Oct. 21, 1941. H. ABBOTT ET AL 2,259,677

ELAPSED TIME RECORDING DEVICE

Filed Jan. 14, 1939 7 Sheets-Sheet 1

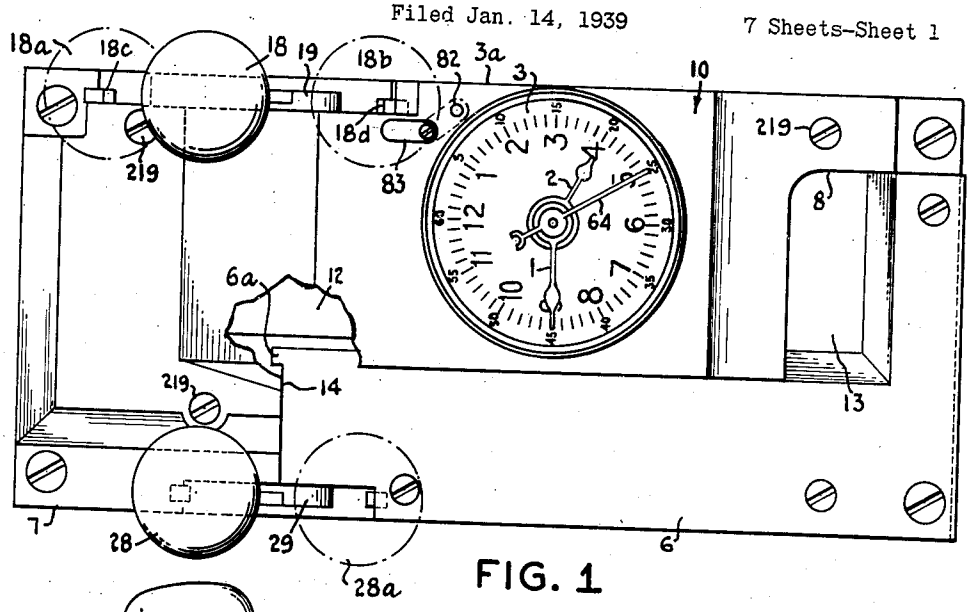


FIG. 1

FIG. 2

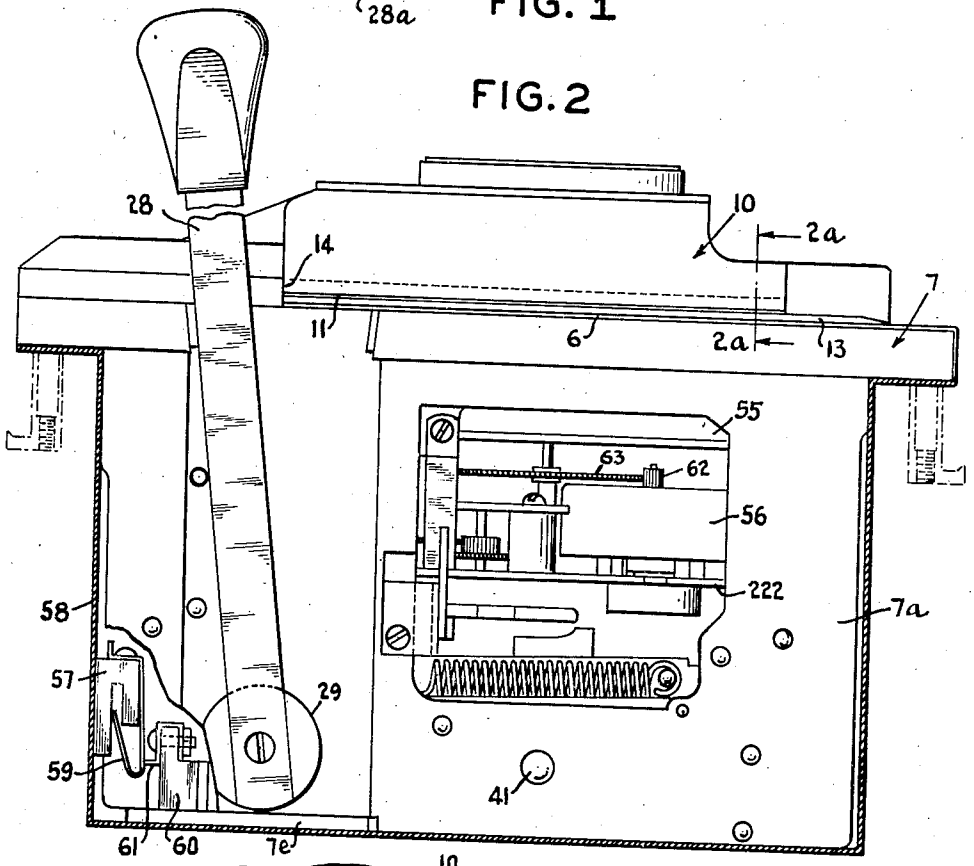
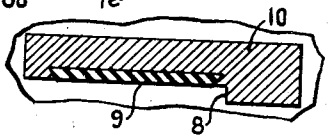


FIG. 2a



BY

Henry Abbott and
William C. Moodie
INVENTORS

Paul Wolfish
ATTORNEY.

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ELAPSED TIME RECORDING DEVICE

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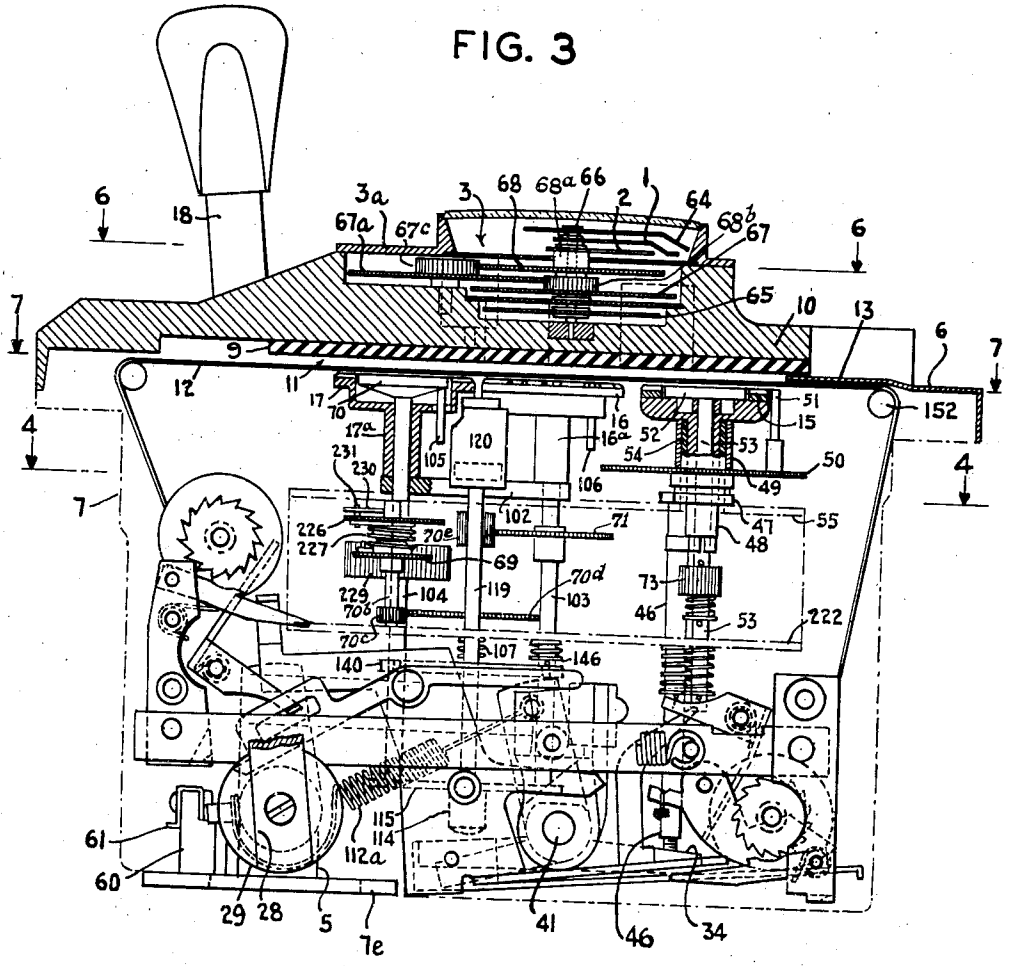
FIG. 3



