United States Patent

Futter

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[54] TIME CARD RECORDER

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[73] Assignee: **Heat Timer Corporation**, New York, N.Y.

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[52] **U.S. Cl.** **346/82**, 346/145

[51] **Int. Cl.** **G07c 1/06**

[58] **Field of Search** 346/82–91, 145, 346/141, 79; 197/44–47, 6.4, 6.7; 101/106, 110, 375

[56] **References Cited**

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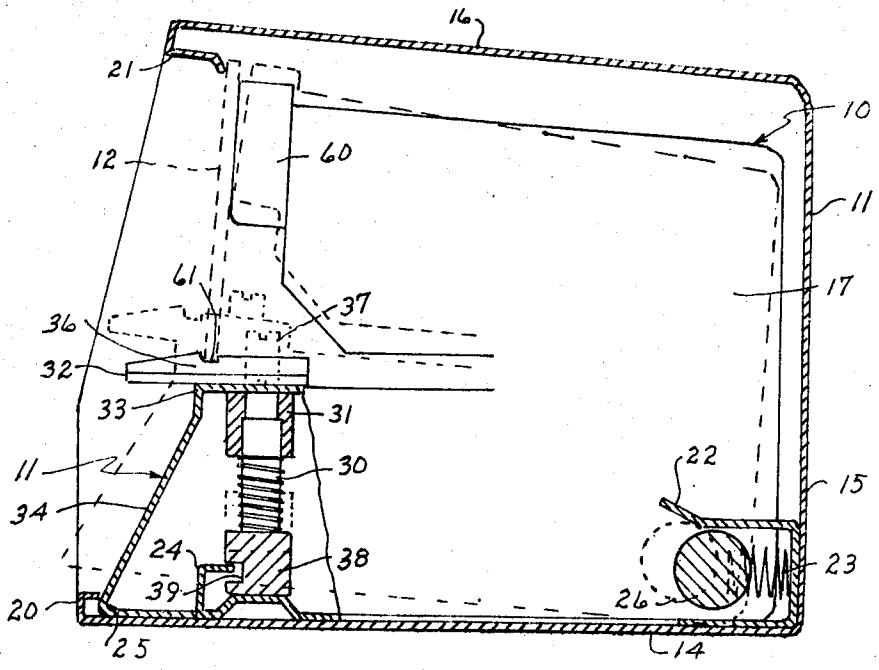
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[57] **ABSTRACT**

A device for recording time of initiation and ending of work periods commonly referred to as a "timeclock" and more particularly certain features of a timeclock. A timeclock should be a precise timing device and safely guarded from any tampering or false recording, therefore in this instance, the timeclock is housed in a foolproof locked housing into which the device is inserted easily, quickly and ready for immediate use or as easily removed by authorized personnel. The timeclock is also provided with mechanized card-handling features to remove the human element, that is, the card when inserted in a slot in the housing is automatically gripped and moved to processing and returned duly processed.

4 Claims, 5 Drawing Figures



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Fig. 2.

