaße	Maßstab	Bezeichnung: Wiring diagram for photo-electric contact-device for Clock Type D		Zeichnung Nr. U-E-718

C. Riefler
Fabrik math. Instrumente
Nesselwang

ADJUSTMENTS TO SINGLE CONTACT MASTER CLOCK

1. Disconnect slave clock circuit from Master Clock.

2. Make sure that the pendulum is hung squarely across the case and that it is neither too far forward so that the click jewel S and jewel securing wire, rub on the back of the Escape (Count) Wheel nor too far backward so that the click jewel S and jewel securing wire, rub on the lever F.

3. When in correct position, the Impulse Plate C when swinging should run exactly in line with the Gravity Lever roller D. In other words, the roller or Impulse Plate should not overlap each other, If necessary the Impulse Plate can be moved round the pendulum by slackening the securing screw.

   Tighten pendulum trunnion clamp wing nuts.

4. Make sure that with the pendulum stationary the shoulder of the Impulse Plate is exactly in line with the pivot of the roller D as shown in Drawing No. 98/49/316.

   To obtain this setting the pendulum can be moved to the left or right along the trunnion. The gap between the roller D and Impulse Plate C should be .005".

5. With the pendulum stationary the click jewel S should be midway between two teeth of the escape wheel as shown in the drawing.

   If the jewel is closer to one tooth than the other, the escape wheel can be moved in a clockwise or anti-clockwise direction by adjusting the length of the back-stop wire L and bead B. Keep the escape wheel lightly pressed to the back-stop when making this adjustment.

6. The jewel S should be adjusted by turning the click wire A pivot bush in the Impulse Plate. The bush should be adjusted for depth of engagement so that the jewel moves the escape wheel just sufficient to allow the back stop to drop behind each tooth of the escape wheel with the minimum amount of backlash. Move the pendulum slowly by hand to check this.

7. The release wire R.L. should be almost touching the catch G prior to releasing the catch, as shown in the drawing; the wire can be bent to obtain this position.

   The length of the release wire is adjustable and it should be set so that it moves lever G just sufficient to unlatch the Gravity lever H.

8. With the gravity lever H resting on the catch G, the air gap between the two magnet poles should be between .025" and .030". This can be obtained by slightly bending the flat gravity lever suspension spring R either up or down as required.

Contd ...

9. With the Gravity Lever H held up to the felt buffer the distance between the gravity lever suspension spring R and step on catch G should be 1/16". Adjust buffer above gravity lever suspension spring to obtain this adjustment.

10. Make sure that the armature flat spring securing contact T and screwed to armature J is perfectly straight.

Turn contact break screw N so that the head of the screw is well away from the armature flat spring when the armature is held up to the gravity lever.

11. Unlock Pillar contact nut P. Hold armature J up to gravity lever H and turn pillar contact screw O up or down so that the Pillar Contact only just touches the Contact plate T. Tighten locknut P.

12. Re-connect the slave clock circuit and set line current to .32 amps (320 milliamps).

13. Check for contact break adjustment. To carry this out release catch G and lower gravity arm H slowly with the left hand and move the pendulum to the right with the right hand. When contacts M and T are made, hold pendulum in this position and allow gravity arm H to rise slowly until contacts M and T are broken.

The position of the Gravity Lever suspension spring R relative to the step on the catch G should then be noted. The suspension spring should be 3/32" to 1/8" down the catch from the step. Alter the position of the contact break screw N to obtain this setting.

14. Set the line current to 0.26 amps. (260 milliamps) by moving the lower clip of the resistance in the top left hand corner of the Master Clock case. Set control lever E over to position A advance and set the pendulum swinging. The Magnet Coils should just manage to lift the armature and gravity lever to the catch without any assistance from the pendulum. Adjust buffer capstan screw Q to obtain this setting.

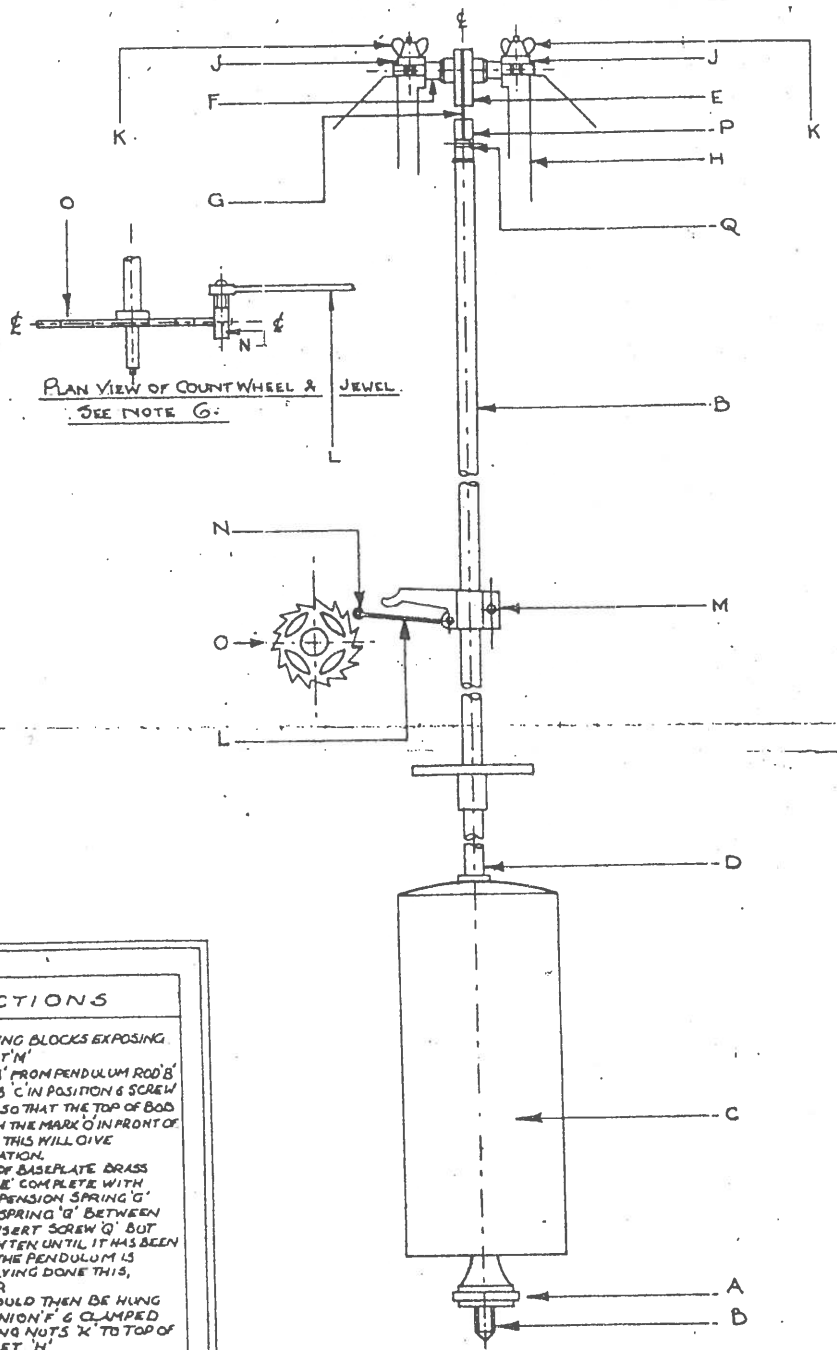
15. Readjust the line current to normal setting i.e. 0.32 amps (320 milliamps) and disconnect meter.

Make sure all screws etc. are tightened.

16. Set all slave clocks and Master Clock Pilot Dial to the same time.

DR	1	5-2-52
	2	14-3-52
CH	3	9-6-59
	4	

INSTRUCTIONS FOR ASSEMBLY OF PENDULUM ROD



INSTRUCTIONS

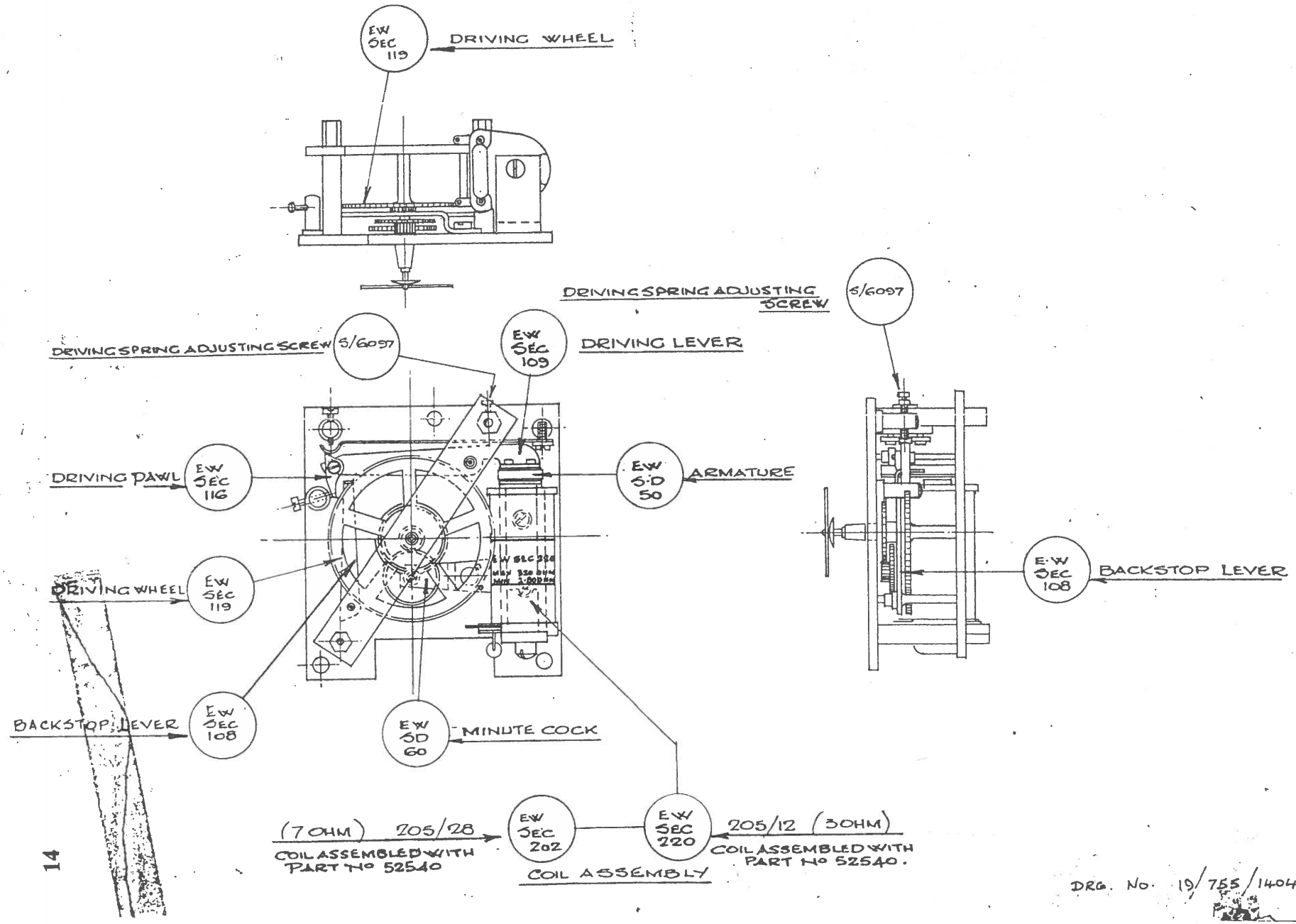
1. REMOVE WOOD PACKING BLOCKS EXPOSING JEWEL WIRE 'L' & PALLET 'N'
2. REMOVE RATING NUT 'A' FROM PENDULUM ROD 'B'
3. PLACE PENDULUM BOB 'C' IN POSITION & SCREW THE RATING NUT 'A' UP SO THAT THE TOP OF BOB BUSH REGISTERS WITH THE MARK 'O' IN FRONT OF THE PENDULUM ROD. THIS WILL GIVE APPROXIMATE REGULATION.
4. REMOVE FROM TOP OF BASEPLATE BRASS SUSPENSION CHOPS 'E' COMPLETE WITH TRUNNION 'F' & SUSPENSION SPRING 'G'
5. INSERT SUSPENSION SPRING 'G' BETWEEN BRASS CHOPS 'P' & INSERT SCREW 'Q' BUT DO NOT FINALLY TIGHTEN UNTIL IT HAS BEEN ASCERTAINED THAT THE PENDULUM IS HANGING PLUMB HAVING DONE THIS, FINALLY TIGHTEN UP.
6. THE WHOLE UNIT SHOULD THEN BE HUNG BY MEANS OF TRUNNION 'F' & CLAMPED BY PLATES 'J' & WING NUTS 'K' TO TOP OF MOVEMENT BRACKET 'H'
7. WHEN THE PENDULUM IS HANGING AT REST THE FLAT SURFACE OF JEWEL 'N' SHOULD BE ABOUT MIDWAY BETWEEN THE POINTS OF TWO TEETH OF THE COUNT WHEEL 'O' WHEN THIS ADJUSTMENT HAS BEEN MADE THE WING NUTS 'K' CAN BE SCREWED HOME FIRMLY.

