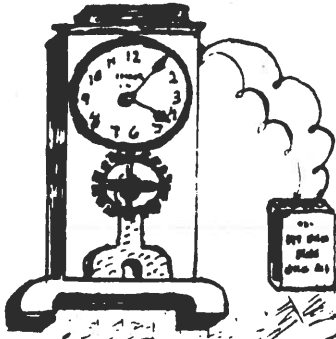


The  
**JOURNAL**  
 OF THE  
**ELECTRICAL HOROLOGY**  
**SOCIETY**  
**Chapter No 78**



February, 1981  
 VOLUME VII---ISSUE #1  
 Martin C. Feldman, Editor

Hello fellow enthusiasts:

This Issue marks approximately nine and one-half years of publishing material solely devoted to electrical horology. For the past seven years your editor has at times scrambled about in a desperate effort to collect enough articles, patents and/or other information to fill a forthcoming Issue. Happily, I have not had to do so for this Issue as we are fortunate in being able to present an original research article by friend and member Joseph J. Singer. This article explores an hitherto area which, to my knowledge, has not received any attention in articles of recent or older vintage.

The second section of this Journal contains material pertaining to the Self-Winding Clock as produced by Seth Thomas. The material, which in its original copy form is of higher quality than seen here, is presented by courtesy of the NAWCC Museum. We are printing Page 1 of the 1913 patent of 4 sheets which complete this patent. The NAWCC Museum has recently acquired a substantial number of patents which have been correlated and filed by computer as to inventor's name, date of patent, patent name, patent number, etc. The cost for a complete copy--no matter how many pages--is 50¢. I am very satisfied with the excellent quality of copying and know that this service by our Museum will be much quicker than that of the U.S. Patent Office in Washington. In addition, all patents have been carefully reviewed so that if you send in a number you will not receive a patent of new modifications to cow bells! (I was the recipient of this patent a few years ago when I sent for what I thought to be a patent describing a rare electrical clock). It should be noted that patents as a rule will endeavor to cover as many variations in the particular invention described as possible, and may not be exactly what you have sitting in front of you as a finished product. However, they do serve to give one an idea of what the inventor had in mind when he originally sought to patent his device.

I wish to take this opportunity to thank the well wishers who knew about my recent major surgery and sent me their very encouraging cards and thoughts. I am

(continued on Pg.12)

NATIONAL ASSOCIATION of WATCH and CLOCK COLLECTORS, Inc.

WESTERN UNION TIME AND MESSENGER SERVICE

JOSEPH J. SINGER (OH)

In three previous issues of the Bulletin (1) the subject of Western Union Time Service, the Self-Winding Clock Company, and the clock movement used were dealt with. In the course of collecting timepieces, I came across some of these clocks that were used in providing this service and began to inquire just how the noon pulses from the Naval Observatory and the hourly synchronizing pulses actually reached a customer's clock.

Setting of master clocks in Western Union offices is described in Ref. (1); these clocks contain a cam and switch arrangement which closes a pair of contacts on the hour, energizing the synchronizing solenoid on the subscriber's clock. The way this was done is shown in the enclosed sketches (2). Figure 1 shows one of the simpler methods employed; the generator furnished anywhere from 110 volts to 160 volts DC, a lethal voltage that commanded respect from those working on clock lines. In this particular scheme a fault in one of the clock circuits was not readily detectable. This shortcoming led to the development of the circuit shown in Fig. 2. In case of an open line to a subscriber's clock, armature G fell to the right, exposing the front end of solenoid C which was painted red. The attendant observing the "clock board" would hear the buzzer and locate the faulty circuit; he then would start a sequence of checks to determine the location of the faults and make the necessary repairs. Just how many subscribers to the Time Service there were is not known by me, however, there is some evidence that the number was anywhere between 120,000 to 500,000 at its peak (3). What this indicates is that there were a lot of circuits needed to synchronize subscriber's clocks. The Western Union Telegraph Company resorted to an ingenious cost savings device; they made use where possible, of Call Box circuits. This is shown in Fig. 3.

A Call Box is a device, the inside gearing is shown in Fig. 4, that when operated by turning a small crank, sent a unique code to the central Western Union office that a messenger is requested to pick up a telegram for transmittal. Wheels A & B in Fig. 4 were coded differently for different Call Boxes; the 400 ohm register records on paper tape the number of times the circuit is opened providing the coded location number (4). The circuit shown in Fig 3 shows how both Call Boxes and subscriber's clocks made use of only one wire; up to twenty clocks were put in series on one circuit. On the left side of the sketch some switches and circuits are left out. These components were used to operate Call Boxes when a circuit opened or grounded out prior to the repair crew correcting the fault. (5).

The running time of the average Call Box was about 6 seconds vs. the duration of the synchronizing clock pulse of 1 second. If both of these signals happen to coincide, the incoming Call Box signal was mutilated. Since messenger service patrons were instructed to "Ring Twice" coincident signals were not too much of a problem. Much more serious was the ever-present danger of two Call Boxes being operated at the same time. When this became a problem, customers were placed on different or direct circuit.<sup>6</sup>

It is interesting to speculate how many lives were saved, by providing the correct time to Railroads, what the impact on commerce was, and how people's lives were made easier through the efforts of the Western Union Time Service! I think it is a fascinating chapter in American technological growth.

REFERENCES AND FOOTNOTES

1. M. W. Bartels, "The Self-Winding Clock," NAWCC Bulletin, (December 1975), XVII, p. 317.

M. W. Bartels, "The Self-Winding Clock Company and the Western Union Time Service," NAWCC Bulletin, (December 1977), XIX, p. 627.

B. E. Honning, "Chester Henry Pond, Who Started It All," NAWCC Bulletin, (April 1979) XXI, p. 136.

2. The sketches were prepared from material loaned to me by J. F. Smith, Western Union City Supervisor, Technical Services, Cincinnati, Ohio.

3. "The Blazing Trail," volume V, Feb. 1933 #2. (A Western Union Telegraph Co. publication.

Private communication, Dr. E. S. Davis, National Telegraph Office, 1149 Weber Street, Union, NJ.

(I have seen type "F" movements with serial numbers above 400,000. It would be interesting to correlate S/N's with dates of manufacture.)

4. "American Telegraphy," M. Maver, Jr., J. H. Bunnell & Co. 1892, Chapter XXV.
5. "District Telegraph and Time Service," American School of Correspondence, 1917, pages 7, 8 and 9.
6. Private communication, Dr. E. S. Davis.

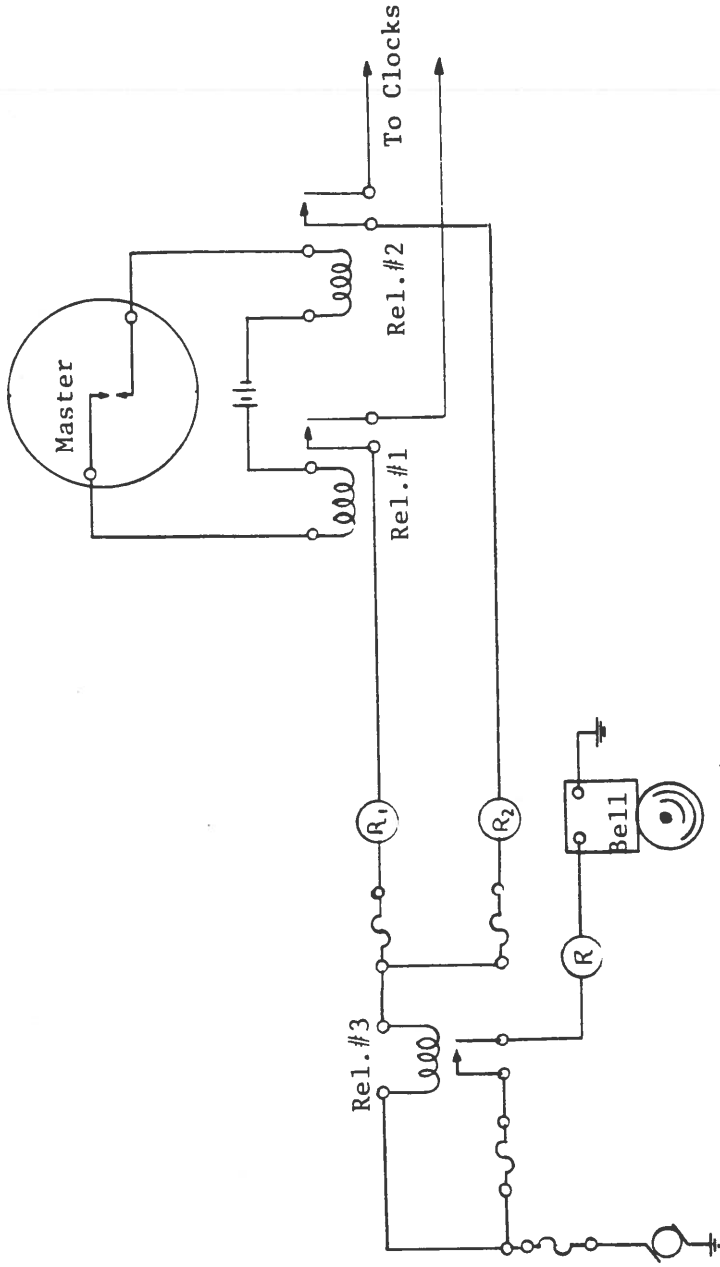


FIG. 1

Western Union Time Service Equipment Circa 1921 (small offices)

Operation

1. Contacts in master clock close on the hour.
2. Relays #1 & #2 are energized closing Normally Open contacts and allowing a current pulse to be sent down the clock lines for as long as the contacts in the master clocks are closed (approximately 1 second).
3. Resistors  $R_1$  &  $R_2$  adjust the magnitude of this current to about 250 ma.
4. Current through Relay #3 closes its Normally Open contact operating the "Tell-Tale" bell.

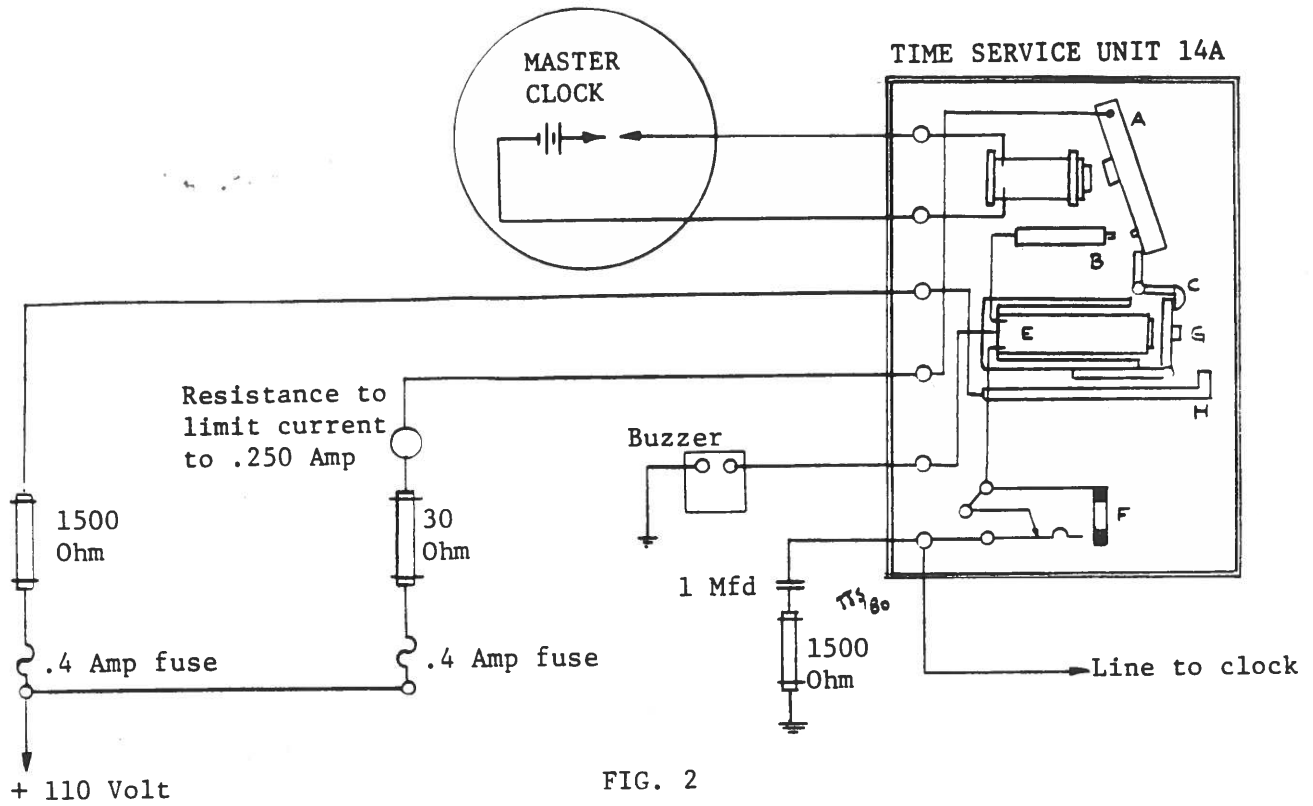
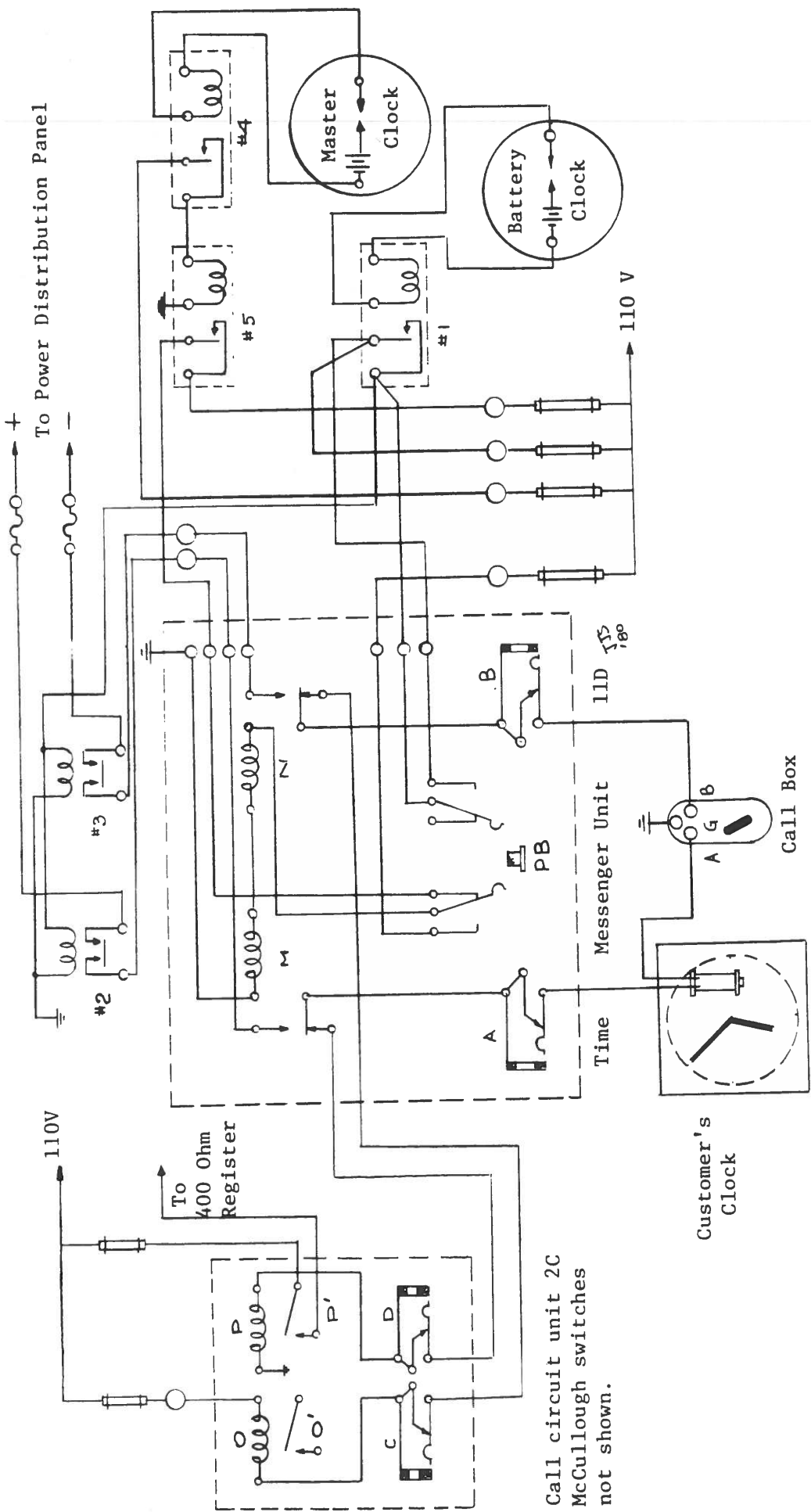


FIG. 2

Time Service Equipment Circa 1921, Small W.U.Tel. Office

Operation

1. Contacts in Master Clock closes.
2. Holding coil in Time Service Unit 14A is energized, attracting armature A and closing circuit through contact at B and raising trip mechanism C.
3. If clock circuit is complete, current (approximately 250 ma) will flow through the 30 ohm resistor, through armature A, contact B, holding coil E, normally closed contact of jack F and the clock circuit(s) to ground.
4. Should the clock circuit be open, no current will flow through holding coil E armature G will fall and make contact at H.
5. This will complete the circuit through the 1500 ohm resistor and energize the buzzer, indicating to the attendant that a fault exists on one of the clock lines.



Call circuit unit 2C McCullough switches not shown.

WESTERN UNION TIME MESSENGER EQUIPMENT (W.U. Drawing C-8, 8/27/27)

**A. Time Service Operation**

1. Contacts in Battery Clock close, energizing coil of relay #1 and closing the normally open (NO) contacts of relays #2 & 3.
2. Contacts in Master clock close, energizing coil of relay #4 closing its NO contact. This permits current to flow through the coil of relay #5, closing its NO contact that permits current to energize coils M & N in Time Messenger Unit 11D.
3. This action closes the NO side of contacts of coils M & N, allowing current to flow through normally closed (NC) contacts of jack A, through the clock's synchronizing coil, through the Call Box, NC contacts of jack B, and back to the negative side of the Power Distribution panel. The customer's clock has now been set.
4. Should the Battery clock be inoperative, coils M&N, as well as relays #2 & #3, can be energized manually by depressing push button PB.

**B. Messenger Service Operation**

1. Current always flows through coils O & P of Call Circuit Unit 2C through NC contacts of jacks C, D, A & B, the clocks synchronizing coil, the Call Box, and the NC contacts of coils M & N.
2. When the Call Box is operated, current stops flowing through coil P (circuit is grounded at Call Box) closing the contact P' energizing the 400 ohm register, indicating that Call Box has been operated.

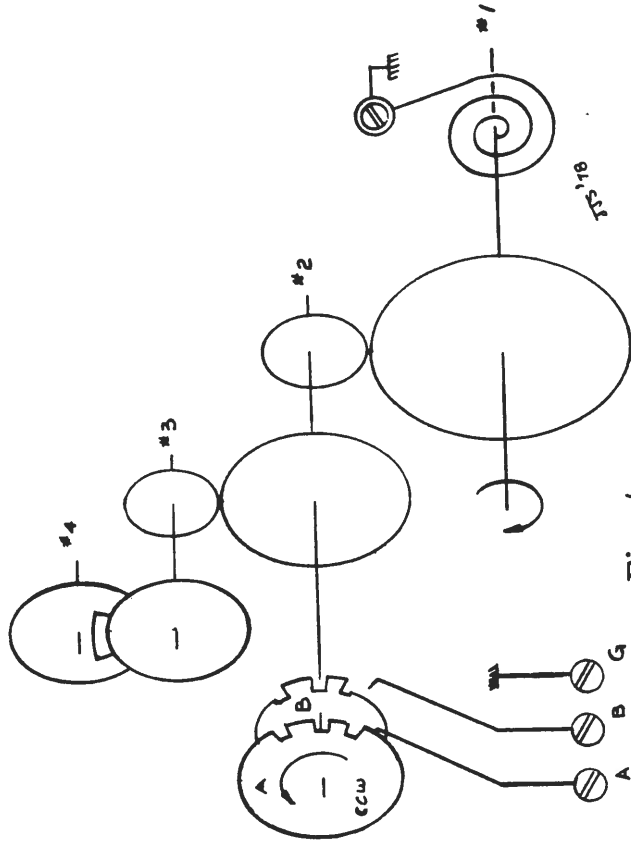


Fig. 4  
CALL BOX

<u>Arbor</u>	<u>Wheel</u>	<u>Pinion</u>	<u>Remarks</u>
1	60	-	Contains winding key & spring
2	40	12	Mounts count wheels
3	24	10	Acts as escape
4	-	-	Disk contains verge

Contact A: Always rides on top cam except when slots break contact. (Cam A)

Contact B: Only touches high portion of cam B.

Terminal G: Electrical contact to metal parts.

41

W. H. THOMPSON.

ELECTRIC CLOCK.

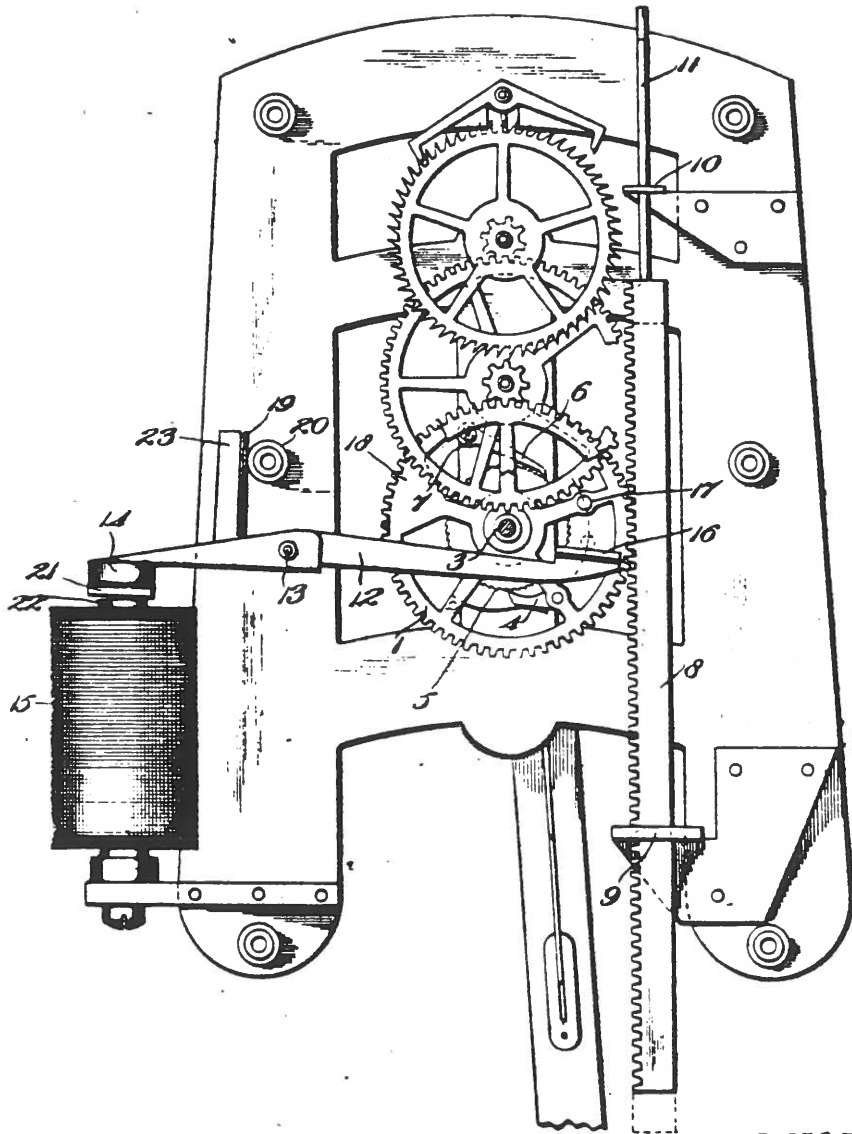
APPLICATION FILED APR. 1, 1912.

1,060,380.

Patented Apr. 29, 1913.

3 SHEETS-SHEET 1.

Fig. 1.



Witnesses  
*Byron Bollings*  
*W. G. Prindle*

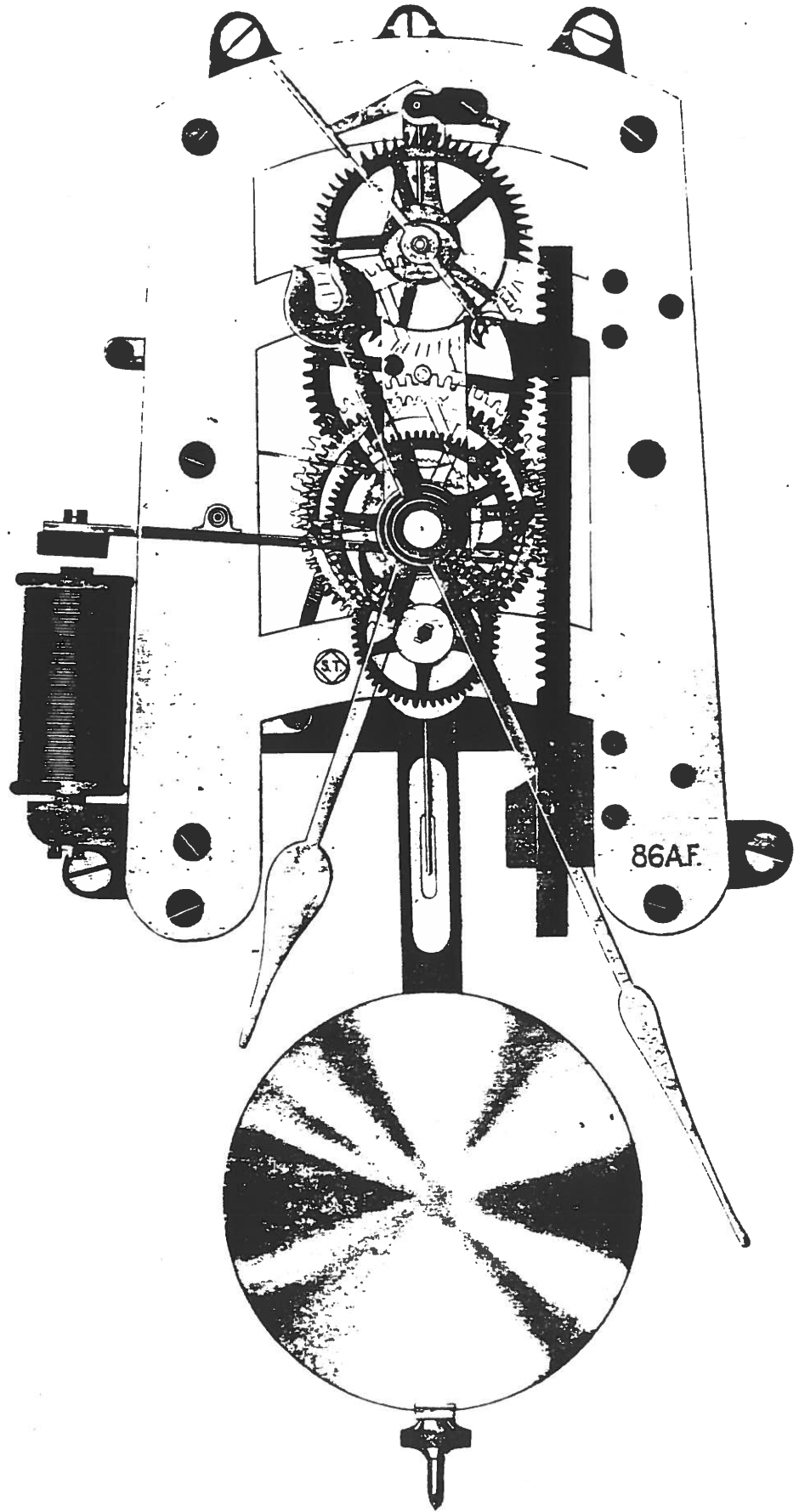
Inventor  
 W. H. Thompson,

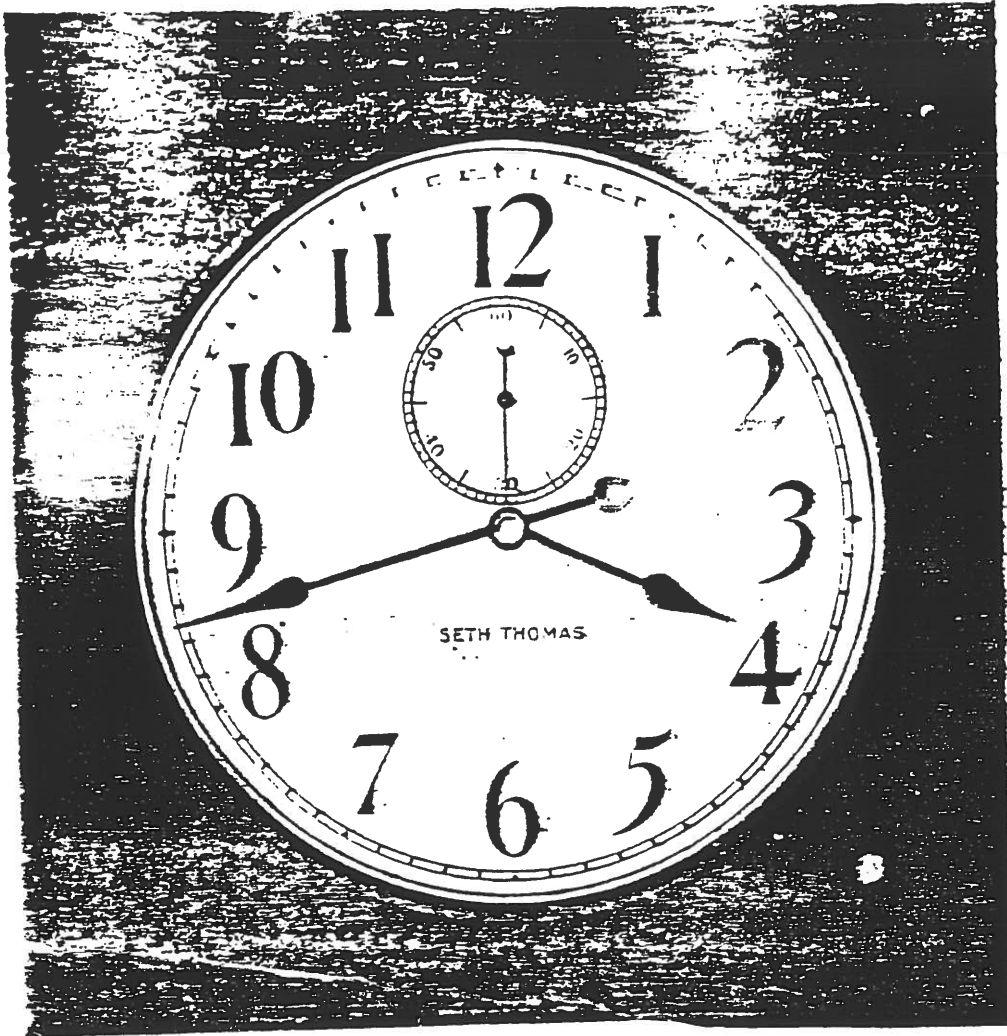
*By Wilkinson, Fisher & Witherspoon*  
 his Attorneys



# SELF WINDING MOVEMENT

*Clock illustrated and described on page 14*





### SELF WINDING

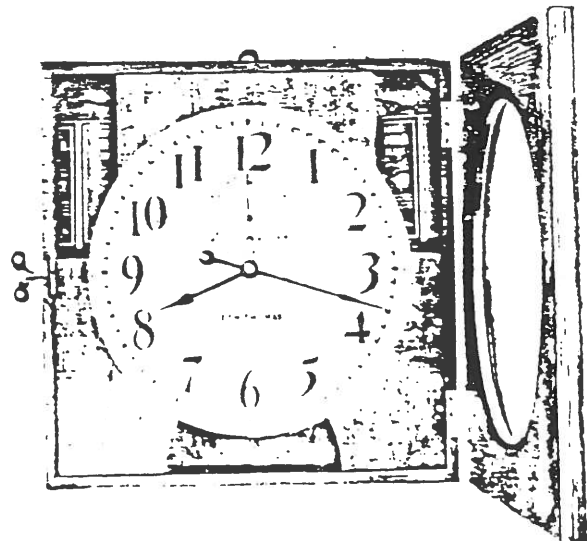
**T**HE Self Winding Clock Movement is an excellent example of the Seth Thomas idea of simplicity in efficient time-keeping.