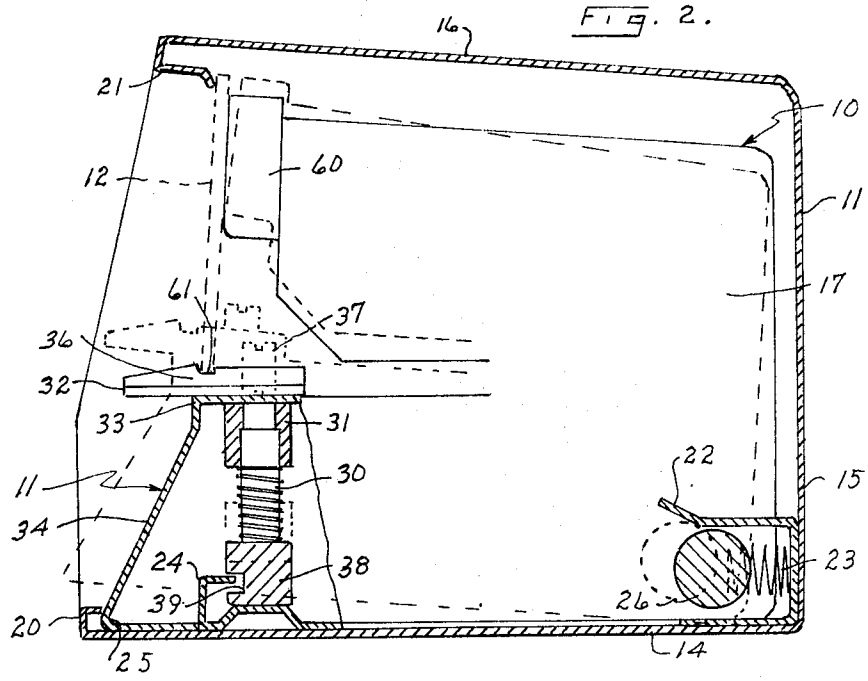
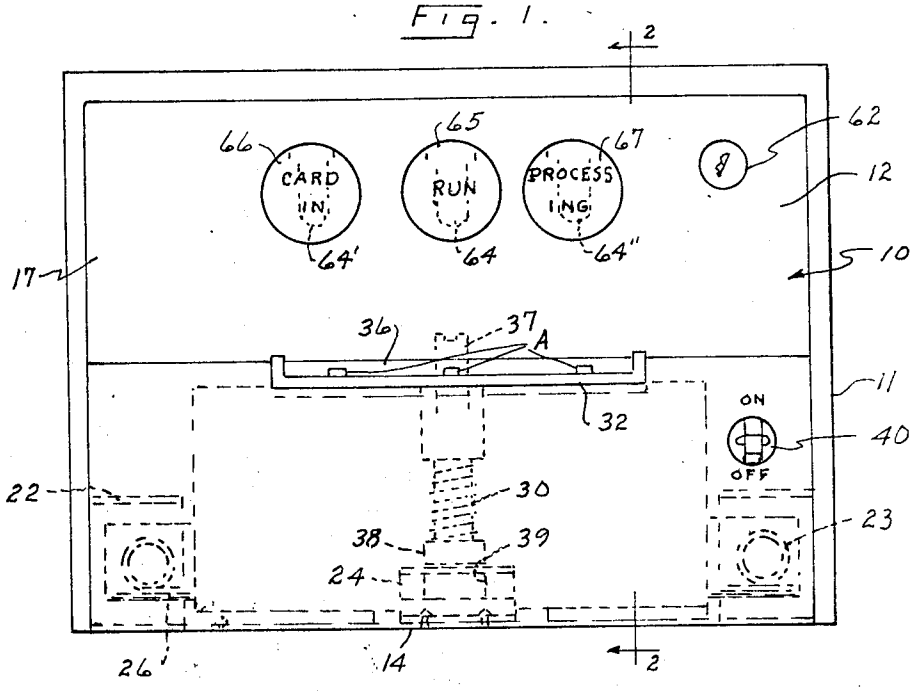


Fig. 1.