ENGLISH CLOCK SYSTEMS. 179-183 GREAT PORTLAND STREET. LONDON W.1.

DRG Nº 5/252/837

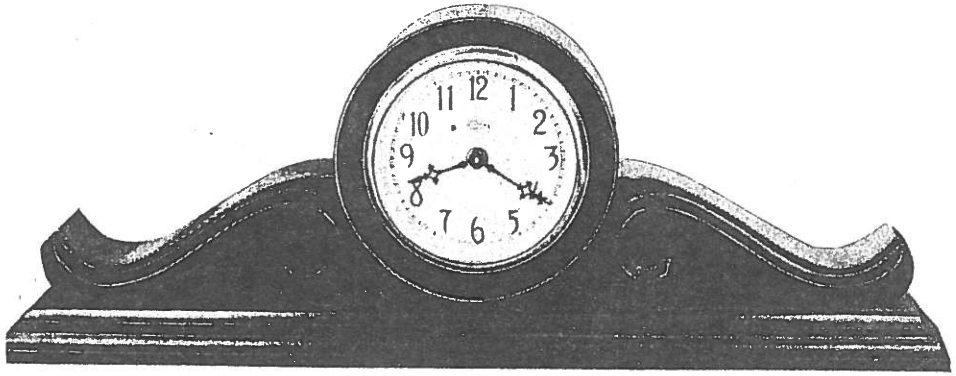
DR XD	2
CH	3
	4

PART NUMBERS OF COMPONENTS APPLICABLE TO 205/12 & 205/28 SLAVE MOVEMENTS.



DRG. No. 19/755/1404

MISCELLANEOUS SECONDARY CLOCKS AND BELLS



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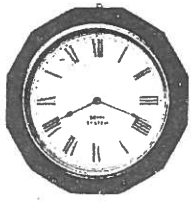

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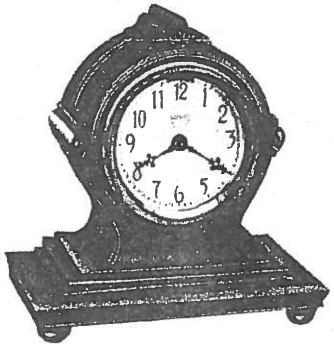


No. 551

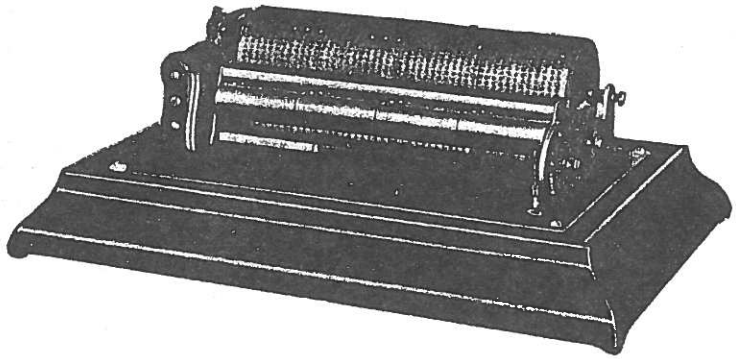
No. 66

No. 801

No. 803

No. 802

SOHM AUTOMATIC BELL-RINGING PROGRAM MACHINE



No. 719

12-HOUR 4-CIRCUIT PROGRAM MACHINE, WITH HALF DAY CUT OUT

The **Sohm Program Machine** is a step by step mecahnism, controlled and synchronized by minute impulses from the **Master Clock.**

It will automatically sound audible signals such as a bell, buzzer, gong, or any number of them, in any or all parts of a building simultaneously or independent of each other, any minute in any hour as desired.

The **Sohm Program Machine** may be used in schools to notify the pupils and teachers at the beginning and conclusion of the various lesson periods, starting, recesses, dismissal gongs, fire drills, etc. In factories to start and dismiss employees during the regular working hours, or for starting and stopping of special processes other than, or in addition to, the regular working schedule. It may be used in plants such as brick kilns and foundries where a special program is necessary, for the firing of furnaces or pouring of metal which must be done in unison by a number of men simultaneously, or in bakeries, tire and envelope factories, chemical laboratories, etc. In fact they are indispensable in any institution requiring a special signal at a given time, notifying

employees when to do a special thing and when to resume regular operation. The interval between these signals may be arranged for any duration from one minute up.

DESCRIPTION

Mounted on a black enameled base plate are two standards. Mounted on these two standards is an aluminum drum, divided into hourly sections. Each section contains sixty holes, each hole representing one minute. A complete revolution of this drum represents one hour. This drum is moved forward on minute impulses by the **Sohm Master Clock** and is so arranged that it cannot move forward more than one minute at a time. A sixty minute dial spaced to show a minute line in alignment with each row of minute holes is fastened to the right end of the minute drum.

Mounted on the same standard are two dials. One is a twenty-four hour dial with an hour indicator. This dial is divided into twelve A. M. and twelve P. M. hours. The other is a half day dial with a contact pin placed for each half day of the week. Mounted on this half day dial is a resilient indicator which points to the half day desired and makes contact with the contact pins.

Another pair of standards is mounted on base plate in front of minute drum. Mounted on these standards is a cylinder containing selector studs, one for each hour, and a separate cylinder and set of studs for each circuit. In front of this selector cylinder and mounted on base plate are 12 contact springs, one for each hour, arranged in alignment with the hour sections of the minute drum. A set of these contact springs is arranged for each circuit.

With every complete revolution of the minute drum (a period of one hour) selector cylinder moves forward one notch (the equivalent of one hour). When the selector stud on this cylinder is in alignment with the contact spring it forces contact spring back towards the minute drum.

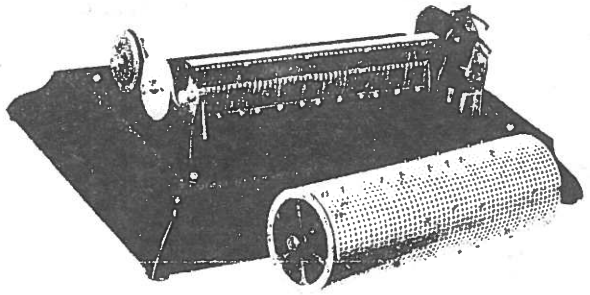
We furnish our patented split bottom contact pins with each **Sohm Program Machine.** The split bottom of these contact pins may be spread with a knife blade far enough to permit them to be seated firmly in the minute holes and preventing them from coming

out. (Be sure contact pins are seated firmly in minute holes and are inserted as far as the shoulder of the contact pin will permit.)

When minute drum revolves contact pin makes contact with hourly contact spring with which it is in alignment.

Above the hour selector cylinder is a bridge on which is mounted an hour dial spaced in alignment with the hour sections of the minute drum. This dial is divided into A. M. hours to the right and P. M. hours to the left facing minute drum.

TO SET PROGRAM



Place a split bottom contact pin in minute hole at minute desired in alignment with minute dial at the right end of minute drum and at the hour desired in alignment with hour dial on bridge in front of minute drum.

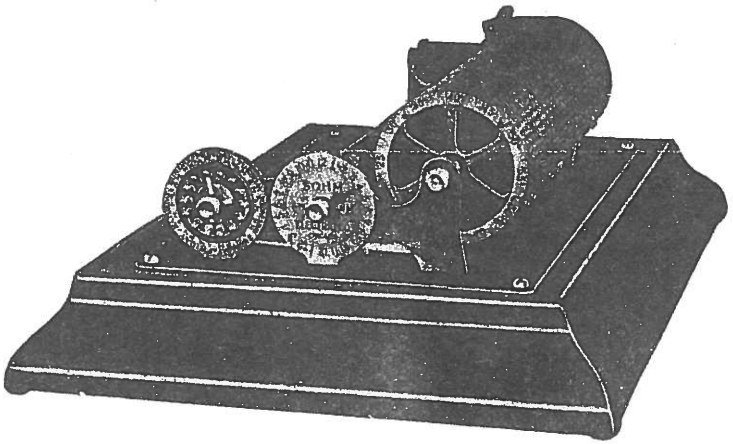
Push back minute drum release lever (mounted on left standard of minute drum). Move minute drum forward until the stationary indicator on right side of bridge points to 60. Press down release lever of the half day cut-out dial. Move the half day indicator until the half day desired is reached.

Press down release lever of the twenty-four hour dial. Move the twenty-four hour dial indicator around to the hour desired.

Now push back minute drum release lever once more and bring minute drum slowly forward until stationary indicator on the bridge shows that Program is in exact unison with the Master Clock.

The Automatic half day cut-out is so arranged that by removing the contact pin from the dial on the half days desired the signals on these half days will be automatically silenced.

Where Programs without half day cut-out are to be set proceed as above with that exception.

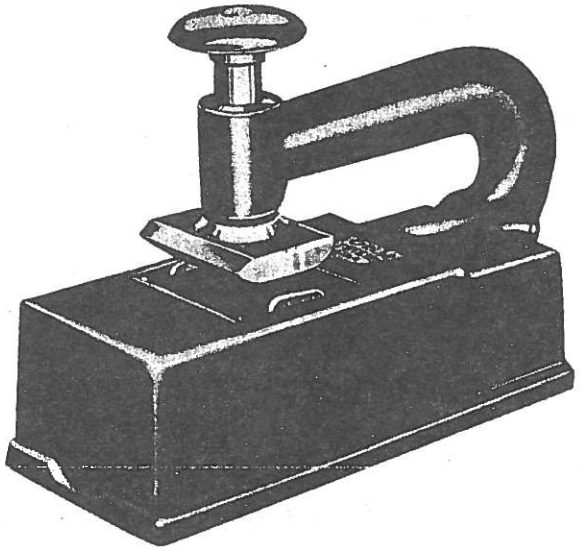


Each machine is mounted on a black enameled metal base and protected by a heavy plate glass cover.

Bell Relay, Switch and Button for each circuit included.

Made and carried in stock with and without cut-out in single, two, three, four, five and six circuit machines, in 12, 18 and 24 hour periods. Larger sizes to order. A single circuit machine will operate bells or signals in all parts of the building simultaneously. Machines of two or more circuits can be set to operate signals at different periods in different parts of the building independent of each other.

THE SOHM AUTOMATIC TIME STAMP



No. 600

The **Sohm Automatic Time Stamp** is controlled and synchronized on minute impulses from the **Master Clock** and prints an indelible and indisputable record of the month, day, hour, minute and year on any document of any transaction or operation in the factory, store, office, shipping or receiving room.

The beauty, simplicity, and rugged dependability of the **Sohm Automatic Time Stamp** is evident at a glance.

The mechanism is placed in the base and being independent of the head is not affected in any way by the force used on the head in making the impression.

The head operates on an air cushion mechanism, will not rattle and is provided with powerful return spring and rubber shock absorber. The solid printing pad is fitted with a resilient mat and is prevented from striking the type on the time wheels by two solid steel horseshoe-shaped ribbon guides, one on each side of the mechanism which also keep the paper to be stamped from contact with the ribbon, preventing its soiling or blurring.

As the head is pressed down to make the impression, the solid printing pad forces the two horseshoe-shaped ribbon guides down until their lower ends touch the steel base plate of the stamp, which absorbs the shock, permitting the ribbon guides to travel far enough to make the impression. It will thus be seen that the time type wheels are protected from injury regardless of the force used in maknig the impression.

The time type wheels are always locked against false action and cannot overjump or make more than one minute at a time no matter what voltage is used. The type is always in perfect alignment.

A Ribbon Shift That Shifts

The **Sohn Automatic Time Stamp** is provided with an autofatic ribbon shift which furnishes a fresh inking surface for each impression. After the ribbon is completely unwound from one ribbon spool, it automatically reverses and winds the other way on the other ribbon spool.

With the removal of the pressure on the head the ribbon shift guides are automatically returned to normal position by four return springs.

An exclusive feature of the **Sohm Automatic Time Stamp** is the ease with which the mechanism can be dismounted from the steel base plate. The time type wheels, ribbon, and automatic ribbon shift mechanism are contained in a separate compact unit. This permits easy access to all working parts for cleaning.