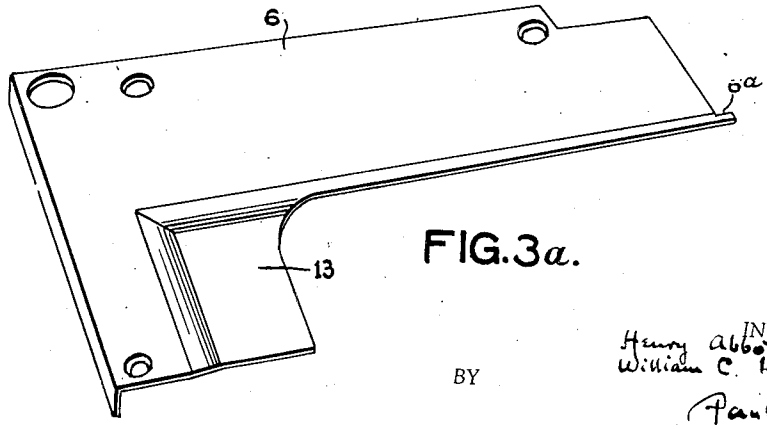


FIG. 3a.

INVENTORS
Henry Abbott and
William C. Moodie

BY

ATTORNEY.

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FIG. 4

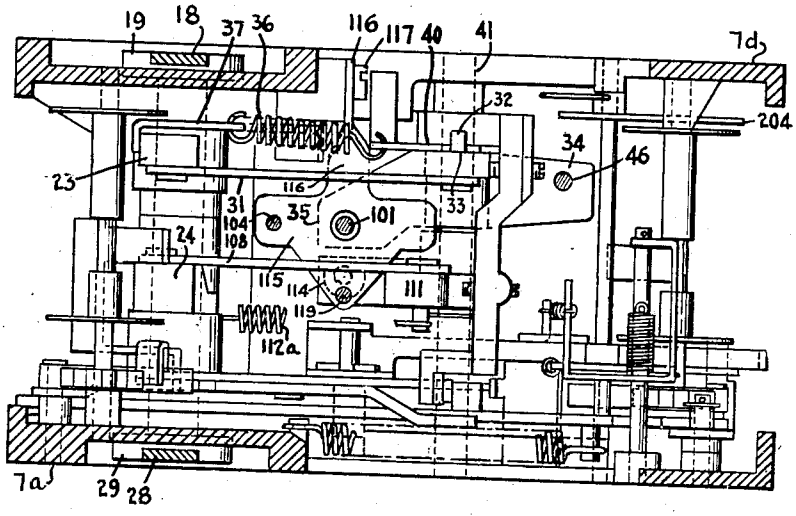
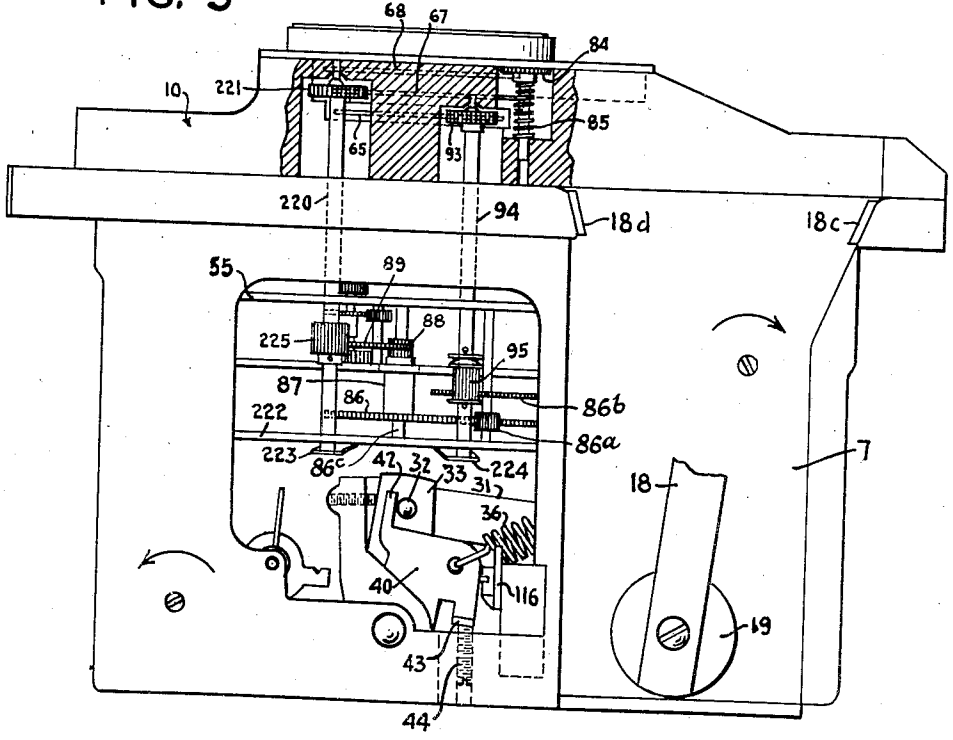


FIG. 5



INVENTORS
Henry Abbott and
William C. Moodie

BY

ATTORNEY.