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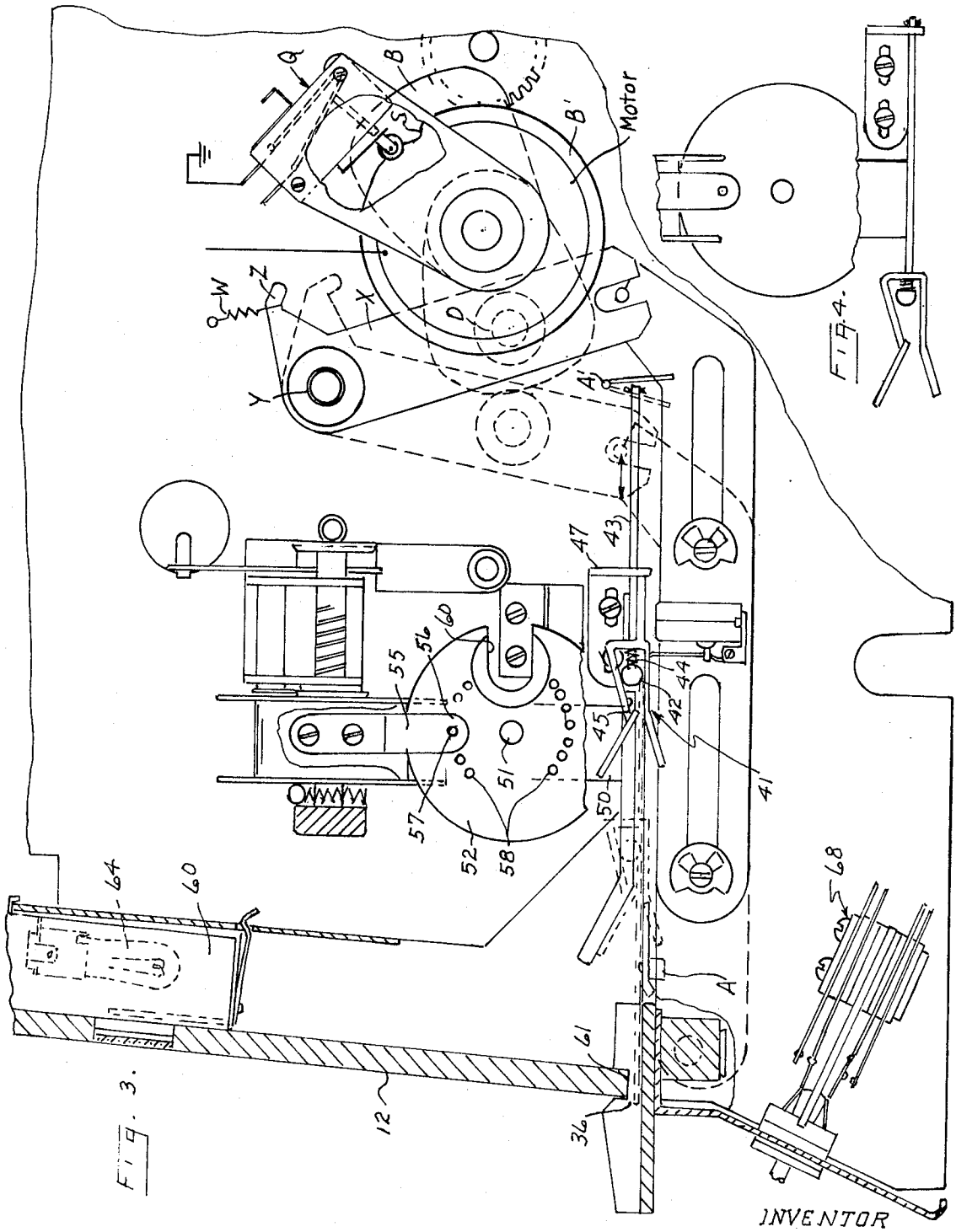


FIG. 4.

FIG. 3.