The **Sohm Automatic Time Stamp** is adapted for myriads of labor saving uses. It has been adopted and is recommended by some of the largest institutions in America.

They have been adopted by banks and other financial institutions, boards of trade, etc., for their accuracy in recording actual time of the handling of checks, drafts, notes, etc.

They are used in hotels to record the arrival and departure of guests on their room cards, the receipt and delivery of mail and telegrams. In the cafes to stamp the date on dinner checks, preventing the presenting of bogus dinner checks of a previous date. They are placed on every hotel floor for their check on room service by maids, bell boys, porters, or others.

For insurance offices, showing accurate time records when policies go into force, and when they expire. In court rooms for all legal papers. In railway depots for the receipt and delivery of freight and express matter. By the claim and correspondence departments, for the baggage and parcel room, telegraph office, etc.

Druggists are using **Sohm Automatic Time Stamps** to record time when prescriptions are received and when compounded. In pool rooms and billiard parlors, they are used to record the actual time tables are in use. A card is issued when the table is rented and is stamped when surrendered, giving the elapsed time it has been in use.

The housing and arm are finished in beautiful black lustre enamel. The head is coated with a special rust-resisting composition, finished in gray. The bottom of the base plate is covered with green felt guarding against the possibility of injury to furniture.

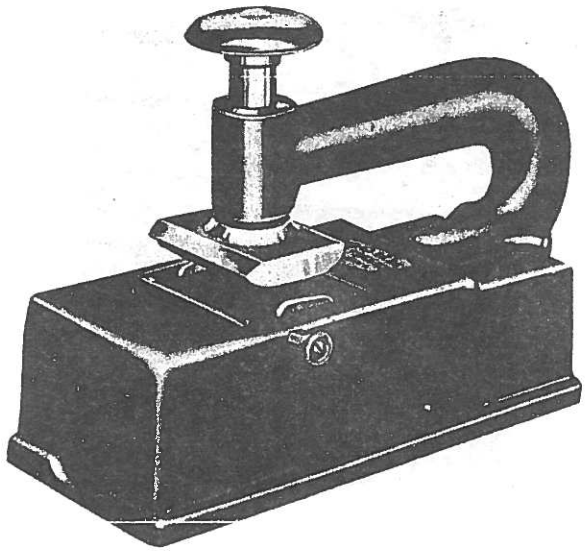
Lettering may be had as desired. Card guage is furnished for factory cost finding.

The coils can be wound for any voltage. Be sure and specify voltage desired.

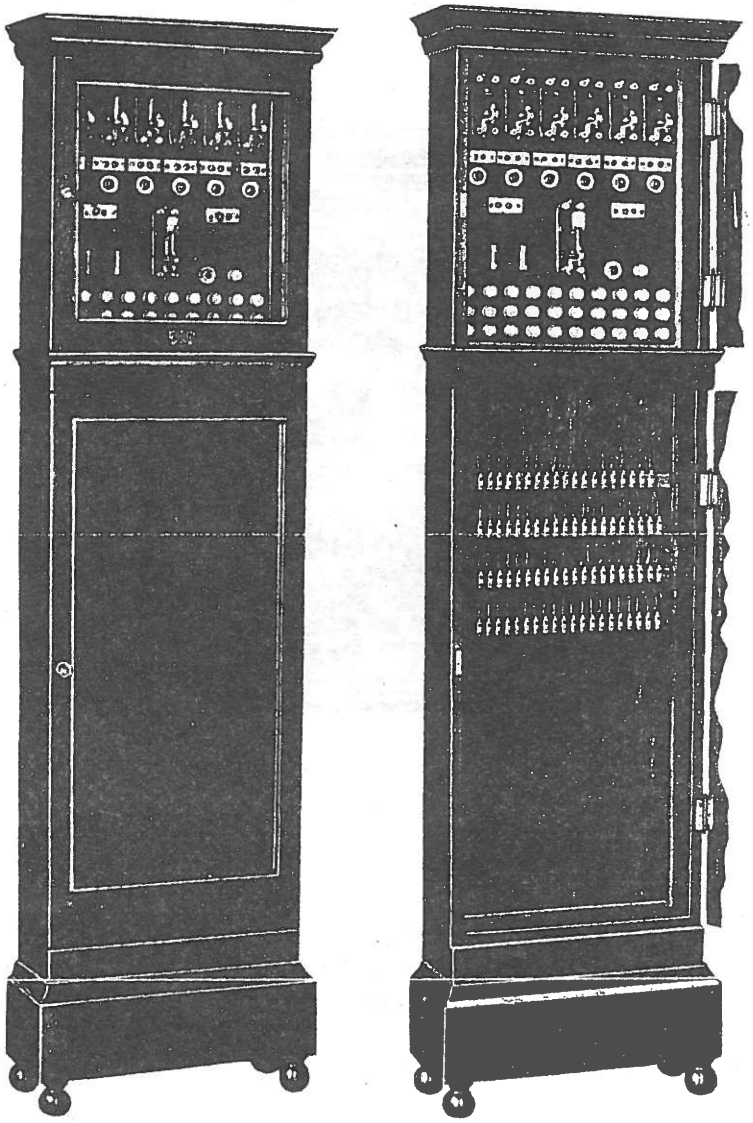
Size of base 9″ long by 4″ wide by 2¾″ high.

Shipping weight approximately 10 pounds.

Special office type is furnished, fitted with hexagon selective word swivel. This type is adapted for those users who require a number of different records during the course of the day's transactions. In addition to the time record and the special lettering of the name plate, this stamp will print the following six standard words: RECEIVED PAID ANSWERED ORDERED SHIPPED MAILED.

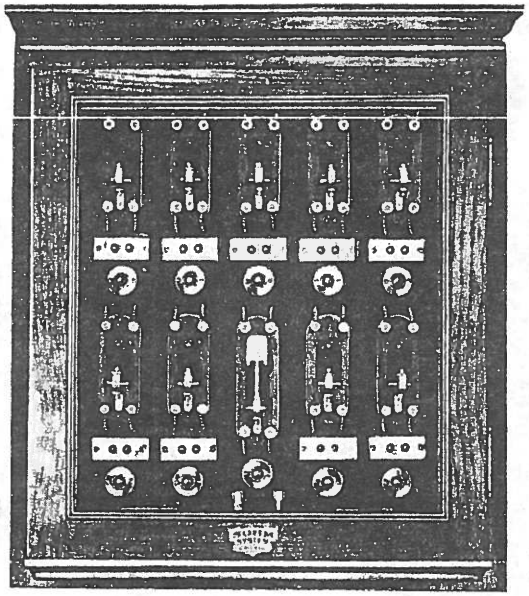


No. 604



Floor type relay cabinet with lower section for terminal and distributing racks. Upper section contains lock-up relay, clock circuits, circuits for bell ringing program, including step-up buttons, circuits operating switches, master bell ring button and switch fuses and individual push button for each bell. Lower section shows terminal strips.

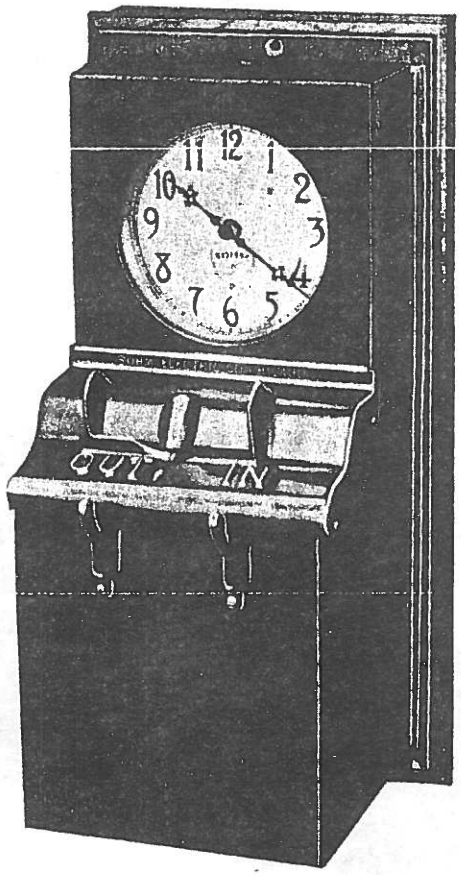
Can be had for any number of circuits. Wiring diagram furnished with each cabinet.



Front View

Wall type relay cabinet equipped with Sohm lock up synchronizer, five secondary clock circuits, four bell circuits with pony line relays, step-up buttons and cut out switches.

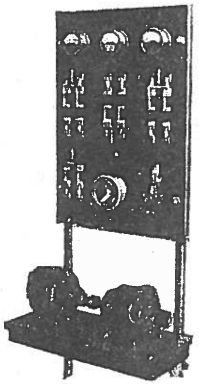
The front door opens, exposing all the front of relays for adjustment and cleaning without any disturbing of wires. The rear panel is fastened permanently upon the wall and the whole cabinet opens from rear hinges, exposing all terminals and rear of relays, step-up buttons and switches, making it very simple for connecting.

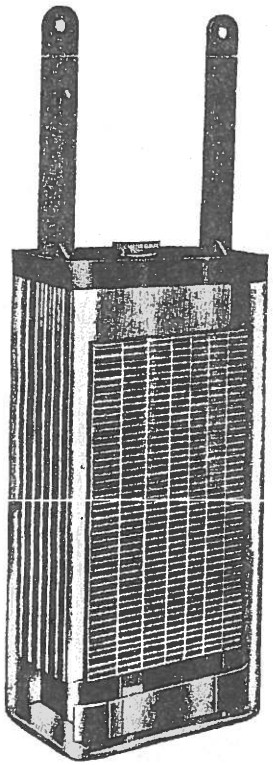


SOHM AUTOMATIC EMPLOYEE'S TIME RECORDER

No card shift levers for in and out. Employees can come and go without shifting card levers. This recorder is controlled by the Sohm master clock and after a card has been once printed it cannot be changed by printing over. It cannot be manipulated. Secondary clock is mounted in case. Case is metal and dust-proof.

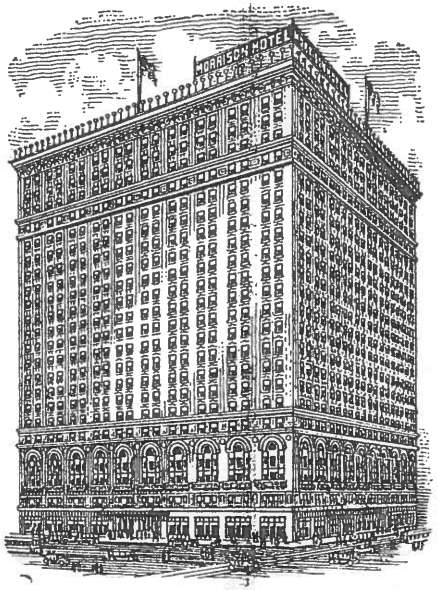
Motor generator set and panel board for charging duplex set of storage batteries. Motor generator set consists of an alternating current motor and a direct current generator. The panel board consists of a charging, and discharging ammeter, volmeter, and charging and discharging double pole, double throw knife switch, one test switch, one main switch, circuit breaker and rheostat.





Single Cell Storage Battery

Six of this type cell will operate any average clock and time system.

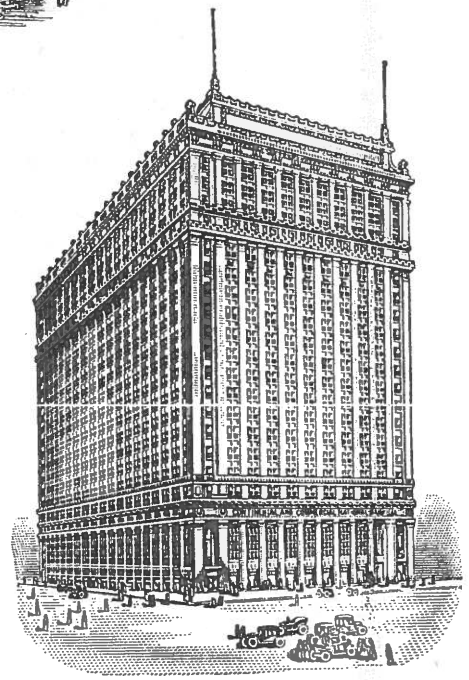


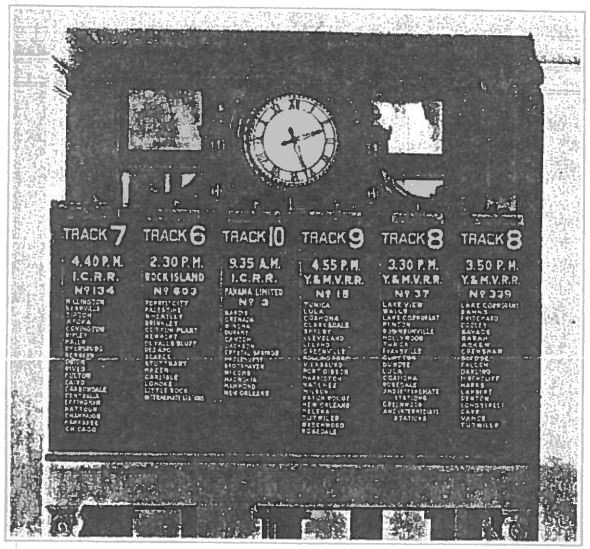
Hotel Morrison, Chicago

Equipped with Sohm system of master clocks, time stamps and secondary clocks.