Oct. 21, 1941. H. ABBOTT ET AL 2,259,677

ELAPSED TIME RECORDING DEVICE

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FIG. 6a

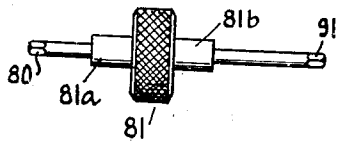


FIG. 5a

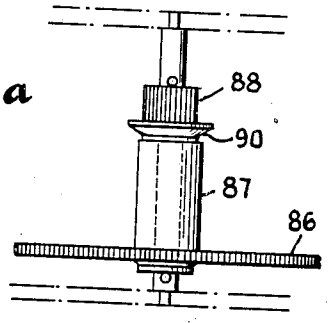
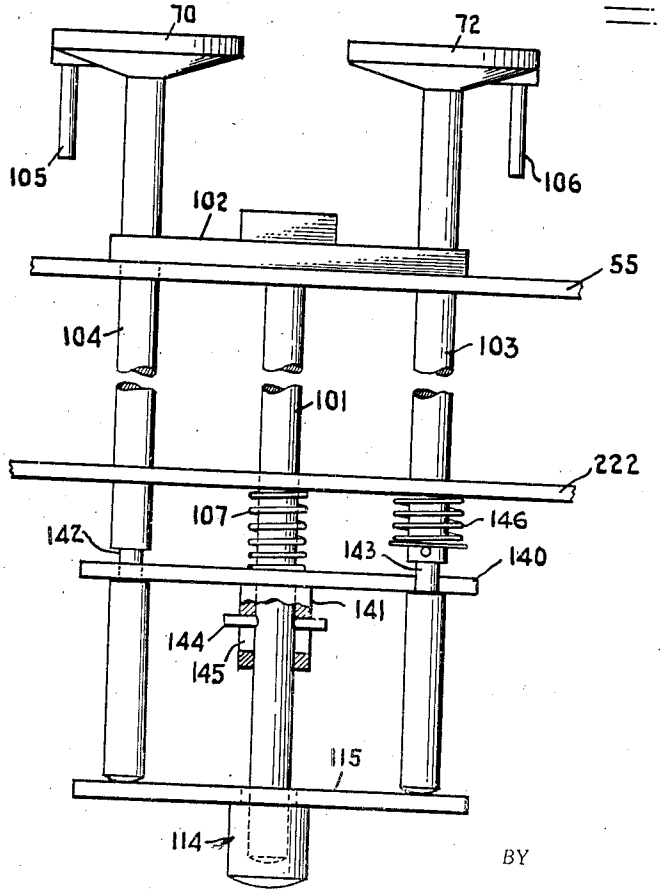


FIG. 9a



BY

INVENTORS
Henry Abbott and
William C. Maodie

ATTORNEY.

Oct. 21, 1941. H. ABBOTT ET AL 2,259,677

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FIG. 6

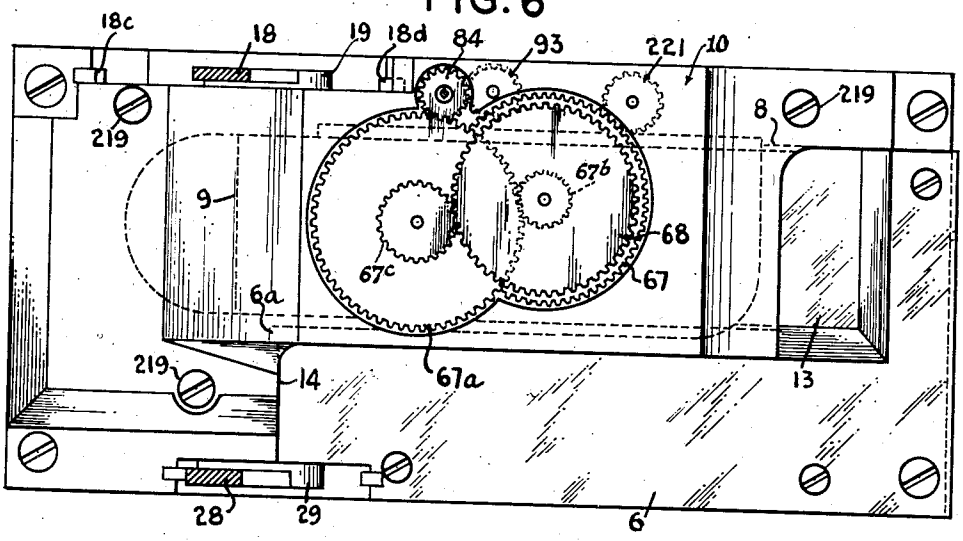
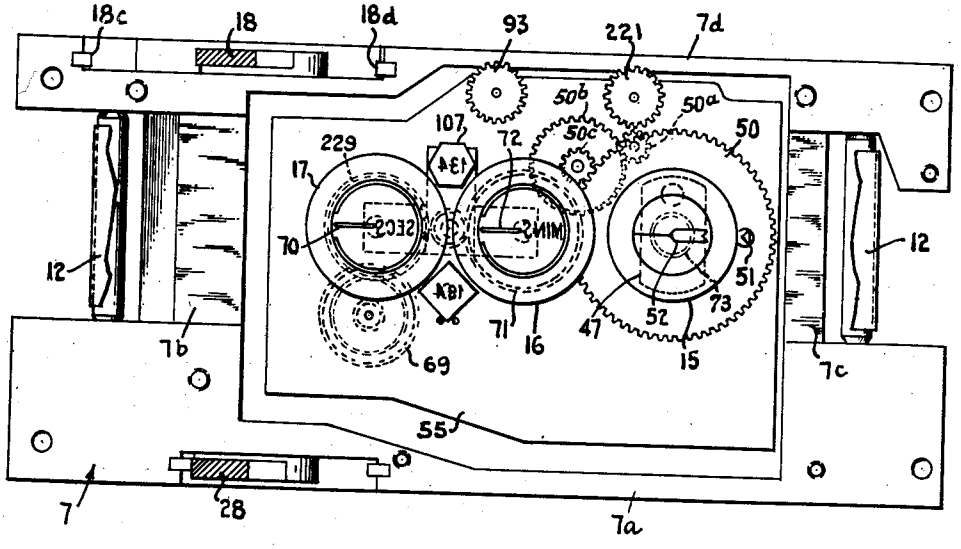


FIG. 7



INVENTORS
Henry Abbott and
William C. Moodie

BY Paul Mosher

ATTORNEY.