This movement is driven by a weight which operates directly in the center wheel. It is automatically re-wound every four minutes. During the re-winding a maintaining spring in the center wheel provides driving power.

It is operated by two dry cell batteries which last a year or more. Space is provided in the clock case for the batteries.

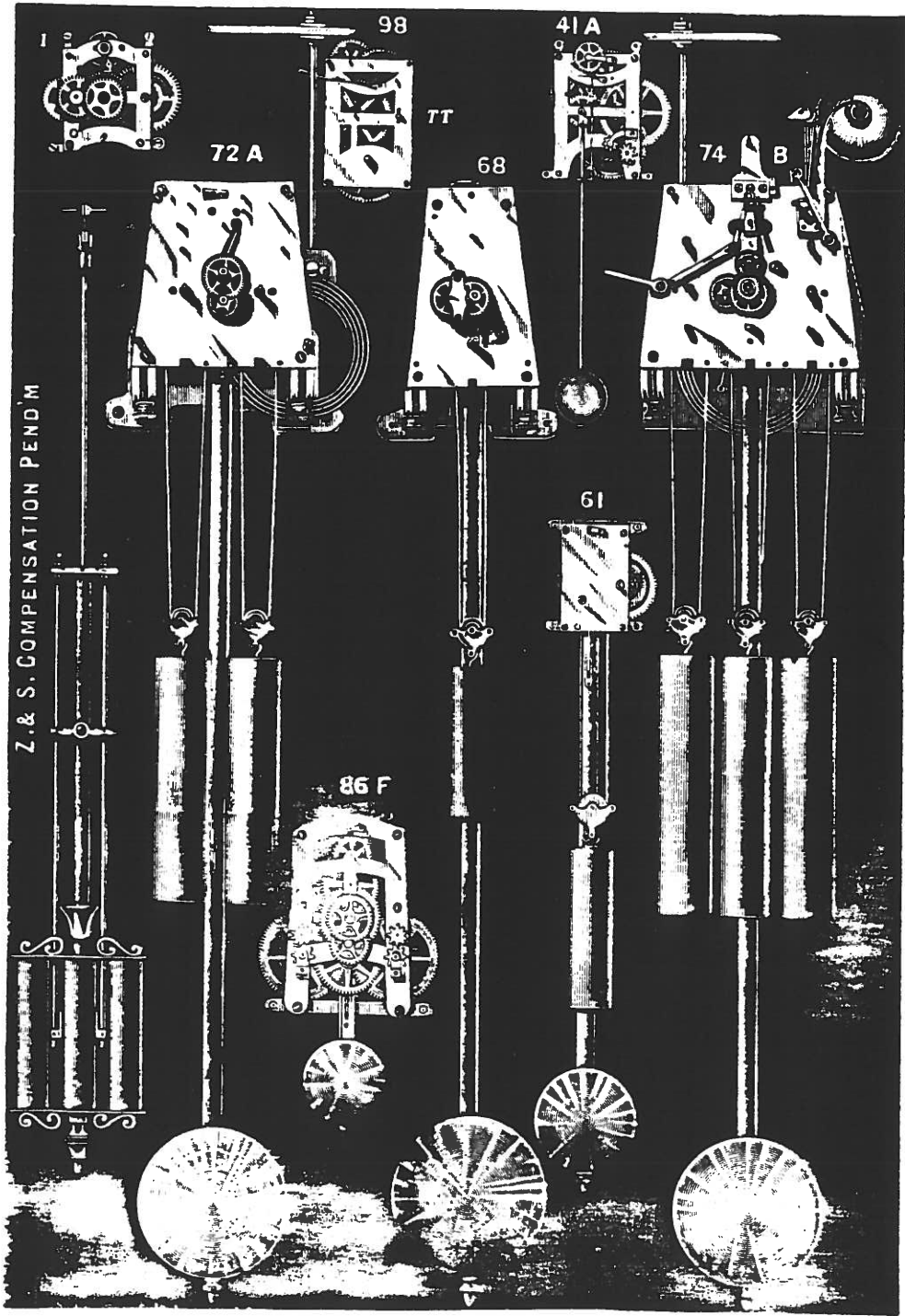
Plates are heavy hard rolled brass, wheels are accurately cut and pinions are of the lantern type. The magnets are enamel covered wire and contacts are pure silver.

Movement illustrated on page 21.



SELF WINDING No. 1

Mahogany and Old Oak. Fourteen-inch Dial.  
Length 13 inches. Width 13 inches.



recuperating nicely and hope to continue to do so. Thanks again.

Enjoy this Issue!

Electromagnetically yours,



Martin C. Feldman, FNAWCC

\* \* \* \* \*

MART

FOR SALE: "ANTIQUÉ MOVEMENT" Brooklyn's Finest Clock Shop. Always has a selection of electromechanicals for your viewing. Call David Vandor (212) 252-9032

WANTED: "Junker" early battery clocks, movements, parts, etc. Send details and \$ wanted. ELECTRICAL CLOCK LITERATURE for possible reprinting in our Journal. Send to Martin Feldman, 620 Reiss Place-7E., Bronx, NY 10467

WANTED: Electrical Horological Literature of any type. Martin C. Feldman

REPAIRS: ALL EARLY BATTERY CLOCKS including Pooles, Barrs, Tiffany Never-Winds, Eureka's, etc. SPECIALIZING IN BULLE CLOCK REPAIRS USING ORIGINAL PARTS. One month maximum time for all repairs. Martin C. Feldman

WANTED: Unusual Electrical Clocks. A.Marx, 105 Bayeau Rd., New Rochelle, NY 10804

ANNOUNCEMENT:

Power supplies to meet your needs will be custom built-upon request describing same. Please write your needs and enclose an SASE for reply. Martin Swetsky, 1910 Coney Island Ave., Bklyn, NY 11230

FOR SALE: 1-Master Clock, IBM, International Time Recording Div, Model 45, with Invar pendulum, complete with control drum, Mint Condition.  
2-Telechron Tower clock, 34" diameter with translucent glass dial for back lighting 115V operation.  
3- Amara Time Clock

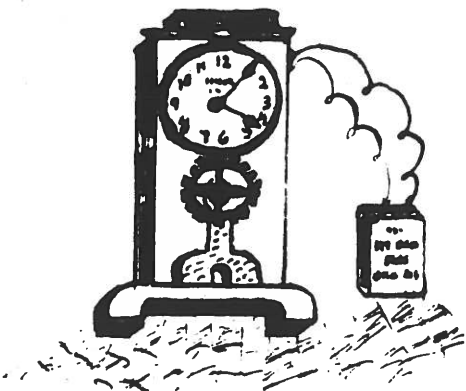
John Cammarata, 2000 S. Wolf Road Des Plaines, IL 60018  
312 255-5748

FOR SALE: Early Synchronome clock (Pre WW II) in fine restored oak case, 30 Sec. contact for slave, one second invar rod plus 1 1/2 lb. pendulum bob; \$1000 plus shipping (packing free). Also Rare Gents Pulsynetic English Master \$1200.00 both in G.R.O. Charles Roth, 2 Circle Lane, Roslyn Hgts., N.Y. 11577

The  
**JOURNAL**  
OF THE  
**ELECTRICAL HOROLOGY**  
**SOCIETY**

**Chapter No 78**

April, 1981  
VOLUME VII---ISSUE #2  
Martin C. Feldman, Editor



Hello fellow enthusiasts:

In Volume VI--#6 we began printing Part #1 of the IBM Manual kindly donated by J. J. Singer. For those of you who missed the printing of the continuation which was promised for "subsequent Journals", your editor found he wished to print information of a more timely nature and postponed Part #2 until this issue. With this issue this particular set of information pages is completed. We shall follow-up at a later date with the complete Model 25--International Time Recording Clock Company Manual which Mr. Singer has also kindly donated for reproduction.

A very interesting and gratifying meeting was held at the home of Mr. & Mrs. Alan Marx which was attended by members of the EHS in the N.Y./N.J. area who took time out from their busy holiday activities to spend a few hours with Dr. and Mrs. Alan Shenton. Dr. Shenton is the author of the recently published book, THE EUREKA CLOCK. Mrs. Shenton is a well known antiquarian horological bookseller and has written CHRISTOPHER PINCHBECK AND FAMILY and PRICE GUIDE TO CLOCKS 1840 THROUGH 1940. The latter book contains much information pertaining to early battery clocks and is worth purchasing for that reason alone. The hospitality of the Marx' was superb as usual, and members brought interesting electrical clocks for exhibit. A photograph of the attendees will be found on Page 12.

Enjoy this Issue!

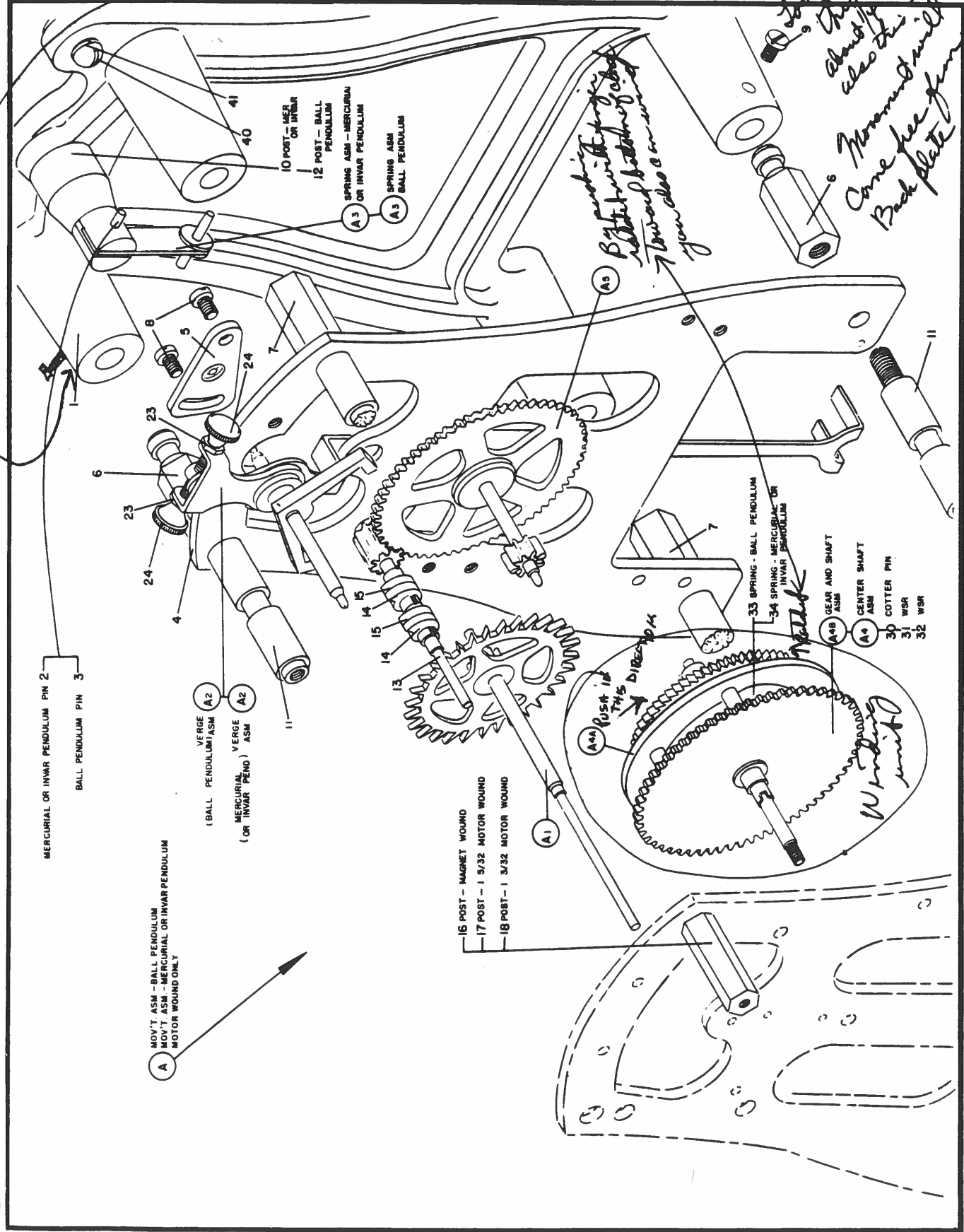
Electromagnetically yours,

A handwritten signature in black ink, appearing to read "Martin C. Feldman". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Martin C. Feldman, FNAWCC



# BACK PLATE VIEW



10 POST - MER OR INVAR  
 12 POST - BALL PENDULUM  
 SPRING ASM - MERCURIA  
 OR INVAR PENDULUM  
 SPRING ASM  
 BALL PENDULUM

MERCURIAL OR INVAR PENDULUM PIN 2  
 BALL PENDULUM PIN 3

A  
 MOV'T ASM - BALL PENDULUM  
 MOV'T ASM - MERCURIAL OR INVAR PENDULUM  
 MOTOR WOUND ONLY

VERGE  
 (BALL PENDULUM) ASM  
 MERCURIAL  
 (OR INVAR PEND) ASM

16 POST - MAGNET WOUND  
 17 POST - 1 5/32 MOTOR WOUND  
 18 POST - 1 3/32 MOTOR WOUND

33 SPRING - BALL PENDULUM  
 34 SPRING - MERCURIAL OR  
 INVAR PENDULUM

GEAR AND SHAFT  
 ASM  
 CENTER SHAFT  
 ASM  
 COTTER PIN  
 WSR  
 WSR

*Wipe with spirit  
 Wash with benz*

*You also can wind*

*Mount with  
 Back plate*

*This screw  
 also the*

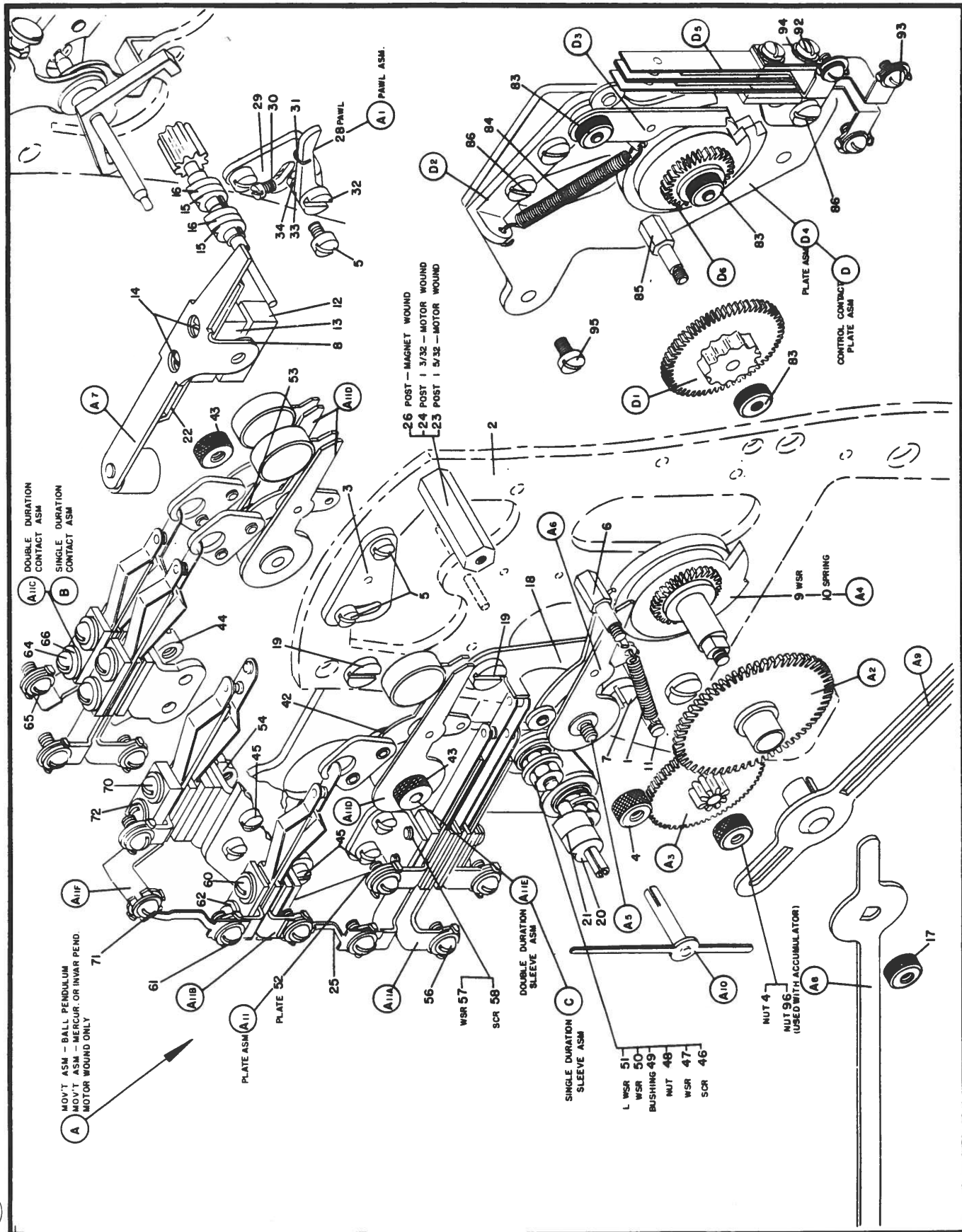
PRINTED  
 IN  
 U.S.A.

REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME
* A	72978	MOVEMENT ASM-BALL PEND FOR 115V 60CY	64	15999	SCREW-3-48 7/16 RDH
* A	72979	MOTOR WOUND ONLY OR INVAR PENDULUM FOR 115V 60CY	65	38910	SCREW-4-40 5/32 WH
1	30333	MOTOR WOUND ONLY	66	52393	WASHER-.020 .106 ID
2	37551	SPRING-CONTACT OPER	A11D	63386	FINGER ASM-CONTACT
3	37554	BRIDGE-VERGE	A11E	63394	SLEEVE ASM-SHAFT
4	37606	NUT-2-56 THUMB	A11F	68959	DOUBLE DURATION
5	38279	SCREW-6-40 3/16 FH	70	15999	CONTACT ASM-RAP ADV
6	39832	STUD-INTER GEAR MTG	71	38911	SCREW-3-48 7/16 RDH
7	42648	SCREW-6-40 1/4 BH	72	52393	SCREW-4-40 1/4 WH
8	45645	SPACER-.020 .125 ID	B	63238	WASHER-.020 .106 ID
9	45749	WASHER-.031 .130 ID	C	63392	CONT ASM-SINGLE DUR
10	46476	SPRING-FRICTION	D	91758	SLEEVE ASM-SHAFT & SINGLE DURATION
11	46815	STUD-CONTACT SPRING	83	37606	PLATE ASM-CTRL CONT
12	47998	CLAMP-RAPID IMP LOW	84	79268	NUT-2-56 THUMB
13	47999	CLAMP-RAPID IMP UP	85	91752	SPRING
14	52523	SCREW-4-40 5/8 FH	86	196298	STUD-INTER GEAR
15	60630	CAM-CONTACT FRONT	D1	49191	SCREW-5-40 3/16 BH
16	60631	CAM-CONTACT REAR	D2	91751	GEAR ASM-INTERM
17	61042	NUT-3-48 THUMB	D3	91754	PLATE ASM-OP FGR ADJ
18	61109	GUARD-SELF REG CAM	D4	91757	LEVER ASM-CONT FGR OP
19	61124	SCREW-TERM PLTE MTG	D5	91763	PLATE ASM-CONT MTG
20	63346	CAM-MIN IMP FRONT	92	36255	CONTACT ASSEMBLY
21	63347	CAM-MIN IMP REAR	93	38911	SCREW-3-48 1/2 FH
22	68958	ARM-SUPPORT CONTACT	94	52393	SCREW-4-40 1/4 WH
23	97748	POST-DIAL 1 5/32 MOT WOUND	D6	92602	WASHER-.020 .106 ID
24	99435	POST-DIAL 1 3/32 MOT WOUND			GEAR ASM-CAM AND
25	139405	STRIP-JUMPER			PARTS NOT SHOWN ON SUB ASSEMBLIES
26	37556	POST-MAG WOUND DIAL	95	38281	SCREW-6-40 1/4 FH
A1	37693	PAML ASM-RETAINING	96	57497	NUT-2-56 THUMB
28	30049	PAML-RETAINING			USED IN PLACE OF 37606 WHEN
29	37659	BRACKET			THE IMPULSE ACCUMULATOR IS USED
30	38244	SCREW-2-56 3/32 FH			

\* COMPONENTS OF THESE MOV'T ASH'S ARE SHOWN IN FIG. 2, 3 & PART OF 4



FRONT PLATE VIEW



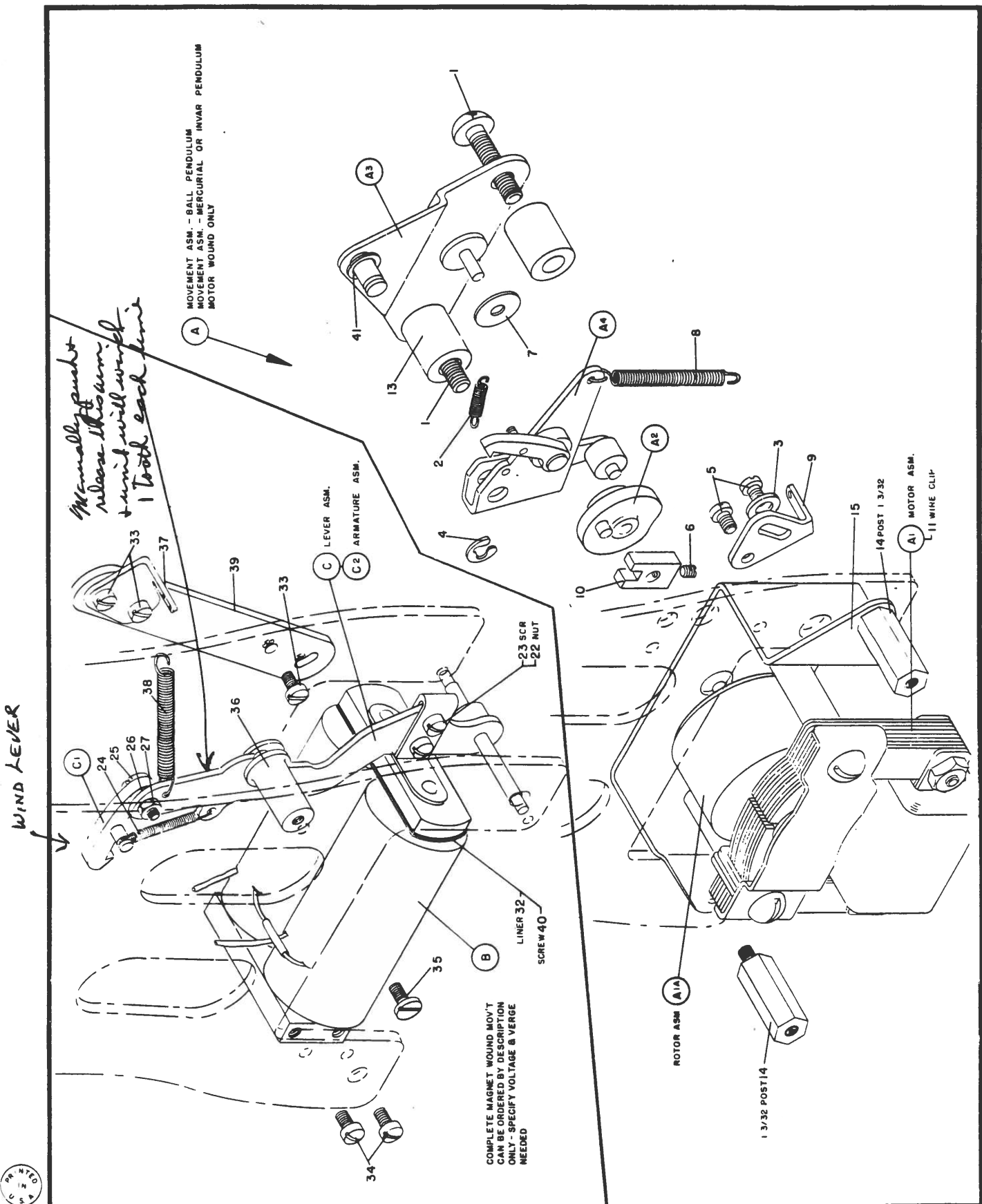
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REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME
* A	72978	MOVEMENT ASM-BALL PEND FOR 115V 60CY	11	97520	CLIP-SYN MOTOR WIRF	24	44946	SPRING
			13	99434	SPACER-.599 .1935 ID	25	57251	SCREW-PIVOT
			14	99435	POST-MOT WIND 1 3/32 DIAL	26	57255	WASHER-.025 .101 ID
* A	72979	MOVEMENT ASM-MERCURIAL OR INVAR PENDULUM FOR 115V 60CY	15	99436	BRACKET-WIND MOTOR	27	58229	NUT-3-48 HEX
			A1	79129	MOTOR ASM-115V 50 CY	C1	37846	PAML ASM-STUD
			A1A	79998	ROTOR ASM	C2	78940	ARMATURE ASSEMBLY
			A2	92551	HUB ASM-WNDG CAM &			
			A3	99427	BRACKET ASM-WNDG LEV			
			A4	99432	ARM ASM-FEED PAML			
			B	37709	MAGNET ASM-12V DC	32	37653	LINER-ARMATURE
			B	37710	MAGNET ASM-24V DC	33	38279	SCREW-6-40 3/16 FH
			B	37712	MAGNET ASM-48V DC	34	38282	SCREW-6-40 5/16 FH
			B	37713	MAGNET ASM-115V DC	35	42648	SCREW-6-40 1/4 BH
			C	57631	LEVER ASM-WINDING	36	57654	STUD-WINDG LEV GDE
			22	34823	NUT-DOUBLE	37	58611	ANCHOR-WINDING SPR
			23	38282	SCREW-6-40 5/16 FH	38	71590	SPRING-ARMATURE RET
						39	71589	BRACKET-ARM RET SPR
						40	42026	SCREW-8-32 9/32 BH
						41	104371	SPACER-.004 .190 ID

PARTS NOT SHOWN ON SUB ASSEMBLIES

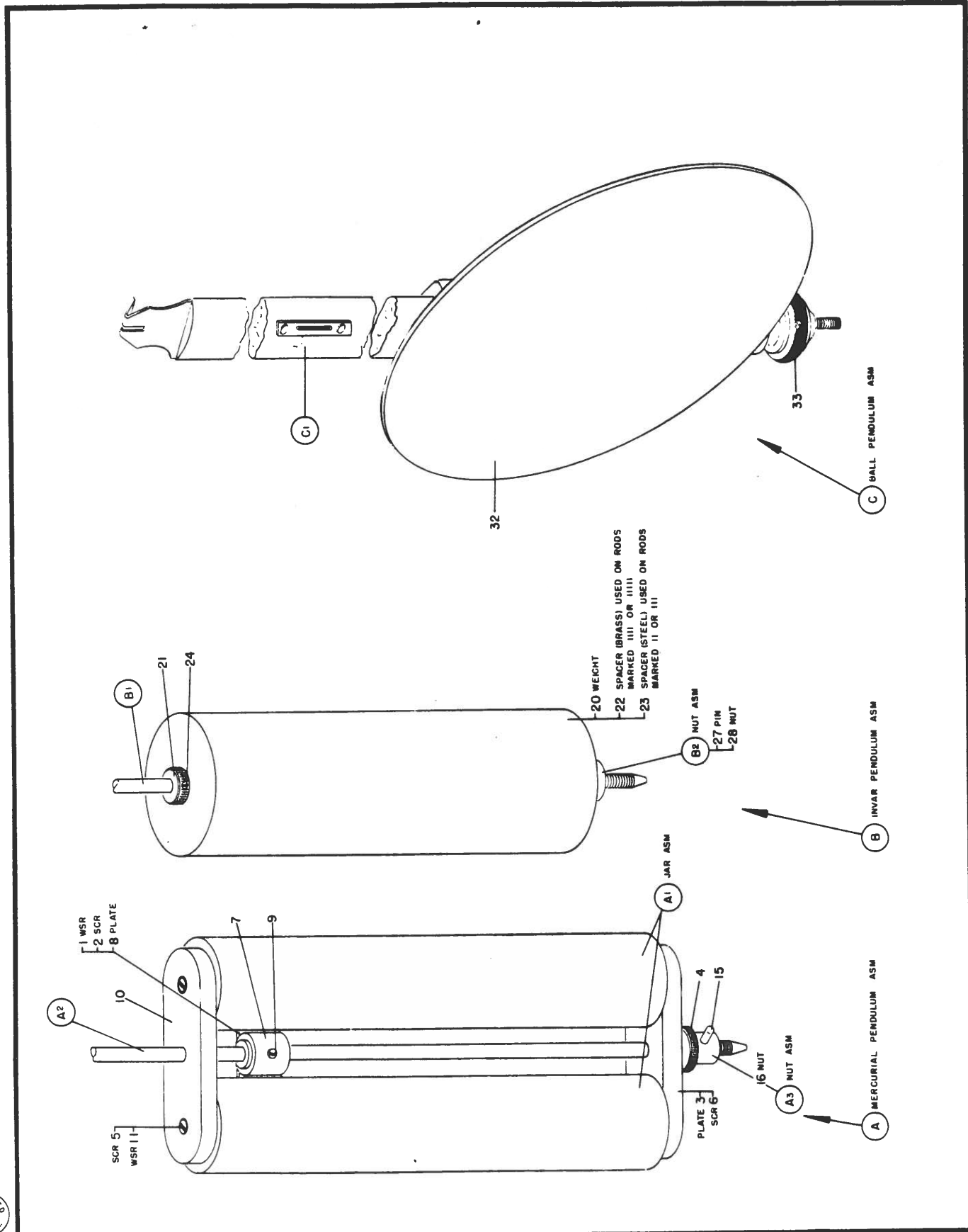
\* COMPONENTS OF THESE MOV'T ASM'S ARE SHOWN  
IN FIG. 2, 3 & PART OF 4.