Continental and Commercial National Bank, Chicago

Equipped with Sohm system. This bank has 40 secondary clocks and 30 time stamps.





Sohm Clock on duty at I. C. Railroad Station
Train Board, Memphis, Tenn.

SYNCHRONOME MOVEMENT. Henry Weiland, 8946 W. Grantosa Dr., Milwaukee, WI 53225

Synchronome, PUL-SYN-ETIC, or other master clock. Also Brillie wall clock. Need help finding following parts: rate adjustment potentiometer & a 1/2" dial for a Bulle. Jerry Hahn (800) 733-3298 M-F 9am-5pm

REPAIR: ALL EARLY BATTERY CLOCKS Specializing in **BULLE** using orig. parts.
Martin C. Feldman, FNAWCC, 6 Stewart Pl , Spring Valley, NY 10977

FOR SALE: **SWCC** Western Union, 15-1/2" convex "glass". Actually it is plastic, but it beats a naked dial. $20.00 (I'll pay UPS up to $5.00) Paul M. Hopkins, 2717 Millwood Rd., Birmingham, AL 35243 (205) 967-1237

BULLE Electric Gallery Clock w/ 12" dial, 17" square overall, walnut wood case w/ pendulum. **BARR** Electric Mantle Clock w/ Glass Dome. **SWCC** Dials and other electric dials and movements.
BARR Electric mantle clk. w/ glass dome. 14" **SWCC** Dials nice, other Dials, Mvts. 60 beat clks, 4 each.
George Frederickson Sr., 1716 West 100th Place, Chicago IL 60643 (773) 238-3294-evenings or 445-5381

Replacement Field Coils for **SESSIONS** and **HAMMOND** synchronous clock movements.
Wining's Clock Service, 2910 Farmdale Rd., Akron, OH 44312 (216) 628-1654

Glass Domes for the **Tiffany Never Wind** and other early electrical & battery clocks. If I don't have it in stock I'll try to get it. Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax. www.glassdomes.com

PUL-SYN-ETIC (pg. 93, 150 Yrs. E. H.) excellent condition, all original & runs $750 **CHROMATIC** (very similar) dirty case, no pend. $250. **MAGNETA** (pg. 89, 150 Yrs. E. H.) case needs refinishing, Howard motion works $450. All 3 for $1200 + shipping
John Perrigo, 5431 Crestview Dr. Hixson, TN 37343, (423) 875-0453 late evenings.

Requests for reprints of previously published material should be directed to the Chapter Historian:
Dr. George Feinstein 75-19 195th Street Flushing, NY 11366

--- MART ---

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PORTESCAP Secticon Clock or Movement. Antique Watch & Clockmaker's Tools & Machinery.
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Martin C. Feldman, 6 Stewart Pl., Spring Valley, NY 10977

BANGHOR Electric, or **NEW ENGLAND Electric,** or a **CONTINUOUS Electric** wall clock. Also want a nice wooden case **TELECHRON** wall model. Phone: (817) 267-9851, Fax: (817) 267-0387
Steve Cunningham, 3200 Ashland Drive, Bedford TX 76021. Email: cunning@cyberramp.net

ITR, STROMBERG, STANDARD, & SWCC Movements and Parts for Master Clocks. Also Wood Cased Slaves. Call or send photo (914) 997-5670 Mitch Janoff, 3 Stratford Ave., White Plains, NY 10605

ELECTRO-MECHANICAL Clocks, Fancy & Simple Cased. Unusual Clocks, Movements. Books.
Elliot B. Siegel, #2 Oakwood Drive, Lloyd Harbor NY 11743, Day or Night (516) 541-2400 or 351-5869

HANDS for a 13 inch Chapter Ring. (312) 238-3294 - evenings or 445-5381.
G. Frederickson Sr. 1716 W. 100th Pl. Chicago IL 60643

TIFFANY NEVER WIND Suspension Unit and Pendulum; Clocks and Parts, any condition. Clocks made by **The American Clock Co.** or the **No Key Clock Co.** Working or not
Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax.

Dead Coil Assemblies for **KUNDO's**, Single or Dual Coils, for Possible Rewinding Project. Also "B" **TELECHRON** Rotor, 1 rpm, 50 (fifty) Hz. John R. Seeley, 7541 Meridian St., Miramar FL 33023-4770 (954) 963-7456.

Movement for a **HAMMOND** Clock: the required movement has a FRONT ENTERING motor starting knob, mounted just below the hour post. I am advised that this may have been a **SESSIONS** movement with a **HAMMOND** motor. The dial has the legend: "HAMMOND MOTORED". Movement for a **SANGAMO** BANJO CLOCK: the desired movement is electric motor-powered spring wound, with front mounted escapement. The regulator on the escapement is bent at a right-angle so that it extends through the dial. The dial has an opening that is marked: "S-F". If your movement escapement doesn't have the right-angle bend, I think I could adapt it. Mel Kaye, Box 682, Short Hills NJ 07078 (973) 912-0038 FAX (973) 912-8092

Electric Clocks by **HAMMOND, WHITEHALL-HAMMOND,** and **HERMAN MILLER.** Also advertisements, catalogs, etc. on same. Collector will pay fair prices. Jack Shelton, 7975 N. Hayden Rd. #C-100, Scottsdale, AZ 85258. (800) 488-1818 x7106. E-mail: a1017@amug.org

Plastic Alarm Dial Plate for **SETH THOMAS** 120 v. el. alarm clock, Model POISE E-861-000.
Richard McCahan, P.O. Box 1296, Center Harbor, NH 03226. (603) 253-4110

SWCC 11 1/4" chapter ring w/ lg. sec. Bit opening for program clock. Roman Num. preferred.
Nice model 9-A, w/ Merc. Pend. Or 18-A, w/ Brass Pend.
Larry Leiper, 3713 Boatman's Point, Belleville, IL, 62221 (618) 632 8135, E-mail @: parkerma@apci.net

THE ELECTRICAL HOROLOGY SOCIETY

CHAPTER #78
NATIONAL ASSOCIATION OF WATCH & CLOCK COLLECTORS

VOLUME XXIV #4, DECEMBER 1998

Fellow Horologists:

In this issue we offer a brief history of the Western Union Time Service, published in the 1960's, we believe as an introduction to the company as part of an effort to sell the organization. (Which did not succeed.) In addition, we continue with the Sohm Electric Clock Co., and the ongoing Riefler Clock series.

Our thanks to Chapter 78 Director Elmer Crum, who has taken over the reins as program and meeting chairman at the major regionals and the national convention. He not only arranges fot time in the scheduled programs, but conducts the meetings as well. Elmer has always been one of the valued voices in the operation of the chapter, but has now found the time to come forward and more prominently display his abilities.

We are advised by our Secretary-Treasurer, Harvey Schmidt that there are still 3 copies of the videotape of the exhibit at the 1996 Syracuse regional which was conducted by our own chapter members. It was agreed that this display ranked with the finest ever held on that occasion, and the professionally taped and edited videos provide a lasting remembrance of the event. These are sold at the cost to us of $15 each plus postage, first come, first served.

The Mart pages will undergo the annual clean-out with the next Journal issue, advise George Feinstein of your intentions. Director Bill Ellison tells us that an updated Journal index will be ready for the next issue.

Journal material is still needed, please keep this request in mind. Happy Holidays to all. Good reading ahead.

Martin Swetsky, FNAWCC, President
Harvey Schmidt, FNAWCC, Co-Editor
Dr. George Feinstein, Co-Editor

HARVEY SCHMIDT, FNAWCC, Secretary-Treasurer, 75-80 179th ST. FLUSHING NY 11366

The Western Union Time Service

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Corporate Development Operation
Western Union
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Mahwah, N.J. 07430
Telephone (201) 529-4600

CONTENTS

Preface

This document is only intended to familiarize the reader with the history and operations of the Western Union Time Service. Western Union is willing to discuss with a proper party the sale of the customer list and certain of the assets of the Time Service. However, the contents of this document do not represent an offer. Any offer or contract for the sale of the Time Service shall be by formal instrument signed by an appropriate officer of The Western Union Telegraph Company.

The Western Union Time Service

I. History and Background

James A. Hamblet founded the Western Union Time Service in about 1877. Hamblet was born in Boston, Massachusetts, on June 16, 1824 and his first position was with William Bond and Son, astronomers. In 1862 he started his own business manufacturing electrical apparatus and telegraph instruments. One of his customers at this time was an ambitious telegraph operator in Boston named Thomas A. Edison who needed apparatus for his inventions, which included a stock ticker. In 1870 Hamblet joined the firm of E. Howard & Company, a Boston clockmaker, and was with that firm until 1876.

In 1877 Hamblet was interested in Western Union's plans to transmit time signals at noon daily from the United States Naval Observatory in Washington D.C. over the telegraph wire network to all of its offices in the nation. Whether Hamblet suggested this service is not known, but he did plan at once to establish a time distribution service. He began providing time service to jewelers and other stores and offices, principally in the Maiden Lane and John Street area of New York City.

Hamblet designed a cogwheel attachment for a master clock which automatically transmitted the time signals to sounders in the subscriber's premises--indicating, by omissions of the seconds beats of the sounders, the passage of minutes, five minutes and hours. His master clock was kept in step with the Observatory time at noon by time beats coming over the telegraph line from Washington D.C. Hamblet took charge of Western Union's time service in 1878 and extended it to thousands of towns and cities over the nation where Western Union's electrically synchronized clocks were installed and became the "Standard of Time".

One means of making standard time known in New York City, beginning in 1877, was the dropping, precisely at noon each day, of a large time ball down a flag pole erected on the tower of the Western Union headquarters building at Broadway and Dey Street, which was then one of the tallest buildings in New York City. The noon time signal from Washington automatically disengaged a lever and caused the ball to slide down the pole. Due to the height of the building, the time ball was visible for many miles. Crowds would gather in the street each day with watches in hand to check their time and captains of vessels trained their telescopes on the time ball.

In 1882 Hamblet petitioned Congress to pass a law establishing time zones and a standard time to replace the many different times then observed by cities and towns throughout the nation. With his snow-white hair and long white beard, James Hamblet became known to the public as "Father Time" and was spoken of and addressed by that name. On November 18, 1883, several large railroads adopted time tables based on the proposed Standard Time and pressure on Congress was renewed. On March 13, 1884, the law establishing Standard Time was passed by Congress.

II. The Time System

Each morning, over an order wire circuit originating from Washington D.C., a series of time pulses are transmitted to each synchronizing office of The Western Union Telegraph Company throughout the country. From a distributing clock in Washington, the pulse is sent each second so that clicks are heard on each office's sounder. Certain clicks are omitted to mark the minutes and half minutes. Thus the 29th second and the 55th to the 59th, inclusive, are always omitted. Just before twelve o'clock, 10 clicks are omitted, that is, the 50th to the 59th inclusive and the last click, at exactly noon, is longer than the rest. These time signals are probably never in error by more than a few tenths of a second. Time is determined in Washington within a few thousands of a second. The distributing clock is correct within a few hundredths of a second. The relays in the telegraph lines introduce most of the error, but in practically every case the signals can be relied upon to be accurate to within a few tenths of a second.

Based upon the clicks heard in each synchronizing office, a Supervisor manually adjusts the master clock located at that office to correspond to the sounder's clicks.

This master clock synchronizes all of the other clocks originating from that office every hour. When everything is working well, no one of the slave clocks should be inaccurate by more than a second or two.

It is possible to service up to 20 slave clocks on one synchronizing circuit. When the number of subscribers totaled in tens of thousands, economy of circuit facilities was enforced. However, as the number of clock subscribers decreased, no attempt was made to use the circuitry to this state of efficiency. Therefore, there are now many synchronizing offices where only one clock appears on a synchronizing circuit. On some circuits, either because of their length or the quality of the line, d.c. repeaters are used to strengthen the synchronizing pulse.