Oct. 21, 1941. H. ABBOTT ET AL 2,259,677

ELAPSED TIME RECORDING DEVICE

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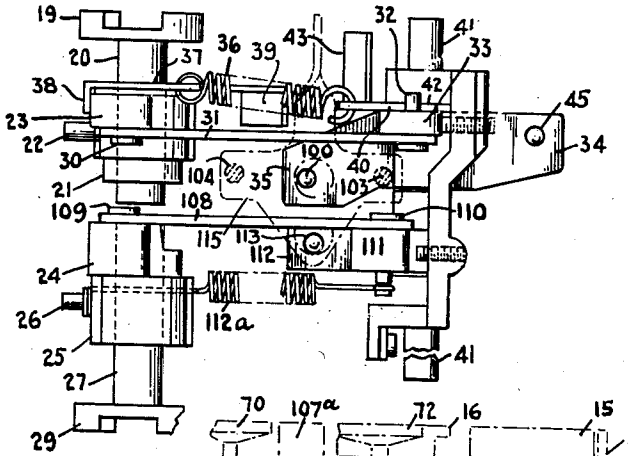


FIG. 8

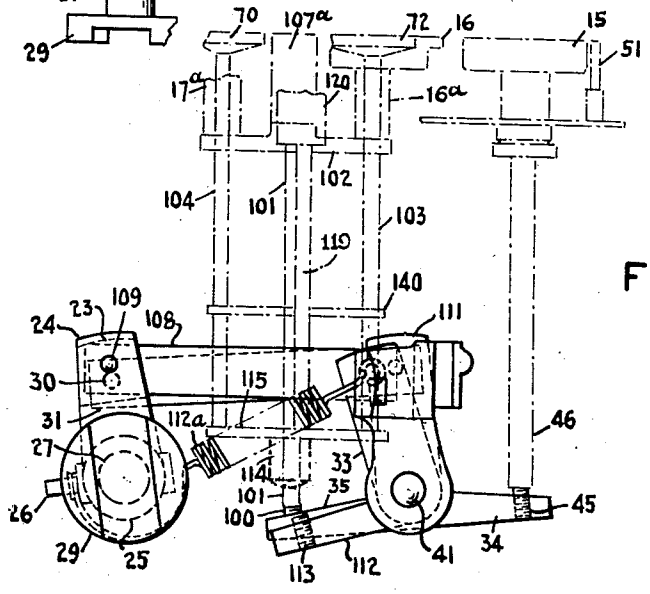
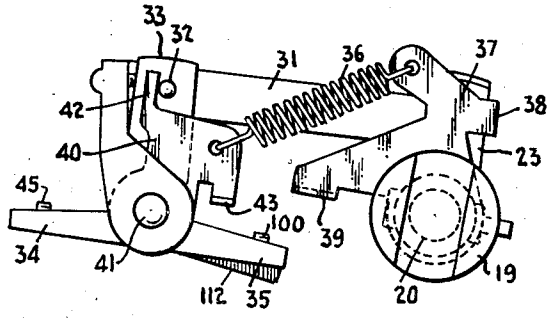


FIG. 9

FIG. 10



INVENTORS
Henry Abbott and
William C. Woodie
BY Paul Kolind
ATTORNEY.

Oct. 21, 1941. H. ABBOTT ET AL 2,259,677

ELAPSED TIME RECORDING DEVICE

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FIG. 11.

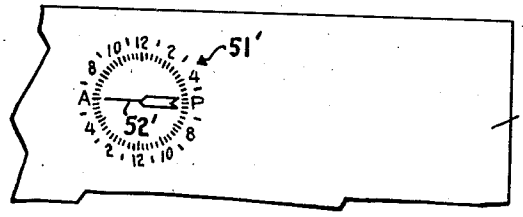


FIG. 12.

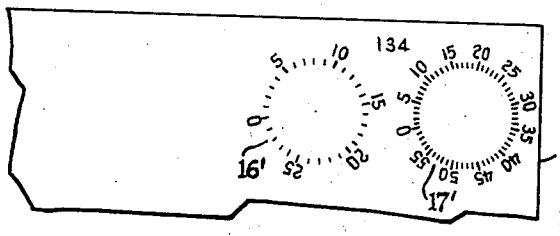


FIG. 13

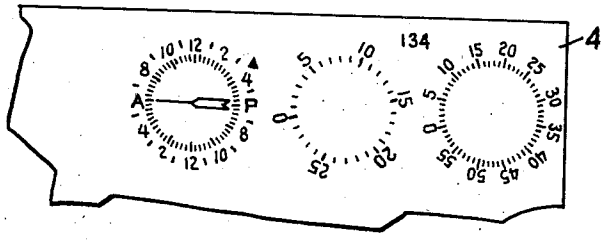


FIG. 14.

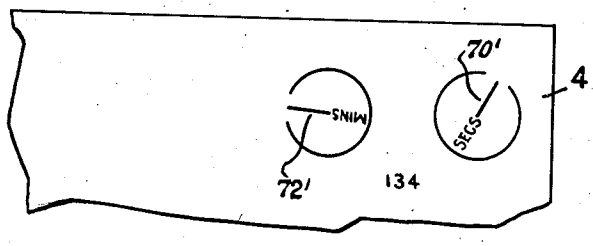
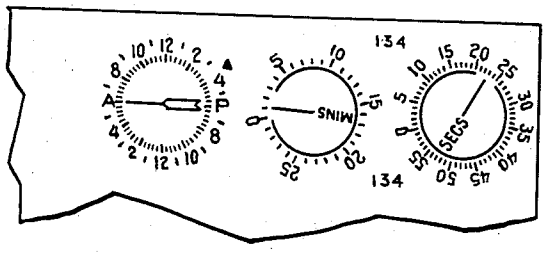


FIG. 15



INVENTORS
Henry Abbott and
William C. Moodie
BY Paul Abbott
ATTORNEY.

Patented Oct. 21, 1941

2,259,677

UNITED STATES PATENT OFFICE

2,259,677

ELAPSED TIME RECORDING DEVICE

Henry Abbott, East Orange, and William C. Moodie, Montclair, N. J., assignors to The Calculagraph Company, New York, N. Y., a corporation of New Jersey

Application January 14, 1939, Serial No. 250,872

2 Claims. (Cl. 234—54)

This invention relates to new and useful improvements in time recording devices and more particularly to devices for printing the time of the day and an elapsed period of time.

The object of the invention is to provide a device of the above designated character so compact and simple in construction that it occupies only a limited space and will yet operate reliably.

With this object in view we provide a device in which the clock movement and all the mechanism for printing the time of the day and the elapsed time are provided within a small rectangular casing. A platen holder is removably mounted on top of this casing and has a ticket chamber extending over the surface of the casing. A visible clock and gears for operating it are provided in the platen holder. Operating connections between platen holder, clock driving gears and the clock movement are outside the limits of the ticket chamber so that tickets inserted will lie below the entire width of the visible clock. Means are provided for permitting the slipping of part of the printing mechanism and the gears driving the hands of the visible clock with respect to the clock movement. The printing mechanism and the visible clock hands may thus be reset by hand without interfering with the smooth continued operation of the clock movement.

These and other features of the invention will be explained in the following description of a preferred embodiment and defined in the appended claims. Variants will readily suggest themselves to those skilled in the art, and some of the features will be found also useful in other devices and combinations than the ones we have specified.