# MOTOR & MAGNET WOUND VIEW



REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME
A	64776	PENDULUM ASM-MERCUR	11	79866	WASHER-.005 .193 ID	24	103894	SCREW-3-48 5/16 RDH
1	22066	WASHER-.025 .140 ID	A1	64770	JAR ASM-PENDULUM	B1	65473	ROD ASM-PENDULUM
2	38261	SCREW-4-40 3/16 PH	A2	65473	ROD ASM-PENDULUM	B2	65474	NUT ASM-AUX ADJUST
3	64762	PLATE-PENDULUM	A3	65474	NUT ASM-AUX ADJUST	27	64760	PIN
4	64763	NUT-REGULATING	15	64760	PIN	28	64761	NUT-ADJUSTING
5	64764	SCREW-PENDULUM PLTE	16	64761	NUT-ADJUSTING	C	37834	PENDULUM ASM-BALL
6	64765	SCREW-PENDULUM PLTE	B	67840	PENDULUM ASM-INVAR	32	37805	BALL-PENDULUM
7	64771	HUB-GUIDE PLATE	20	67839	WEIGHT-PENDULUM	33	42288	NUT-REGULATING
8	64772	PLATE-GUIDE	21	62705	COLLAR-PEND WT STOP	C1	37832	STICK ASM-PENDULUM
9	64773	SCREW-4-40 7/32 RDH	22	79820	NUT-BRASS SPACER			
10	78961	PLATE-PENDULUM	23	79867	NUT-STEEL SPACER			

# PENDULUM VIEW



PRINTED  
U.S.A.

MAY 2, 1955

25 FIG. 5

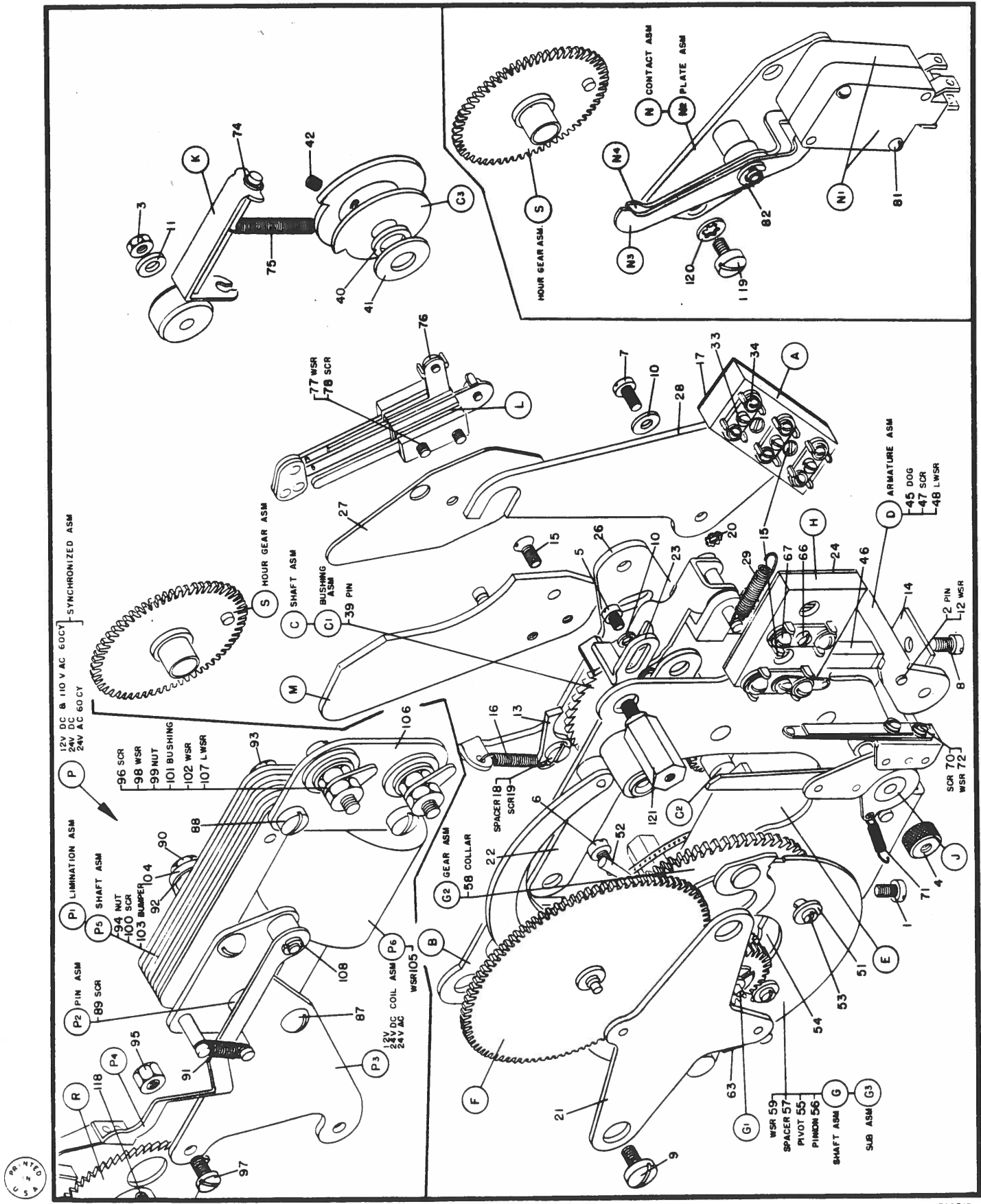
REF. NO. PART NO. PART NAME REF. NO. PART NO. PART NAME REF. NO. PART NO. PART NAME

REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME	REF. NO.	PART NO.	PART NAME	
1	2300	SCREW-8-32 1/4 FH	48	163899	LOCKWASHER-.126 ID	P	62970	SYNCHRONIZER ASSEMBLY	
2	34611	PIN-ARMATURE PIVOT	E	57401	MAGNET ASM-24V	P	76178	12V DC 6 110V AC 60 CY	
3	36823	NUT-2-56 HEX	E	57402	MAGNET ASM-48V	P	76179	SYNCHRONIZER ASSEMBLY	
4	37606	SCREW-4-40 3/16 FH	F	57404	GEAR ASM-SHAFT & INT	P	420	24V DC 60 CY	
5	38261	SCREW-4-40 3/16 FH	G	57410	SHAFT ASM-DIFFEREN	87	420	24V AC 60 CY	
6	38262	SCREW-4-40 3/16 FH	51	9660	WASHER-.032 .121 ID	88	1851	SCREW-5-40 1 RDH	
7	38262	SCREW-4-40 3/16 FH	53	12473	TAPER PIN 1/4 FH	89	1851	SCREW-5-40 1 RDH	
8	38282	SCREW-6-40 5/16 FH	54	38262	SCREW-DIFFERENTIAL	90	3225	SCREW-2-56 3/16 FH	
9	42648	SCREW 6-40 1/4 BH	55	57345	PIVOT-SPIDER	91	11474	NUT-5-40 HEX	
10	45621	WASHER-.025 .120 ID	56	57348	PINION-SPIDER	92	19069	SPACER	
11	45625	WASHER-.040 .0935 ID	57	57357	SPACER-.068 .125 ID	93	23951	SPACER-.125 .169 ID	
12	49098	WASHER-.040 .0935 ID	58	57376	COLLAR	94	37749	NUT-BUMPER SCREW	
13	51018	PANEL-DETENT .094 ID	59	57407	GEAR ASM-DIFFERENTIAL	95	37749	NUT-BUMPER SCREW	
14	51018	PANEL-DETENT .094 ID	G1	57408	GEAR ASM-DIFFERENTIAL	96	37749	NUT-BUMPER SCREW	
15	52522	CLAMP-ARMATURE PIV	G2	57409	GEAR ASM-DIFFERENTIAL	97	42648	SCREW-6-40 3/4 FH	
16	54280	SPRING-DETENT PAML	G3	45130	PLATE ASM-CONT ACT	98	45956	SCREW-6-40 1/4 BH	
17	55081	INSULATOR-TERM BLCK	H	57414	BLOCK ASM-CONNECTOR	99	52359	MASHER-.0403 .142 ID	
18	55694	SPACER-.090 .113 ID	66	38261	SCREW-4-40 3/16 FH	100	57705	SCREW-4-40 3/4 FH	
19	55695	LOCKWASHER .136 ID	67	38911	SCREW-4-40 1/4 WH	101	57705	BUSHING-BINDING POST	
20	57344	SUPPORT-FRONT DIFF	J	70	57415	FINGER ASM-CONTACT	102	57705	BUSHING-BINDING POST
21	57344	SUPPORT-FRONT DIFF	70	38245	SCREW-2-56 1/8 FH	103	57705	BUSHING-BINDING POST	
22	57345	STOP-DRIVING PAML	71	45611	WASHER-.018 .089 ID	104	60979	BUMPER-ARMATURE	
23	57389	INSULATOR-COMM BLCK	72	45611	WASHER-.018 .089 ID	105	66506	PLATE-BACK	
24	57389	INSULATOR-COMM BLCK	74	57845	BAR ASM-SHIFT	106	72706	PLATE-TERMINAL	
25	57595	PLATE-BACK	75	51941	WASHER-LOCK	107	105047	LOCKWASHER-.136 ID	
26	57723	INSULATION-COMT FNS	76	38910	CONTACT ASM-HR SUP	108	147297	RING-LOCK	
27	68286	LOCKWASHER .136 ID	77	52393	WASHER-.020 .106 ID	P1	61673	ARMATURE ASSEMBLY	
28	68286	LOCKWASHER .136 ID	78	58284	SCREW-3-48 5/8 FH	P2	62967	ARMATURE ASSEMBLY	
29	108287	SPRING-RETURN	M	71989	PLATE ASM-TRSF CONT	P3	62967	ARMATURE ASSEMBLY	
A	52489	BLOCK ASM-TERMINAL	N	81757	CONTACT ASM-12 HOUR	P4	62969	ESCAPEMENT ASM-ARM	
33	38261	SCREW-4-40 3/16 FH	81	97357	SCREW-2-56 5/8 RDH	P5	711089	SHAFT ASM-ARMATURE &	
34	38911	SCREW-4-40 1/4 WH	82	123206	CLIP-SPRING	P6	71153	COIL ASM-12V MAGNET	
B	57395	PLATE ASM-MAIN	N1	65266	SWITCH ASSEMBLY	P6	71154	COIL ASM-24V DC MAG	
C	57397	SHAFT ASM-CENTER	N2	81742	PANEL ASM-HUB & PAML	R	62965	DISC ASM-BSHNG & ST	
39	44285	TAPER PIN	N3	81748	PANEL ASM-HUB & PAML	S	62656	GEAR ASM-BSHNG & HOUR	
40	45649	SPACER-.031 .2185 ID	81	97357	CONTACT ASM-12 HOUR				
41	58282	WASHER-.078 .220 ID	82	123206	CLIP-SPRING				
42	160942	SCREW-4-40 3/16 FH	N1	65266	SWITCH ASSEMBLY				
C1	57396	SCREWING ASM-GATCH &	N2	81742	PANEL ASM-HUB & PAML				
C2	57396	SCREWING ASM-GATCH &	N3	81748	PANEL ASM-HUB & PAML				
C3	57787	CAM ASSEMBLY							
D	57398	ARMATURE ASSEMBLY							
45	34510	DOG							
46	34514	LINER-BRASS							
47	45200	SCREW-4-40 3/16 TH							

PARTS NOT SHOWN ON SUB ASSEMBLIES

118	2863	SCREW-2-48 1/4 RDH
119	38271	SCREW-2-40 3/8 FH
120	105047	LOCKWASHER-.136 ID
121	99435	POST-DIAL 1 3/32

# 12 HR. REG., SYNCHRONIZER & ACCUMULATOR



MAY 2, 1955

### 25 FIG. 6



L E T T E R

R. Shenton, Dr. A. Shenton, M. Feldman,  
Dr. M. Levy, Dr. B. Levy, P. DeAngelo,  
R. McInnes, Dr. G. Feinstein, A. Marx

Dr. Shenton pondering a question about  
an early battery clock.

\*\*\*\*\*

M A R T I N

WANTED: "Junker" early battery clocks, movements, parts, etc. Send details and \$  
wanted. ELECTRICAL CLOCK LITERATURE for possible reprinting in our Journal.  
Send to Martin Feldman, 620 Reiss Place-7E., Bronx, NY 10467

WANTED: Electrical Horological Literature of any type. Martin C. Feldman

REPAIRS: ALL EARLY BATTERY CLOCKS including Pooles, Barrs, Tiffany Never-Winds, Eureka's, etc.  
SPECIALIZING IN BULLE CLOCK REPAIRS USING ORIGINAL PARTS. One month maximum time  
for all repairs. Martin C. Feldman

WANTED: Unusual Electrical Clocks. A. Marx, 105 Bayeau Rd., New Rochelle, NY 10804

ANNOUNCEMENT:

Power supplies to meet your needs will be custom built-upon request describing  
same. Please write your needs and enclose an SASE for reply.  
Martin Swatsky, 1910 Coney Island Ave., Bklyn, NY 11230

WANTED: Nice Poole or Bulle- Please contact C. George Wiedmaier  
9207 Lawnview Lane Laurel, MD 20811

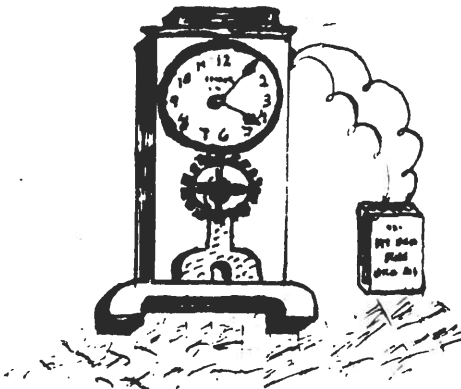
WANTED: LARGE SECONDARY CLOCK  
Henry Weiland, 8946 West Grantosa Dr., Milwaukee, Wisc. 53222

WANTED: Self-Winding Clock Co. 60 beat movement or parts to convert a  
72 beat mvt. to a 60 beat one. J.J. Singer, 2572 Traymore Rd.  
University Hts., OH 44118

FOR SALE: Very high quality Early Battery Clocks for the serious  
collector by Synchronome, Gents, Holden, Vaucanson. Fully  
restored.  
Charles W. Roth, 2 Circle Lane, Roslyn Hts., N.Y. 11577



The  
**JOURNAL**  
 OF THE  
**ELECTRICAL HOROLOGY**  
**SOCIETY**  
**Chapter No 78**



June, 1981  
 VOLUME VII--Issue #3  
 Martin C. Feldman, Editor

Hello fellow enthusiasts:

The summer and its hot humid weather has taken its toll of all of us, your editor included. It certainly dulls initiative and fosters all sorts of excuses for postponement of obligations and duties. However, we once again have overcome our natural inclination to lie back and let things slide; thus your Journal reaches you a bit later than usual but I hope with information which will make up for its tardiness.

We are indebted to Al Stevens for donating a copy of his information on the Holtzer-Cabot Electric Co. and the clock they produced. While we don't know of an example which is extant we nevertheless feel that publishing this manual is worthwhile and will add to the fund of knowledge about early battery master clocks. Al has also donated a copy of the Time-Frequency Standard apparatus used by the Telephone System in New Jersey for some years and we hope to publish part of it in future Journals.

The Chicago Branch of the EHS is extremely active according to Steve Berger and we congratulate them on their efforts on behalf of electrical horology. We also look forward to accepting new members and to our continued growth.

I hope you all continue to have a pleasant summer and if local groups can get together in this fine weather, all the better.

Electromagnetically yours,  
*Marty Feldman*  
 Marty Feldman, FNAWCC

THE HOLTZER-CABOT ELECTRIC CO.  
BOSTON, MASS.

MASTER CLOCK INSTRUCTIONS  
(Automatic Resetting)

CDA-501

(1) Hang the clock on a screw or lag bolt not less than 5/16" diameter. Drill the hole for this support downward at an angle of about 15° from the horizontal, so that when screwed into place, the outer end of the bolt will be higher than at the point where it enters the wall. When the clock is hung, it will then have a tendency to slide back against the wall. Do not hang a Master Clock on a toggle bolt. Use a lag-bolt in solid masonry walls or wood studding.

(2) Where the drilled hole breaks into a cavity in hollow tile, enlarge the hole, fill the cavity with plaster of paris or cement, insert the lag bolt at the proper angle and allow the mass to harden. Any form of plaster block must be carefully prepared for the support of a Master Clock. Master Clocks may weigh 75 pounds or more and must have firm anchorage.

(3) After the case is hung, install the pendulum according to instructions on a separate sheet and then plumb the case by means of the Pendulum by moving the bottom of the case to right or left until the Pendulum tip is directly in line with the center of the Pendulum scale; hold in this position and insert a 2 1/2" x No.]2 round head wood screw in the hole provided below the Scale and make sure that the case is absolutely firm at the bottom.

(4) It may be necessary to mark through the bottom hole and remove the case from the wall in order to drill and plug the hole. "Rawl" plugs are suitable for this purpose where solid masonry walls are encountered. Toggle bolts in wire lath or hollow tile walls and wood screws where the center of the Master Clock hangs directly over wooden studding. Do not attempt to plumb the case by means of a spirit level placed in the bottom of the case.

(5) After the case is securely attached to the wall, it is ready for connections but before these are made, examine all switches on the Control Panel in the bottom of the case, or in a separate case where one is furnished, and place the levers in the down or "OFF" position; then with the aid of wiring diagram shipped with the Clock; make the necessary connections to the case and auxiliary apparatus.

PLACING MASTER CLOCK IN OPERATION

(6) These are general instructions. See separate sheets applying to particular types of Movements and Accumulator. After all connections are made and the Pendulum is swinging properly, the Hands on the Master Clock and the Escapement actions should be checked.

(7) The Seconds Hand is shipped in the correct position and should arrive at figure "60" at the same time that the Secondary Clocks jump, and at the same instant, the Pendulum should swing to the left.

(8) The Seconds Hand is held in place by friction and may be turned in either direction, but should only be turned while the Pendulum is at rest, and then only to set it in time with the contacts.

(9) If the Seconds Hand moves irregularly, that is, one beat or movement longer than the other, then an adjustment should be made by means of the beat Adjuster "A" which extends above the Movement at the rear.

(10) By turning the adjusting nut, "N", in one direction or the other, the Escapement can be adjusted so that the interval between all "Beats" or "Ticks" will be of equal duration.

(11) The Minute and Hour Hands are attached to the Movement in such a way that they may be turned in either direction, within certain limits.

(12) If the Master Clock is operating an Automatic Resetting System, the Minute Hand must not be moved backward past the Figure "12" at the top of the dial.

(13) If it is necessary to set the Hands, it is better to stop the Master Clock until time catches up with it, if it is fast; or set it forward by turning the Minute Hand, if it is slow.

(14) The Minute Hand must be set so that the tip is directly over a minute division at the instant the Seconds Hand arrives at Figure "60". If they are not set accurately with respect to each other, the resetting feature will not function.

(15) The Hands should be set carefully to avoid bending them, and they should be left with sufficient clearance between them so that they will not strike or interfere with each other. Neither Hand should rub against the Dial. The following paragraph applies to a Resetting Master Movement.

The hub of the Minute Hand has a square hole through it, which makes it possible to mount it in any of four positions, only one of which is correct; therefore, it is advisable to stop the Pendulum when it is necessary to remove the Minute Hand, note the position of the Hand and then replace it in the same position. Of the position was not noted, it can be ascertained by trying it in each of the four positions or removing the Dial and mounting it so that it points straight up when the hourly contact on the front of the movement is closed.

(16) If for any reason the Dial and Hands have been removed, be sure that after replacing them, the knurled steel nut which holds the Minute Hand in place is screwed back as far as it will go.

AUXILIARY CONTROL APPARATUS

(17) This is necessary for use in connection with the operation of Secondary Clicks and other Secondary Equipment. It consists of Relays located in the upper part of the Master Case, with Switches and Push Buttons located inside at the bottom.

(18) One Relay operates once a Minute and transmits impulses to the Secondary apparatus while the other Relay operates once an Hour and the two together operate in conjunction to transmit resetting impulses at the 60th minute.

(19) The horizontal impulse contacts on the upper left hand side of the Master Movement are arranged in the following sequence, from front to back:

(20) Hourly Resetting: Closes from 49th to 59th second each minute.

(21) Minute Impulse: Closes from 58th to 60th second each minute to operate Minute Impulse Relay.

(22) Duration: Closes at one second after each minute; remains closed 4 seconds; and used in connection with a Program Device, determines the length of time Bells or other Signals shall sound.

(23) Below those and attached to the front plate is a fourth set which closes once an hour, remains closed approximately 30 seconds and is connected in series with the Resetting Contacts referred to above. Together these two transmit an impulse one an hour, operate the Resetting Relay, and reset any Secondary Units which for any reason may be out of synchronism with the rest of the System.

(24) After the Master Clock has been connected to the power supply and appears to be running properly, the Secondary Clock Switches may be closed and the operation of the Secondary Units observed.

(25) Inasmuch as Secondary Clocks are usually shipped with the Hands indicating 12:00 o'clock, the easiest and suggested method of starting secondaries is to close the Switches about 30 Seconds before twelve which will not only start them off without the necessity of stepping them around manually but at the exact hour, The Resetting Impulse will be transmitted, correcting any minor differences in time among the Secondaries themselves.

(26) If the Secondaries do not start upon closing the Switches, it will be evident that there is an open connection somewhere or that the power supply is not functioning properly. If a Type "C" Rectifier is being used, read Bulletin #1498.

#### WOOD ROD METAL BALL PENDULUM INSTALLATION AND ADJUSTMENT

The Clock is usually shipped with the Ball removed and the lower end of the Rod tied down. While removing wrappings and adjusting nut, the rod should be held down firmly and without twisting to avoid damage to the delicate suspension spring which support the Pendulum.

After the Pendulum was regulated at the factory a pencil line was scribed across the rod directly above the ball and when replacing the ball, it should be restored to the same position.

If the suspension spring "S" is kinked or otherwise damaged, it will cause the pendulum to wobble as it swings, and may prevent the clock from keeping accurate time.

Be sure also that pin "P" attached to crutch rod "C" is properly inserted in slot in escutcheon "E" in pendulum rod. Rod "C" should be adjusted so that it neither bears against pendulum rod "R" nor rubs against movement plate "M".

The correct way to start a pendulum swinging is to grasp the rod directly above the ball with the left hand, pull it to the left until the lowest point reaches Figure II on the pendulum scale and then release it. Do not "bat" it or cause it to swing to an excessive degree.

If and when required, the clock can be made to run faster by turning the front of the adjusting nut to the right, or slower by turning it to the left. A fraction of a turn will affect the rate a matter of seconds in 12 hours. Some experimenting may be necessary to secure the desired results.

AUXILIARY CONTROL APPARATUS  
(Automatic Resetting Type)

CDA-517

(Read Bulletin CDA-501 before reading the following.)

- (1) This consists of contacts on the Master Clock movement, Relays located either in the Master Case or in a separate cabinet, Switches, Push Buttons and such other equipment as may be necessary for the proper control of Secondary Units.
- (2) The Relay or Relays receive impulses from the contacts on the Master Movement and the Relays with their larger contacts, transmit the necessary current impulses to the Secondary Units. A single Relay will carry the equivalent of 100 #1 Secondary Movements.
- (3) A switch is provided for each Secondary Circuit so that the Units may be stopped or started as the case may be, at the time the system is being installed or serviced.
- (4) There is also furnished a "quick make and break" Push Button for each circuit by means of which it is possible to manually "step up" or advance the Secondaries on any circuit independently of the Master Clock.

(5) Before starting a Clock System, all Clock Switch Handles should be pushed downward into the "OFF" position until the Master Clock has been started and is in condition to operate the Secondary Units. This procedure is advisable in order to avoid "scattering" the Secondary Units or putting them out of time with one another.

(6) After the power has been switched on and the Master Clock is operating properly, the Secondary Switches may be closed and operation of the Secondaries observed.

(7) Inasmuch as Secondary Clocks are shipped with the Hands set at twelve o'clock, the best time for an inexperienced person to start them is at that time; therefore the Clock Switches should be closed directly after the Minute and Seconds Hands have passed that hour and the Secondaries will receive their first impulse at 12:01.

(8) To advance the Secondaries to any time after 12:00 o'clock it is only necessary to operate the "stepping" Button as follows: Depress the Button; hold for one second; release and wait a second; then repeat as many times at the same speed as may be necessary to advance the hands of the Secondary Units up to the time indicated by the Master Clock.

(9) Not more than 25 #1 Secondary Movements, or their equivalent, should be connected in a single circuit, or group, and where two or more circuits are to be operated, there will be provided separate control means for each circuit, consisting of Switch and Stepping Button.

(10) When it is found necessary to advance any one of a number of Circuits, simply open the Switches of these circuits which are not to be changed, leaving closed that one, or those, which are to be, and proceed as outlined in paragraph #8.

(11) Systems incorporating the Automatic Resetting feature will correct each hour on the hour any Secondaries which may have become not more than 32 minutes slow or 27 minutes fast in any one hour.

(12) If one or more Secondaries are out of time in excess of the above amount it will be necessary to set them ahead manually to where they will agree with the Master Clock.

(13) If any Secondary becomes 33 minutes, or more, slow in any one hour, it will throw backward and become one hour slow at the next exact hour, and in the same way will be advanced to one hour fast if it has for any reason gained 28 or more minutes in any one hour.

(14) To set a Secondary Clock, hold it, back up, in the crook of the left arm; remove the movement cover and then while holding down the left end of the upper Armature with the left index finger, turn the Ratchet Wheel slowly to the left a sufficient number of times with the thumb to advance the Clock Hands to the correct position. Do not spin the Hands and then stop them suddenly by releasing the Armature. Allow the Hands to stop moving before releasing the Armature.

(15) It is best to follow the above procedure up to within a few minutes of the final setting, and then finish by stepping up the Movement one minute at a time by oscillating the Armature with a finger.

AUTOMATIC RESETTING

(16) Performing the Resetting function manually requires extra care and the following should be studied until thoroughly understood before an attempt is made to try it out.

(17) In addition to "Minute Impulse" Buttons and Switches there will be found adjacent to them duplicate sets marked "Manual Reset" and these latter must be used in conjunction with the former.

(18) When it is desired to set Secondaries forward or backward, as a group, to the nearest exact hour the correct procedure is as follows:- With one hand first press the "Minute Impulse" Button and while holding it in press with the other hand the "Manual Reset" Button and hold it for ten seconds then release it first and afterward the "Minute Impulse" Button. Unless that rule is strictly observed the Secondaries may be thrown out of time to an extent that may require individual manual resetting.

(19) Manual group Resetting requires but one long impulse as outlined in the foregoing and Not a series of short ones as referred to in paragraph #8. The long impulse is particularly necessary where a Program Device is a part of the System, as this device is reset by means of a small Motor and requires more time in which to complete the operation than Secondaries do.

COORDINATION OF MASTER CLOCK HANDS

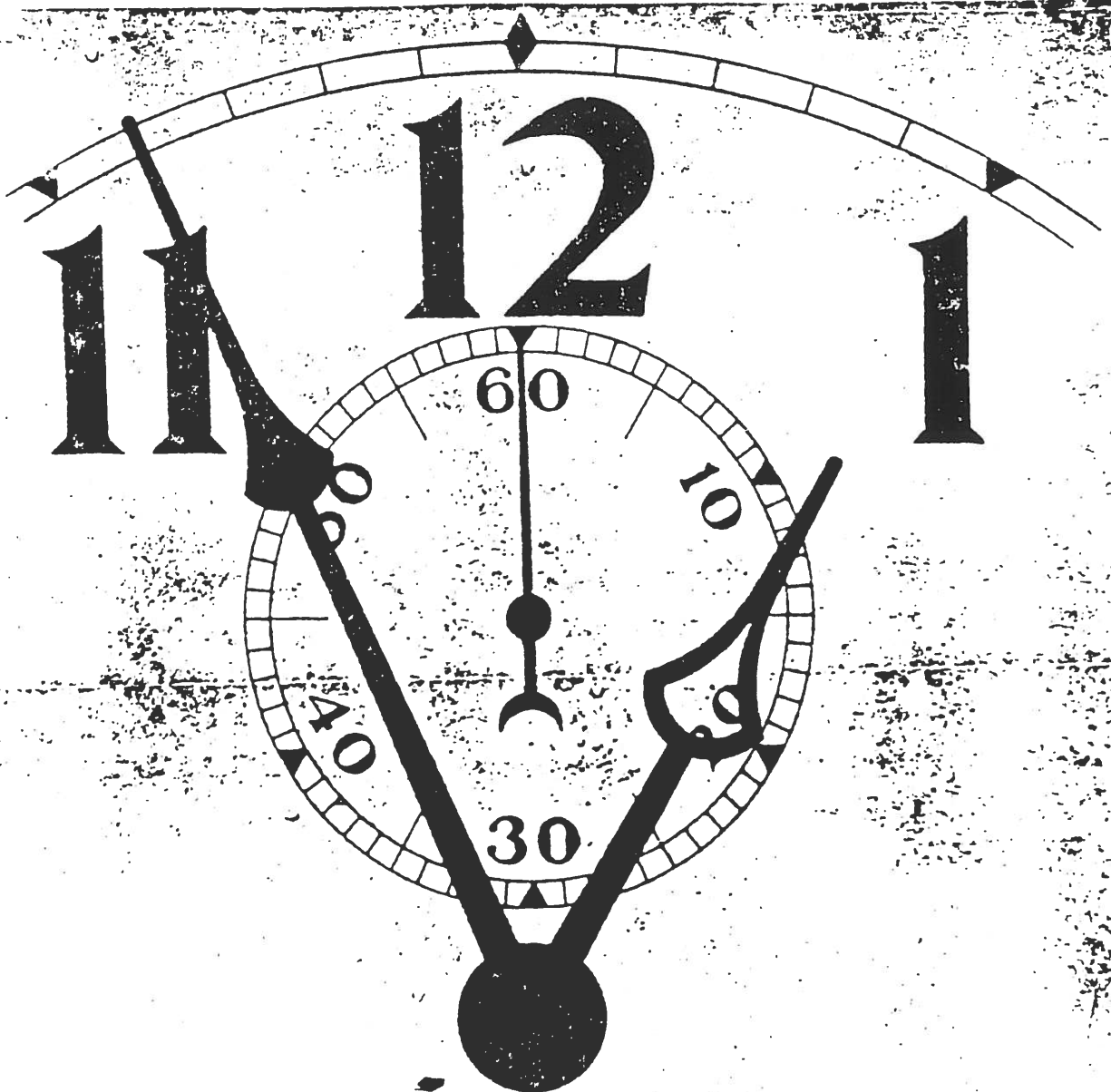
The matter of setting Master Clock Hands accurately, with relation to each other, is of extreme importance and is referred to in all Master Clock Instructions.