III. The Clock

The synchronizing self-winding clocks used in the Time Service were made by the Self-winding Clock Company of Brooklyn, N.Y. The term "self-winding" refers to the technique used as the driving power to wind the mainspring periodically. The clock's spring is wound up every hour electrically. The controlling mechanism in the clock is an anchor escapement and pendulum which is a common mechanism used in many clock designs. The driving mechanism is a spring. Each hour the clock mechanism automatically closes a contact which sends current through a little motor that winds up the spring. The spring is wound just one turn and then the circuit is broken for another hour. The same amount of expansion of the mainspring is thus used each hour.

The clock mechanism was invented in 1846 (Ed. Note: this date is in error the system was invented by Chester H. Pond between 1883 and 1888.) Two No. 6, 1-1/2 volt batteries are used to power the winding mechanism and they last for about 18 months before requiring replacement. The master clocks function in the same way in winding, etc. except that a contact is closed upon each hour to transmit the synchronizing pulse to the slave clocks. This pulse is a 120V d.c. signal of about one second duration. If the minute hand on a slave clock is within 50 seconds of the hour, the clock automatically corrects to the proper time.

In most cases, a clock is provided to a customer subscribing to the service. However, there are some customers, such as railroads, who only subscribe to the time-beat service.

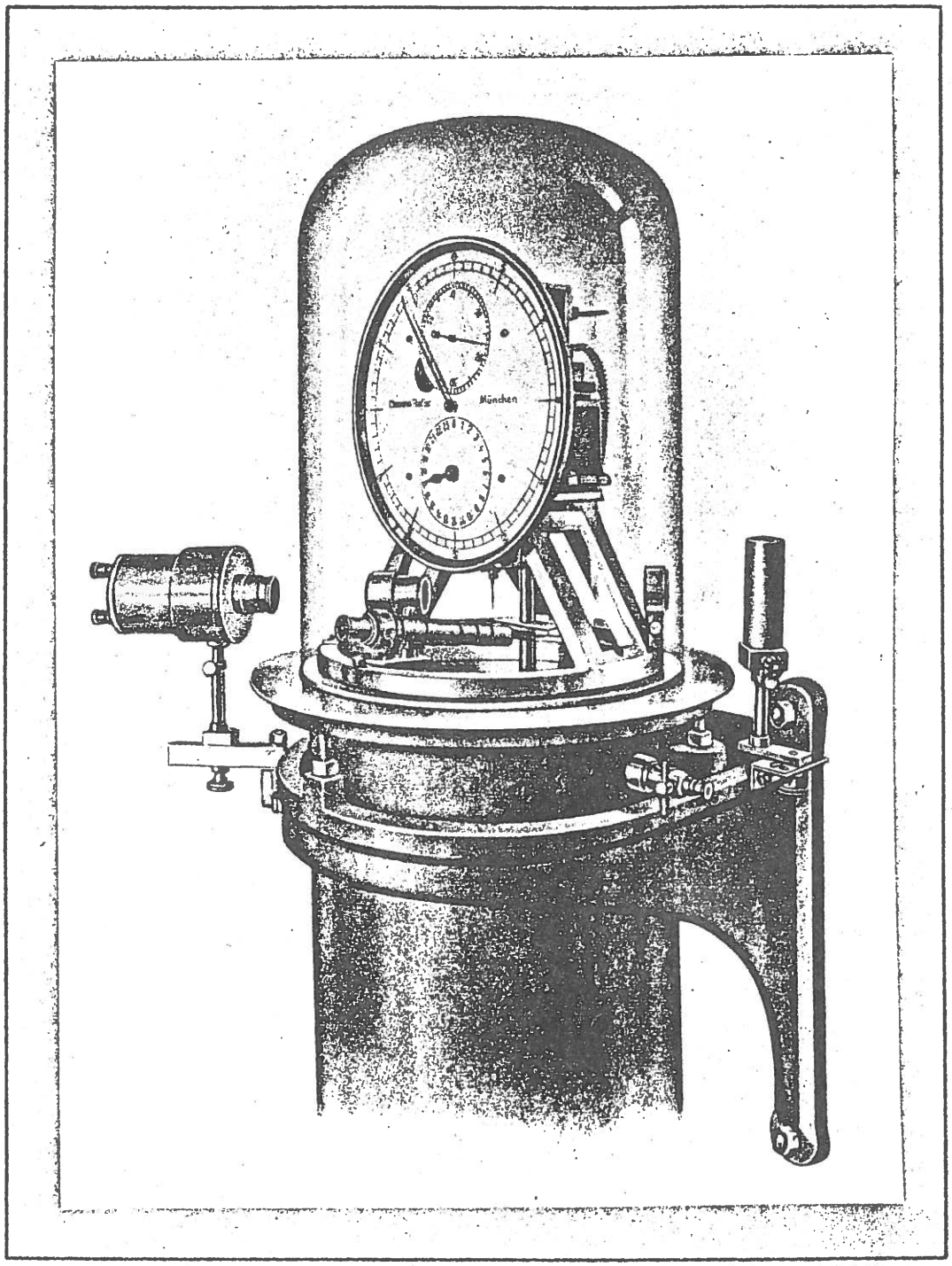
Up until 1963 the clocks were owned by the Self-winding Clock Company. During that year Western Union bought the clocks from Self-winding Clock Company.

When time changes from Daylight Savings Time to Standard Time, and vice versa, the clocks have to be changed manually. However, in some synchronizing cities, the Operations Supervisor is able to simulate, manually, the synchronizing pulses and retard the clocks' movement for an hour. A maintainer is required to visit each clock to set the clock back an hour. Sometimes, the customer will cooperate and reset the clock an hour.

CLEMENS RIEFLER
Fabrik mathem. Instrumente
NESSELWANG / Bavaria

Astronomical Precision Seconds Pendulum Clock

Type D



ASTRONOMICAL PRECISION SECONDS PENDULUM CLOCK TYPE D

The Astronomical Precision Seconds Pendulum Clock Type D operates in an air-tight metal cylinder with glass cover, and is provided with the Riefler free gravity escapement, and with an electric winding by means of 3 dry elements. A seconds gear contact with/ or without marking of second '0' enables the overchecking of the rate of the clock by a chronograph. The pendulum is a nickel-steel compensation pendulum type J 1 sch with compensation of the temperature and its stratifications. A barometer and a thermometer is inbuilt to observe the air-pressure and temperature in the metal cylinder. By means of a microscope you can read the arc of oscillation.

Additional equipment:

For exact time measurements by means of the chronograph a photo-electric contact-device, consisting of photo-cell, lamp and amplifier, with a measurement accuracy of ± 0.001 - 0.003 seconds, can be inbuilt.

The Astronomical Precision Seconds Pendulum Clock Type D is for time measurements of the highest accuracy, and is mainly used in observatories and scientific laboratories.

Of essential importance for the exact operation of the clock is the careful maintenance, as well as the adequate place where the clock will be mounted. This place shall be free of percussions and shall have temperatures as constant as possible. The room must be protected against sun rays and may not be damp. At a careful consideration of these points the daily rate of the clock will remain within the indicated limits, which vary from 0.01 to 0.03 seconds. Such results are attainable only at the use of first class precision clock-works and well compensated nickel-steel pendulums. All brass parts of the clock are electro-gild and the steel parts are chromium plated.

For the exact regulation of the pendulum, the following data are necessary :

1.- whether the pendulum shall oscillate in normal time or sideral time seconds

2.- the geographical latitude and hight above sea level of the place where the clock will be mounted

3.- the kind of contact required, e.g. intermittent seconds gear contact (with 30, respectively 29 teeth) or a seconds gear contact (contact gear with 60, respectively 59 teeth).

At the same wall where the clock type D is mounted, there may not be a second clock, as otherwise the pendulum oscillations would interfere themselves. It is advisable to suspend the clock at a separate solid pillar.

Our Precision Pendulum Clocks - from which some hundreds had been furnished since their invention to various Observatories, Scientific Institutions, Naval-Stations, Central Clock Plants, etc. all over the world - equipped with the free elasticity escapement, have attained superior rate results, which can be seen from numerous reports and scientific treatises, published in course of the years. However, single cases showed that some of the clocks are not quite satisfactory despite of showing a perfect rate in our laboratories,where they were controlled and supervised mostly for years. Thorough examinations resulted that the clocks - apart from a not quite unobjectionable and competent maintenance had been set up in rooms exposed to frequent percussions, which are of very bad influences to the free elasticity escapement with its extremely sensitive pendulum spring and its fine mechanism.

The idea of producing also for such unfavourable circumstances a first-class precision pendulum clock led us to extensive yearlasting experiments and finally to the design of a new escapement which is called the 'Free Gravity Escapement, with pendulum swing over knife-edges' .

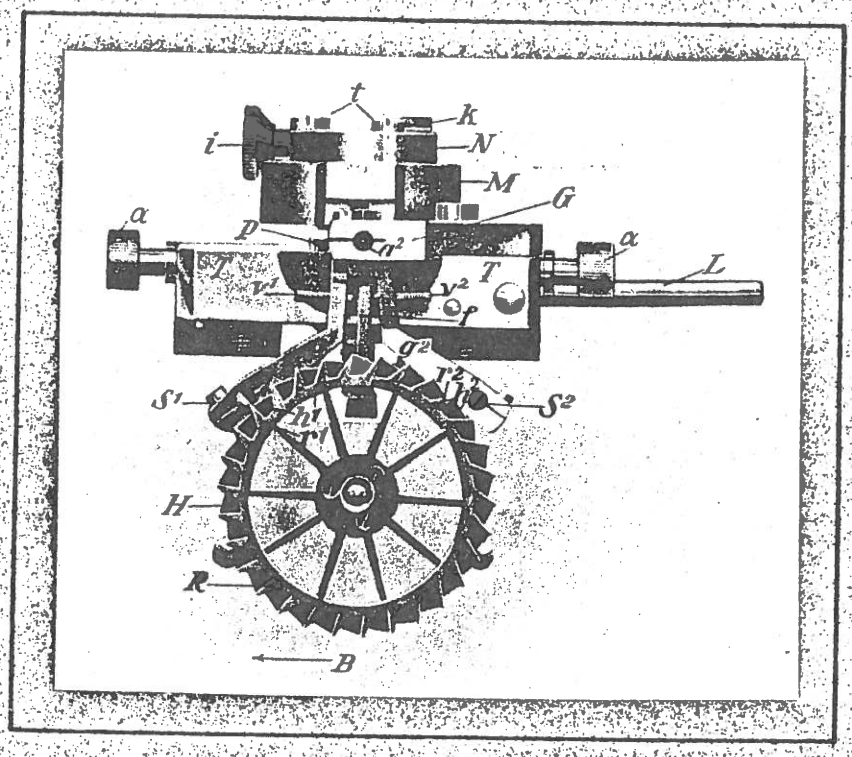
This gravity escapement, where the pendulum oscillates over two knife-edges, and where no pendulum spring is used, has in comparison with the free elasticity escapement the advantage of a simpler mechanism, a lower degree of sensitivity against the exterior influences and a higher stability.

Therefore a clock with gravity escapement is suitable for Observatories, Scientific Laboratories, etc. and everywhere, where the conditions of the place where the clock is to be set up are not adequate, for instance for measurements of the earth gravitation in the open air.