In the drawings,

Fig. 1 is a top plan view of the device;

Fig. 2 is a side elevation with portions of the casing cut away;

Fig. 2ª is a transverse cross-section of the platen holder along lines 2*a*—2*a* of Fig. 2;

Fig. 3 another side elevation like Fig. 2, but illustrating some of the mechanism in vertical cross-section and with all the casing and some of the framework showing in Fig. 2 removed;

Fig. 3ª is a perspective view of the ticket plate;

Fig. 4 is a horizontal cross-sectional along lines 4—4 of Fig. 3;

Fig. 5 is a side elevation, partly in cross-section, similar to Fig. 2 but illustrating the other side of the machine;

Fig. 5ª is an enlarged detail of the clock mechanism;

Fig. 6 is a horizontal cross-section along lines 6—6 of Fig. 3;

Fig. 6ª is a side elevation of the key;

Fig. 7 is a horizontal cross-section along lines 7—7 of Fig. 3;

Fig. 8 is a plan view of the levers for actuating the printing mechanism;

Fig. 9 is a side elevation of the same;

Fig. 9ª is an enlarged side elevation of some of the mechanism shown in dotted lines in Fig. 9;

Fig. 10 illustrates in side elevation some of the detail partly concealed in Fig. 9;

Figs. 11 to 15 illustrate portions of a ticket bearing the various records that may be printed by means of the device, Fig. 11, illustrating the time-of-day record on the ticket; Fig. 12, the two elapsed time dials imprinted on the ticket with the serial number of the machine; Fig. 13, the ticket bearing the records of both Figs. 11 and 12; Fig. 14 shows the minutes and seconds elapsed time pointers imprinted on a ticket; and Fig. 15 shows a ticket bearing the complete record of what is shown in Figs. 13 and 14.

When it is desired to record on a card or ticket the time of day as indicated (Figs. 1 and 3) by a minute hand 1 and an hour hand 2, on a visible clock dial 3, the operator places the card 4 (Fig. 11) flat on the edge of an L-shaped ticket plate 6 (Fig. 1) suitably fastened to a frame 7 of the device and extending partly around the lower and the right-hand borders thereof as viewed in Figs. 1 and 6. The upper edge (as viewed in Fig. 1) of the ticket is guided along a guide 8 formed in platen holder 10. Guide 8 constitutes the lateral wall of a chamber 11 (Figs. 2 and 3) formed within the platen holder 10, and into which the ticket may be slid. A rubber platen 9 fastened to the bottom of the platen holder 10 constitutes the roof of chamber 11 and an inking ribbon 12 which extends horizontally below the ticket plate 6 constitutes the bottom of the chamber. One side and the end of the chamber are open so that the ticket lying on plate 6 may protrude beyond the platen holder 10. The leading edge of the ticket will be arrested by a shoulder 14 (Figs. 1 and 6) of the platen holder 10 when the ticket is pushed into chamber 11. As shown in Figs. 3 and 6, the L-shaped plate 6 does not extend below platen 9 so as to leave the ribbon 12 unobstructed below platen 9 suitably spaced therefrom. The plate 6 is slightly bent up to form a raised ledge 13 (Figs. 1, 2, 3 and 6). This will raise the ticket towards the platen when its edge is placed on plate 6 and slid thereon towards chamber 11. The ledge 13 is of slightly greater width than rib-

bon 12 and projects within the chamber 11. The relatively stiff ticket will thus be held away from ribbon 12 and guarded from smudging the lower edge of the ticket projecting from platen holder 10 resting on plate 6 (Figs. 1 and 6).

The dotted lines in Fig. 6 indicate the hidden outlines of the ticket plate 6 and the recess in the lower face of the platen holder 10 within which the rubber platen 9 is held.

It will be noticed in Fig. 2[a] that the guide 8 is set back with respect to the edge of the rubber platen 9. If the two were flush, then the edge of the ticket pressed against guide 8 would often get caught on the rough edge of the rubber platen 9, because it is well-nigh impossible commercially to cut rubber so straight as to form a perfect fit with a metallic surface. In the present construction the rubber platen 9 is set in a groove and the surface of the guide 8 is far enough removed from the edge of the rubber to insure that the edge of the ticket 4 will contact with the metallic guide surface.

To prevent the leading edge of the ticket 4 pushed against stop 14 from curling down and, instead of abutting against the stop, protruding within the crack between the stop 14 and the edge of the ticket plate 6, a projection 6[a] (Figs. 1 and 6) is provided on the latter to hold up the leading edge of the ticket in alignment with the stop 14.

The frame (see particularly Fig. 7) consists of a casting having a side 7[a] and arms 7[b] and 7[c], and a side 7[d] fastened to arms 7[b] and 7[c]. The two sides 7[a] and 7[d] are held together at the bottom by a plate 7[e] cast in one piece with a bearing 5 projecting within the frame. The frame is open on all sides for easy access to the mechanism carried therein.

The operator now pushes back a right-hand lever 18 into the position 18[a] indicated in dotted lines in Fig. 1. The lever extends parallel with the frame side 7[d] and may be rocked back and forth within a depressed portion of 7[d] between stops 18[c], 18[d]. The lower end of lever 18 is keyed to head 19 of a stub shaft 20 which projects through the frame 7 and the end of which is carried in the casting 5 (Fig. 3). As best shown in Figs. 8–10, a casting comprising a collar 21 is fastened by means of a pin 22 to the shaft 20 and will be rotated therewith when the lever 18 is moved. An arm 23 projects from this casting. This arm is substantially like an arm 24 projecting from and forming part of a companion casting 25 pinned at 26 on a stub shaft 27 provided in alignment with shaft 20 and rotatable under the control of a left-hand lever 28 keyed to head 29 of shaft 27. The shaft 27 rotates in bearing 5 and side 7[a] of the frame.

The lever 23 is pivoted at 30 to a link 31, the other end of which is pivotally mounted at 32 to a lever 33 of a double bell crank, the two other levers of which are indicated at 34 and 35.

Normally, a coiled spring 36 tends to rotate shaft 20 in a clockwise direction, as shown in Fig. 8, and the double bell crank 33, 34, 35 in a counter-clockwise direction. This is accomplished by fastening one end of spring 36 to a plate 37 which is rotatably mounted on a hub (not shown) of the frame 7 through which the shaft 20 projects. The plate 37 is provided with a lug 38 bent at right angles and engaging the rear of the arm 23 in alignment with the pivot point 30. The plate 37 also has a stop 39 which, after a limited rotation of the plate, engages a stop (not shown) projecting from the frame 7.

Similarly, the other end of the spring 36 is hooked into a plate 40 on a shaft 41. A lug 42 projecting from plate 40 engages the pivot pin 32 of the link 31. A stop 43 of plate 40 cooperates with a stop 44 projecting from frame 7. As shown in Fig. 5, the stop 44 is screw-threaded so as to permit angular setting of the plate 40.