The detail below illustrates correct positioning and this implies particularly to Resetting Systems.

When all Hands are accurately adjusted the tip of the Minute Hand should always arrive at a position directly over a Minute Mark at the same instant that the Seconds Hand arrives at "60", especially at the several Minute Marks immediately preceding each exact Hour.

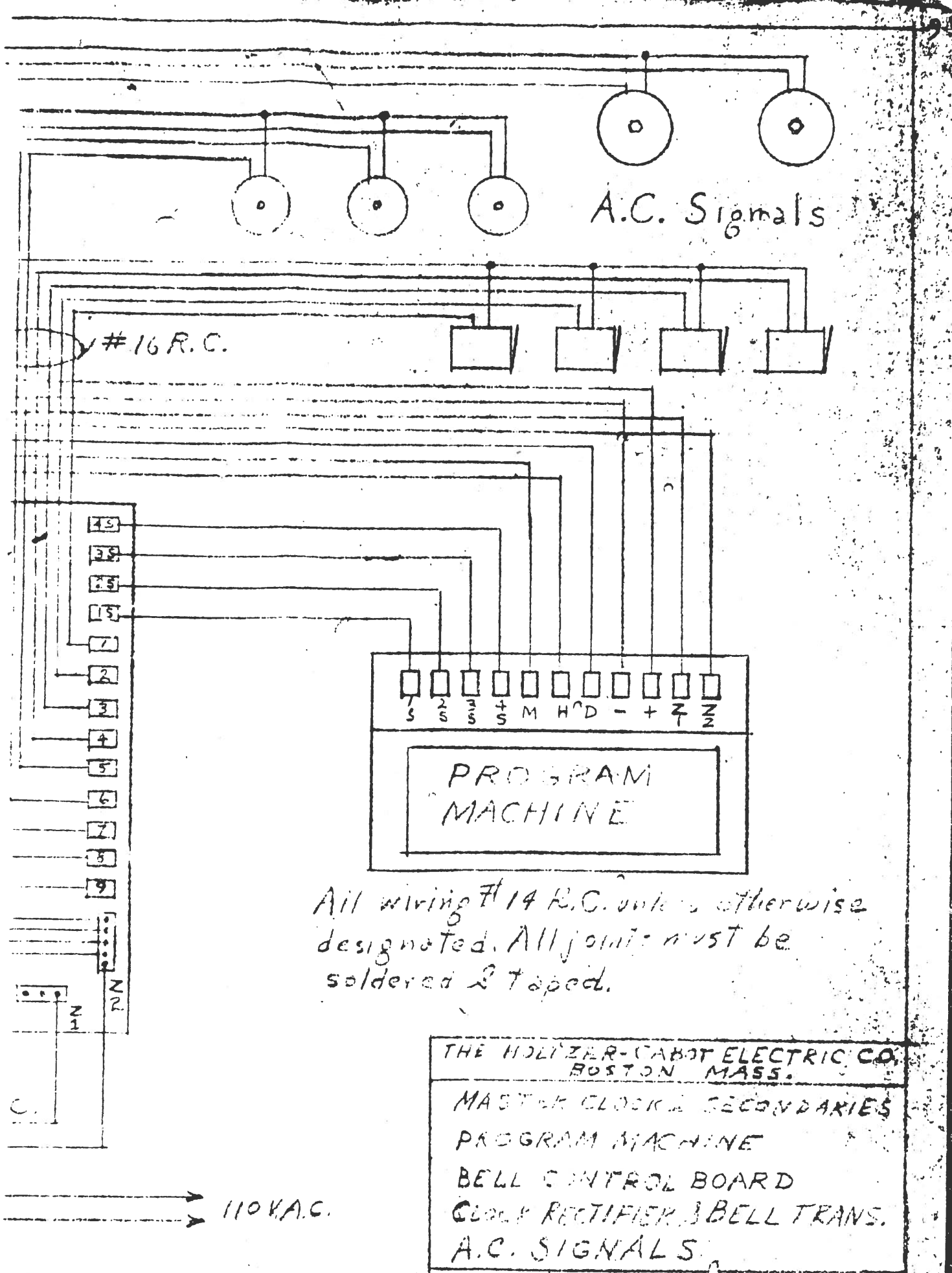
The reason for this is that both Minute and Seconds Hands are attached to Cams back of the Dial and unless there is perfect co-ordination of these Cams the Resetting function will not occur.

ME 4-15-81



THE HOLTZER-CABOT ELECTRIC CO.  
BOSTON MASS.

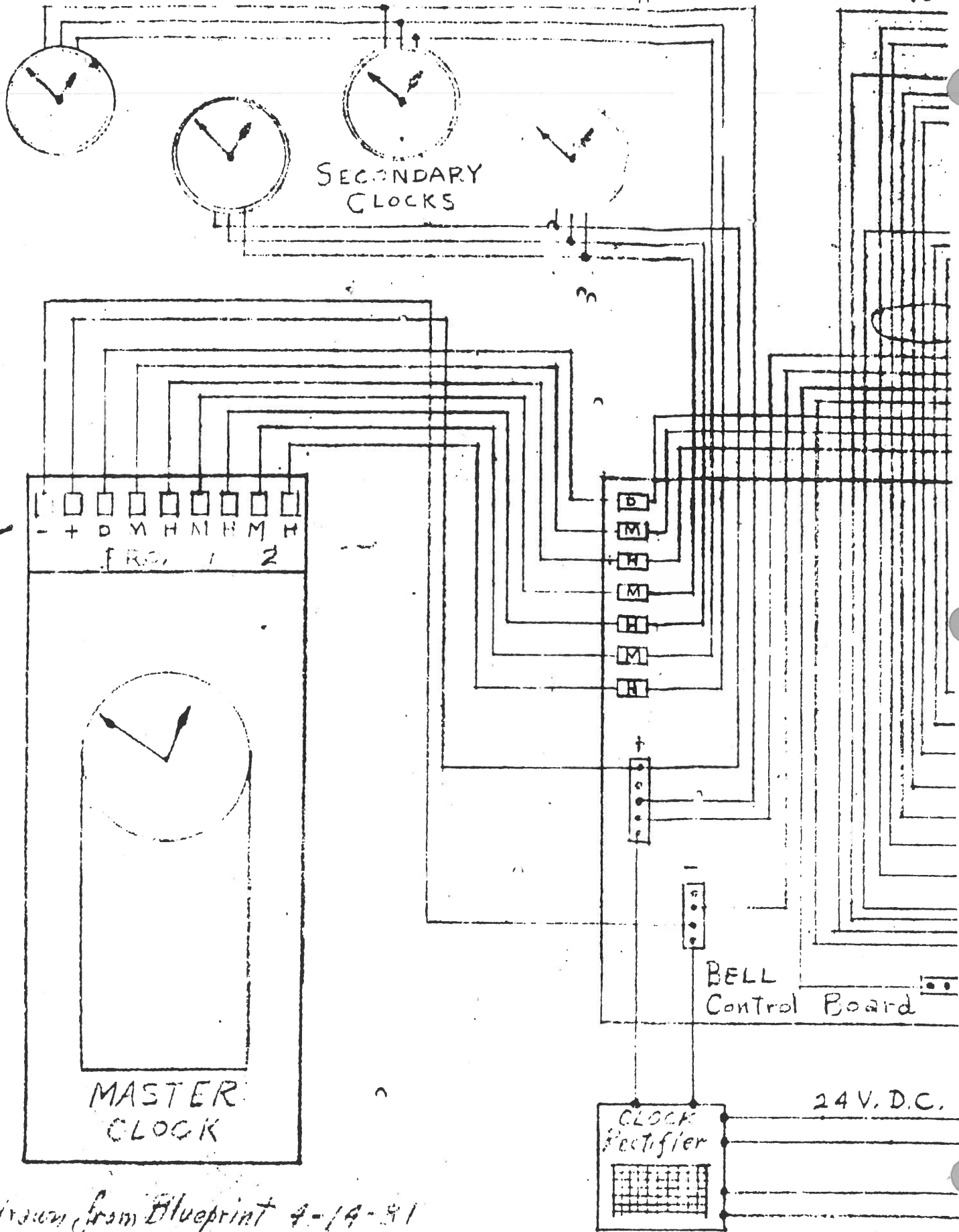




All wiring #14 R.C. unless otherwise designated. All joints must be soldered & taped.

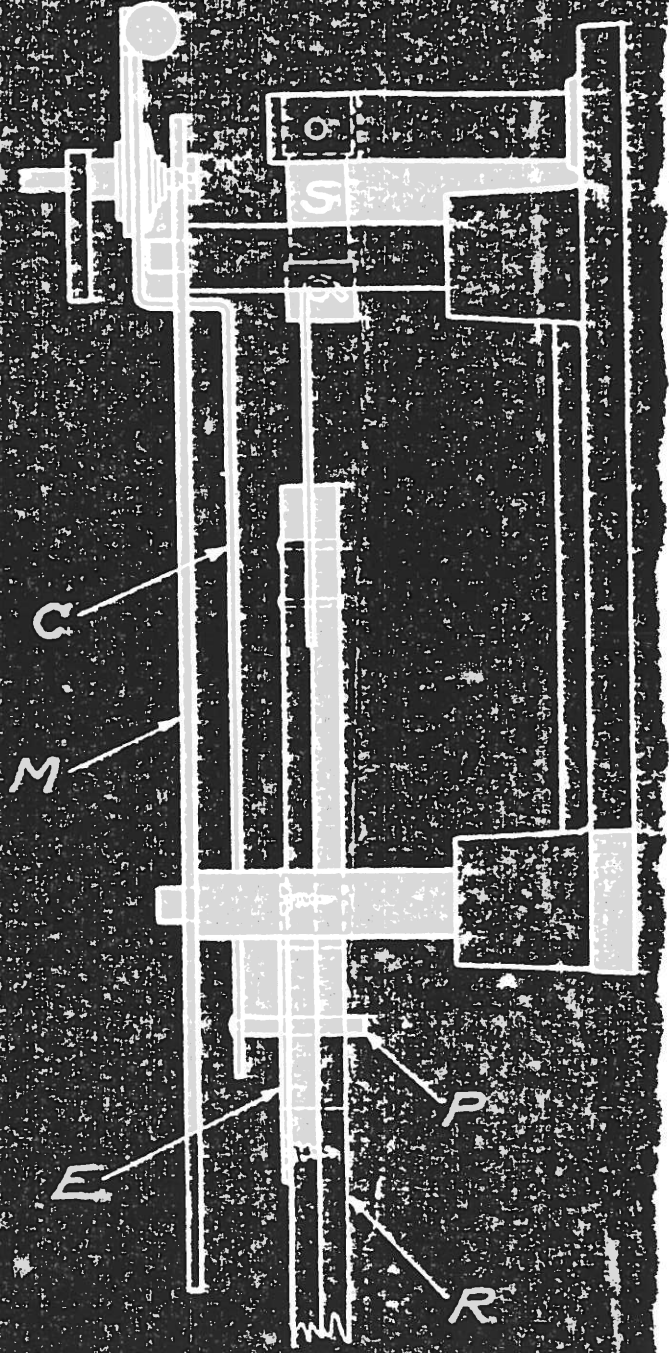
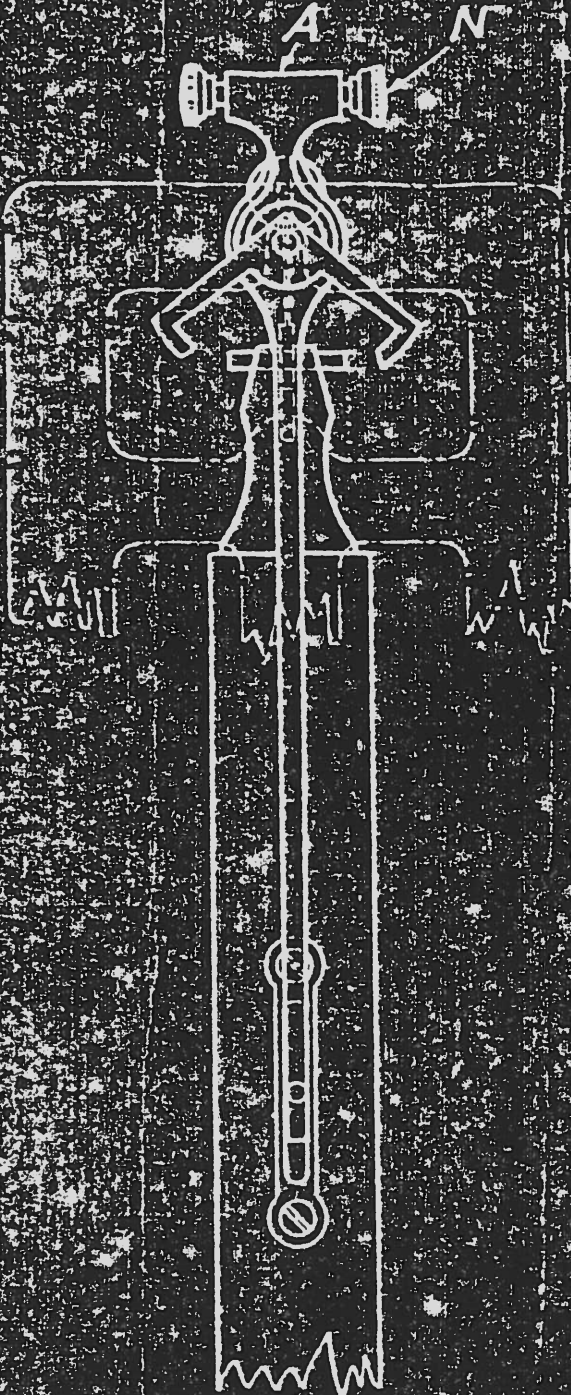
THE HOLZER-CABOT ELECTRIC CO.  
 BOSTON MASS.  
 MASTER CLOCK SECONDARIES  
 PROGRAM MACHINE  
 BELL CONTROL BOARD  
 CUPRY RECTIFIER & BELL TRANS.  
 A.C. SIGNALS

110 V.A.C.



Redrawn from Blueprint 4-14-31  
 A.L. Stevens #25781

WOOD ROD METAL BALL PENDULUM IN MASTER CLOCK



THE HOETZER CABOT ELECTRIC COMPANY  
BOSTON, MASS.

MART

WANTED: "Junker" early battery clocks, movements, parts, etc. Send details and \$ wanted. ELECTRICAL CLOCK LITERATURE for possible reprinting in our Journal. Send to Martin Feldman, 620 Reiss Place--7E., Bronx, NY 10467

WANTED: Electrical Horological Literature of any type. Martin C. Feldman

REPAIRS: ALL EARLY BATTERY CLOCKS including Pooles, Barrs, Tiffany Never-Winds, Eureka's, etc. SPECIALIZING IN BULLE CLOCK REPAIRS USING ORIGINAL PARTS. One month maximum time for all repairs. Martin C. Feldman

WANTED: Unusual Electrical Clocks. A. Marx, 105 Bayeau Rd., New Rochelle, N. Y. 10804

WANTED: Hahl-Wenzel pneumatic clock pendulum and weights. Will buy entire clock if necessary. Martin C. Feldman

ANNOUNCEMENT: Power supplies to meet your needs will be custom built-upon request describing same. Please write your needs and enclose an SASE for reply. Martin Swetsky, 1010 Coney Island Ave., Bklyn, NY 11230

WANTED: LARGE SECONDARY CLOCK  
Henry Weiland, 8946 West Grantosa Dr., Milwaukee, Wisc. 53222

FOR SALE: Very High Quality Early Battery Clocks for the serious collector by Synchronome, Gents, Holden, Vaucanson. Fully restored. Charles W. Roth, 2 Circle Lane, Roslyn Hts., N.Y. 11577

The Electric Time Machine

By: Dr. George Feinstein  
75-19 195th Street  
Flushing, N.Y. 11366

Questions And Answers

From: L.A. Seymour  
2148 N.W. 197th St., Seattle, Washington 98177

Clock no. 1 (Photos 1, 2, and 3) has the initials D.E.H.O., and the address 40 Rue De Colisee, Paris on a metal plate on the outside of the case. The style of case would indicate this clock was made during 1930.

Q: Who invented the clock? When?

Is it related to other French, German, English or American clocks?

A: This clock was built by Telefonbau and Normalzeit of Berlin and Francfort, Germany. The design is based in part on Frank Hope-Jones gravity impulse lever, patented in 1895. It appears to have been designed in the 1920's or 1930's. It was also sold by Elektrozeit of Francfort. D.E.H.O. was probably the French distributor of the clock. If anybody knows what D.E.H.O. stands for, I would appreciate hearing about it.

Clock no. 2 (Photos 4, 5, 6, and 7) has the label "Chronos" on the dial and stamped inside is Systeme Aron. In "Electrical Timekeeping" by F. Hope-Jones on page 53 there is a sketch of the mechanism and a few words about the operation. The case would seem to date it from 1910 to 1930 or possibly later.

Q: Who was Aron? When did he invent this rewind? Was "Chronos" the only application? Is there anything like it in England, Germany, or the U.S.?

A: This clock was one of two invented by Dr. Hermann Aron of Charlottenburg, Germany. It was invented around 1887, and manufactured by the Heliowattwerke of Berlin. Models were made for use with 1.5V (75 ohm coil), 3V (150 ohms), and 110V (1250 ohms). It appears to have been sold by Dr. Aron through at least 1908.

Clock no. 3 (Photos 8, 9, and 10) is mounted on brass posts on a wooden base. It has a glass dome 18" high and 8" in diameter. The dial is 5" in diameter. The pendulum has mercury vials and is identical with those in French marble clocks with exposed Brocot escapements made in quantity from 1860 up until WW I and even later. On the base are three terminals, two for power supply and a third to supply a slave. There is a pushbutton to step the slave ahead. There are no identifying marks anywhere on the dial or movement.

Q: Is this a production type or one of a kind?

Is this type of rewind used on any other clock in the U.S., England, or Germany? When was it made and where?

A: This clock was invented by Victor Reclus of Paris, France in the 1880's. He produced the clocks and a variety of slave devices at least into the 1890's. The idea of a periodically rewound spring or reset weight to drive a clock movement is common to clocks of most countries although this particular system is peculiar to the Reclus clock.

Fig. No. 1

D.E.H.O. Clock Case

Height overall 40", Dial Diameter 8"  
Pendulum length (Support to center of bob) 20.5". (This is a drawing based on the photograph. The photograph was not reproduceable)

Fig. No.2

Rear view of D.E.H.O. clock Time Mechanism

Rewind mechanism drives main arbor through helical spring which engages pin on disc, seen in front of pendulum rod stirrup. Deadbeat escapement. No evidence of time pulse circuitry on clock.

Fig. No. 3

D.E.H.O. Clock Rewind Mechanism

Large round wheel is inertia device. The driving weight is the small weight to the right of the pendulum rod. Stamped on magnet is 2 volt 2.4 ohms. Armature is pivoted centrally and rotates clockwise, when contact is made-inertia wheel rotates counter clockwise and keeps firm contact during rewind and carries beyond when armature reaches stop, breaking contact.

Fig. No. 4

"Chronos" Clock Case

Pendulum length 20"

(This is a drawing based on the photograph. The photograph was not reproduceable)

Fig. No. 5

"Chronos" Rewind Mechanism

Mounted in top of case. Drives clock through vertical shaft and helical spring.

Fig. No. 6

"Chronos" Rewind Mechanism

Closeup view.

Fig. No. 7

Rear view of "Chronos" Movement showing vertical drive shaft and bevel gear to main arbor.

Fig. No. 8

Master Clock. Overall View. (Reclus Clock) Leveling screws on base. Silk covered leads to rewind mechanism.

Fig. No.9

Master Clock (Reclus Clock) Rear View Showing Rewind Device. Driving force is weight of armature plus spring force. The long pawl pulls down on ratchet wheel. As the wheel turns another tooth of the ratchet wheel lifts the shorter pawl, which in turn lifts the contact arm. As the pawl drops off the tooth, the contact arm moves to the left and the contact at the bottom touches the silver roller fixed on the lower pawl completing the circuit. The magnet is energized and lifts the armature, the lower pawl picks up a new tooth and breaks the circuit. The cycle takes 30 seconds.

Fig. No. 10

Master Clock (Reclus Clock) View showing Brocot escapement.  
The pendulum suspension is also the usual Brocot screw-thread type, but it has no horizontal shaft leading to dial.