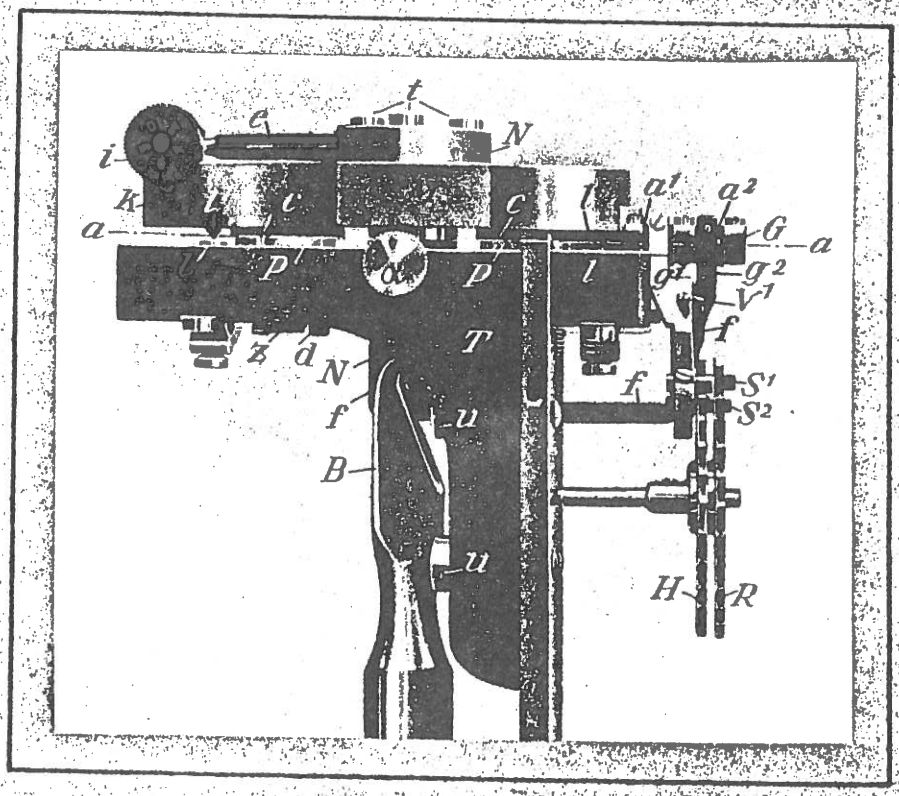
The clock-work equipped with the gravity escapement is of first-class manufacture. The pendulum swings over a knife-edge axis consisting of 2 knife-edges, which are mounted to the pendulum support and are rigidly connected to the pendulum by the pendulum pivot, which pivot is led through the pendulum support, so that the pendulum spring can be abolished entirely. The pendulum drive is effected by the own-weight levers which are independent from one another; their plane of oscillation is parallel to the one of the pendulum, and their axis of revolution coincides with the prolonged axis of oscillation of the pendulum. The two weight levers are acting directly on the pendulum and are each equipped at their lower ends with a pallet which gears into the locking wheel respectively into the lifting wheel in the similar way as at other pendulum clocks. The lifting wheel produces the necessary hub of the weights lever, required for the drive. The adjusting and locking of the two abovementioned knife-edges of the pendulum support - which rest on flat agate plates - follows in the similar way as at the escapement of our free elasticity escapement.

In that clock we use our nickel-steel compensation pendulum type J 1 sch with the utmost temperature compensation error of $\pm$ 0.005 seconds per $1^{\circ}C$ and day.

Free Gravity Escapement
with pendulum swing over knife-edges



Front view



Side-view

Furthermore, this clock is equipped with an intermittent seconds-gear-contact, which serves for the comparison of the time determinations over a chronograph, etc. The contact gear of this contact is provided with 3o teeth, so that there is recorded on the chronograph always one second with closed contact and the next second with interrupted contacts. For the marking of second '0' the thirtieth tooth is taken out of the contact gear.

It is also possible to use a contact gear with 6o (respectively 59) teeth, instead of the contact gear with 3o (respectively 29) teeth.

For the drive of the clock with gravity escapement we provide the clock with an electric winding, which had prooved to be of great advantage since its invention many years ago. No supervision is required except for the cleaning of the contact by means of a small file, about every 1 or 2 years. The current consumption is extremely low (53 milliampères) so that a 4-Volts battery will be sufficient for the drive. Only the winding interval (3o to 36 seconds) should be overchecked monthly, and if necessary it should be corrected by means of the sliding rheostat.

The electric winding of the clock is against the usual weights winding in the advantage of having a considerably more constant pendulum drive, as its power transmission is not so disadvantageously influenced by such large gear-transmissions. A further advantage also is that the clock with automatic winding has to suffer neither from percussions - which are always of bad influence to the clock - nor from other accidental disturbances. The heavy weight of about 1-1/2 to 2 Kg at clocks with usual weights winding, is at the electric winding replaced by a weights lever of about 1o gramms, which gives the drive to the clock. The power transmission from the power source (weights lever) up to the scape wheel is only the 7-1/2 fold against the 9oo fold of a usual winding.

A sliding rheostat is provided for the regulation of the winding voltage.

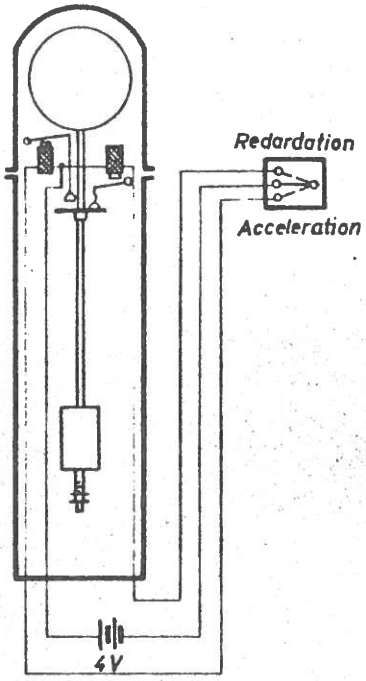
To be completely independent from the air-pressure, the clockwork operates in an air-tight metal cylinder with glass cover, as the daily rate of the clock usually depends on the variations of the atmospheric air-pressure. By evacuating of about 1oo mm air from the cylinder, the rate of the clock is prevented from the exterior influences of the air-pressure. For this purpose we furnish the clock with an air-pump. For the overchecking of the air-pressure and the temperature in the clock-case a barometer with thermometer is used, which is screwed to the clockwork frame. A microscope serves for the control of the pendulum oscillations; herefore, an oscillation scale is fixed to the pendulum tray. The marking of this scale comprehends two angle degrees to the left and two to the right. The angle degrees are subdivided in minutes. The glass scale of the microscope is divided in 1o minutes and 1/1oth minutes to the left and to the right. Therefore, the oscillation arch of the pendulum can be read to an accuracy of 1/1oth angle degree minutes.

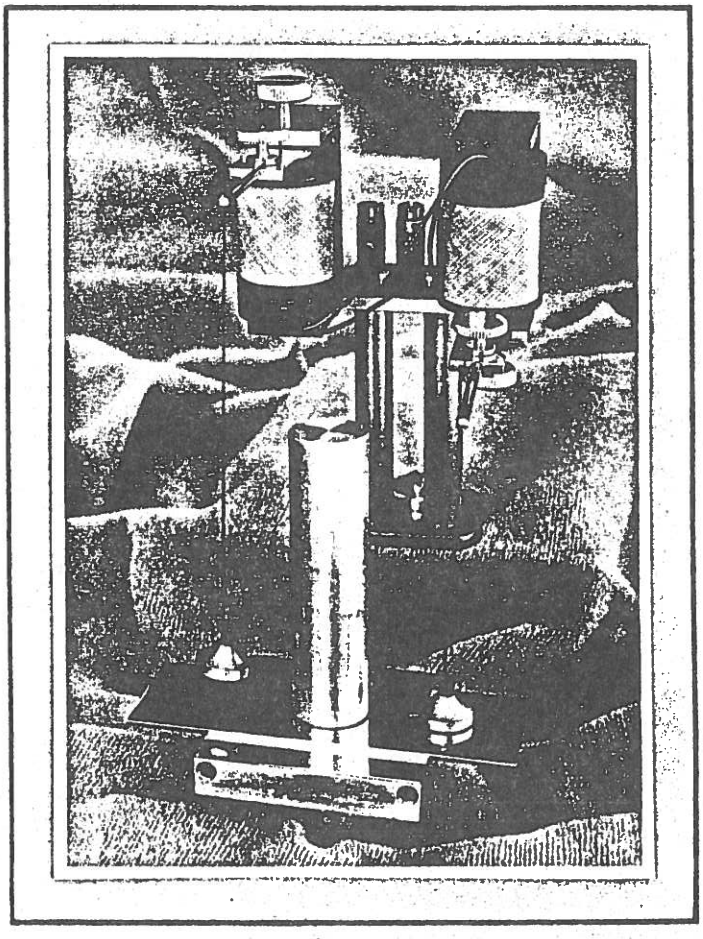
The precision seconds pendulum clocks are further provided with a seconds-gear-contact which for measuring purposes transforms the single second intervals to a chronograph or oscillograph or

operates directly a relais. The switching contacts, respectively the contact release follows here over a contact lever which slides over the teeth of a contact gear. Though the herewith caused friction resistance is extremely small, deviations in the accuracy of the single contact signs of some hundredths seconds may appear. For time comparisons of pendulum clocks, for time determinations or reception of time signals, the accuracy of the gear contact generally is sufficient. But in case a higher accuracy of the contact signs is required, it is advisable to provide the pendulum clocks additionally with a photo-electric contact-device. The contact release follows here directly by the pendulum. A fine light beam is projected to the photo-electric cell and sets this cell herewith under current. During the center position of the pendulum at each pendulum swing, this light beam is interrupted and released again by a diaphragm which is mounted to the pendulum. The photo-electric cell is switched on and off and controls herewith an amplifier with a connected relay. The accuracy of this frictionless acting photo-electric cell amounts to 0.003 - 0.005 seconds and will be sufficient for all measurements. A more detailed description of this photo-electric cell will be furnished upon request.

Electrical remote-adjustment for Clocks type D. At the internal time-service in the observatories a rate correction of the clock is of no value, as it might easily be calculated. But the clocks of the public time-services have to show the time as exactly as possible. As each clock has a daily rate, i.e. the clock is either too fast or too slow, it might occur that after a couple of days this daily rate comes to a certain amount which the public time-service may not miss. The rate-correction is easily to be adjusted by the remote-adjustment. A greater correction can be done by a change of the air-pressure in the cylinder.

The electric adjustment device consists of 2 electro-magnets. The one of them is arranged to the right side and the other to the left side of the pendulum. The balanced armature of each of these electro-magnets is provided with an additional weight of about 2 gramms which is suspended by a silk-thread. According to the position of the balanced armature the respective additional weight will be suspended freely or will rest on the pendulum tray. Usually the left additional weight will be suspended freely above the tray. But if the circuit for the acceleration is closed by the switch the balanced armature is tightened and the additional weight lies on the tray. Herewith the center of gravity of the pendulum is slightly pressed up, which causes such an acceleration to the pendulum oscillation that the clock will go fast within 6 minutes by 0.01 seconds, i.e. in one hour by 0.1 seconds. When we interrupt now the circuit again the coil-spring of the electro-magnet lifts the weight from the tray. For the retardation serves the additional weight of the balanced armature of this electromagnet, which is at the right side of the pendulum. As the corresponding additional weight at an open circuit usually must lie on the pendulum tray, this balanced armature is provided with a leverage. By closing of the circuit the weight is lifted whereby a retardation of the pendulum is caused. The thread of the additional weight for the retardation, which usually rests on the tray, is slightly bent at each pendulum swing. If this thread has a sufficient length, the pendulum oscillation will slightly be influenced by the small resistances caused by the bendings of the thread. If the clock to be adjusted is provided with an electric seconds contact, it will be the best to determine the rate of the state-correction to be eliminated by a chronograph.


Redardation
Acceleration
4V



ASTRONOMICAL PRECISION SECONDS PENDULUM CLOCK TYPE E

Highest exactitude, with temperature compensated seconds pendulum of Supra-invar-steel.

Drive by gravity escapement and synchronized electric winding

Dial with seconds hand

In air-tight metal cylinder with glass-cover, and inbuilt : thermometer - barometer and amplitude-microscope with lighting of the amplitude-scale.

Time control device with control-lamp, optic and photo-electric cell, mounted on an adjustable bar.

Separate photo-cell amplifier, equipped for remote-starting, with relay for closed circuit contact and open circuit contact.

Control instruments for controlling all the working data and voltages.

Working voltage 110 - 220 Volts a.c. Inbuilt gas-tight and acid-proof battery for 18 months drive spare and 24 hours amplifier spare.

The daily variations of rate are below ± 0.004 seconds

XXXXXXXXXX

Price : .....

Delivery : The abovementioned clocks can be furnished within about 8 to 10 months from receipt of order.

Payment: Is requested by irrevocable letter of credit on our export bank the Bayerische Vereinsbank, Filiale Kempten, Kempten/Bavaria - together with order, respectively when the clock is ready for dispatch.

Shipment: Seaworthy packing and delivery FOB-German sea-port are included in our prices.

Mounting : In case, the Astronomical Precision Seconds Pendulum Clock Type E must be mounted in your institute by our specialist, we had to invoice to you the effectively occurring costs too.