It will be seen, therefore, that through the agency of plate 37, the spring 36 will rotate the shaft 20 in one direction and at the same time longitudinally displace the link 31 until the stop 39 engages the co-acting stop projecting from the frame. Similarly, through the agency of plate 40 the spring 36 will rotate the double crank 33, 34, 35 and displace the link 31 in the opposite direction until stop 43 engages stop 44 on frame 7.

The displacement of the right-hand lever 18 into position 18[a] will therefore, as viewed, for instance, in Fig. 9, result in the rotation of the double bell crank 33, 34, 35 in a counter-clockwise direction. The bell crank arm 34 has projecting through its end an adjusting screw 45 against which rests the lower free end of an arbor 46. As best shown in Fig. 3, the upper end of arbor 46 carries a lifter 47 through which passes the elongated hub 48 of a time-of-day printing dial 15. Seated on the lifter 47 and spacing it from the dial 15 is a hub 49 of a large gear wheel 50. The wheel 50 carries near its periphery a triangular marker 51, which can be seen also in Fig. 7. A steel hub 54 surrounds the elongated hub 48 of the dial 15 and spaces therefrom the outside hub 49 of the gear wheel 50. The steel hub 54 extends from top mounting plate 55 of the clock movement.

When the arbor 46 is lifted by the arm 34 of the double crank, through the agency of lifter 47, gear wheel 50 will be lifted as well as the time-of-day dial 15. The triangular finger 51 and the type carried by the dial 15 will be pressed against the lower surface of the inking ribbon 12 and the lower surface of the ticket 4 resting against platen 9, and will imprint thereon what is seen in Fig. 16. It will be noticed that the triangular pointer 51 will leave a mark 51′ on the paper and the dial 15 will leave a mark consisting of a circle of numerals and lines indicating the twenty-four hours of the day. The position of the triangular mark 51′ with respect to the numerals will indicate the hour of the day when the handle was actuated. The imprint of an arrow 52′ within the circle of numerals will indicate the minutes. The minutes pointer is indicated as 52 in Figs. 7 and 3. This pointer 52 rests on a hub provided within a central cavity of the time-of-day dial 15 and it is carried by a shaft 53 which projects through the hubs 48 and 49.

We shall now explain how the clockwork controls the displacement of the minute hand 52 and triangle 51 so as to indicate with respect to dial 15 the time of day when the handle 18 is rotated as above described.

A synchronous electric motor 56 of the usual type is operated under the control of alternating current sent from a central station. The two terminals of the power line are connected to two spring contacts mounted on a contact block 57 of insulating material which is fastened to the inside of a casing 58. One of these spring terminals is indicated at 59, the other being identical with it. When the frame 7 including, of course, the motor 56, is inserted within the casing 58, two terminals mounted on a block of insulating material 60 fastened to frame 7 make a

rubbing contact with the spring clips 59. One of these terminals is indicated at 61, the other being identical therewith. Thus the electrical connection with the motor will be established and broken as the frame 7 is inserted into or removed from the casing 58.

A pinion 62 on the shaft of the rotor of electric motor 56 drives a train of gears, the first of which is 63 (Fig. 2). The clock movement gearing i. e., the gearing below the platen holder 10 and gear 221 on arbor 220 and gear 93 on arbor 94, is of the conventional type. The second hand 64 of the visible clock hands (Figs. 1–3) is rotated through the agency of a gear 65 mounted on the second shaft 66 within the platen holder 10. This gear, together with all other gears and pinions in the platen holder 10, except 93 and 221 will be referred to as platen holder gears which, through 93 and 221 are coupled with the clock movement gears and thus with the electric motor 56.

The pinion 62 rotates at a high speed which is reduced and transmits the power of motor 56 to the second hand 64 through a train of gears and pinions of the conventional type (most of them not shown) in the clock movement including 63 (Fig. 2), 86 (Fig. 5), pinion 86^a (Fig. 5), gear 86^b (Fig. 5), pinions 95 and 93 on arbor 94 and platen holder gear 65 (Figs. 3 and 5).

The minute hand 1 of the visible clock is rotated through the agency of a platen holder gear 67 fastened to a hub (not shown in detail) which surrounds the second shaft 66. The power from motor 56 (Fig. 2) to gear 67 (Figs. 3 and 5) is transmitted through a conventional clock movement train of gears (most of it not shown) including pinion 62 (Fig. 2), gear 63, gear 86 (Fig. 5), shaft 86^c, pinion 88, gear 89, pinion 225, arbor 220, and pinion 221. Similarly, the hour hand 2 of the visible clock is rotated through the agency of an hour gear 68 of the platen holder gearing (Figs. 3, 5 and 6) which is fastened on a hub 68^a carrying the hour hand, this hub surrounding the hub of the minute hand. Power is transmitted to platen holder gear 68 through pinion 67^b in the platen holder (Figs. 3 and 6), gear 67^a, and pinion 67^c riveted to gear 67^a. The visible clock hands and their operating platen holder gears are mounted within a recess in the top of platen holder 10 which recess is closed by clock casing 3^a.

The gearing of the clock movement including 62, 63 and other conventional gearing actuates a gear 69 (Figs. 3 and 7) through which the seconds elapsed time pointer 70 and associated seconds dial 17 and rotated through gear 229 fastened to the arbor 104 (Fig. 3). Through gear 69 and shaft 70^b and pinion 70^c fastened thereon (Fig. 3), a gear 70^d rotatably mounted on arbor 101 (Fig. 9^a) directly behind shaft 119 drives through pinion 70^e, mounted on a common hub with gear 70^d, a gear 71 to rotate the minutes elapsed time pointer arbor 103 (Figs. 3, 9, 9^a), pointer 72 and associated dial 16. The gearing is such that the seconds pointer 70 and associated dial 17 are caused to perform one complete revolution during the period of one minute, i. e., during one complete revolution of the visible second hand 64 of the clock. The minutes elapsed time pointer 72 and associated dial 16 are caused to perform one revolution during thirty minutes.

The rotor 56 and pinion 62 are coupled through the gear 63 to the seconds printing pointer 70 through the agency of a gear 226 (Fig. 3). Connected through a coiled spring 227 with gear 69, the latter engages a gear 229 which is mounted on the arbor 104 carrying the seconds pointer 70. The purpose of the spring coupling is not to interfere with the rotation of gear 63 while the seconds pointer and its arbor 104 are pressed up against the ticket. While the seconds pointer and its arbor are thus held against rotation, the gear 69 which remains in engagement with 229, and the gear 226 which is continuously being rotated by the gear 63, will simply wind up the spring 227 for a limited time. The spring is so dimensioned that this may continue for almost a minute. In the meantime the operator will have released the lever 28 or 18, whereupon the coiled spring 227 will unwind until a pin 230, which is carried by the arbor of gear 69, engages a pin 231 on the gear 226.