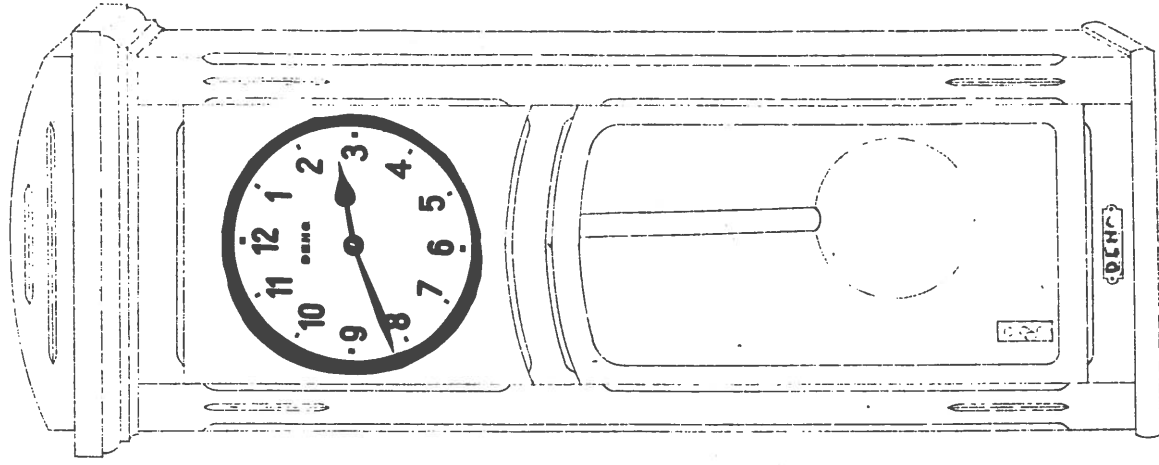


Fig. 1

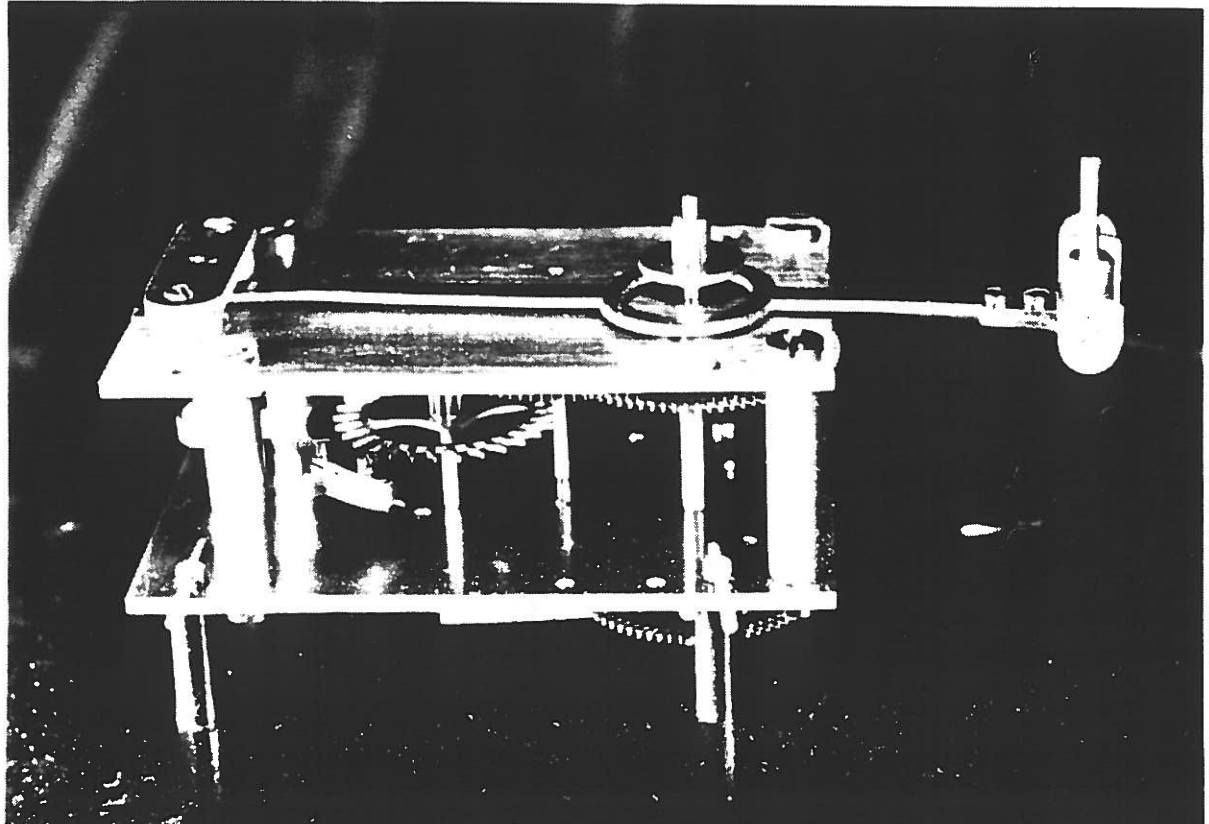


Fig. 2



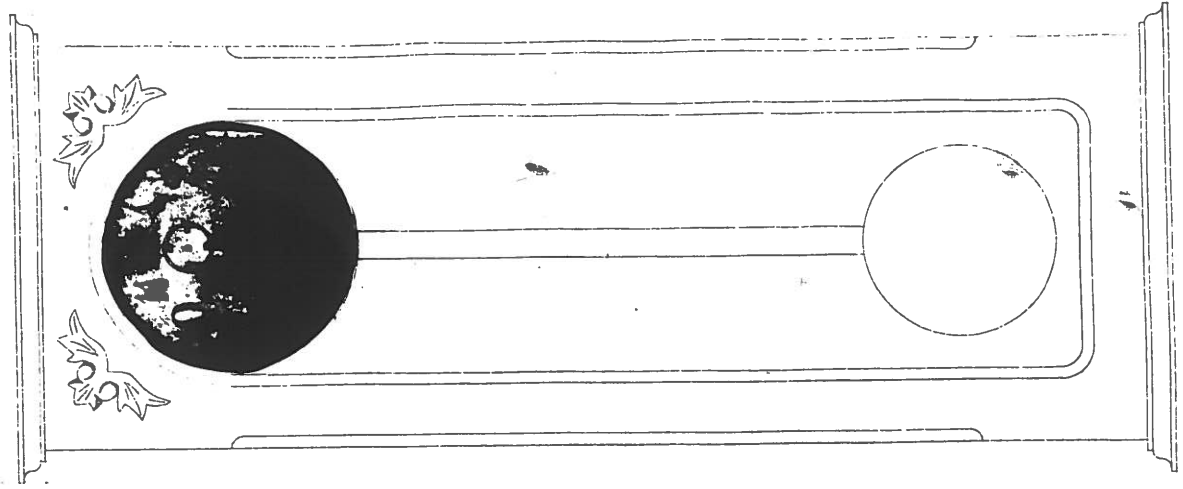


Fig. 4

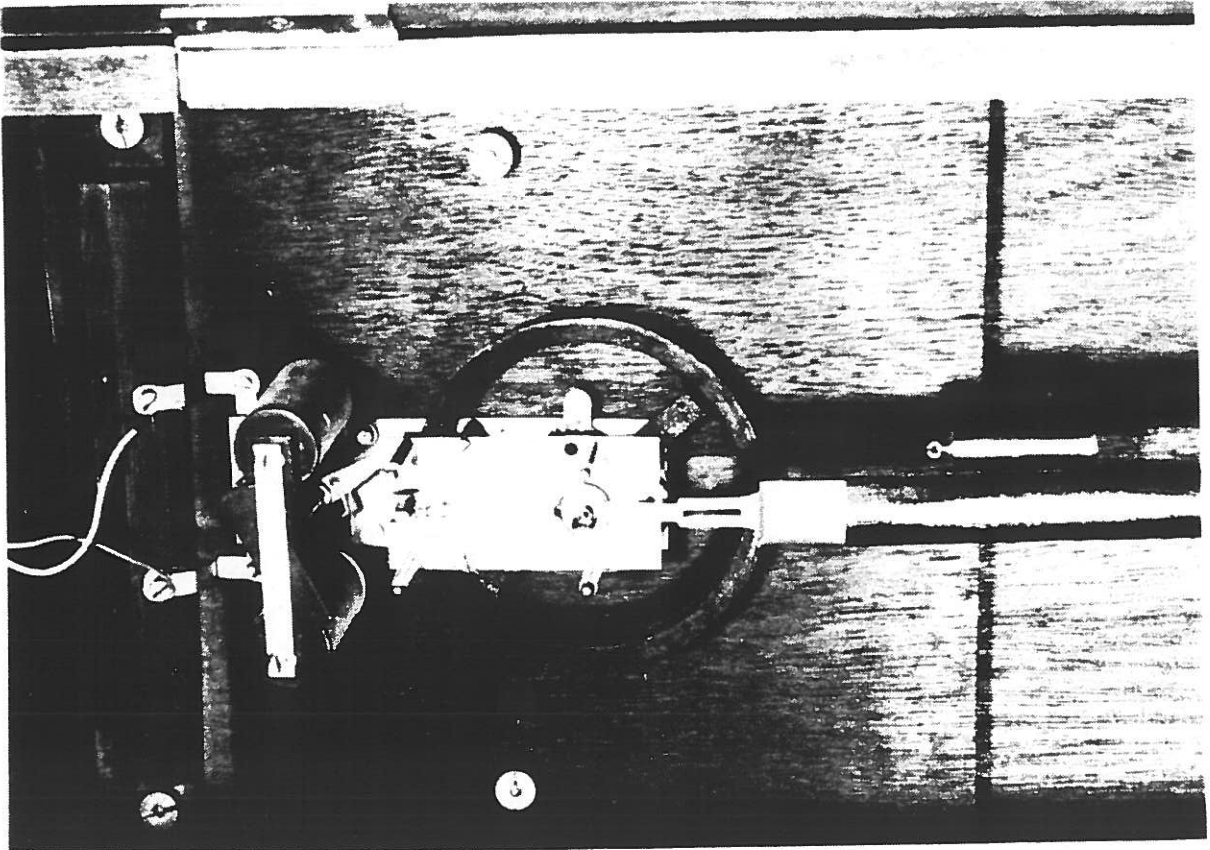


Fig. 3



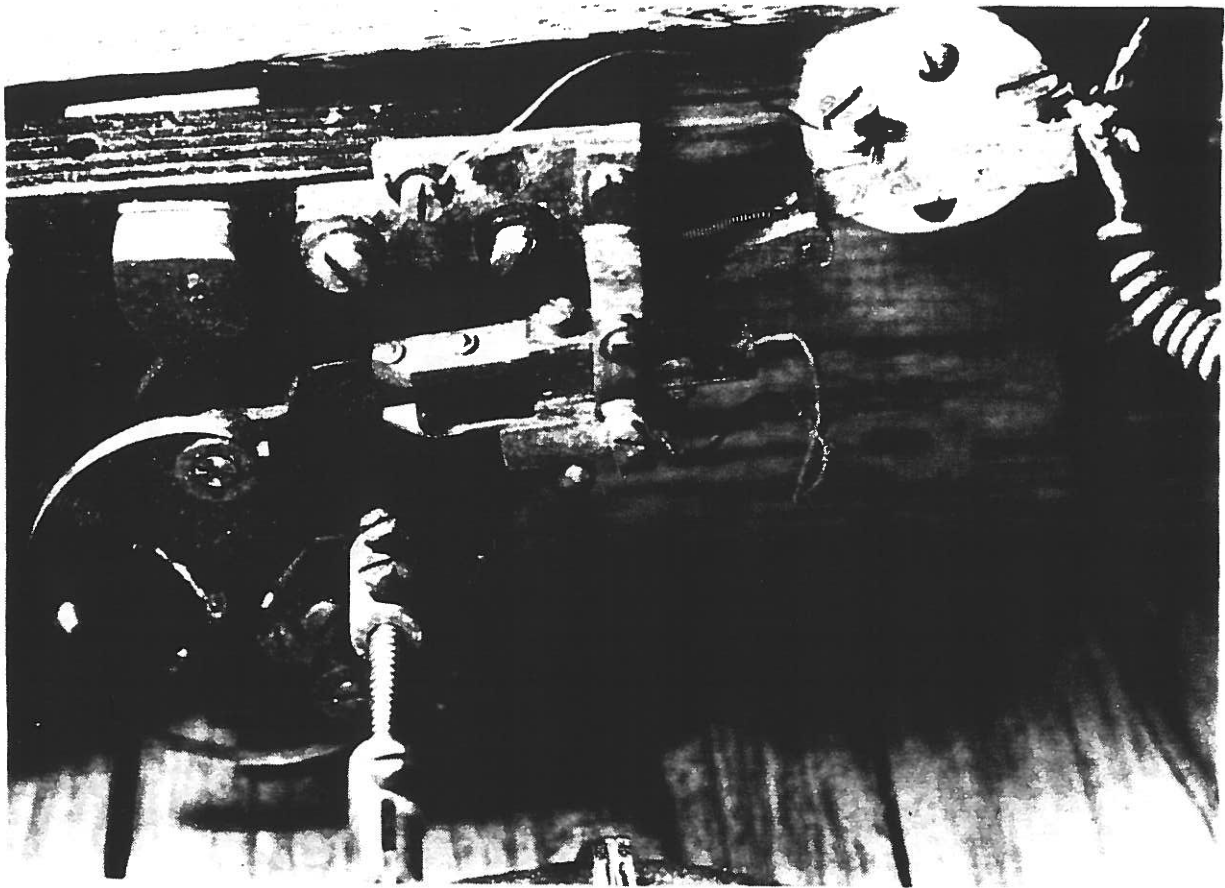


Fig. 6

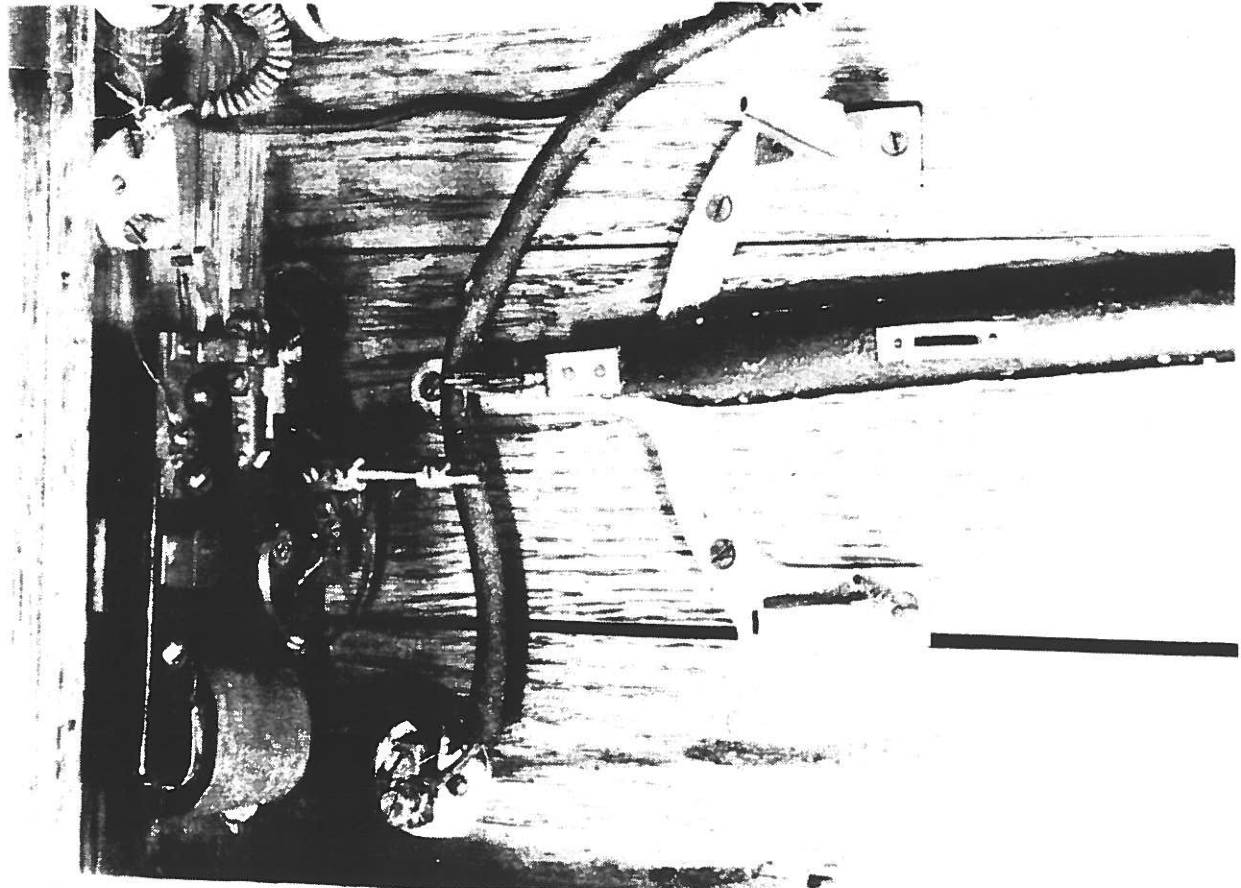


Fig. 5

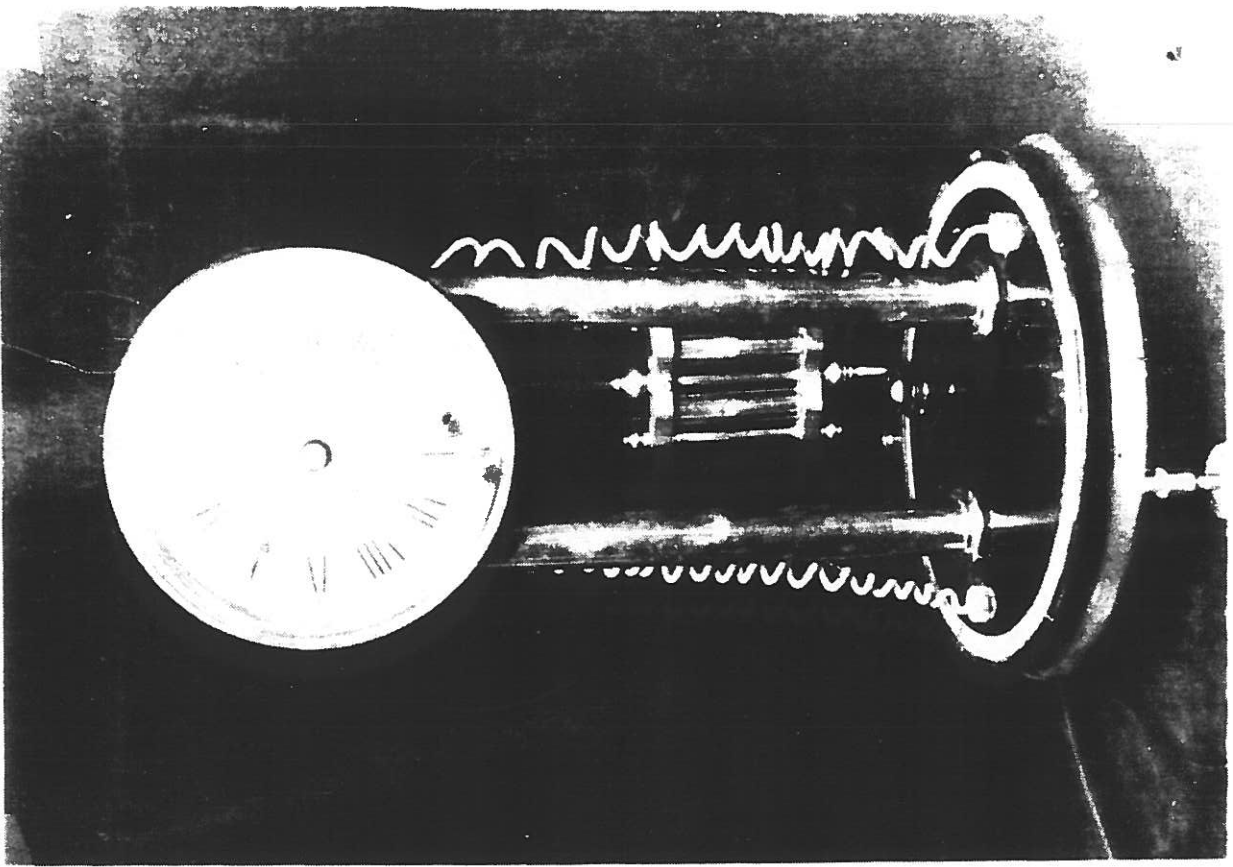


Fig. 8

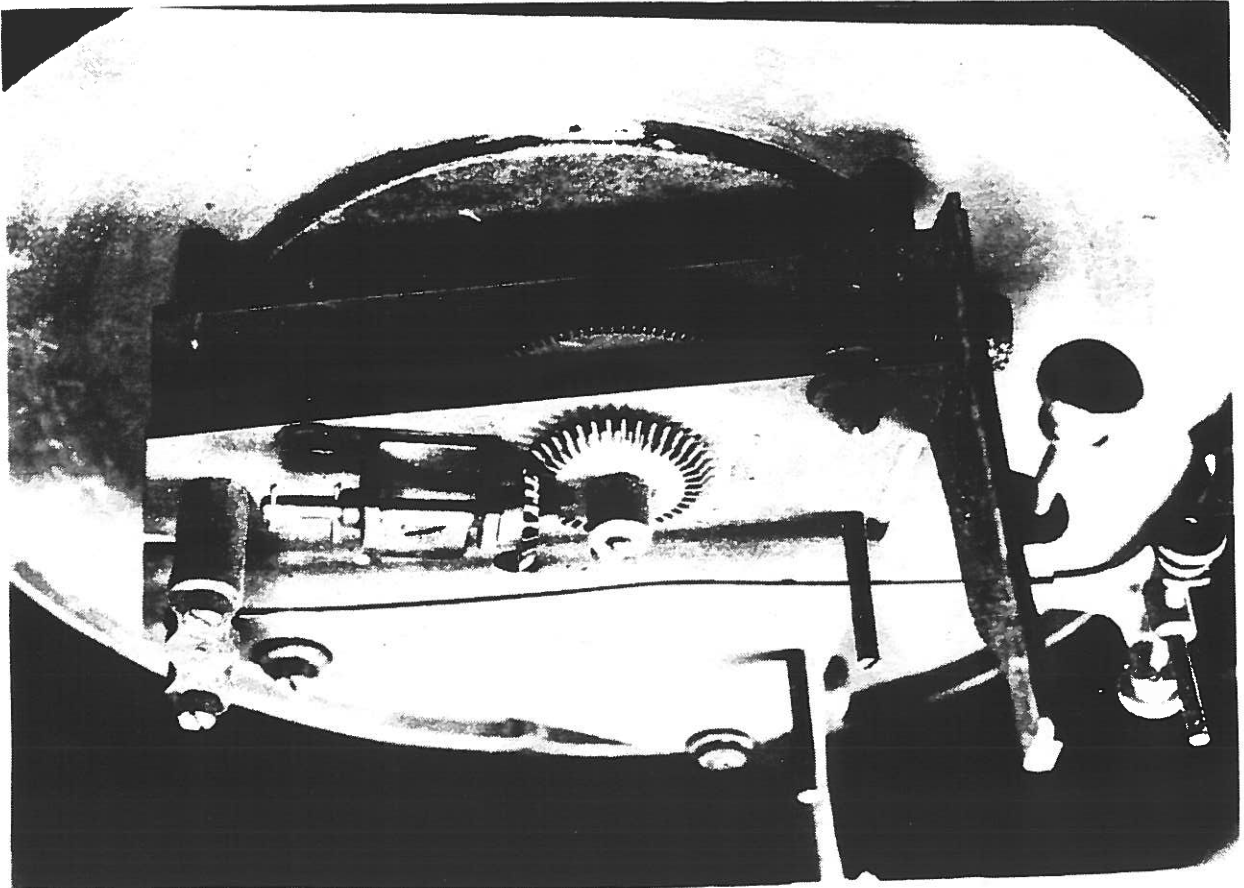


Fig. 7



Fig. 10

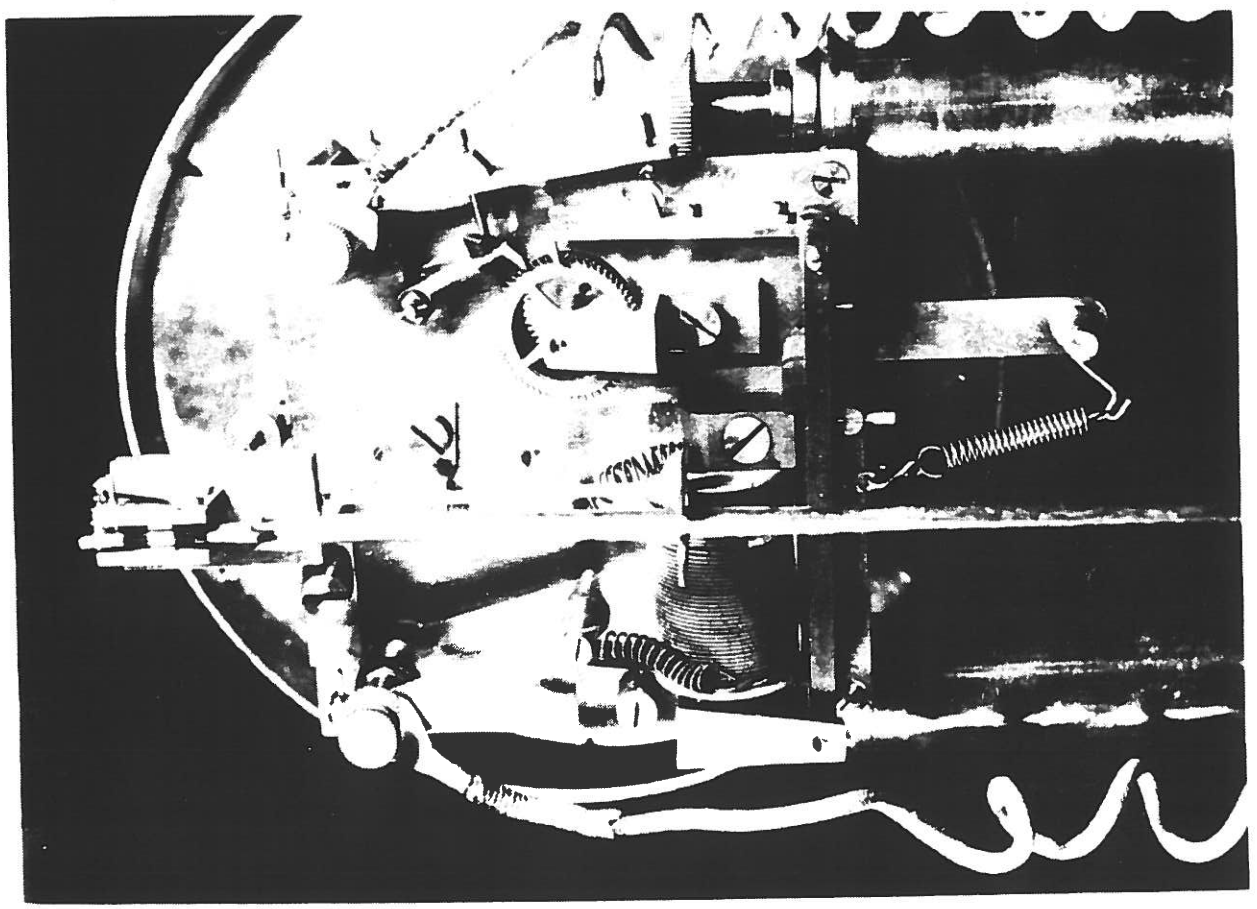
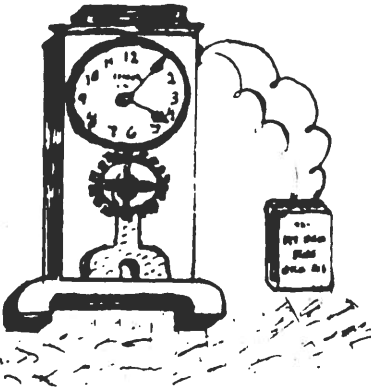


Fig. 9



The  
**JOURNAL**  
 OF THE  
**ELECTRICAL HOROLOGY**  
**SOCIETY**  
**Chapter No 78**

AUGUST, 1981  
 VOLUME VII--ISSUE #4  
 Martin C. Feldman, Editor



Hello fellow enthusiasts:

In this issue we complete the Holtzer-Cabot Electric Company Instruction Manual begun in our last issue donated by Al Stevens. We begin Part 1 of the Instruction Manual for the STROMBERG AUTOSET SYSTEM donated by Joseph J. Singer. We appreciate these donations as, by reprinting them, we are able to pass along the important information they contain to you for present as well as future use.

As the membership of our Chapter is so dispersed geographically, member and good friend Martin Swetsky has suggested "mini meetings" at Regionals and local Chapter meetings (if they can be arranged with the respective Meeting Committees) so that information, experiences and knowledge could be shared. Since Martin attends many such meetings during the year he has kindly offered to coordinate this program. Of course, we strongly support local meetings such as those held by the Chicago and New York/New Jersey Branches of our Chapter. The Chicago Branch, in particular, has been very active in holding meetings which are well attended. Those in the Chicago area interested in attending meetings should contact Rusty Bourell (283-5207) or Steve Berger (394-4818) for further information.

We were very pleased to receive the Presidential Citation for our Chapter's work in furthering the aims of the NAWCC. On a personal note, I received an Achievement Award for my work in the field of electrical horology. We are extremely proud of both awards as it indicates the recognition and importance of our contributions in the field of horological research, preservation and education.

Enjoy this Issue!

Electromagnetically yours,

Martin C. Feldman, FNAWCC

TYPE "C" RECTIFIER  
GENERAL INSTRUCTIONS

1. Certain points governing the installation, care and use of type "C" Copper Oxide Rectifiers are emphasized in the following:-
2. These Rectifiers must be installed in cool, dry locations free from excessive heat, moisture or corrosive fumes, as these tend to destroy any type of rectifier disc.
3. Cabinets must be mounted where free circulation of air through them can be had and must not be placed upon shelves or flat surfaces of any kind which might block ventilation from below.
4. Excessive heat will break down the resistance of the copper oxide coating and create a short circuit through some disc or section of discs and as these are connected directly across the secondary winding of the transformer it is necessary to protect the latter. A "Fusetron" or time element fuse is connected between winding and discs, as a short circuit through the discs will not always blow the primary fuse.
5. There is always a slight current leakage through disc assemblies or "stacks" as they are called even when no DC is being drawn and a certain amount of heat is normally generated in the stacks which is not dangerous, but when it is aggravated by grounds in wiring, overloading, defective discs, or excessive heat from external sources the internal temperature of the stacks will gradually increase until the breakdown point of the oxide is reached.
6. Each type "C" rectifier is tested at the factory by connecting its primary to AC of the proper voltage and allowed to stand for several hours without D.C. load. This permits the secondary AC applied to the stacks to remain high and if excessive heat develops in any stack, it can be readily detected by placing the backs of the fingers against the exposed end of the stack.
7. The temperature rise of any stack under ordinary conditions should be not more than barely perceptible to the fingers and a slight rise may not be dangerous, but when the rise results in discomfort to the touch it is advisable to discontinue further use of the Rectifier.
8. After a "C" Rectifier has been installed, it is advisable to connect the primary only at first and allow to stand for several hours before connecting any DC load. If during this period no abnormal temperature rise occurs the DC load can be connected, preferably through an ammeter in order to avoid overloading, and ground tests should be made with a voltmeter.
9. Extreme care should be exercised while connecting the DC load and making tests to avoid blowing fuses. Connections and disconnections should be made with primary current switched off.

10. If a Fusetron is blown during tests, it indicates trouble and a second Fusetron should not be inserted until load conditions and connections have been thoroughly checked. If a second Fusetron blows without any apparent cause, that particular rectifier should not be used until the cause of the trouble is definitely located and removed.

11. An oversize Fusetron must absolutely not be substituted in any case nor must an ordinary plug fuse be used as H-C will not be responsible for any damage resulting from such substitutions.

12. Before and after installation, stacks should be carefully inspected and all screws, nuts, wire ends or other loose metal fragments carefully removed from where they may have fallen between or against any part or parts of the stacks in order to prevent short circuiting.

13. It is impossible to determine the cause of a burnout of either a stack or transformer by mere inspection. Study of surroundings and operating conditions only may lead to the actual cause.

14. A single section in an individual stack may be the cause of trouble but it can only be located by removing all interconnections and making the necessary tests.

15. A low reading DC Voltmeter in series with two dry cells may be used for making such tests. A good section will produce a high reading in one direction and low in the opposite, while a burned out section will read high or the same in both directions.

16. It is possible to disconnect a damaged stack or section of one and use the remaining for operation of equipment temporarily, provided the transformer is undamaged.

17. Rosin core solder only must be used to solder connections to stacks, or in fact to any electrical device, to avoid corrosion as any other flux will positively cause destruction of the rectifying oxide.

18. The Fusetrons referred to are used in capacities as recommended by the Westinghouse Co. and are listed for use as indicated in the table below. W. E. Co. also state "Fusetrons will carry related load continuously, 200% load for one minute, 300% load for 30 seconds and 600% load for 3 seconds."

19. "If the time limit for the load drawn through the Fusetron is not reached, the Fusetron is not damaged. The Fusetron should stand overloads an indefinite number of times, provided the time interval between the load applications allows the thermal cutout to cool to normal temperature."

20.	"C"	224	1.	Amp.	Fusetron	--	Pce.	#23088
	"	424	1.6	"	"	--	"	#23089
	"	624	2.5	"	"	--	"	#23090
	"	824	3.2	"	"	--	"	#23091
	"	1224	5.	"	"	—	"	#23092

21. Primary AC and Secondary DC Cartridge Fuses are as follows:-

		Primary	Pc.#	Secondary	Pc.#
"C"	224	3 amp	22761	4 amp	23106
"	424	4 "	23106	6 "	22593
"	624	5 "	23107	8 "	23108
"	824	6 "	22593	10 "	23109
"	1224	10 "	23109	15 "	23110

22. A process of aging occurs in copper oxide rectifiers mostly during the first year of service. The effect is an increase in internal resistance with a consequent lowering of DC voltage estimated at approximately 10%. It is necessary then to adjust the secondary voltage a little higher than normal in the beginning and then have it checked several times during the first year and readjustment made if necessary in order to maintain the correct voltage.

23. Wiring diagrams will be mounted on the inside of the front cover bearing instructions for making and changing connections.

24. A small supply of Fusetrons will be carried by principal Branch Offices and an extra one should be carried by Holtzer-Cabot representatives when enroute to install or inspect a rectifier.

25. An extra Fuse will be sent to any customer with a Rectifier when so specified on the order.

THE HOLTZER-CABOT ELECTRIC COMPANY  
BOSTON, MASSACHUSETTS

The Holtzer-Cabot Electric Co., Ltd., Montreal



**INSTRUCTIONS**  
**FOR INSTALLING AND OPERATING**  
**STROMBERG AUTOSET SYSTEM**



**STROMBERG TIME CORPORATION**  
**109 LAFAYETTE STREET • NEW YORK 13, N. Y.**

INSTRUCTIONS FOR INSTALLING AND OPERATING

A STROMBERG AUTOSET SYSTEM

WITH

SYNCHRONOUS MASTER CONTROL

GENERAL

These instructions indicate operating principles of the Stromberg Autaset System and its installation. Special directions will supplement this standard form if the system incorporates features that require additional explanation.

Directions for secondary clocks, recorders, stamps or other devices are supplied with the device.

The name "Autaset" is a contraction of "Automatic Set". This system will automatically set all secondary devices connected to it if they are within the normal resetting range of 15 minutes fast or 45 minutes slow. The fast units (except for tower clocks) will be corrected at the rate of 7 minutes each hour and slow devices at 15 minutes each hour. If the system is more than 15 minutes fast or 45 minutes slow, manual correction will be necessary. A special resetting switch is provided in the control cabinet for this purpose.

Ordinarily Stromberg devices do not need correction. There may be times, however, when the voltage is low or when the power has been cut off that the corrective feature is a valuable asset. Also when connecting secondary devices, the resetting controls will correct any device which has been set only to the approximate time.

PRINCIPLE OF THE AUTOSET SYSTEM (For a more detailed explanation see "Circuit Analysis of the Auto-set System" at back of booklet)

Autaset secondary devices receive an "impulse" of direct current from the central controlling equipment once each minute. The duration of current flow is about two seconds and is used to energize electro-magnets in the secondary units.

At a certain time during the hour the direction of current flow is reversed. At this time any devices which may be fast are held inoperative or "locked".

The locking action is an exclusive Stromberg feature based on the principle that like magnetic poles repel each other and unlike poles attract. During current reversals, the polarity of the electro-magnet is changed and it attracts a permanent magnet of opposite polarity. This holds the fast device inoperative.

Devices which are slow are advanced in time during the 58th minute. Impulses of current are sent at intervals of 2 seconds to reset these slow units.

SYNCHRONOUS MASTER CONTROL CLOCK

The Master Control Clock is the "heart" of the time system. It has the responsibility of maintaining accurate time and of converting this time to electrical impulses for operating the entire secondary system of recorders, clocks etc.

Normally, an alternating current of regulated frequency provides time through the use of a synchronous motor. If for any reason this supply fails, an automatically wound spring movement with jeweled escapement immediately operates to perform the timing function. The spring movement will operate at least 2 days on one winding. Note: When there is a longer interruption the clock will "run down", but will automatically rewind when power is restored. Because of the low power used for winding, several days will be required to obtain full winding.

The Master Control unit is ordinarily supplied as part of the control cabinet which contains the system relays, rectifiers etc. In some cases, however, it may be furnished as a separate unit.

It is housed in a dust proof case and is sealed at the factory after being carefully tested. It requires no regulation.

LOCATING

It is preferable, to mount the clock in a dry location on an inside wall. Do not mount it above heating equipment as excessive heat will cause the lubricating oils to deteriorate.

Ordinary temperature and humidity changes will not affect the accuracy of the Master Control Clock.

If additional control devices, such as relays, program instruments, code devices and the like are used they should, if possible be installed near the Master Control Clock and its associated power supply. This simplifies maintenance and wiring.

MOUNTING

The control cabinet is attached to the wall by three screws. (See sketch). After screw locations have been determined by measurement, the bottom screw should be placed in wall, and the cabinet attached through the lower key hole. The upper screws may be placed and the case screwed tight.

## WIRING

Wiring conduits may be attached through the knockout holes in the top and upper sides of cabinet. Access to connecting terminals is obtained by removing screws on terminal cover plate.

A complete wiring diagram of connections will be found in the back of this booklet together with tables showing wire sizes to use with various secondary devices.

The circuit from the 115 volts A.C. supply should run to a distributing source which is independent of other apparatus.

It is recommended that the fuses at this source be marked so that they will not be disturbed.

Storage batteries when required should be connected with #10 or larger wire and located as close to control cabinets as is practical to avoid voltage loss.

Wiring used outdoors should be suitably protected and of sufficient size to prevent breakage if pole line construction is used.

No more than 10 recorders and time stamps or 25 secondary wall clocks should be connected to any operating circuit. Combinations of these devices may, however, be used in this relative proportion.