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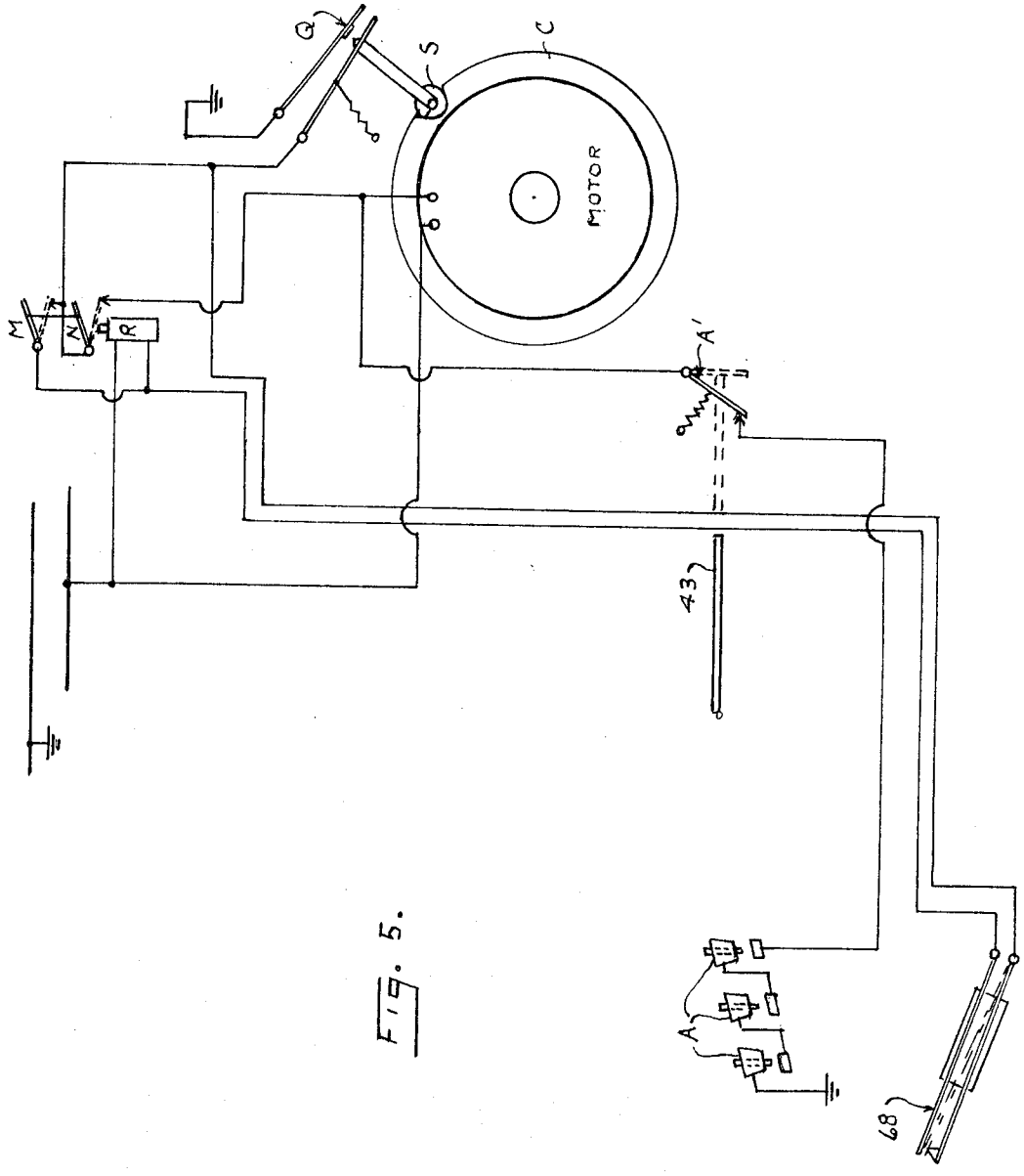


Fig. 5.

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TIME CARD RECORDER

This invention relates to a device for recording times of initiation and ending of time work periods, commonly referred to as timeclocks and more particularly the device comprises a casing into which a timing means may be inserted and locked therein so that a timecard may be inserted into a slot in the casing to a position of initiating the automatic feeding of the card to a position of registration whereupon the time of initiating the work period is automatically marked thereon and the card is ejected. After completion of the time-work period, the card may be reinserted and termination of the time period will be automatically marked thereon and the card again ejected.

It is an object of this invention to impress a time mark on the card, or punching of holes in the card to indicate time, in addition a serial number, key or identity mark may be concurrently placed on the card.

It is a further object to provide a time device or clock that keeps correct 24-hour time as the means of setting the 24 to 0 hour changeover and mechanical means to provide for converting (or reading) this time for punching or printing the time of day or night.

A still further object is to automatically actuate the device by the insertion of the card to trigger the device to RUN, and thereafter to be fed automatically to a position CARDIN and lock the card so that it cannot be moved or removed while the time-recording unit is PROCESSING and subsequently when the recording operation is complete to eject to a position where the operator may remove the card.

A still further object of this invention is to provide a protective casing into which the time recorder clock may be inserted and locked for use and may also be quickly and easily unlocked and removed when not in use.