PROGRAM MACHINES

Single Circuit

12 Hour		18 Hour		24 Hour	
No.	Price	No.	Price	No.	Price
700	$45.00	702	$52.50	704	$60.00
With cutout		With cutout		With cutout	
701	60.00	703	67.50	705	75.00

Two Circuit

12 Hour		18 Hour		24 Hour	
706	$80.00	708	$95.00	710	$110.00
With cutout		With cutout		With cutout	
707	95.00	709	110.00	711	125.00

Three Circuit

12 Hour		18 Hour		24 Hour	
712	$115.00	714	$137.50	716	$160.00
With cutout		With cutout		With cutout	
713	130.00	715	152.50	717	175.00

Four Circuit

12 Hour		18 Hour		24 Hour	
718	$150.00	720	$180.00	722	$210.00
With cutout		With cutout		With cutout	
719	165.00	721	195.00	723	225.00

Five Circuit

12 Hour		18 Hour		24 Hour	
724	$185.00	726	$222.50	728	$260.00
With cutout		With cutout		With cutout	
725	200.00	727	237.50	729	275.00

Six Circuit

12 Hour		18 Hour		24 Hour	
730	$220.00	732	265.00	734	$310.00
With cutout		With cutout		With cutout	
731	235.00	733	280.00	735	325.00

Combination 80 beat Master Clock and Single Circuit program machine Combined

Finish	12 Hour No.	12 Hour Price	With cutout No.	With cutout Price
Qr. Sawed Oak	205	$100.00	207	$115.00
Mahog. Finish	206	$100.00	208	$115.00
18 Hour				
Qr. Sawed Oak	209	$107.50	211	$122.50
Mahog. Finish	210	$107.50	212	$122.50
24 Hour				
Qr. Sawed Oak	213	$115.00	215	$130.00
Mahog. Finish	214	$115.00	216	$130.00

Time Stamps

No.		Price
600	Wired for any voltage from 10 to 110 volts	$50.00
601	Wired for 220 volts	55.00
	Fitted with card gauge for factory cost finding.	
602	Wired for any voltage from 10 to 110 volts	55.00
603	Wired for 220 volts	60.00
	Fitted with hexagon selective word swivel.	
604	Wired for any voltage from 10 to 110 volts	60.00
605	Wired for 220 volts	65.00

Prices of relay cabinets, relay equipment and employees time recorders on application

SOHM ELECTRIC CLOCK CO.
CHICAGO, ILLINOIS

PRICE LIST -- CATALOG No. 61

EFFECTIVE JANUARY 1, 1922

MASTER CLOCKS

80 Beat Master Clock. 12" dial

No.		Price
229	Quarter Sawed oak	$55.00
230	Mahogany Finish	55.00
231	Solid Mahogany	65.00

60 Beat Master Clock Standard pendulum bob. 14 in. Silver Etched Dial.

No.		Price
350	Quarter Sawed oak	$125.00
351	Mahogany finish	125.00
352	Solid mahogany	140.00

(With Secondary Pilot Clock, Voltmeter and step-up button.)

No.		Price
353	Quarter Sawed oak	$150.00
354	Mahogany finish	150.00
355	Solid mahogany	165.00

60 Beat Master Clock,

genuine mercury pendulum bob. 14" Silver Etched Dial

No.		Price
356	Quarter Sawed oak	$190.00
357	Solid mahogany	190.00

(With Secondary Pilot Clock, Voltmeter and step-up button.)

No.		Price
358	Quarter Sawed Oak	$225.00
359	Solid mahogany	225.00

60 Beat Master Clock (Floor type)

365	Solid Mahogany	225.00
366	Solid Quarter Sawed Oak	225.00

Special designs to order

SECONDARY CLOCKS

Square wood cases

12″ dial. Case 20½″x20½″x3½″

No.		Price
500	Plain Oak	$13.50
501	Quarter Sawed oak	16.00
502	Mahogany finish	13.50
503	Solid Mahogany	17.50
504	White Enamel	13.50

15″ dial. Case 20½″x20½″x3½″

No.		Price
505	Plain oak	$16.50
506	Quarter Sawed oak	19.50
507	Mahogany finish	16.50
508	Solid mahogany	21.50
509	White Enamel	16.50

18″ dial. Case 24½″x24½″x3½″

No.		Price
510	Plain Oak	$20.50
511	Quartered Sawed oak	25.50
512	Mahogany finish	20.50
513	Solid mahogany	29.50
514	White enamel	20.50

Round spun metal case

8″ dial. Depth of case 1½″

No.		Price
515	Natural oak	$12.00
516	Natural mahogany	12.00
517	White enamel	12.00

12″ dial. Depth of case 3½″

No.		Price
518	Natural oak	$15.00
519	Natural mahogany	15.00
520	White enamel	15.00

15″ dial. Depth of case 3½″

No.		Price
521	Natural oak	$19.00
522	Natural mahogany	19.00
523	White enamel	19.00

18″ dial. Depth of case 3½″.

No.		Price
524	Natural oak	$23.00
525	Natural mahogany	23.00
526	White enahel	23.00

Round spun metal cases flush type (suppressed model)

8″ dial.

No.		Price
527	Natural oak	$12.00
528	Natural mahogany	12.00
529	White enamel	12.00

12″ dial

No.		Price
530	Natural oak	$15.00
531	Natural mahogany	15.00
532	White enamel	15.00

15″ dial

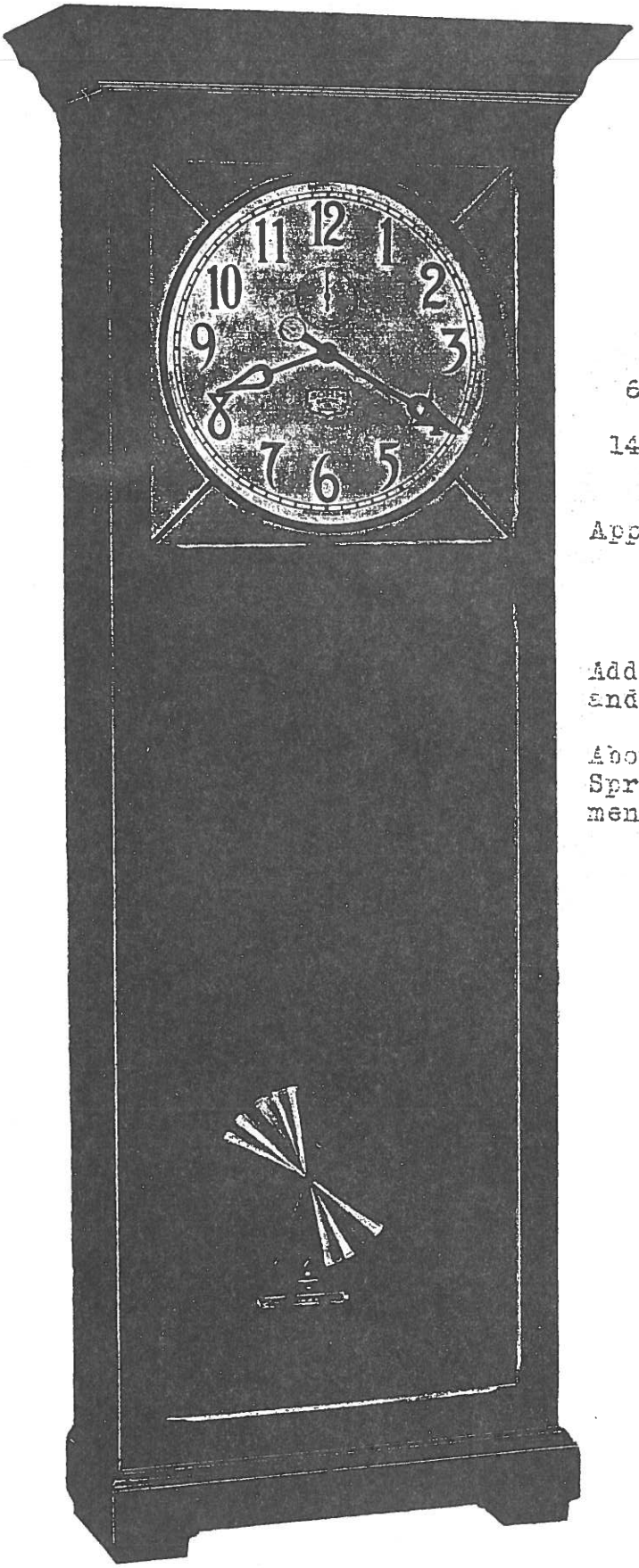
No.		Price
533	Natural oak	$19.00
534	Natural mahogany	19.00
535	White enamel	19.00

18″ dial

No.		Price
536	Natural oak	$23.00
537	Natural mahogany	23.00
538	White enamel	23.00

Miscellaneous Secondary Clocks

550	Mahogany finish, 6″ dial	$30.00
551	Metal case, any finish, 4″ dial	$25.00
77	Marble dial	Price on application
66	Carrara glass dial	Price on application



60 BEAT SOHM KEYLESS SELF-WINDING
INDIVIDUAL
14" Silver Etched Dial Local Battery
65 X 24 X 8"

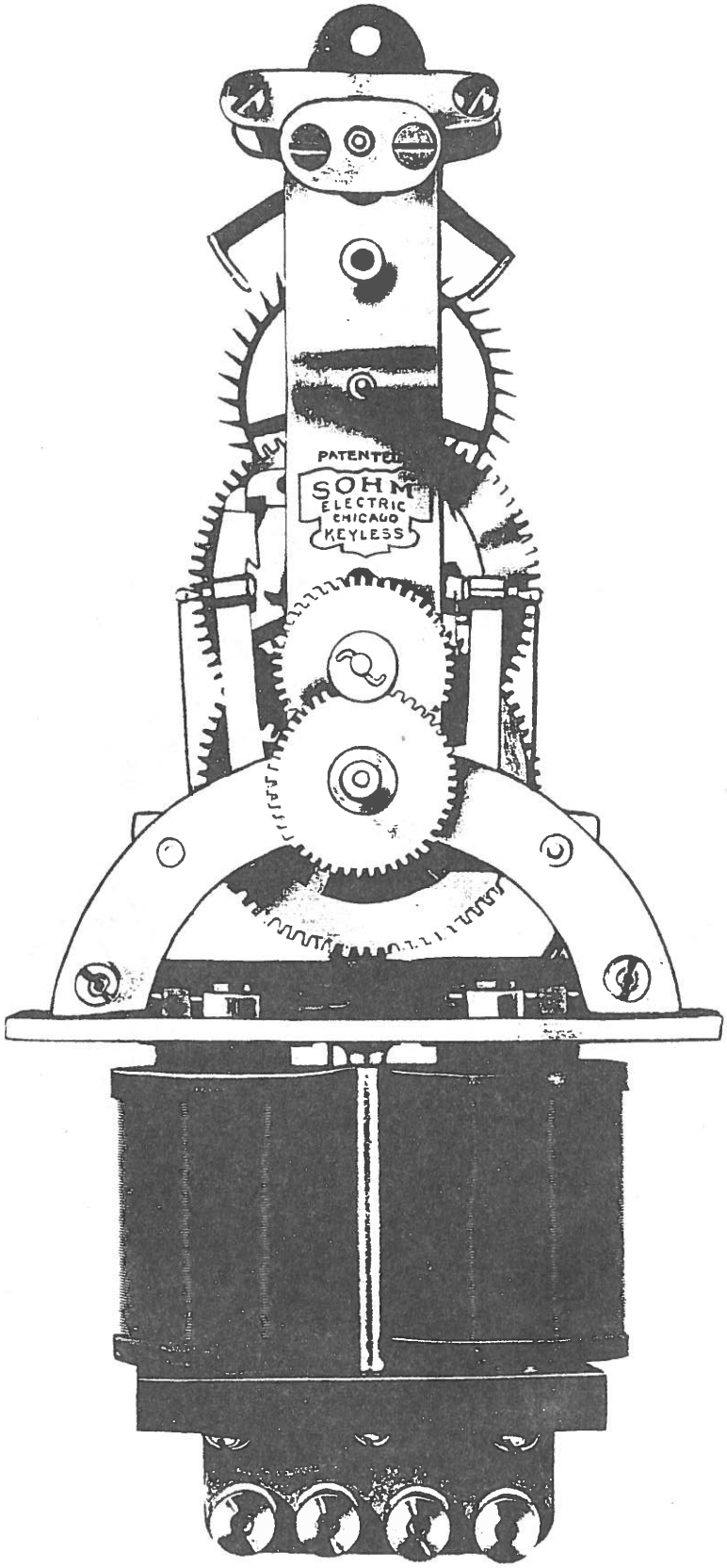
Approximate shipping weight boxed 145#

300 Quarter Sawed Oak
301 Mahogany Finish

Add letter "A" to number if "Luma" Dial and Hands are wanted. (Viz 300A)

Above fitted with Keyless Self-Winding Springless Contact Master Clock movement.