## SETTING

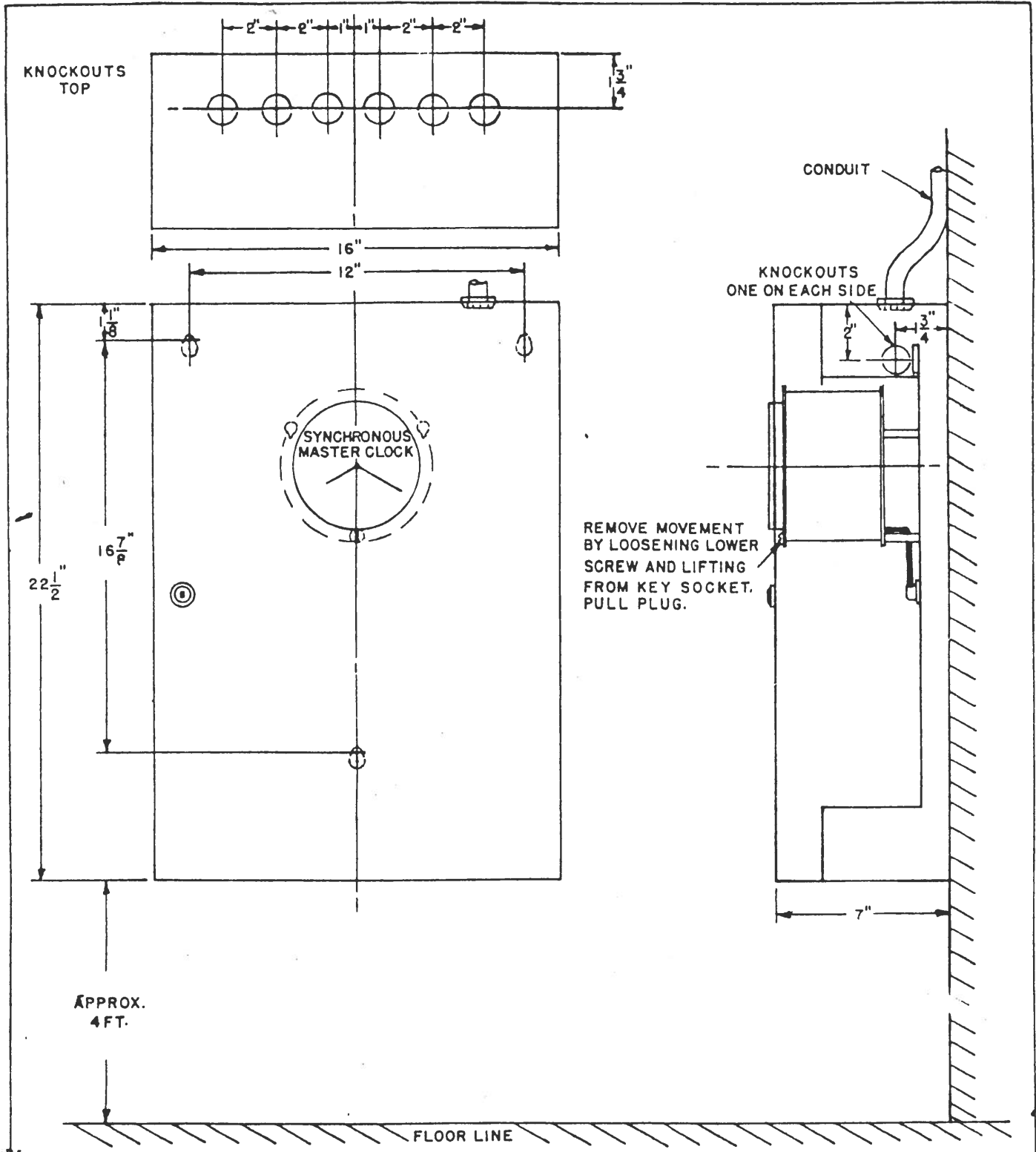
The setting stem is located immediately above the figure 12 on the dial. This should be pulled forward, after which it can be turned in a clockwise direction to set the clock. While the setting stem is pulled forward, the clock is not running. To obtain accuracy the clock should be set slightly fast but held stopped. When correct time coincides with the clock time, the clock may again be started by depressing the setting stem. Always secure time from a reliable source.

## CONTROLS

The control cabinet contains all apparatus required for sending impulses to the Autaset secondary system. Terminal connections for power supply, Master Clock and Secondary circuits are made within this cabinet.

The control cabinet will contain charging equipment including meter and regulating rheostat for systems which obtain their power from storage batteries. Rectifiers for this purpose are intended to charge the battery continuously at a fixed rate. The trickle charge rate for the average system is .15 to .2 of an ampere. A higher rate will be obtained. This may be required if the charging current has been off for a long period. The electrolyte, (acid

### CONTROL CABINET



FINISH	BAKED HAMMER GRAY.
KNOCKOUTS	7/8" DIA. FOR 1/2" CONDUIT.
LOCK	TUMBLER LEVER.
MATERIAL	16 GA. (.0625) STEEL.

**MOUNTING INSTRUCTIONS.**  
 LOCATE BOTTOM SCREW HOLE AND PLACE SCREW.  
 MARK LOCATION OF TOP SCREWS WITH CABINET RESTING ON BOTTOM SCREW.  
 INSTALL TOP SCREWS.  
 PLACE CABINET AND FASTEN TOP SCREWS.

WIRE SIZES FOR SECONDARY CIRCUITS

FIGURES BASED ON LINES FULLY LOADED\*

RECORDER MODELS 9 - 35 - 36

WIRE SIZES

MAXIMUM DISTANCE IN FEET FROM CONTROL SOURCE

	14 VOLT SYSTEM	24 VOLT SYSTEM	48 VOLT SYSTEM
14	500	1000	4700
12	750	1600	7500
10	1200	2500	12000
8	1900	4000	19000
RECORDER MODEL 15 TIME STAMPS 5 or 12			
14	500	650	2600
12	800	1000	4150
10	1300	1700	6600
8	2000	2700	10500
SECONDARY WALL CLOCKS (PER DIAL)			
14	1200	3000	7300
12	1900	4700	11600
10	3000	7500	18400
8	4800	14000	29300

\* FULL LOAD EQUALS TEN RECORDERS OR 25 SECONDARY CLOCKS PER CIRCUIT

EXCEPT THAT 5 MODELS 5 - 12 - 15 CONSTITUTE A FULL LOAD ON 14 VOLT SYSTEMS.

solution) in the lead plate storage battery should always be kept above the tops of the plates; this can be done by adding small quantities of distilled water to make up the evaporation loss. This service is normally required about every two weeks. Care should be exercised in filling the battery not to overfill the jars. Any solution getting on top of the jars should be immediately wiped off. Keep all dust wiped off the tops of the cells; they should be dry and clean.

The specific gravity of the electrolyte may be disregarded except when necessary to add new solution due to spilling or loss of solution in shipping. The normal specific gravity of the solution in most batteries of this type is 1.200; this will rise to 1.215 on charge.

Systems which do not operate from storage batteries may use a direct connection to a rectified alternating current supply. Direct current obtained this way is available except during interruptions to the A.C. power. In cases where it is not desirable to install storage batteries, but where continuous service is desired an emergency power supply in the form of "Hot Shot" batteries is frequently used. A transfer relay connects the emergency power upon failure of the regular A.C. supply and also sounds a buzzer once each minute to indicate a power interruption.

The D.C. voltage of the converter may vary depending upon the degree to which it is loaded and also by the value of primary A.C. voltage. To compensate for this variation, taps are provided on the transformer to permit voltage adjustments. Voltages above minimum values should be obtained at the end of lines on the most heavily loaded circuits. A D.C. voltmeter is the simplest means for reading these values.

Some systems employ a small synchronous motor with contactor to use for emergency service. Switches are provided to connect this unit into service. This contactor will keep the system running during such times as the master clock may be stopped for cleaning, or other interruption.

The relays used are designed with characteristics that make them particularly suitable for time system work. The special winding of the master relay coils prevents any destructive arcing at the Master Clock contacts. The contact material used for this relay is graphite, impregnated with metal to reduce contact resistance.

These contacts are cylindrical and can be rotated to present a new contact surface as required. Many years of service will be obtained, if these contacts are turned to a new contacting surface every two or three months.

To install a new contact, remove the two screws in the yoke holding the outer contact arm. The arm may then be pulled out of the insulating block. It is a simple matter to remove the shafts and insert new contacts. Replace the shafts so the cotter pins are at opposite ends. This will prevent the pins from touching each other.

MART

WANTED: Unusual Electrical Clocks. A. Marx, 105 Bayeau Rd., New Rochelle, NY 10804

ANNOUNCEMENT: Power supplies to meet your needs will be custom built-upon request describing same. Please write your needs and enclose an SASE for reply.  
Martin Swetsky, 1010 Coney Island Ave., Bklyn, NY 11230

FOR SALE: Seth Thomas Self Winding Electric, Model 86AF in 18" square mahogany case. Fine condition and in G.R.O. -----\$460 ppd. Martin C. Feldman

WANTED: "Junker" early battery clocks, movements, parts, etc. Send details and \$ wanted. ELECTRICAL CLOCK LITERATURE for possible reprinting in our Journal.  
Send to: Martin C. Feldman

WANTED: Electrical Horological Literature of any type. Martin C. Feldman

REPAIRS: ALL EARLY BATTERY CLOCKS including Pooles, Barrs, Tiffany Never-Winds, Eureka's, etc. SPECIALIZING IN BULLE CLOCK REPAIRS USING ORIGINAL PARTS. One month maximum time for all repairs. Martin C. Feldman

WANTED: Hahl-Wenzel pneumatic clock pendulum and weights. Will buy entire clock if necessary. Martin C. Feldman, 620 Reiss Place-7E., Bronx, NY 10467

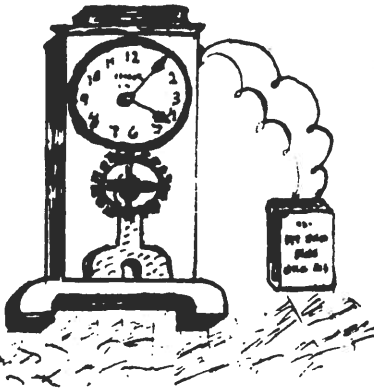
WANTED: LARGE SECONDARY CLOCK  
Henry Weiland, 8946 West Grantosa Dr., Milwaukee, Wisc. 53222

FOR SALE: Very High Quality Early Battery Clocks for the serious collector by Synchrononme, Gents, Holden, Vaucanson. Fully restore.  
Charles W. Roth, 2 Circle Lane, Roslyn Hts., N.Y. 11577

FOR SALE: Hahl Pneumatic Master Clock, 7'7" Tall, Gothic Cherry Case, Rare and beautiful. All Orig. and G.R.O. Picture \$2.00 S.A.S.E.  
C. Dinner P.O. Box 455, Valley Stream, N.Y. 11582 516-872-6867



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**Chapter No 78**



OCTOBER 1, 1981  
 VOLUME VII--ISSUE #5  
 Martin C. Feldman, Editor

Hello fellow enthusiasts:

In this issue we complete the STROMBERG AUTOSET MANUAL. In addition the Directions For The Installation And Setting of the STROMBERG UNISPEED RECORDER (Model 9) is included as well. Both manuals have been donated by friend and member J. J. Singer.

In December we shall feature information about the Self-Winding Clock Company of New York which will include a short history of the Time Service and various mechanical aspects of mounting the mechanism, its rotary motor, etc.

May I take this opportunity to wish our Jewish friends and members a Very Happy and Healthy New Year.

Enjoy this Issue!

Electromagnetically yours,

Martin C. Feldman, FNAWCC

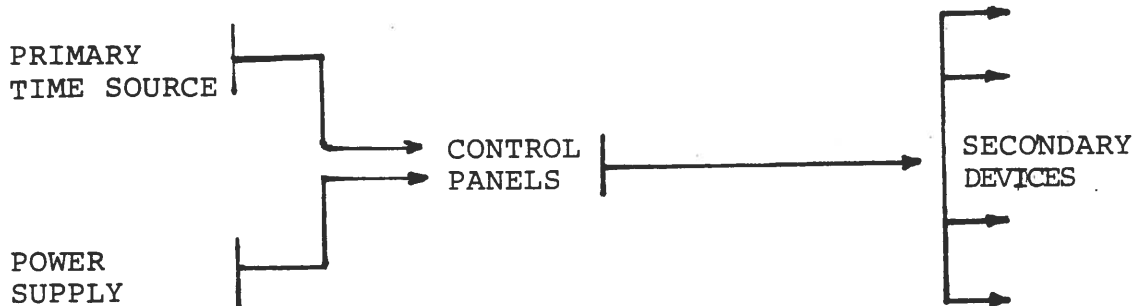
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CONNECTING SECONDARY DEVICES

It is necessary to maintain proper polarity of wiring when connecting secondary devices to the system. Use of color coded wires simplifies this identification although a D.C. voltmeter may be used to determine polarity if coded wires are not used. Between the 59th minute and the 51st minute of each hour the impulses of current flow in one direction. At the 52nd minute a relay in the control cabinet reverses the direction of current flow until the 58th minute. Polarity markings as indicated on secondary devices are for impulses between the 59th and 51st minutes. If coded wiring is not employed and a voltmeter is not available, correct connections are indicated if the device has been manually set to correct time and remains so for a period of one hour. Should it show an incorrect time, connections must be reversed.

CIRCUIT ANALYSIS OF THE AUTOSET SYSTEM

This is a centrally controlled time network where the primary time source consists of a contact making device operated either by clock works or synchronous motor. The contacts close circuits at regular intervals to control panels on which are located relays, switches, fuses etc. and to which is connected the power for operating the system. From the control equipment, circuits are run to the secondary devices which are kept in time step with the primary time source by "impulses" of current being sent to them.



A schematic circuit is indicated which may be explained as follows: Current from the power supply positive (+) flows through the minute contact terminals 3 and 4, manual control switch, impulsing relay winding and returns to the power supply negative (-).

The impulsing relay is thereby operating momentarily once each minute and upon closure of its contacts sends an impulse of current to the secondary devices to keep them in time step with the primary power source.

This circuit may be traced from the positive terminal of the power source through normally closed contact "D" of the reversing relay, the secondary devices, contact "B" of the reversing relay, impulse relay contact, and the negative power terminal.

If a secondary device has been connected to the system at an incorrect time, it will be automatically stopped at its 58th minute if fast and held inoperative until the primary time source agrees with it after which it will operate at correct time.

This is accomplished by reversing the direction of current flow to the secondary circuits.

Current from the power source flows through contacts 5 and 6 which are closed at 51'30" to the coil of the reversing relay, the switch contacts and returns to the power supply. Operation of the reversing relay then connects its terminals "A" and "C", opening "B" and "D" thus reversing the direction of flow. At 58'50" the reverse control contacts are opened restoring the reversing relay to its normal position.

The range of fast correction is, therefore, 7 minutes each hour.

If for any reason the power is interrupted temporarily, the secondary system will lose time.

The primary time source may continue to maintain time but no power will be available for the secondary equipment. For this reason, the circuit is arranged so that when the power returns, the slow secondary units will be brought up to correct time.

This is accomplished by having the fast control contact close at 58'10" to 58'40" to send impulses at 2 second intervals, thus restoring the secondary devices to correct time. Fifteen impulses are sent out each hour. If the secondary devices are slow by more than 15 minutes, additional resetting will be accomplished during the following hours to a limit of 45 minutes.

The circuit is from the positive power source through contacts 1, 2, 8, 7 connecting at 4 to the switch and impulsing relay winding and returning to the negative power terminal.

Operation of the manual switch will provide unlimited use of the 2 second contacts to account for any resetting requirement beyond the 45 minute automatic range.

It will be noted that operation of this switch also disconnects the reversing relay thereby preventing any secondary devices from locking during the period when the switch is used.

#### OPERATION OF AUTOSSET SECONDARY EQUIPMENT

The sketch illustrates Autoset parts in a typical Recorder. A similar assembly is built into each secondary device.

Armature "F" is normally in the position shown by Figure A. Once each minute the electro-magnet "C" is energized from the impulse relay which attracts the armature.

When the contact is released, the armature returns to normal. As it returns, the recorder is advanced one minute. (This is accomplished by a pawl and ratchet action - now shown). When the electro-magnet is energized, the soft iron extension "D" is temporarily

magnetized, and tries to move the permanent magnet "A" to either one of the positions shown by figure A or B, depending upon the direction that the current is flowing through the electro-magnet. (Like poles repel each other and unlike poles attract.)

During reversed impulses from the 52nd to 58th minute the latch "B", which is mechanically attached to the permanent magnet, moves toward the cam "E". If the cam is in the position shown by figure A it will prevent the latch from moving. The cam is positioned in time with the secondary unit so that when the 58th minute is reached, the cam reaches a position shown in figure "B" and in this position the reversed impulse will permit the latch to move and since the armature is attracted simultaneously to the electro-magnet, the latch will move over lever "G". The latch remains in this position after the electro-magnet is de-energized and the armature remains in a locked position, held by the armature lever against the latch.

This position will be maintained during all further reversed minute or 2 second impulses. At the 58' 50" the reversing relay is released and when the next minute impulse passes in a normal direction at the 59th minute, the permanent magnet will be attracted in an unlocking direction, allowing the latch to move away from the armature lever and permitting the device to operate in synchronism with the primary time source.

AUTOSET FUNCTION OF SECONDARY DEVICE

F

Figure "A"

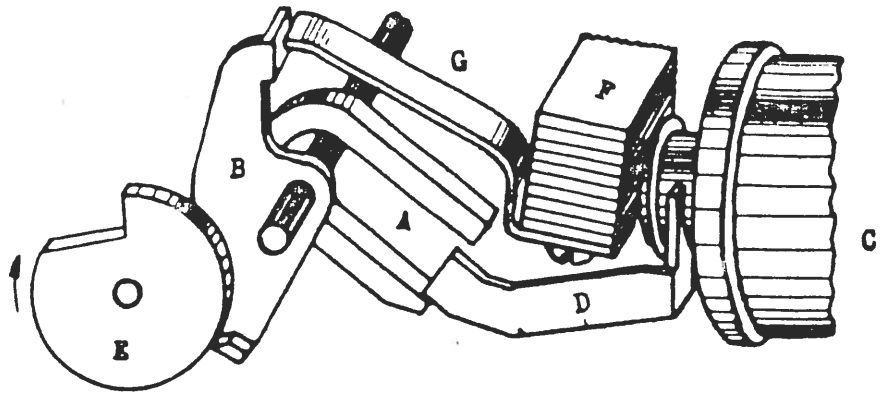
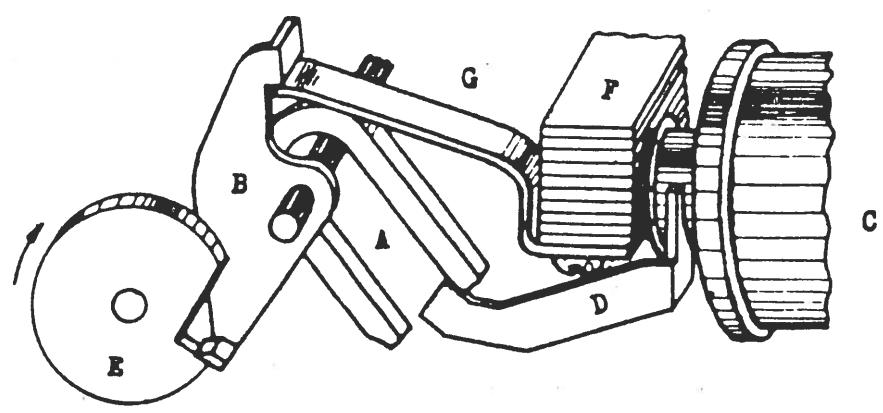
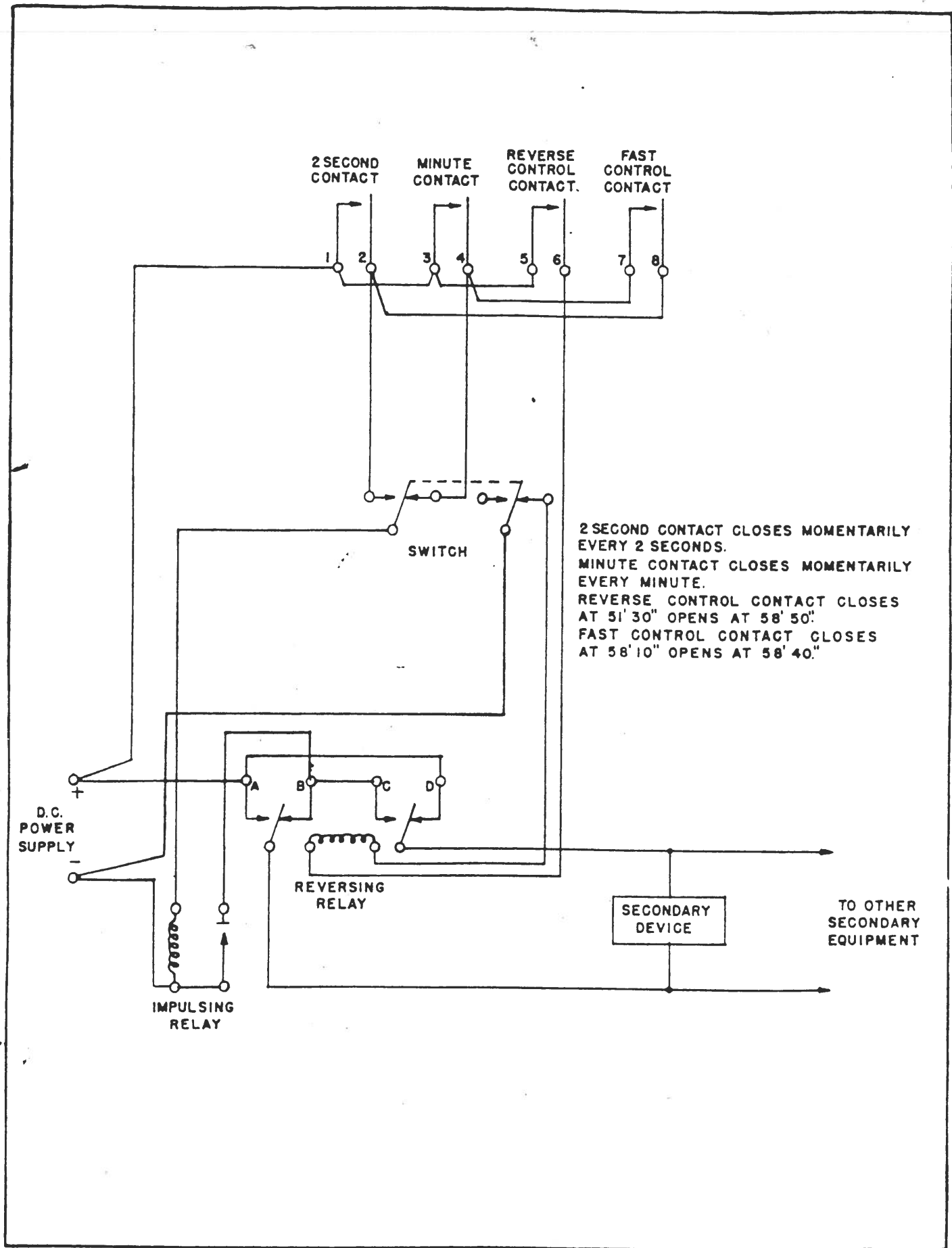
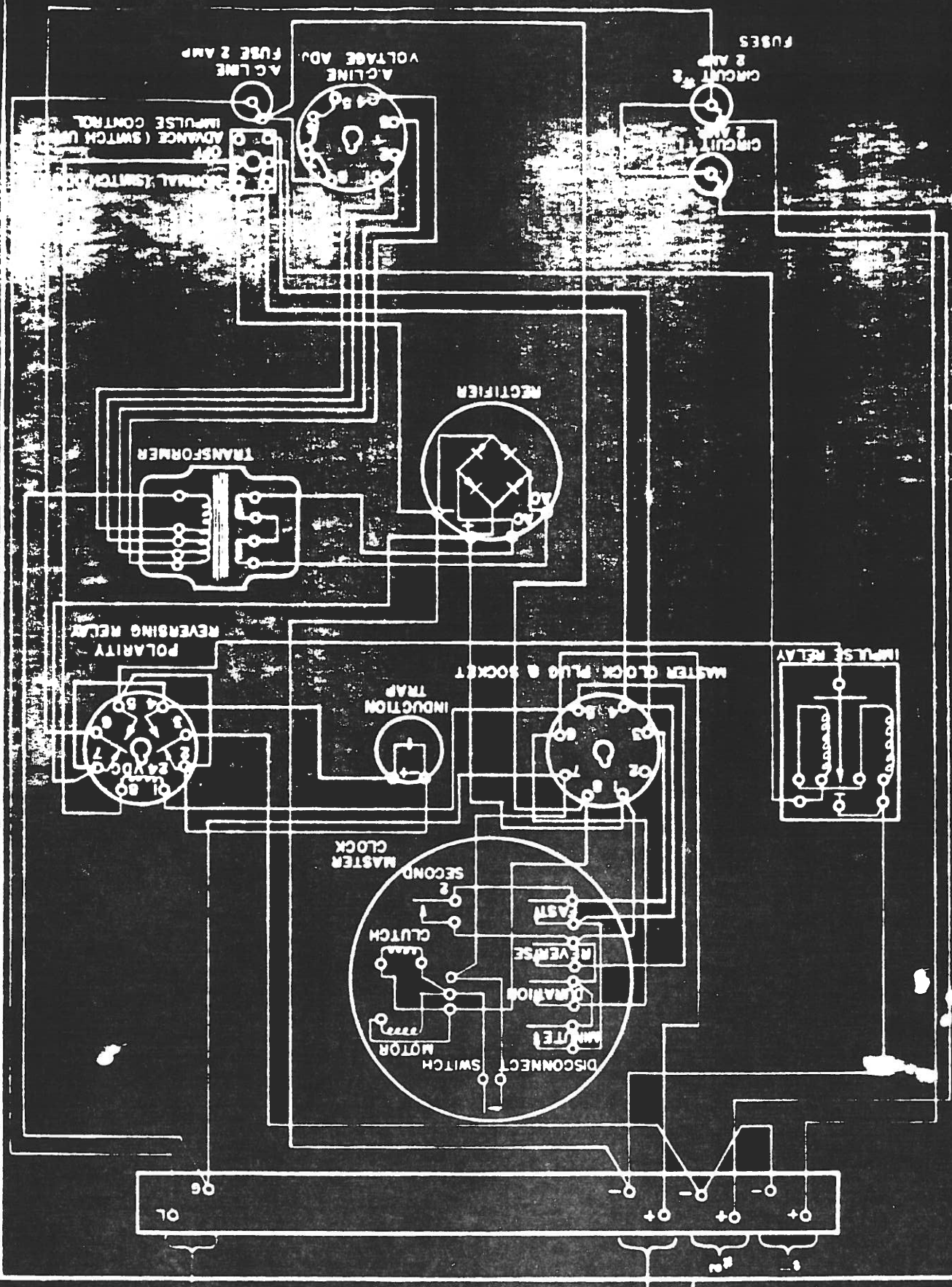


Figure "B"



### SCHEMATIC CIRCUIT OF AUTOSET SYSTEM





115 VOLTS A.C.  
POWER  
SUPPLY

TO SERIAL  
DURATION  
CONTROL  
ON PROGRAM  
INSTRUMENT

AUTOSSET  
INPUTS  
TO  
RECORDING  
& CLOCK  
CIRCUITS

PANEL  
SYNCHRONOUS MASTER CLOCK  
AMP CONVERTER

DATE 4-16-52

STROMBERG TIME CORPORATION

DRNF W M	TMCD
CHAN (	SCALE

5045-A

**DIRECTIONS**  
FOR THE INSTALLATION AND SETTING OF  
**UNISPEED RECORDER**  
(MODEL 9)



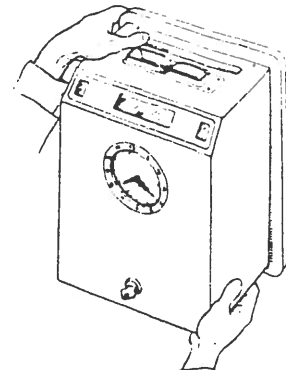
**STROMBERG TIME CORPORATION**  
109 LAFAYETTE STREET • NEW YORK 13, N. Y.



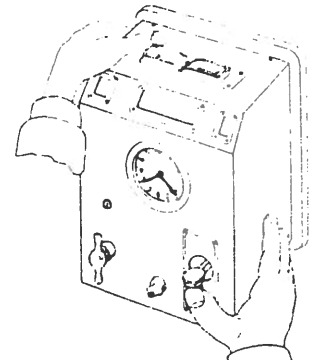
INSTALLING: Unlock case and remove in the manner shown below:

UNISPEED RECORDER

No. 97 or 98 RECORDER



DEPRESS BAR, PULL BOTTOM FORWARD AND LIFT

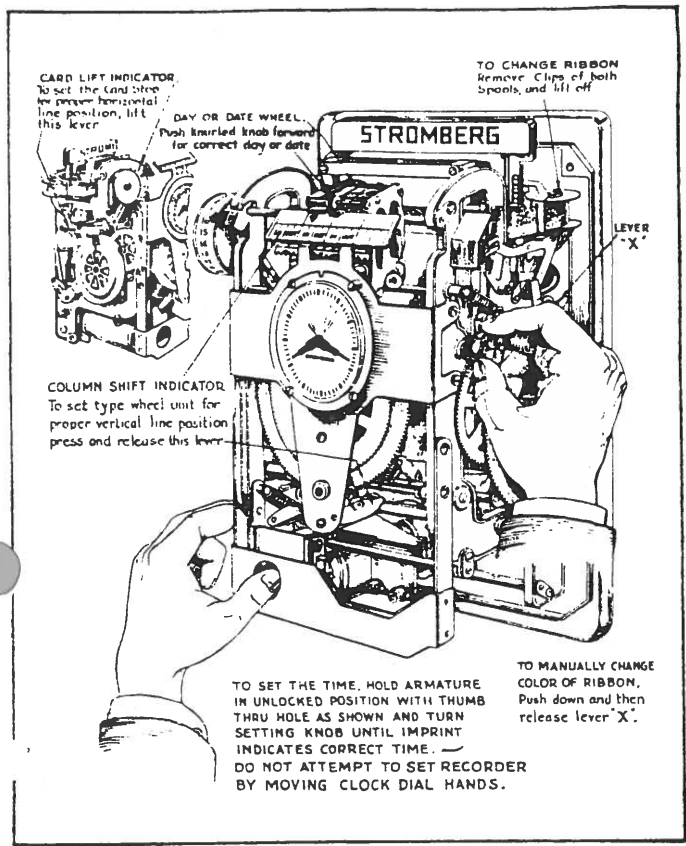


RAISE SLIDE ESCUTCHEON, LIFT CASE AND PULL FORWARD

Remove mechanism from back plate by drawing out large bolt with knurled head, at lower back of mechanism. Mount back plate securely, with top 48 inches above floor line. Remove blocks holding typewheel unit. Return movement to back plate and make circuit connection. When replacing case drop over locating pins at top with bottom of case slightly forward of the back plate. When fully set on top pins, push bottom against the back plate and lock.

SETTING FOR TIME: **Do not set by turning clock hands.** Insert time card in funnel, depress push bar or lever and note imprint on card. Snap switch "Off" immediately after a minute click. Set recorder as instructed on sketch, setting a few minutes ahead of correct time. When recorder setting equals the correct time, snap switch "On".

SETTING UP SCHEDULES FOR AUTOMATIC FEATURES: This recorder may contain some or all of these features; **Automatic shift** to position the card for the correct vertical column, **Automatic lift** to position the card on the correct **horizontal line**, **Two color ribbon change** to indicate schedule irregularities. If schedules for these features have not been set up before delivery, proceed as follows: Micrometer units, as illustrated below, are supplied which each recorder.



CARD LIFT INDICATOR  
To set the card strip in proper horizontal line position, lift this lever

DAY OR DATE WHEEL  
Push knurled knob forward for correct day or date

TO CHANGE RIBBON  
Remove clips of both spools, and lift off

LEVER "X"

COLUMN SHIFT INDICATOR  
To set type wheel unit for proper vertical line position press and release this lever

TO SET THE TIME, HOLD ARMATURE IN UNLOCKED POSITION WITH THUMB THRU HOLE AS SHOWN AND TURN SETTING KNOB UNTIL IMPRINT INDICATES CORRECT TIME. DO NOT ATTEMPT TO SET RECORDER BY MOVING CLOCK DIAL HANDS.

TO MANUALLY CHANGE COLOR OF RIBBON, Push down and then release lever "X".