A still further object of this invention is to automatically lock the timecard when it reaches the printing position and release the timecard after processing.

A still further object of this invention is to provide a printing wheel with serial numbers, keys or identity marks that is quickly and easily mounted and positioned and locked for printing or punching the timecards and is as easily released for removal or replacement.

Other objects of this invention may be apparent by reference to the accompanying detailed description and the drawings in which:

FIG. 1 is a front elevational view of the timecard recorder according to this invention;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is an enlarged detail partly in cross section to illustrate additional components of the device;

FIG. 4 is an enlarged detail of the automatic card lock and release; and

FIG. 5 is a wiring diagram.

Referring to the drawings and particularly FIGS. 1 and 2, there is illustrated a timecard recorder 10 enclosed in a housing 11 and having a removable front panel 12. The enclosing housing comprises a base 14, a back 15, a top 16 and two sides 17 as well as the removable front panel 12. The enclosing housing 11 has an open front with a lower lip 20 and an upper lip 21. Within the housing mounted on the base 14, there is a locking element 24 in the form of a right angular lip, in which the leading edge faces the rear of the housing 11. The time recorder 10 fits within the two lips 20 and 21 and between the sides 17 and is pushed into the housing as illustrated in dotted lines (FIG. 2). At the lower rear, supported on the back 15 are a pair of guide bars 22, one on each side. Within the guide socket formed by the guide bars are springs 23. The timecard recorder is not as wide as the housing in the rear and is provided with a short protruding circular bar 26 on each side to fit between the guide bars 22 and the base 14 and abut with the springs 23. The recorder is also provided with a lower front edge 25. When the recorder has been pushed toward the back of the housing to compress springs 23 with the bars 26, the front lower edge may be dropped within the front lip 20 of the housing and the lower front edge 25 will be pushed by the compressed springs 23 to thus abut with the inner face of lip

20 as shown in full lines in FIG. 2. To lock the recorder in this position, there is provided a bolt 30 mounted through a block 31. Block 31 being welded under the card insert tray 32 and the tray 32 fixed to a horizontal supporting edge 33 of the front 34 of the recorder. The bolt 30 is approximately at the center of the recorder as shown in FIG. 1 and in its released position, extends upward into the card slot 36. Thus a card can never be inserted until the recorder is locked in the housing. To lock the recorder in place, the screwhead 37 is pushed downward forcing the bolt 30 downward until the lower end 38 of the bolt abuts with the base 14. The lower end 38 has a groove 39 in the front that will align with the locking element 24. Thus when the recorder is inserted in the housing, the screwhead 37 should be depressed to place the lower end 38 of bolt 30 in position to lock. With the bolt 30 in position as shown in FIG. 2, the screwhead 37 may be turned clockwise thus taking up or shortening bolt 30 until the lower end 38 securely grips the locking element 24 and thus holds the recorder as illustrated in FIG. 2 ready for operation and clearing the screwhead 37 to permit entry of a card through slot 36.