350 Quarter Sawed Oak
351 Mahogany Finish
352 Solid Mahogany



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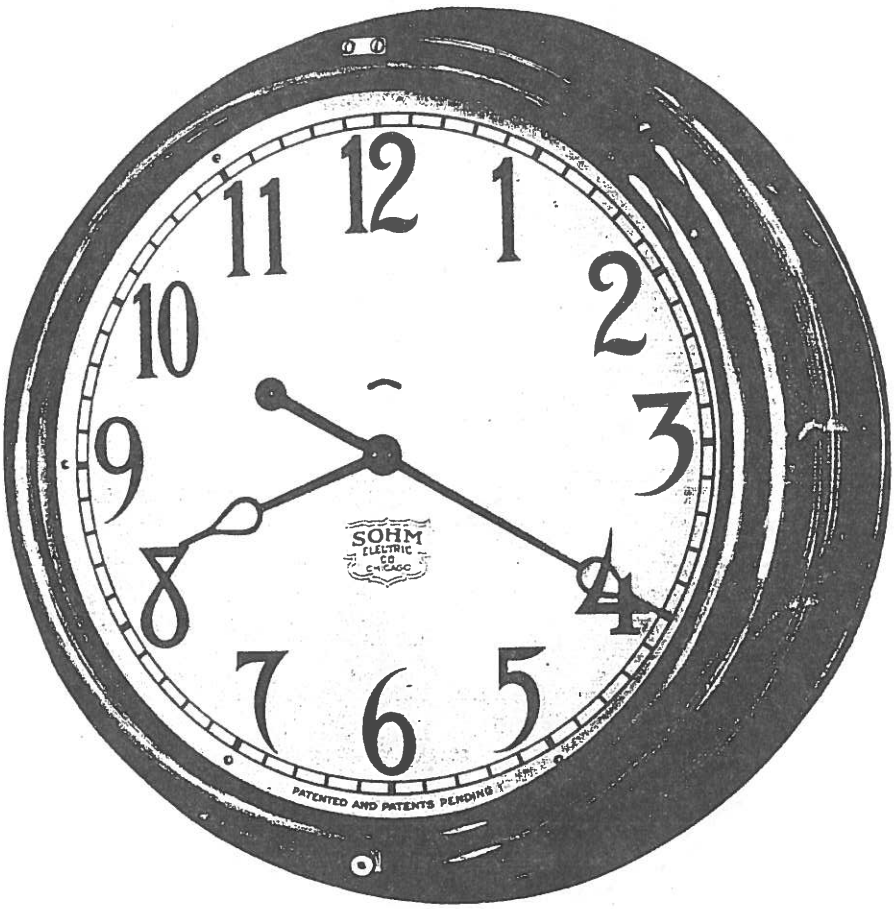
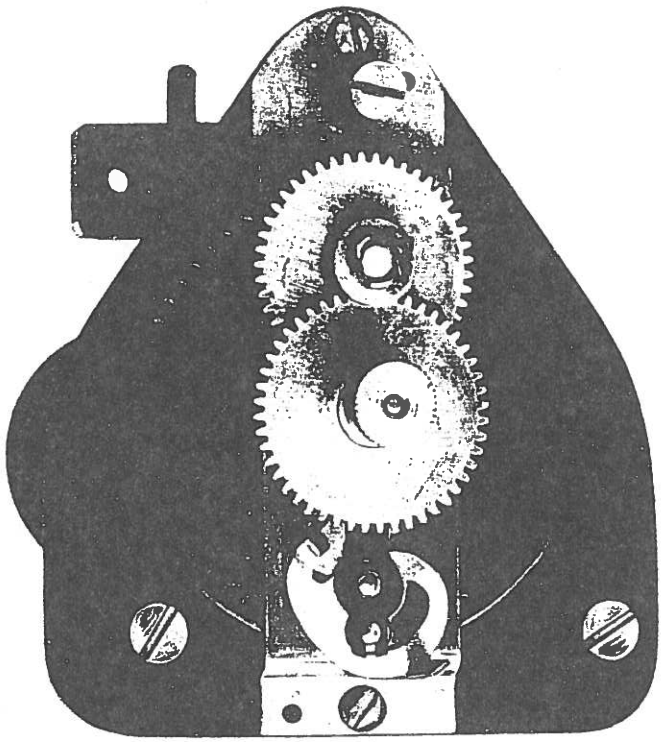
Master Clock Movement

Note, no delicate springs.



Metal secondary clock any finish

F 2554



SOHM SECONDARY CLOCK MOVEMENT

Front view

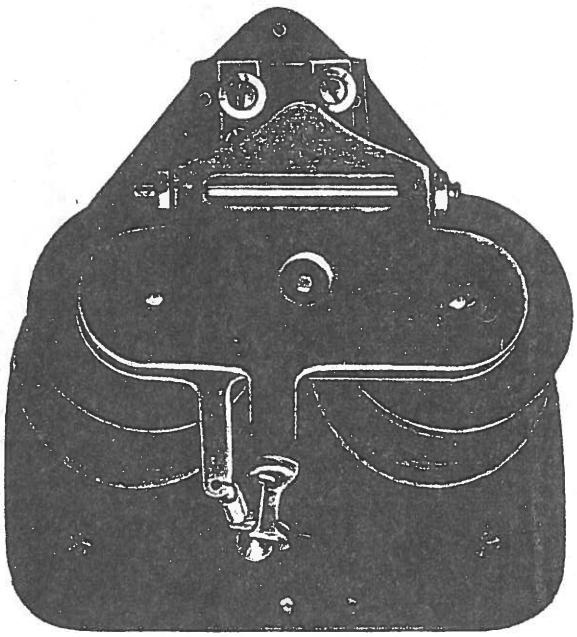
Note Simplicity

No oiling, no cleaning, will not freeze in cold weather.

Weighs less than 12 ounces.

Will operate dials 2 to 36 inches in diameter, of Carrara Glass, Marble, Bronze, Brass etc.

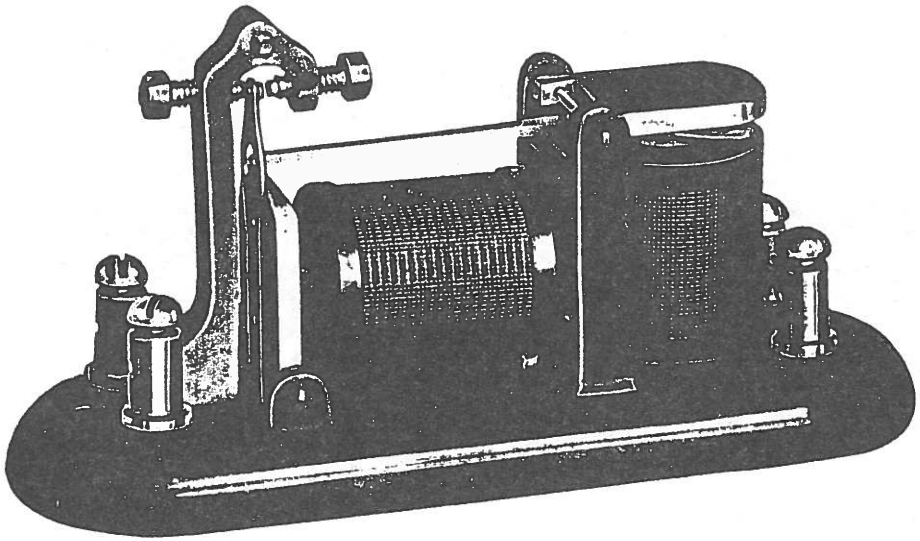
E-20560



SOHM SECONDARY CLOCK MOVEMENT

Rear view

H-20560



Synchronizer

Operated from Master Clock.

St Memphis

28" Dial

SYNCHRONOME MOVEMENT. Henry Weiland, 8946 W. Grantosa Dr., Milwaukee, WI 53225

Synchronome, PUL-SYN-ETIC, or other master clock. Also Brillie wall clock. Need help finding following parts: rate adjustment potentiometer & a 1/2" dial for a Bulle. Jerry Hahn (800) 733-3298 M-F 9am-5pm

REPAIR: ALL EARLY BATTERY CLOCKS Specializing in **BULLE** using orig. parts.
Martin C. Feldman, FNAWCC, 6 Stewart Pl., Spring Valley, NY 10977

FOR SALE: **SWCC** Western Union, 15-1/2" convex "glass". Actually it is plastic, but it beats a naked dial. $20.00 (I'll pay UPS up to $5.00) Paul M. Hopkins, 2717 Millwood Rd., Birmingham, AL 35243 (205) 967-1237

BULLE Electric Gallery Clock w/ 12" dial, 17" square overall, walnut wood case w/ pendulum. **BARR** Electric Mantle Clock w/ Glass Dome. **SWCC** Dials and other electric dials and movements.
BARR Electric mantle clk. w/ glass dome. 14" **SWCC** Dials nice, other Dials, Mvts. 60 beat clks, 4 each.
George Frederickson Sr., 1716 West 100th Place, Chicago IL 60643 (773) 238-3294-evenings or 445-5381

Replacement Field Coils for **SESSIONS** and **HAMMOND** synchronous clock movements.
Wining's Clock Service, 2910 Farmdale Rd., Akron, OH 44312 (216) 628-1654

Glass Domes for the **Tiffany Never Wind** and other early electrical & battery clocks. If I don't have it in stock I'll try to get it. Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax. www.glassdomes.com

PUL-SYN-ETIC (pg. 93, 150 Yrs. E. H.) excellent condition, all original & runs $750 **CHROMATIC** (very similar) dirty case, no pend. $250. **MAGNETA** (pg. 89, 150 Yrs. E. H.) case needs refinishing, Howard motion works $450. All 3 for $1200 + shipping
John Perrigo, 5431 Crestview Dr. Hixson, TN 37343, (423) 875-0453 late evenings.

STOLEN: **BULLE** wall clock. Very unusual light oak wooden case w/ front door. Approximately 16" tall. Painted round dial w/ rolled brass edge. Dial paint flaking off in various places. Stolen 11/3/98. If you see clock contact Detective Ken Woellert, Cincinnati Police Dept. At (513) 357-7529 or District 2 at (513) 352-3591. Or contact Jerry Hahn at (800) 733-3298. Cash reward for information leading to the recovery of clock and conviction of persons responsible.

Requests for reprints of previously published material should be directed to the Chapter Historian:
Dr. George Feinstein 75-19 195th Street Flushing, NY 11366

--- MART ---

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BANGHOR Electric, or **NEW ENGLAND Electric,** or a **CONTINUOUS Electric** wall clock. Also want a nice wooden case **TELECHRON** wall model. Phone: (817) 267-9851, Fax: (817) 267-0387
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Elliot B. Siegel, #2 Oakwood Drive, Lloyd Harbor NY 11743, Day or Night (516) 541-2400 or 351-5869

HANDS for a 13 inch Chapter Ring. (312) 238-3294 - evenings or 445-5381.
G. Frederickson Sr. 1716 W. 100th Pl. Chicago IL 60643

TIFFANY NEVER WIND Suspension Unit and Pendulum; Clocks and Parts, any condition. Clocks made by **The American Clock Co.** or the **No Key Clock Co.** Working or not
Ben Bowen, Rt. 3 Box 134C, Monticello FL 32344, (850) 997-3797 phone & fax.

Dead Coil Assemblies for **KUNDO's**, Single or Dual Coils, for Possible Rewinding Project. Also "B" **TELECHRON** Rotor, 1 rpm, 50 (fifty) Hz. John R. Seeley, 7541 Meridian St., Miramar FL 33023-4770 (954) 963-7456.

Movement for a **HAMMOND** Clock: the required movement has a FRONT ENTERING motor starting knob, mounted just below the hour post. I am advised that this may have been a **SESSIONS** movement with a **HAMMOND** motor. The dial has the legend: "HAMMOND MOTORED". Movement for a **SANGAMO** BANJO CLOCK: the desired movement is electric motor-powered spring wound, with front mounted escapement. The regulator on the escapement is bent at a right-angle so that it extends through the dial. The dial has an opening that is marked: "S-F". If your movement escapement doesn't have the right-angle bend, I think I could adapt it. Mel Kaye, Box 682, Short Hills NJ 07078 (973) 912-0038 FAX (973) 912-8092

Electric Clocks by **HAMMOND, WHITEHALL-HAMMOND,** and **HERMAN MILLER.** Also advertisements, catalogs, etc. on same. Collector will pay fair prices. Jack Shelton, 7975 N. Hayden Rd. #C-100, Scottsdale, AZ 85258. (800) 488-1818 x7106. E-mail: a1017@amug.org

Plastic Alarm Dial Plate for **SETH THOMAS** 120 v. el. alarm clock, Model POISE E-861-000.
Richard McCahan, P.O. Box 1296, Center Harbor, NH 03226. (603) 253-4110

Two **SWCC** dials, both having 11 1/4" chapt. ring One can be **WU** dial, & other dial w/ sec. bit opening for program clock. Also looking for program tapes for **Std. Elec.** program clck & 2 mag. relays that go behind dial.
Larry Leiper, 3713 Boatman's Point, Belleville, IL, 62221 (618) 632 8135, E-mail @: parkerma@apci.net