A. M. TIME

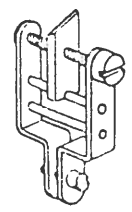
P. M. TIME

EQ30

EQ30

**DIRECTIONS**

GENERAL: This recorder must be **permanently** connected to a current supply circuit which is free of interruptions. A separate circuit to the main power source is recommended. The current supply **must correspond** with the voltage and cycles stamped on the terminal plate.



Attach units by slipping into place on calibrated program disc at a 15 minute notch nearest the time a change is to take place. Fasten to disc with screw through hole corresponding to notch. Set to desired minute by turning adjusting screw. When lug is at center, change will occur at 15 minute periods. Turn screw clockwise, one revolution for each minute, to advance setting, counter clockwise to retard.

**CARD LIFT:** Controlled by program wheel on side of frame with card lift indicator. Schedule intervals must be 15 minutes apart.

**COLUMN SHIFT:** Controlled by program wheel on front of recorder. Larger lugs are used and schedule interval must be 30 minutes between changes.

**RIBBON CHANGE:** Controlled by program wheel on side with color indicator. Schedule interval must be 15 minutes.

**INSTALLING NEW RIBBON:** *Use only the No. 3 (one color) or No. 4 (red and blue) ribbon furnished by Stromberg Time Corporation and made especially for this recorder.* Remove clips from both spools and lift off. Unwind old ribbon from one spool, hook end of new ribbon to it. Place both spools on shafts with ribbon winding to outer side and through slots in reverse lever. Turn spools until they drop on driving pins. **Replace the clips.** When two color ribbon is used, red section should be at bottom.

## **DIRECTIONS FOR SETTING A SCHEDULE ON THE UNISPEED PROGRAM**

**GENERAL:** The program drum is directly geared to the recorder mechanism and is synchronized with the type-wheels and other automatic features. Setting the recorder to time also sets the program.

When operating, the black plastic program drum makes one revolution every two hours, during which the contact sensing finger remains in a fixed position over it. At 23 minutes past the even hour, a cam control shifts the sensing finger to a new position on the drum. Twelve shifts occur during each twenty-four hours, which move the sensing finger across the width of the drum and automatically returns it to the starting position, usually at 2:23 A.M.

Pins are inserted in the drum according to the signal schedule and whenever the sensing finger is lifted by a

pin it closes an electrical contact to the signal system.

**SETTING THE PROGRAM SCHEDULE:**

**NOTE:** When setting a schedule on a recorder that operates independently on alternating current the pins must be inserted one minute ahead of the time the signal is required. For example, to have a signal sound at 12:00 Noon, the pin would be inserted at the point corresponding to 11:59 A.M.

When the recorder is part of a centrally controlled time system the pins are inserted at the point corresponding to the exact minute the signal is to sound.

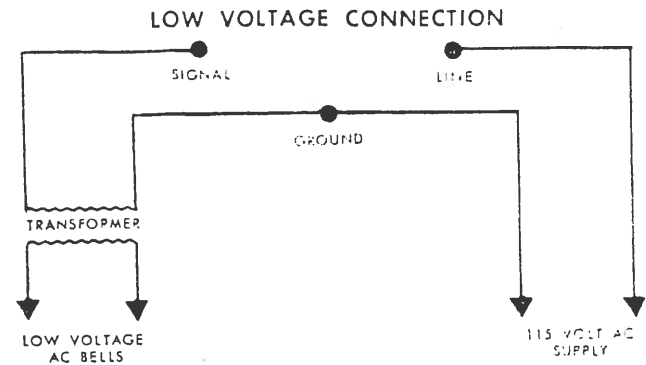
Remove the lift indicator drum. Set the recorder to the time a signal is scheduled and press on the sensing finger to make a small indentation on the program drum. Set the recorder to the next scheduled minute and repeat. Continue until the complete signal schedule has been marked by indentations on the program drum.

Remove the "E" clamp from the drum shaft and slip off the program drum. Using a light wood block as a base to hold the drum, drive program pins into each indentation. Make sure the square heads are at a square plane to the side of the drum and are in a firm base position. Use long-nose pliers to hold the pins. To eliminate a signal time, simply pull out the pin. When the pins have all been inserted replace the drum, making sure the slot in the drum fits into the square stud. Replace the "E" washer on the drum shaft and put on the lift indicator drum. The program device will now sound the signals according to the schedule.

Set the recorder to the correct time according to the standard setting instructions.

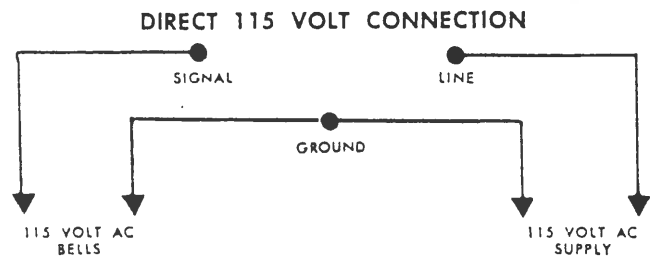
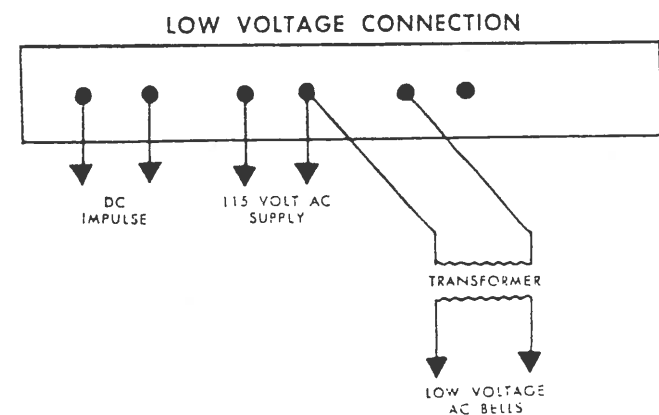
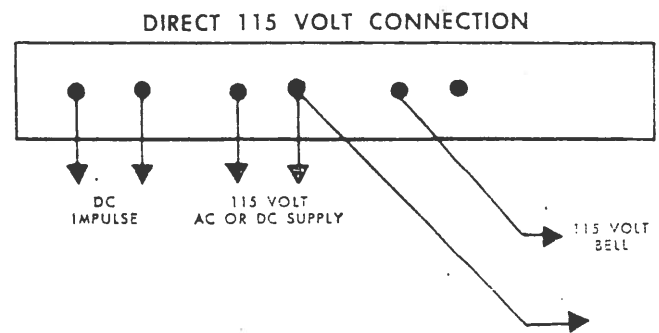
**CONNECTING THE SIGNAL EQUIPMENT:** When the Unispeed Recorder is synchronous motor operated, connections should be made according to the following diagrams:

**NOTE:** The capacity of the program on this type of operation is two signal units.



When the Unispeed recorder is operated as part of an Autoset Master system connections should be made according to the following diagrams:

**NOTE:** The capacity of the program on this type of operation is five signal units.



MART

WANTED: Unusual Electrical Clocks. A. Marx, 105 Bayeau Rd., New Rochelle, NY 10804

ANNOUNCEMENT: Power supplies to meet your needs will be custom built-upon request describing same. Please write your needs and enclose an SASE for reply.  
Martin Swetsky, % EWC, 1910 Coney Island Ave., Bklyn, NY 11230

FOR SALE: Seth Thomas Self Winding Electric, Model 86AF in 18" square mahogany case. Fine condition and in G.R.O.-----\$460 ppd. Martin C. Feldman

WANTED: "Junker" early battery clocks, movements, parts, etc. Send details and \$ wanted. ELECTRICAL CLOCK LITERATURE for possible reprinting in our Journal. Electrical Horological Literature of any type.

Hahl-Wenzel pneumatic clock pendulum and weights. Will buy entire clock if necessary. (Martin C. Feldman)

REPAIRS: ALL EARLY BATTERY CLOCKS including Pooles, Barrs, Tiffany Never-Winds, Eureka's, etc. SPECIALIZING IN BULLE CLOCK REPAIRS USING ORIGINAL PARTS. One month maximum time for all repairs.  
Martin C. Feldman, 620 Reiss Place-7E., Bronx, NY 10467

FOR SALE: ITR 60 Beat Regulator, oak case, double weight motor wind, mercury compensated pendulum, GRO - \$1500.  
Sam Greenglass, 81-22 - 254 St. Floral Park, NY 11004

FOR SALE: Very High Quality Early Battery Clocks for the serious collector by Synchronome, Gents, Holden, Vaucanson. Fully restored.  
Charles W. Roth, 2 Circle Lane, Roslyn Hts., N.Y. 11577

FOR SALE: Many types shelf-style electro mechanicals-call for information 12 noon-2 p.m. 212 763-6124 George Zlobin 956 E. 79 St. Bklyn, N.Y. 11236

FOR SALE: Oak I.T.R. 2 wt. master with 2 Jar Pend., rare Holtzer Cabot Walnut Master with 2 Jar Pend. and slave, S.W.C.C. round and S.W.C.C. Square Gallery, stand elec. Slave, Nice Bulle Gallery, Poole under dome, Cloister Neverwind under dome. S.A.S.E., Pictures \$1.00 each. C. Dinner 516 872-6867  
Box 455, Valley Stream, N.Y. 11582

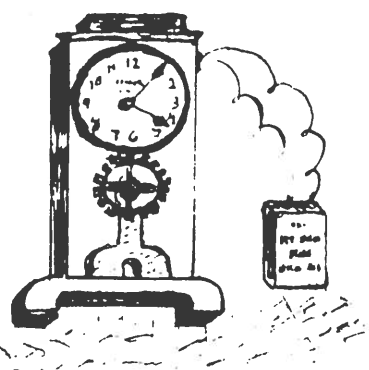
WANTED: Face For I.T.R. MASTER - C. Dinner - " " "

WANTED: French ATO Mov't or magnet & coil for same, Synchronome Slave, and HAHN Pneumatic Slave. Craig Dinner Box 455, Valley Stream, N.Y. 11582 516 872-6867

WANTED: LARGE SECONDARY CLOCK  
Henry Weiland, 8946 West Grantosa Dr., Milwaukee, Wisc. 53222

FOR SALE: Originals of the Journal from 1975 - 1980  
50¢ a copy-minimum \$4.00 Inquiries S.A.S.E. or send money payable E.H.S. to C. Roth.

The  
**JOURNAL**  
 OF THE  
**ELECTRICAL HOROLOGY**  
**SOCIETY**  
**Chapter No 78**



DECEMBER 1, 1981.  
 VOLUME VII--ISSUE #6  
 Martin C. Feldman, Editor

Hello fellow enthusiasts:

This month we feature a short history of the Time Service provided by the Western Union Telegraph Co. which has been submitted by friend and member J.J. Singer. Mr. Singer has also sent along various diagrams referring to the Self Winding Clock Co. clocks which to my knowledge have not been published previously. The Type "C" Rotary Motor Electrical circuit will be of particular use to those of you who are restoring this type of movement. From friend and member R. L. O'Briant we are printing the catalog and "expert opinion" of the Sempire Clock Co. Elechrometers. These particular clocks appear to be very interesting with not too many examples having been seen by collectors!

Please note also there are past Journals for sale which will be sold on a first come-first served basis. This is an excellent opportunity to complete your file if you are missing any of our past publications.

We are accepting nominations for the offices of: President, 1st Vice-President, 2nd Vice-President, Secretary/Treasurer and a new office, Corresponding Secretary. The latter officer will concern himself with continuing to publicize the activities of our Chapter. The incumbent officers may stand for reelection if they so desire. For those wishing to nominate candidates please send the name of the candidate and office for which he/she is running, name of nominating member and name of a seconding member. A short biographical statement with reasons for running as well as the candidates future plans for our Chapter should be included as well. Officers serve for a period of two years commencing May 1982. The entire slate will be published in the February 1982 Journal. The deadline for receipt of nominating information is January 5, 1982. Send to: Martin C. Feldman, 620 Reiss Place-7E., Bronx, NY 10467.

There will be a local meeting at the home of Martin Swetsky on December 20 at 10:00 a.m. His address is, 2443 East 26 Street, Brooklyn, N. Y. He must be called to confirm your attendance and can be reached at, (212) 375-2700 on weekdays.

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con't. on Pg.13

NATIONAL ASSOCIATION of WATCH and CLOCK COLLECTORS, Inc.

A HISTORY OF THE TIME SERVICE OF THE  
WESTERN UNION TELEGRAPH CO.

Nearly fifty years ago Western Union initiated the Official Time Service with a small trial circuit in the City of Chicago. Today this service is nationwide and recognized by everyone as the one reliable source of correct time for commercial purposes.

During the 1880's - the period of origin - we find that wholesale confusion prevailed in determining the exact time of day in various parts of the country. Railroads particularly were affected. The increased speed of trains and the establishment of trunk lines with some fifty-three interconnecting points evoked confusion as to the correct time of arrivals and departures. Every large city had its own time. Trains leaving the East on "New York time" had difficulty connecting with roads out of Chicago leaving on "Chicago time". Passengers arriving two minutes early by New York time sometimes found the Western train had left on Chicago time ten minutes before.

Officials recognized the inadequacy of this arrangement and made sporadic attempts to remedy the situation at early railroad time conventions. However, it was not until 1883 that the time of the terminal areas was definitely established as the Standard Time for all roads operating within this area. A further step was taken by the United States Government in 1884 sponsoring an international time congress held in Washington and resulting in the establishment of the country's present Official Time zones - Eastern, Central, Mountain and Pacific. The time of the meridian passing through the center became the Official Time of that zone.

Western Union during its early history transmitted to a limited extent Naval Observatory time signals to a few important railroad and business centers but no attempt had been made up to this time to make this Official Time service available generally, through automatic clocks, until the present time service system was established in 1886, the development of this nationwide service actually resulted from the enterprise of two separate groups each working independently on a means of distributing the correct time from a central point. Perhaps the first of these was Gardner of Washington who established a circuit of some 4000 to 5000 key-wound clocks synchronized each day from a central master clock and operating in many of the Government buildings. While this system was probably the first to attempt in this country to synchronize subscribers' clocks from a central point, its serious drawback was the necessity of laboriously winding each clock every week.

About this same time one of the founders of the Self-Winding Clock Co., C. H. Pond, organized the American Time Telegraph Co. with offices in lower New York City. This Company, like Gardner's,

was distributing correct time over a wire system but instead of using the synchronized clock they employed minute impulse secondary clocks similar to those now used in schools and public buildings. The fallacy in this system, however, was that where connecting wires ran exposed to the weather - grounds would develop with the result that outlying clocks failed to receive impulses and would remain inoperative until circuits were repaired.

As an outgrowth of this venture Pond subsequently organized the American Manufacturing & Supply Co. which specialized in the manufacture of a new type of clock movement automatically wound every hour from old-fashioned wet cells installed in the tope of the clock cases. Such automatic operation of a clock movement in those days was a distinct novelty. The Self-Winding Clock Co. still has in its files letters revealing the amazement of some purchasers in the satisfactory operation of clocks that were so automatic they would run without winding for over a year.

It was inevitable that the two primary features of Pond and Gardner's systems should eventually be combined. Gardner's clocks were synchronized electrically and Pond's were automatically wound. The combination was the basis of a time distribution system where every clock could obviously be made to give constant service without attention and automatically maintained on correct time.

Pond sensed an opportunity, particularly in view of the agitation among the railroad companies for a uniform method of time distribution of their trunk line terminal points, and with a new organization - the Self-Winding Clock Co. - at once opened negotiations with an official of the Western Union Telegraph Co. to employ his clocks as part of a countrywide system for distributing Naval Observatory time to every commercial organization in the country.

Preliminary tests were made in Chicago in 1885. Fifty self-winding clocks were connected to a regular telegraph circuit and synchronized once each night during a light telegraph traffic period. Later tests showed the advisability of establishing separate circuits for clocks alone, and as a further assurance of continued accuracy, checking the clocks automatically once each hour. Tests were successful beyond all expectations. The clocks kept good time. Their operation was completely automatic and they required little attention. Gardner's remaining patents were purchased and large scale production of this new type clock began.

High grade master clocks were installed in Western Union offices in important cities throughout the country and time circuits set up through business centers to bring Official Time within the reach of all commercial organizations. The time service as we know it today was definitely on its way to success. One representative - Henderson by name - secured 5000 applications for this time service within a period of a single year. Everyone was eager for correct

time. Before long the Western Union clock was recognized by all as the one clock that could be relied upon as correct.

Today we find practically every railroad using Western Union time service. The American Railway Association duly credits the part this service plays in transportation scheduling by stating in their annual bulletin:--

"The best generally available source of accurate time is the time signal as transmitted over land by telegraph throughout the United States from the Naval Observatory at Washington".

In addition to transportation lines Western Union time service finds many other practical applications. The Telephone Company employs this service for maintaining time uniformity throughout its many properties. Broadcasting stations use Western Union service because of its uniform accuracy. Outlying stations cutting in on chain programs do so with the minimum of time loss. Large industrial plants employing labor on an hourly basis also find it to their advantage to use this one standard of time because it can be relied upon as accurate and beyond dispute of workmen or code enforcement agencies.

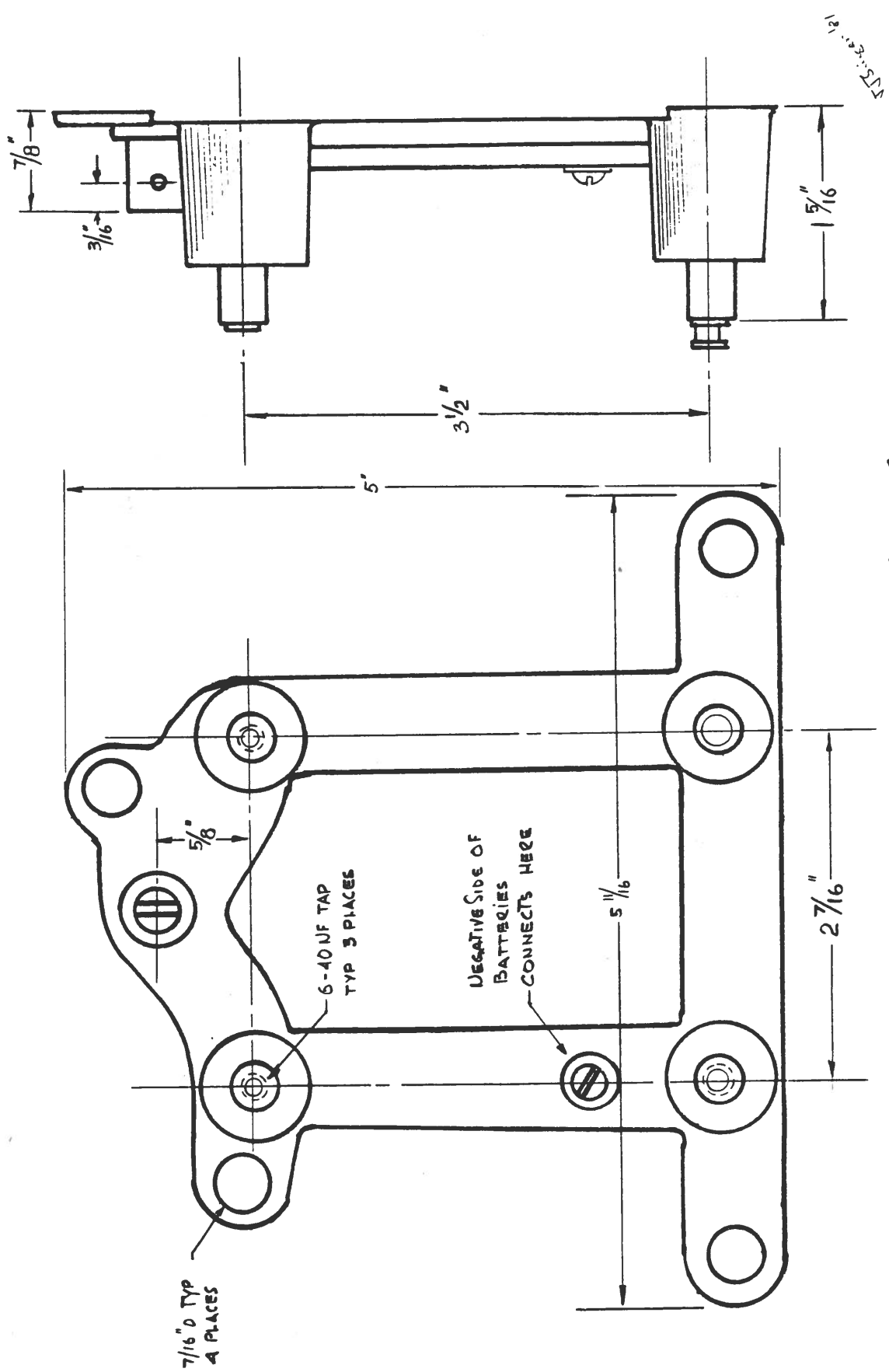
Many other lines of business employ it. Banks, brokers and financial houses generally rely upon Western Union time service because it automatically synchronizes their offices with the time of the important security and commodity exchanges throughout the country. Retail stores install Western Union clocks because they appreciate the goodwill value of offering their patrons correct time from a clock that everyone knows to be correct. These clocks are also used as advertising methods. Display cards placed in or adjacent to the clock case catch the public eye as they look for correct time.

With Western Union time service there is no compromise with accuracy. The clocks are never "about right". They are on time because every hour on the hour a telegraphic signal definitely checks the time with the accurate master clocks synchronized with the Naval Observatory. In addition to this assurance of accuracy users of Western Union time service never have to worry about continued service. Clocks are installed and maintained in good order by competent employees, and their movements are entirely independent of the lighting circuit and other sources of power supply. Automatic in service and accuracy Western Union clocks actually

TIME THE NATION.

S.W.C. CO.  
August 29, 1934

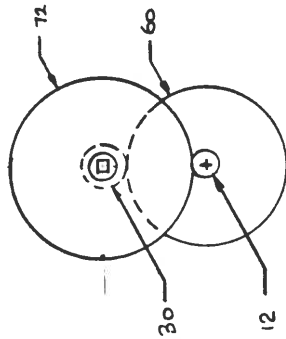




CAST IRON BRACKET USED IN WOODEN CLOCK CASES

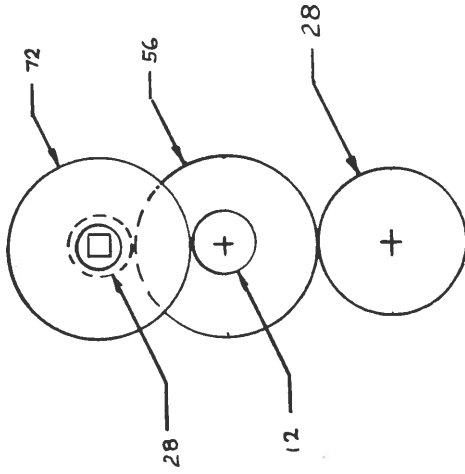
COMPARISON OF NOTION WORK  
TYPE F & TYPE FS  
SELF WINDING CLOCK CO MOVEMENTS

TYPE F



TOOTH COUNT

TYPE FS



MOVEMENT

TYPE F

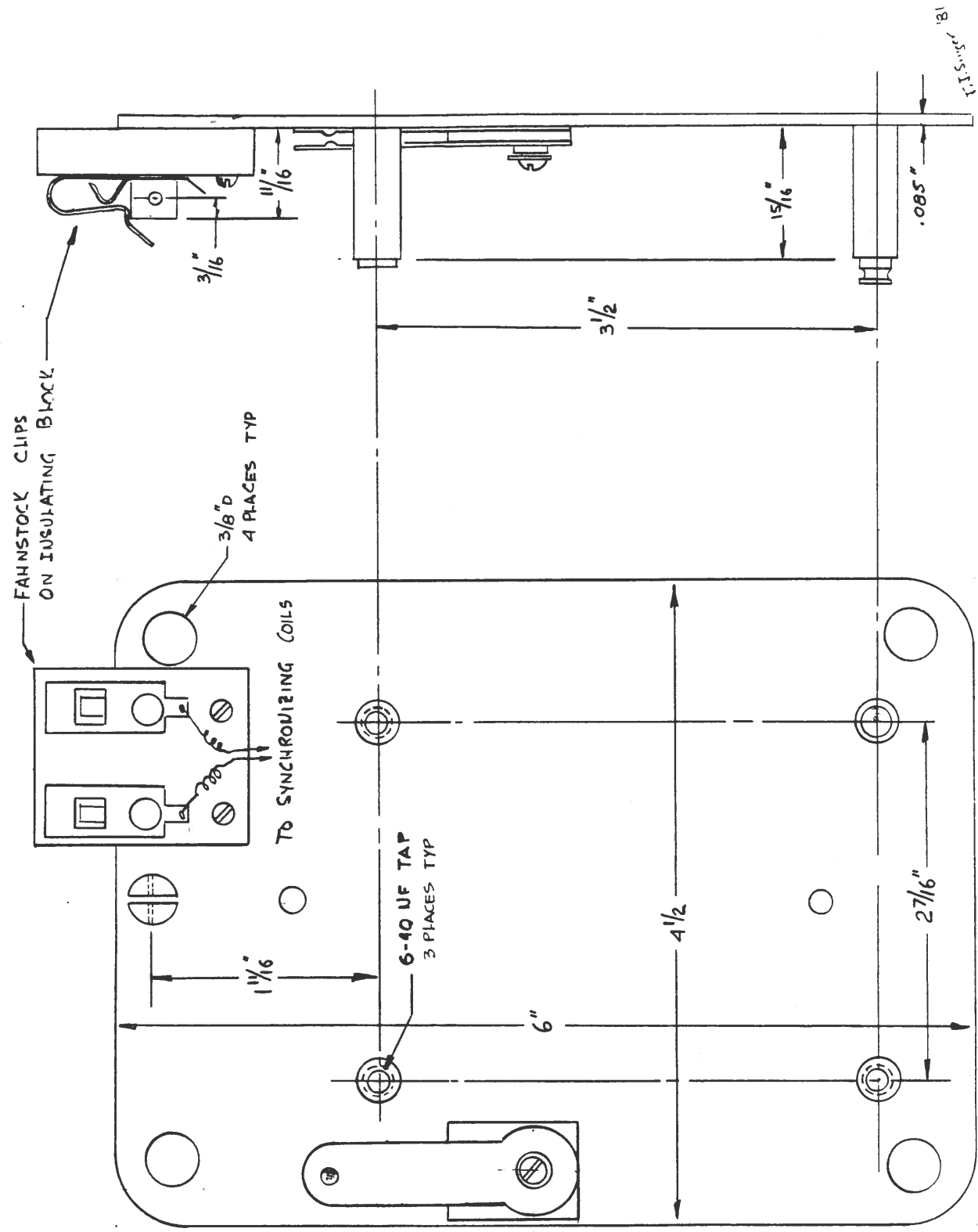
TYPE FS

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 .275" DIA

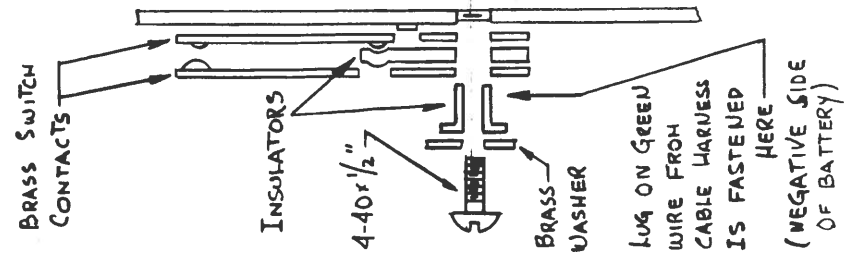
.230" x .230"  
 .390" DIA

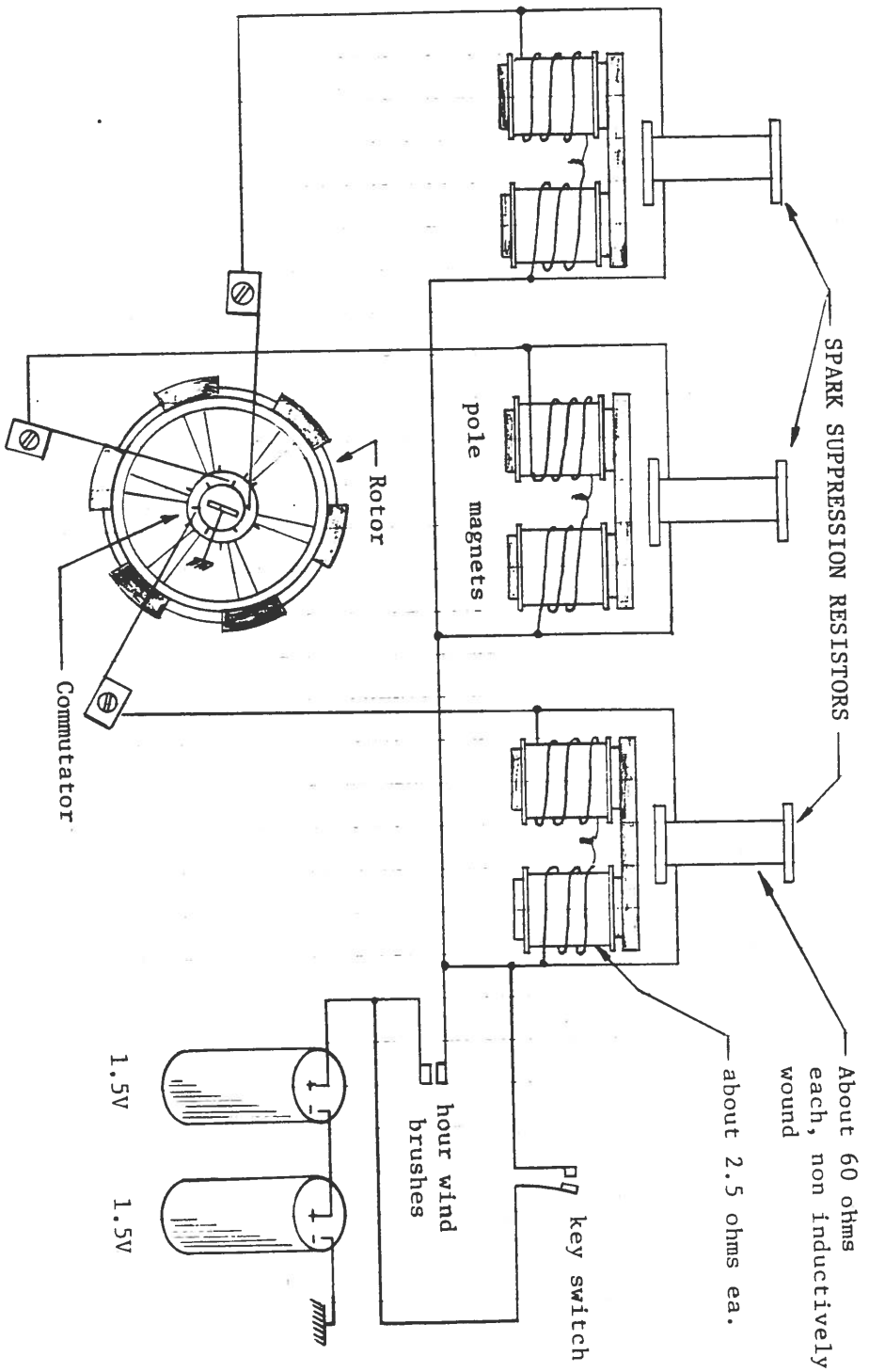
MINUTE ARBOR  
 HOUR PIPE

J.J. SIMPSON  
 3-21-81



MOUNTING BRACKET USED WITH METAL CASES





Type "C" Rotary Motor, Electrical Circuit

STBurgess  
No. 23-19

# Sempire Clock Co. Elechrometers

## THE ONLY ACCURATE AND PERFECT ELECTRIC CLOCK MADE.

### EXPERT OPINION (UNSOLICITED)

*Washington University Observatory.*

SEMPIRE CLOCK CO., CITY.