The recorder is plugged in to 110 AC and the exact time is set so that the recorder will continue to operate as long as it is plugged in and connected to 110 AC. There is a card-carrying carriage 41 mounted in back of slot 36 so that when a timecard is entered through a slot 36, the front edge of the card will trip switches A to, in turn, energize and drive an electric motor; the motor drives the card carriage 41. When the card is fed into the element 41, within element 41 there is a cam 42 mounted on a rod 43 that is pressed forward by a spring 44. The carriage 41 has a cam face 45 that is slanted downward so that cam 42 as it is pressed outward by the spring 44, it will be exerting pressure on the card edge that has been inserted along the card slot and under cam 42, thus gripping the card. The front edge of the card will trip or close switches A. Switches A are connected in series to a switch A', and in turn to one side of the driving motor. The opposite end of the circuit is connected to a ground. Thus due to the motor being connected to the hot side of the powerline on the opposite side, with all switches closed the motor will be operated. The motor shaft is connected to drive a camshaft C. A cam B is mounted on shaft C and it will rotate with the shaft C. Cam B bears against a roller D and roller D is freely rotatable on an arm X. Arm X on one side of the device and arm X' on the opposite side are affixed to rotate with the shaft Y. Arms X and X', have a projection Z for the end of a spring W to be attached, the spring being mounted with a tension to exert a pull on Z. Thus the roller D will be retained to bear against cam B at all times. The switches A being closed by the card and the motor operating to rotate cam B until it reaches a predetermined point and arms X and X' will be in the full line position as illustrated in FIG. 3. At this extended position, switch A' is opened by the abutment of element 41 with the switch and the ground is removed from the operating circuit to the motor; this stops the motor and the card is in the print position. The carriage 41 is thus moved to the right, FIG. 3, until the card is in the recording position, this is an automatic operation. The card is stopped at this point for processing (recording). When the card has been processed, by a clock-operated printer, the retract or card return switch 68 may be closed. By means of the circuit when the switch 68 is closed, a ground is provided to the relay R and due to its connection to power on the opposite side, the relay will be energized and pull switches M and N closed, thus a ground is connected to the motor to operate same. The motor as already explained will rotate cam B and as it turns the cam bearing against roller D will push arm X and X'. Since both arms are pivotally attached to the carriage on either side, they will push the carriage 41 to the left, FIG. 3. At the same time camshaft C is also rotating a cam B'. Cam B' has a microswitch Q with a roller bearing on the periphery of the cam. Cam B' has one cutout portion S so that when the roller reaches this position and momentarily opening switch Q to remove the ground connection and the motor stops, the relay opens and the circuit is reset for the next card. When the

carriage reaches the position indicated in dotted lines, rod 43 will have moved to the left, FIG. 3. At the end of rod 43 there is a stop such as a cotter pin that will abut with the casing 47, stopping the movement of rod 43. The carriage 41 moves slightly further to the left, thus the cam 42 is moved away from cam surface 45 and thus compressing spring 44 and releasing the card that was held by cam 42. The card is moved to the left, FIG. 3, and ejected through the card slot. For purposes of identification, the printing pedestal 50 supports a shaft 51 adjacent the clock printer upon which a printing wheel 52 may be mounted. The disc may be rotated to a printing position and any one of a plurality of positions may be selected. To provide easy mounting or removal of wheel 52, the wheel is provided with a cutout portion 60 and the pedestal 50 is provided with a spring lock 55 that bears against the outer face. Lock 55 is in effect a spring leaf fastened by bolts to the pedestal 50. The opposite or loose end 56 is provided with a projecting halfround button 57 that will be pressed into setting holes 58 in the face of wheel 52. Each setting will align a particular identification mark in position for printing. Thus the wheel 52 may be easily mounted or removed and a particular identification may be chosen and set.

Various other components of the device are not described as they are not a pertinent part of this invention. It is to be understood that when the recorder mechanism 17 has been inserted in the housing 11 and locked in position as described, the front of the casing from the tray 32 to the lip 21 will be open. Therefore to insure the device 17 being locked within the housing 11, the front panel 12 is inserted to bear against a lock and light housing 60 with its upper edge positioned behind lip 21 and its lower edge inserted in a notch or groove 61 in the slot 36. There is a lock 62 in the front panel 12, the lock mating with the housing 60 so that the lock permanently affixes the panel 12 in the position as illustrated in the figures. Thus when the device 17 is mounted in the housing 11 and the lock 62 locked, the device is securely retained within the housing until the lock 62 is again opened to permit the removal of panel 12 and the removal of the device from the housing. It is also to be understood that when the device 17 is mounted in the casing 11 and the device is connected to a 110 power supply, the device is ready for operation. When operation commences, the motor (not shown) is connected to a lamp 64 in the housing 60 to energize same. The lamp 64 is aligned with a transparent window 65 in the panel 12 which indicates that the motor is running. Upon the insertion of a card in slot 36, the trigger switches A are actuated to start the mechanism. In addition, the switches A are in series and will energize another lamp 64' in the housing 60 which illuminates a transparent window 66 in the cover panel 12 which shows that the card is in. When the card trips switches A and the card is gripped by the carriage 41, the card will be carried to the processing point under pedestal 50. Upon reaching this point for processing, a further switch A' is actuated and the switch will illuminate a third lamp 64'' which illuminates a transparent window 67 indicating processing. This lamp remains illuminated until the recording operation has been completed. When the card carriage mechanism moves forward to eject the card, the processing lamp 64 is no longer illuminated. When the carriage 41 reaches its full forward position to eject the card, the lamp 64' is no longer illuminated and the machine is ready for the next card insertion. In addition it is to be remembered that the motor operation to eject the card is controlled by the button 40 and button 40 is connected to a switch 68 so that button 40 may be pushed for ejection of the card and may be released as the relay retains the ground to the motor. The opening of switch A stops the operation of the motor and of course will black out the lamp 64 indicating that the machine is no longer running. Thus with the device shut off, the lock 62 may be opened, the panel 12 removed and the mechanism 17 removed from casing 11. It is to be understood that the timeclock must be accurately set each time the device is mounted within the casing 11 and after the apparatus has been plugged in.