The upper end of the shaft 94 (Fig. 5) which, through the agency of pinion 93 drives the visible seconds hand 64 of the clock, is journaled in the platen holder 10. Similarly journaled in the platen holder is a shaft 220 which, through the agency of pinion 221 (Figs. 5 and 6), drives the visible minute and hour hands 1 and 2 of the clock. To prevent injury of the shaft bearings, pinions, gears, and shafts, the lower ends of these shafts project through the lower plate 222 of the clock movement and are seated on leaf springs 224 and 223, respectively, fastened to plate 222. These springs will permit up-and-down movement of the shafts 94 and 220, the pinion 95 on shaft 94 and a pinion 225 on shaft 220 being wide enough to insure continuous engagement with the gears 89 and 86^b that mesh with these pinions. The bearings for the upper ends of shafts 94 and 220 are in that part of the platen holder which serves as a casing for the platen gears. These bearings have tapered openings so as to guide the shaft ends into their bearing seats.

If, during adjustment or cleaning of the machine, the time-of-day printing head 15 is displaced so that upon reassembling the machine it is found that the imprint made therewith does not correspond to the indications of the visible hands on the clock, the two may be brought into agreement by moving shaft 220 down against the tension of spring 223 until the pinion 221 disengages its associated gear 67 through which it drives the visible hands. The short end 80 of the key 81 may now be inserted in the keyhole 82 to push the pinion 84 into engagement with the gear 67^a, and thus reset the visible hands 1 and 2 into the position in which the printing dial 15 and associated printing mechanism appears to be. After the visible hand and time-of-day imprint (Fig. 16) are in agreement, the shaft 220 is permitted to be moved up into its normal position by spring 223 (Fig. 5) when pinion 225 is in engagement with gear 89. The visible hands and time-of-day printer may now be set by inserting the short end 80 of key 81 into opening 82 (Fig. 1).

A pinion 73 (Figs. 3 and 7) mounted on the minutes printing shaft 53 is rotated through conventional clock movement gearing (not shown) at the same speed as the minutes hand 1 of the visible clock and, therefore, causes the rotation of the minutes printing pointer 52 in unison with the visible minute hand 1. The gear 50 and the triangular marker 51 carried thereby, are rotated through a train of gears including 50^a, 50^b and 50^c at half the speed of the visible hour hand 2 because the time-of-the-day printing dial indi-

cates 24 hours, whereas visible dial 3 only 12 hours.

It will be seen, therefore, that when the lever 18 is actuated as above described the imprint shown in Fig. 11 will record the hours and minutes as indicated by the visible clock hands.

Since it is important that the indication as shown in Fig. 11 be always in strict accord with the visible clock, means are provided to reset the printing triangular hour pointer 51 and minute pointer 52 in unison with the hour and minute hands of the visible clock without disturbing the balance of the mechanism.

The square, short end 80 of a key 81 (Fig. 6a) is inserted through a key hole 82 in the outer clock casing 3a on the platen holder 10. The key hole may be covered up by a keyhole cover 83. The end of the key 80 will project into a square socket to engage a pinion 84 (Fig. 5) provided within a cavity of the platen holder. It will depress the pinion 84 against the tension of a coiled spring 85 and force it into meshing engagement with the platen gear 67a (Figs. 3 and 6) through which the visible hour and minute hands are rotated. The pinion 84 cannot be depressed farther down, because the shoulder 81a on the key will abut against clock casing 3a. Since, as above explained, the visible hour and minute hands are geared with the clock movement gears in the same manner as the triangular hour printing pointer 51 and minute printing pointer 52, the latter are also rotated in response to the setting of the visible hour and minute hands. The rest of the clock movement mechanism and the elapsed time printing mechanism are not affected during this resetting operation for the following reasons:

The drive from the electric motor 56 to the visible minute and hour hands 1, 2, as well as the time-of-day printing mechanism 51 and 52 is supplied (see Figs. 5 and 5a) through gear 86; hub 87, pinion 88, and then one gear train starting with a gear 89 and leading to the time-of-day printing mechanism 15, 51 and 52, and another train of gears which terminates in the platen gears 65, 67, 68 (Fig. 3).

In order not to interrupt the operation of the motor, a frictional coupling is provided between the pinion 88 and the gear 86, said frictional coupling being shown in detail in Fig. 5a. As shown in the drawings, the hub 87 rotates the pinion 88 through the agency of a friction spring 90. When by means of the key 80 through a train of gears the pinion 88 is rotated in the opposite direction, it will slip over the friction spring. Besides, the hub 87 which is driven with the gear wheel 86 in one direction, is free to rotate with respect thereto in the opposite direction.

When it is desired to set the visible second hand, then the long, square end 91 is inserted in the keyhole 82, whereby the pinion 84 will be depressed against the tension of spring 85 until shoulder 81b on the key engages the clock casing 3a. The pinion 84 will now be in engagement with the pinion 93 which drives the gear 65 and thus the visible seconds hand 64. The shaft 94 carrying the pinion 93 is also coupled with its pinion 95 through a friction coupling like the one shown in Fig. 5a, whereby the gear train which leads to the motor will not be affected and the gear train leading to the elapsed time printing mechanism will continue rotating undisturbed under the control of the clock mechanism.

The operator, having indicated on the ticket, as shown in Fig. 11, the time of the day when the record is made, must now perform the first operation whereby the ticket will be marked, so that later, upon the termination of the period of time, the elapsed time may be recorded thereon. For this purpose the operator will print on the ticket 4 two circular scales 16' and 17' for the elapsed seconds and minutes, and a numeral, in the present case "134", identifying the particular device used in making the record on this ticket. This printed record 17' and 16' (Fig. 12) is made by the dials 17 and 16 in the following manner:

The operator moves the right-hand lever 18 into the forward position against stop 18d indicated in dotted lines in Fig. 1 at 18b. The lever will rotate through the head 19, the shaft 20 in the opposite direction from the direction in which it was rotated in the previously assumed case, as viewed, for instance, in Fig. 9, the double bell crank lever 33, 34, 35, will be rotated in a clockwise direction. The lever 35 is provided with an adjusting screw 100 which engages the lower end of an arbor 101. Fastened to the upper end of this arbor is a T-piece 102 which has two perforations at its ends through which pass, respectively, an arbor 103 and an arbor 104. The arbor 103 carries the elapsed minutes pointer 72 located within the dial 16 and the arbor 104 carries the elapsed seconds pointer 70 located within the dial 17. As best shown in Fig. 3 in connection with pointer 70, a pin 105 projects from the lower surface thereof and engages the dial 17 so that the arbor 104 will rotate the pointer 70 and dial 17 in unison. In a similar manner, a pin 106 couples the pointer 72 with the dial 16 to insure the rotation of the two in unison and yet permit independent vertical movements of dial and pointer.

The T-piece 102 carries also a printing block 107a (Fig. 9) on which the serial number of the device appears, in the present case "134".