GENTLEMEN: After having had the several clocks submitted by you to the Observatory under observation for some time, giving myself ample time to become familiar with the principles involved in their construction, and opportunity to thoroughly examine their operation as timekeepers, the following is respectfully submitted, along with the attached record of one of the 84-beat pendulums, as evidencing the practical performance of a clock of this character.

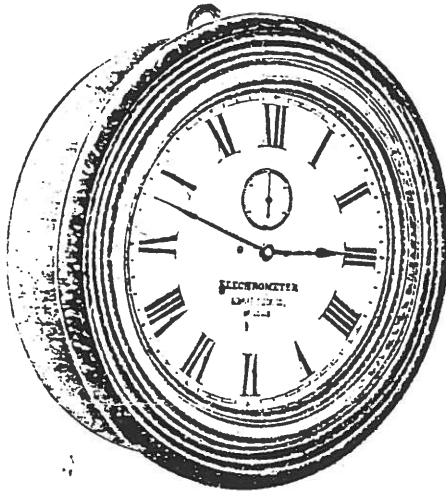
Mechanically:—The clock is simple, well and substantially constructed. The attention paid to the minor details evidence to me the thoughtfulness of design and construction of some one possessed of practical experience in clock building. The driving or motive power of the clock is evening, and constantly applied in a manner essential to a good rating in the timekeeping possibilities of the movement. As shown by the record herewith, the rating possibilities of one of these clocks is strictly comparable with that which might be expected from a much higher-priced regulator.

Electrically:—The two essential features—a positive contact for making circuit and one for short duration are admirably, from a practical standpoint, provided for. The clocks under my observation, although subjected to severe tests, and running continuously for several months, have never failed to wind. The contact made is a rubbing one, self-cleaning, and cannot be but of an instant's duration. The placing of the battery, the ease and convenience with which the working parts of the movement can be gotten at, are of material importance to one who has the care of a number of clocks of this character.

In the synchronized controlled system:—The make circuit in the master clock is admirably designed to positively close the synchronizing circuit while influencing to a minimum degree the rate of the regulator. The synchronizing device in the secondary clock is unique, and capable of effectively controlling the clock with a minimum of battery power.

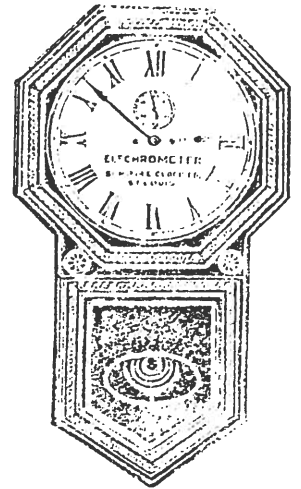
In conclusion:—My experience in connection with this Observatory, with self-winding and synchronizing clocks, extends over a long period, and I have had the care of a number of self-winding and synchronized clocks of different designs, and will say that until I had the opportunity to look into the working of your clocks, I was deeply prejudiced against the same. To interested parties, I cheerfully indorse your product.

Respectfully, A. RAMEL, Asst in charge Observatory.



No. 8. Gallery.

14-inch dial, diameter 21 1/4 inches, depth 6 1/2 inches; oak or mahogany finish, pendulum movement ..... \$17 00



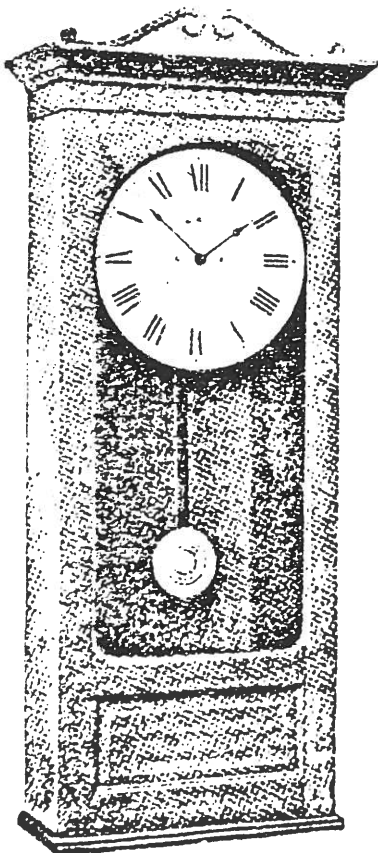
No. 9. School.

12-inch dial, height 33 inches, width 17 1/2 inches, enclosed oak case ..... \$19 20

No. 10. School.

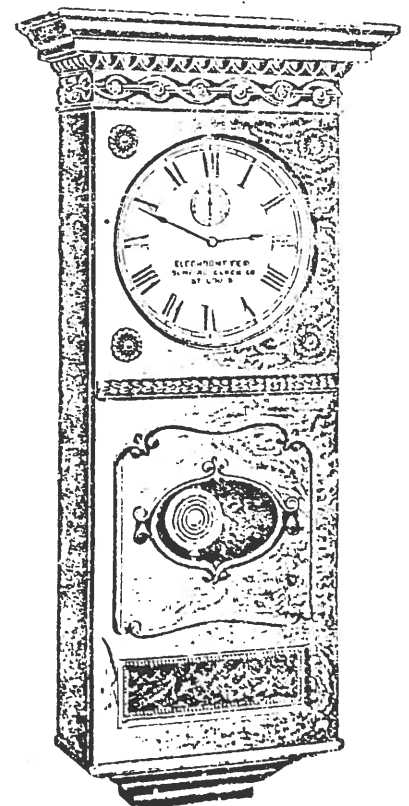
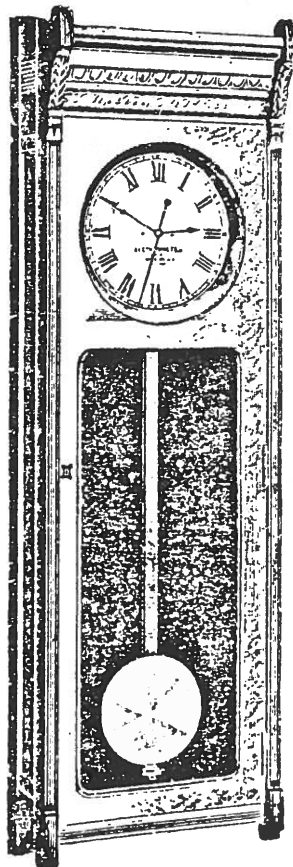
Same style as above, 14-inch dial, height 37 inches, width 16 1/2 inches ..... \$21 30

Prices quoted on Nos. 8, 9 and 10 are the lowest ever quoted on Electric Clocks, and are special value.



No. 58. Jewelers' Regulator.

12-inch dial, 60 beat, sweep second; 62 inches long, 19 inches wide.



No. 12. Vestibule.

SEMPRE CLOCK CO., CITY.

GENTLEMEN: After having had the several clocks submitted by you to the Observatory under observation for some time, giving myself ample time to become familiar with the principles involved in their construction, and opportunity to thoroughly examine their operation as timekeepers, the following is respectfully submitted, along with the attached record of one of the 84-beat pendulums, as evidencing the practical performance of a clock of this character.

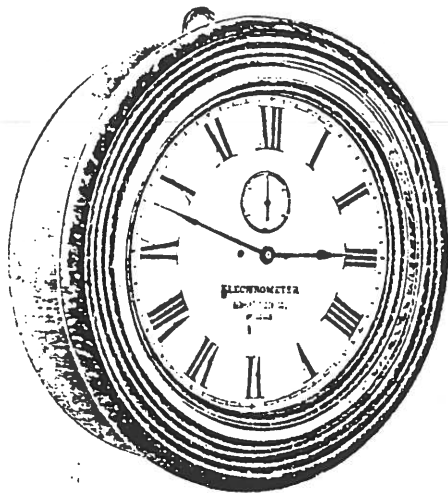
Mechanically:—The clock is simple, well and substantially constructed. The attention paid to the minor details evidence to me the thoughtfulness of design and construction of some one possessed of practical experience in clock building. The driving or motive power of the clock is evening, and constantly applied in a manner essential to a good rating in the timekeeping possibilities of the movement. As shown by the record herewith, the rating possibilities of one of these clocks is strictly comparable with that which might be expected from a much higher-priced regulator.

Electrically:—The two essential features—a positive contact for making circuit and one for short duration are admirably, from a practical standpoint, provided for. The clocks under my observation, although subjected to severe tests, and running continuously for several months, have never failed to wind. The contact made is a rubbing one, self-cleaning, and cannot be but of an instant's duration. The placing of the battery, the ease and convenience with which the working parts of the movement can be gotten at, are of material importance to one who has the care of a number of clocks of this character.

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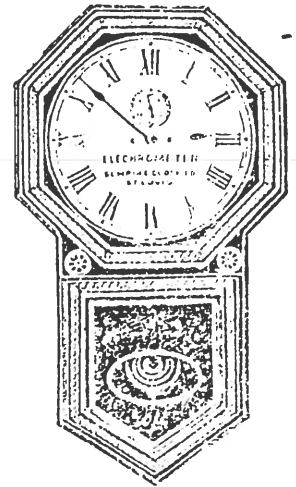
In conclusion:—My experience in connection with this Observatory, with self-winding and synchronizing clocks, extends over a long period, and I have had the care of a number of self-winding and synchronized clocks of different designs, and will say that until I had the opportunity to look into the working of your clocks, I was deeply prejudiced against the same. To interested parties, I cheerfully indorse your product.

Respectfully, A. RAMEL, Asst. in charge Observatory.



No. 8. Gallery.

14-inch dial, diameter 21 1/4 inches, depth 6 1/2 inches; oak or mahogany finish, pendulum movement. **\$17 00**



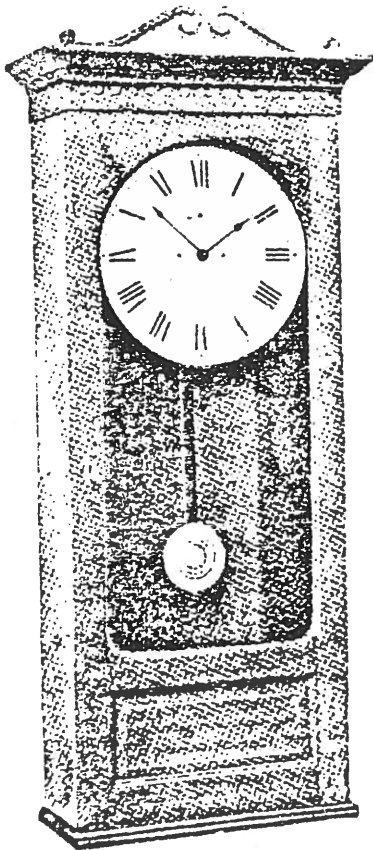
No. 9. School.

12-inch dial, height 33 inches, width 17 1/2 inches, embossed oak case. **\$19 20**

No. 10. Select.

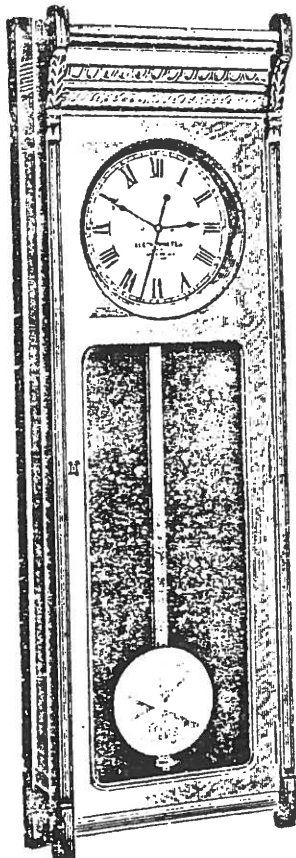
Same style as above, 14-inch dial, height 36 inches, width 19 1/2 inches. **\$21 30**

Prices quoted on Nos. 8, 9 and 10 are the lowest ever quoted on Electric Clocks, and are special value.



No. 22.

12-inch dial, 84 beats; dimensions 45x19 inches.  
Oak case **\$37 50**  
Mahogany case **43 75**

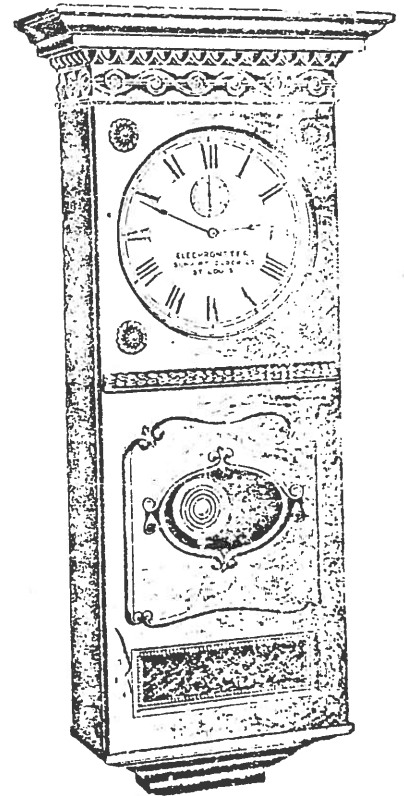


No. 58. Jewelers' Regulator.

12-inch dial, 60 beat, sweep second; 62 inches long, 19 inches wide.

Oak **\$53 50**  
Mahogany **64 00**

This regulator can also be fitted with 3-jar mercury pendulum (cut glass jars) at **\$45 00** additional.  
(For Pendulum see page 83, Galesburg Clock.)

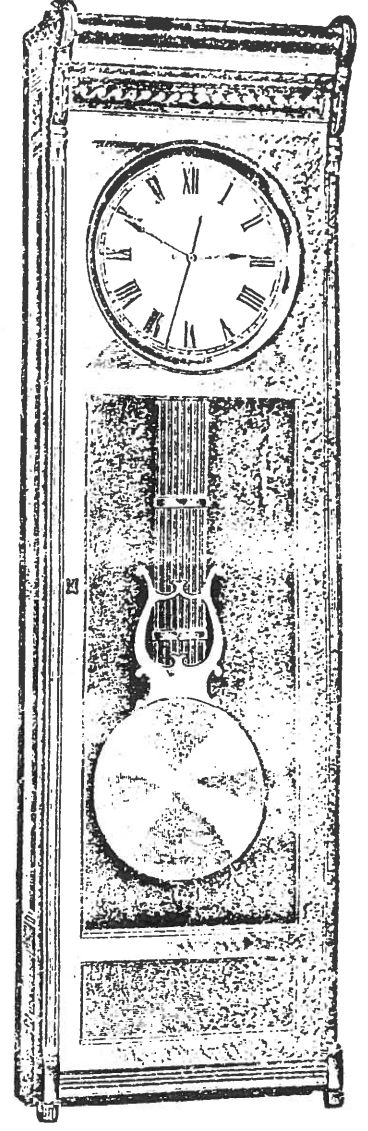
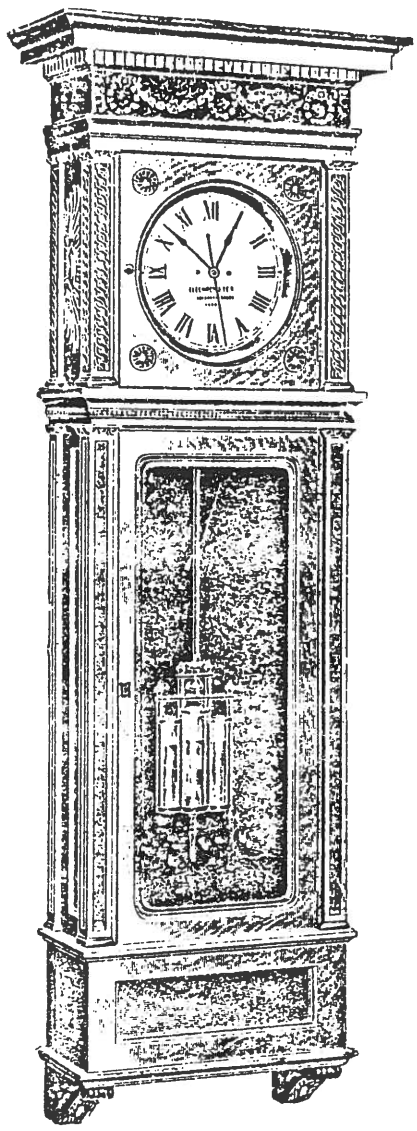
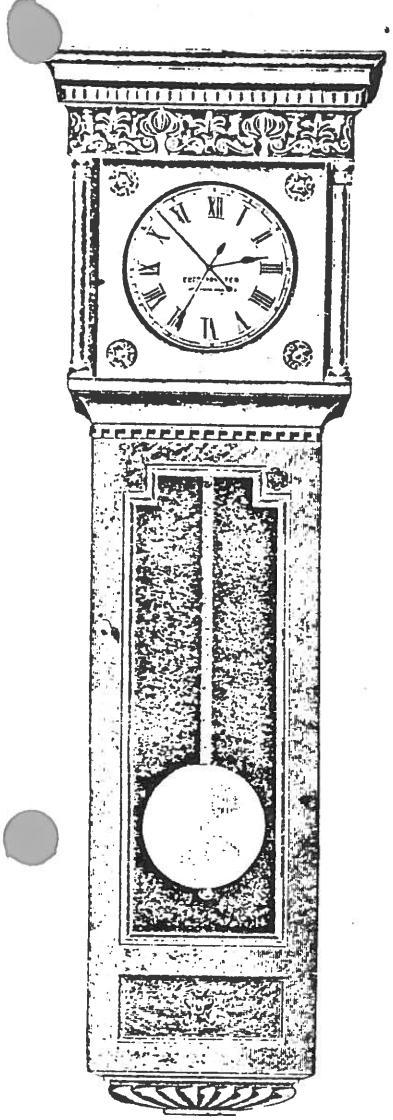


No. 48. Vestibule.

12-inch dial, 84 beats; height 37 inches, width 19 inches.

Oak **\$45 00**  
Mahogany **50 00**

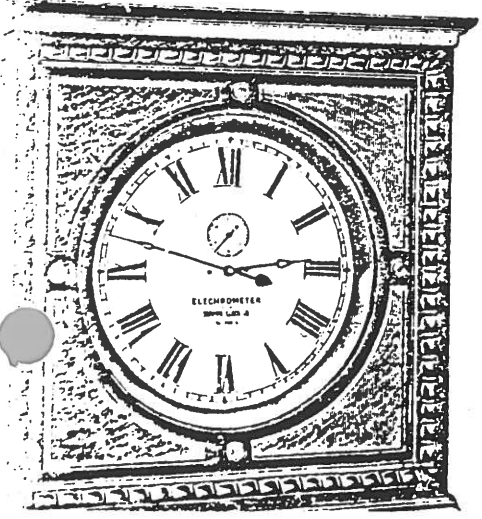
# SEMPIRE ELECHROMETERS, SELF-WINDING.



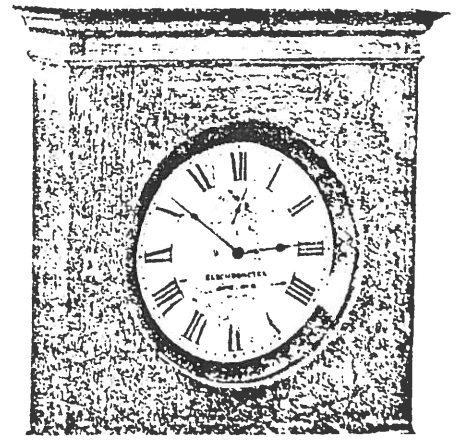
**No. 68. JEWELERS' REGULATOR.**  
 12-inch Dial; 60 Beat; Sweep Second; 72 inches Long;  
 26 inches Wide.  
 ..... \$ 94.00  
 ..... 104.50  
 This Regulator can also be fitted with a 3-Jar  
 Mercury Pendulum (Cut Glass Jars) at \$45.00  
 Additional. See Galesburg Regulator for Pendulum.

**PALESBURG.**  
 Special Jewelers' Regulator.  
 12-inch Dial; 60 Beat; Sweep Second; 3-Jar Cut Glass  
 Mercurial Pendulum; Height, 78 inches;  
 Width, 28 inches.  
 Oak ..... \$180.00  
 Mahogany ..... 190.50

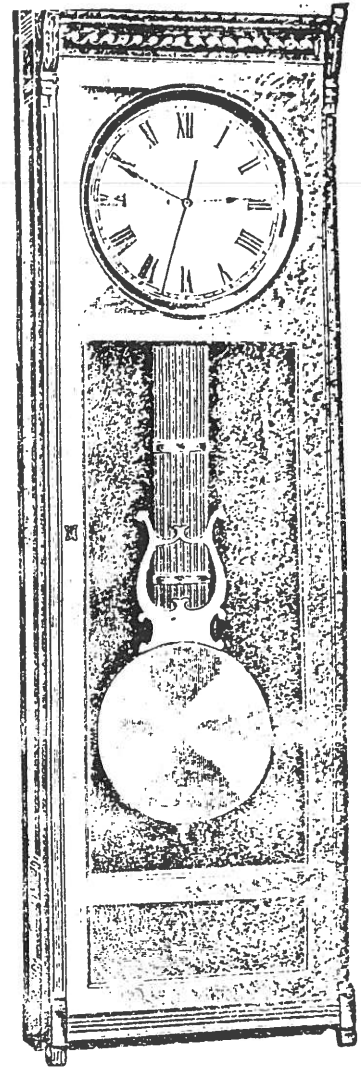
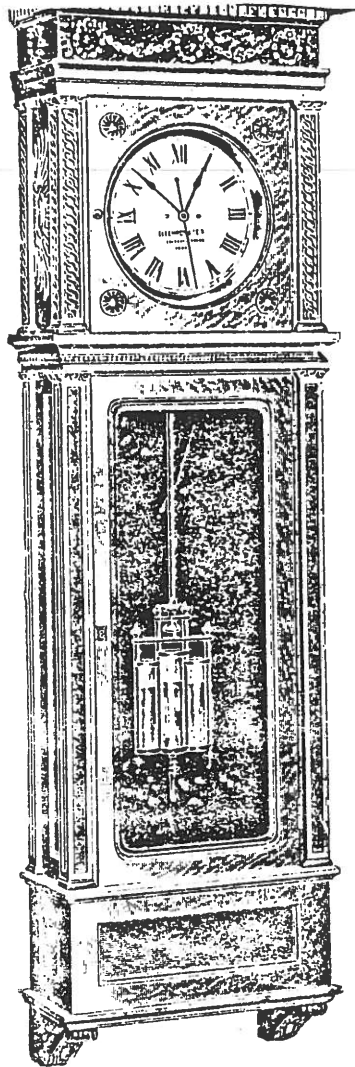
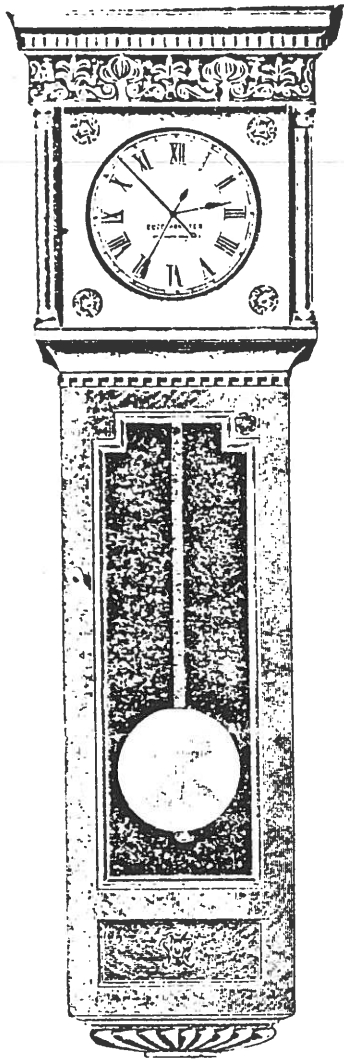
**No. 65. JEWELERS' REGULATOR.**  
 15-inch Dial; 60 Beats; Sweep Seconds; 78 inches  
 Long; 22 inches Wide.  
 Oak ..... \$86.00  
 Mahogany ..... 92.00  
 This Regulator can also be fitted with 3-Jar  
 Mercury Pendulum (Cut Glass Jars) at \$45.00  
 Additional. (For Pendulum see page 83, Galesburg  
 Clock.)



**SOME ONE** will introduce these Clocks  
 in your city or neighborhood. Will it  
 be YOU, or some other dealer? It  
 supplies a real existing want. It is  
 absolutely accurate and reliable. It  
 will not wear out or get out of order.  
 It overcomes every objection urged  
 against all key-winding clocks. It is  
 adapted for use in the largest buildings  
 or on the parlor mantel. It is sold at a  
 price that places it within easy reach  
 of every one. Order a Sample Line.







**No. 68. JEWELERS' REGULATOR.**

15-inch Dial; 60 Beat; Sweep Second; 72 inches Long; 26 inches Wide.

\$ 94.00  
104.50

This Regulator can also be fitted with a 3-Jar Mercury Pendulum (Cut Glass Jars) at \$45.00 Additional. See Galesburg Regulator for Pendulum.

**PALESBURG.**

Special Jewelers' Regulator.

12-inch Dial; 60 Beat; Sweep Second; 3-Jar Cut Glass Mercurial Pendulum; Height, 78 inches; Width, 28 inches.

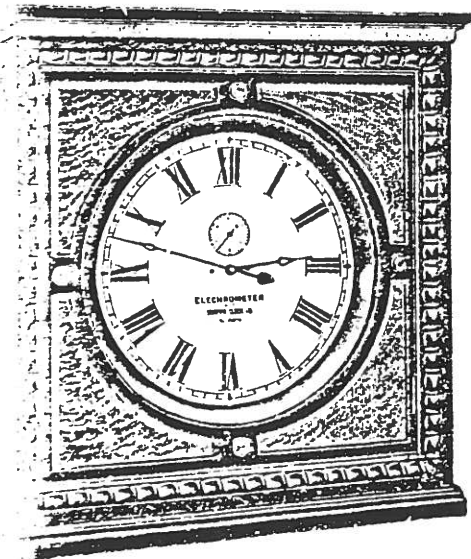
Oak ..... \$180.00  
Mahogany ..... 190.50

**No. 68. JEWELERS' REGULATOR.**

15-inch Dial; 60 Beats; Sweep Second; 78 inches Long; 25 inches Wide.

Oak ..... \$86.00  
Mahogany ..... 92.00

This Regulator can also be fitted with 3-Jar Mercury Pendulum (Cut Glass Jars) at \$15.00 Additional. (For Pendulum see page 58, Galesburg Clock.)

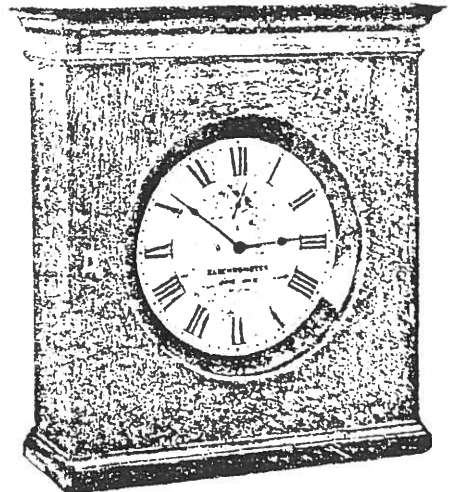


**No. 36. GALLERY.**

18 inch Dial. 29x30 inches Diameter.

\$45.50  
50.75

SOME ONE will introduce these Clocks in your city or neighborhood. Will it be YOU, or some other dealer? It supplies a real existing want. It is absolutely accurate and reliable. It will not wear out or get out of order. It overcomes every objection urged against all key-winding clocks. It is adapted for use in the largest buildings or on the parlor mantel. It is sold at a price that places it within easy reach of every one. Order a Sample Line.



**No. 32. OFFICE.**

12-inch Dial. Dimensions, 25x24 inches.

Oak Case ..... \$37.50  
Mahogany Case ..... 42.75



con't. from Pg.1

REMINDER:

All current memberships come to an end with this issue and must be renewed at the \$10.00 per year dues rate which should be sent to Secretary/Treasurer Charles Roth, 2 Circle Lane, Roslyn, N.Y. 11577. This year we have seen an exorbitant rise in postage, printing, mailing envelopes, etc. which has put a large dent into our budget as well as it probably has all of yours. However, as long as we keep our present total in membership we estimate that we can squeeze through without raising dues from \$10.00 during the 1982 fiscal year. We also project that we shall continue sending out our bi-monthly 12+ page Journal without having to cut back in that area as we realize how important this publication is in overall communication and in maintaining our cohesiveness. Please don't delay and send your dues in as you read this issue. We all thank you.

Let me take this opportunity on behalf of the officers and myself to wish you all a Joyous and Healthy Holiday Season and a Happy New Year.

Electromagnetically yours,



Martin C. Feldman, FNAWCC  
President

SUPPORT YOUR MART-----ADVERTISE AT \$2.00 per 4 typewritten lines per issue. Send ads to M.C. Feldman, 620 Reiss Place-7e, Bx, NY 10467. Make checks payable to EHS, %C.Roth.

\*\*\*\*\*MART\*\*\*\*\*  
\*\*\*\*\*

WANTED: Unusual Electrical Clocks. A. Marx, 105 Bayeau Rd., New Rochelle, NY 10804

ANNOUNCEMENT: Power supplies to meet your needs will be custom built-upon request describing same. Please write your needs and enclose an SASE for reply.  
Martin Swetsky, % EWC, 1910 Coney Island Ave., Bklyn, NY 11230

FOR SALE: Seth Thomas Self Winding Electric, Model 86AF in 18" square mahogany case. Fine condition and in G.R.O.----\$460 ppd. Martin C. Feldman

Bulle in glass crystal regulator case with filigree panels, fully restored, in excellent running order-----\$425. Martin C. Feldman

WANTED: "Junker" early battery clocks, movements, parts, etc. Send details and \$ wanted. ELECTRICAL CLOCK LITERATURE for possible reprinting in our Journal.

Electrical Horological Literature of any type.

Hahl-Wenzel pneumatic clock face and weights. Will buy entire clock if necessary. Martin C. Feldman

REPAIRS: ALL EARLY BATTERY CLOCKS including Pooles, Barrs, Tiffany Never-Winds, Eureka's, etc. SPECIALIZING IN BULLE CLOCK REPAIRS USING ORIGINAL PARTS. One month maximum time for all repairs.

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