Although we have described a timecard recorder which is primarily designed for recording the time of employees for their starting time and quitting time, each employee inserting his card to record the duration of time of his particular occupation or labor, however this device is also to be used in various other ways to record elapsed time for any desired recorded operation, travel, etc. For example, a flight operation of a plane may be recorded by the insertion of a card at the beginning of the flight, that is, departure and may be recorded at the end of the flight, that is, arrival, to keep an accurately recorded record of flight operations. Various other uses may be apparent without departing from the spirit of this invention.

I claim:

1. The combination of an open time recorder mechanism, a locking panel and a casing to enclose and protect same, in which the casing is completely closed except for an open front large enough for the time recorder mechanism to pass through, said open front provided with a raised and inwardly turned lip along the lower edge, said inner rear wall of said casing provided with a spring-biased circular bar against which the recorder mechanism bears when mounted, said base of said casing provided with a locking element positioned centrally adjacent the open front, said front edge of said recorder mechanism abutting said inwardly turned lip to retain and position said recorder mechanism and a single threaded bolt with a grooved base element mounted horizontally through the bottom of said card slot and extending to a position to abut with said locking element, said bolt turned to take up the grooved base element until the locking element is engaged to tightly retain the recorder mechanism to the casing and said locking panel mounted in said open front above said card slot and locked to said casing.

2. In a device according to claim 1 in which said time recorder includes a card slot that includes a plurality of switches that are closed by pressure of the card thereon, said card slot positioned adjacent and in front of a card carriage, said card carriage including a card-gripping cam lock to grip the edge of said card when it is inserted through said card slot, said switches in said card slot when closed energizing through a circuit the operation of a motor, said motor rotating a cam that bears against a lever to control the movement of said card carriage and said carriage bias in one direction of movement by a spring, a normally closed switch means in said circuit that is opened when said card carriage reaches a printing position, a continuously operated clock printer that is actuated when said card is in the printing position, and a card-ejecting switch to energize said motor and by means of said rotating cam move said card carriage toward the card slot to eject said card, and a cam driven by said motor to break said circuit when said card carriage reaches its extreme ejecting position and an automatic mechanical cam release released at the fully extended forward position of the card carriage to release the card-holding cam lock.

3. In a device according to claim 1 in which said time recorder includes a removable printing wheel mounted on one side of a pedestal and includes a central pivotal shaft mounting for rotation of said wheel, a slot cutout slightly less than the radius of said wheel and a retention spring fastened to the pedestal side of said printing wheel and passing over said wheel to bear against the side of said wheel opposite to said pedestal, said retention spring being of a size less than the slot cutout to permit removal of said wheel when the spring aligns with said slot.

4. In a device according to claim 3 in which the face of said wheel away from said pedestal includes stops that mate with a projection on said retention spring and also align with printing indicia on the circumference of said wheel, means to set said printing wheel at any desired stop for printing the preselected indicia and manual means to release said retention spring and rotate said wheel to align said slot with said retention spring to remove said printing wheel.

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