The arbors 101, 103 and 104 project through the top plate 55 and bottom plate 222 of the clockwork proper. Below plate 222 these arbors project through cut out portions of a pull-back plate 140. The central opening through said plate is extended into a hub 141 and is large enough to permit free passage of arbor 101. The two side openings are smaller than arbors 103 and 104 and they engage these arbors at grooves 142 and 143, respectively. A pin 144 projects from the arbor 101 through a relatively large opening 145 of the hub 141. The lower end of arbor 101 freely projects through pointer lifter 115. The lower ends of the arbors 103, 104 rest on the pointer lifter.

When, under the control of the double bell crank arm 35 the projecting free end of arbor 101 is lifted up, then this motion will be transmitted through pin 144, hub 141, to pull back plate 140, and the latter will be moved up with the arbor 101 until it encounters the upper ends of the grooves 142 and 143 in arbors 103, 104. From this point on the pull-back 140 will move the arbors 103 and 104 in unison with the arbor 101. It will be seen, therefore, that first the two elapsed time dials 16 and 17 will be moved by means of the T-piece 102 on which their hubs 16a and 17a rest (Figs. 3 and 9), and shortly thereafter, as determined by the width of the grooves 142, 143, the pointers 70 and 72 will be moved up. As clearly shown in Fig. 3 the dials 16 and 17 will be leading the associated pointers 70 and 72 and only the dials will leave their imprint on the ticket because there is a clearance

between the bottom of each pointer and the dial cut by which it is lifted.

The operator will now permit lever 18 to return to its normal position and the T-piece 102, as well as arbors 103, 104 and dials 16 and 17, will drop down into the normal position by gravity aided by a coiled spring 107 provided on the arbor 101.

The operator may now remove the ticket and use the same instrument for making records on other tickets. When the operation which it is desired to record on ticket 4 is completed, then this particular ticket (Fig. 13) is reinserted into the ticket slot as above described, and the operator will rotate the left-hand lever 28 forward into the position indicated in dotted lines 28a in Fig. 1. This will rotate (Figs. 8–10) through head 29 to which lever 28 is keyed, the stub shaft 27 in the same manner as stub shaft 20 was rotated under the control of lever 18. Through arm 24 which projects from casting 25, a link 108 pivoted to the arm 24 at 109 is moved as viewed in Figs. 8 and 9, from left to right. The other end of the link 108 is pivoted at 110 to an upstanding arm 111 of a single bell crank, mounted for rotation on the shaft 41. The second arm of this single bell crank is shown at 112.

A spring 112a has one end hooked to the pin 110 projecting through the arm 111, and its other end to the pin 26 by means of which the casting 25 is pinned to shaft 27. The pin, therefore, will tend to rotate the single bell crank 111, 112 and the casting 25 so as to restore them to the normal position when the handle 28 is released.

When the crank arm 112 is lifted, an adjustment screw 113 provided near its end, engages the end of a short post 114 projecting from the lower face of pointer lifter 115. This will move vertically the two arbors 103 and 104. The pointers 70 and 72 will be lifted and at the same time the pull-back 140 resting on the lower edges of grooves 142 and 143, will also be lifted against the tension of spring 107. This will continue until the lower edge of the hole 145 in hub 141 of the pull-back 140 engages the pin 144 and lifts, through said pin, the arbor 101, T-piece 102 and the dials mounted thereon. Therefore, in this case, the pointers 70 and 72 will be leading the dials 17 and 16 by a length determined by the diameter of hole 145 and thus they will leave their imprint (Fig. 14) rather than the dials on the ticket.

On the pointer lifter 115 is mounted an arbor 119, the upper end of which carries a printing block 120 which will imprint on the ticket 4 the numeral "134" of the machine, but in the position indicated in Fig. 19.

The appearance of the ticket will now be as shown in Fig. 15. The purpose of the circles which are printed with the pointers 70 and 72 is to indicate on the ticket whether it was correctly placed in the ticket slot so as to make sure that the relationship between the pointer indications 70' and 72', and the seconds and minutes scales 17' and 16' will be correct. If the circles are concentric with the dots then the ticket was correctly placed.

From the finished ticket one can determine that it was first placed in device "134" and, therefore, the operation in question was started at 3:45 P. M., and that one minute and twenty-three seconds had elapsed before the ticket was again inserted into the same device "134" and the lever 28 pulled to indicate the termination of the operation in question.

A coiled drag spring 146 is provided on the arbor 103 to prevent accidental displacement thereof by shocks or jars (Fig. 3).

It will be noted that the configuration of the device is rectangular, and that the entire mechanism is compact, whereby it readily lends itself for mounting within narrow confines, e. g., on telephone switchboards.

Briefly to summarize the operation of the machine, when the operator inserts a ticket in the chamber 11 below the platen holder 10, she will first push the lever 18 into the position 18a (Fig. 1) whereupon the time of day will be printed on the ticket as shown in Fig. 11 through the operation of the time-of-day printing mechanism 51, 52, 53, 15. She will then pull the lever 18 into the position 18b (Fig. 1) whereupon the seconds and minutes elapsed time dials will be printed on the ticket as shown in Fig. 12 by means of dials 16 and 17 and the pointers 70, 72 (Fig. 7). The serial number of the machine will also be printed on the ticket by means of the dial 107.

The operator then removes the ticket and the machine will be available for operation on other tickets. When it is desired to indicate the elapsed time, the first-mentioned ticket is again placed in the machine and the lever 28 is moved towards the operator into the position 28a whereupon the minutes and seconds elapsed time pointers 70 and 72 (Fig. 7) will make their imprint on the ticket (Fig. 14) so that the ticket will be as shown in Fig. 15. The serial number will again be printed on the lower portion of the ticket so that it will clearly appear that the ticket was originally placed in the same machine. From the information appearing on the ticket, one can read off that the operation was started at 3:15 a. m. and that the total elapsed time was one minute and 23 seconds.

What is claimed is:

1. In combination, an inking ribbon, a printing dial on one side of said ribbon, means for operating said dial, a printing platen on the other side of said ribbon and spaced therefrom for the insertion of a ticket between the ribbon and the platen, means for pressing said dial against the ribbon, and a ticket plate having a cut-out in alignment with the ribbon and a raised portion along said cut-out gradually to lift the ticket towards the platen as it is slid on the ticket plate into the space between the ribbon and the platen.

2. In combination, a frame, a motor within said frame, an inking ribbon within said frame, means for stretching said ribbon horizontally along the top of said frame, printing dials and cooperating pointers below said ribbon, an operating connection between said dials and pointers and said motor, a printing platen and holding means therefor above said ribbon, said platen being spaced from said ribbon for the insertion of a ticket between them, means for pressing said dials and pointers against the horizontally stretched portion of the ribbon, a guide for said ticket in the platen holder, a stop for the leading edge of the ticket in the platen holder, and a ticket plate on top of said frame having a cut-out in alignment with the horizontally stretched ribbon and a raised portion along said cut-out gradually to lift the ticket towards the platen as it is slid on the ticket plate into the space between the ribbon and the platen.

HENRY ABBOTT.
WILLIAM C. MOODIE.