

Oct. 10, 1933.

P. M. FARMER

1,930,265

TIME RECORDER

Filed Sept. 5, 1930

3 Sheets-Sheet 1

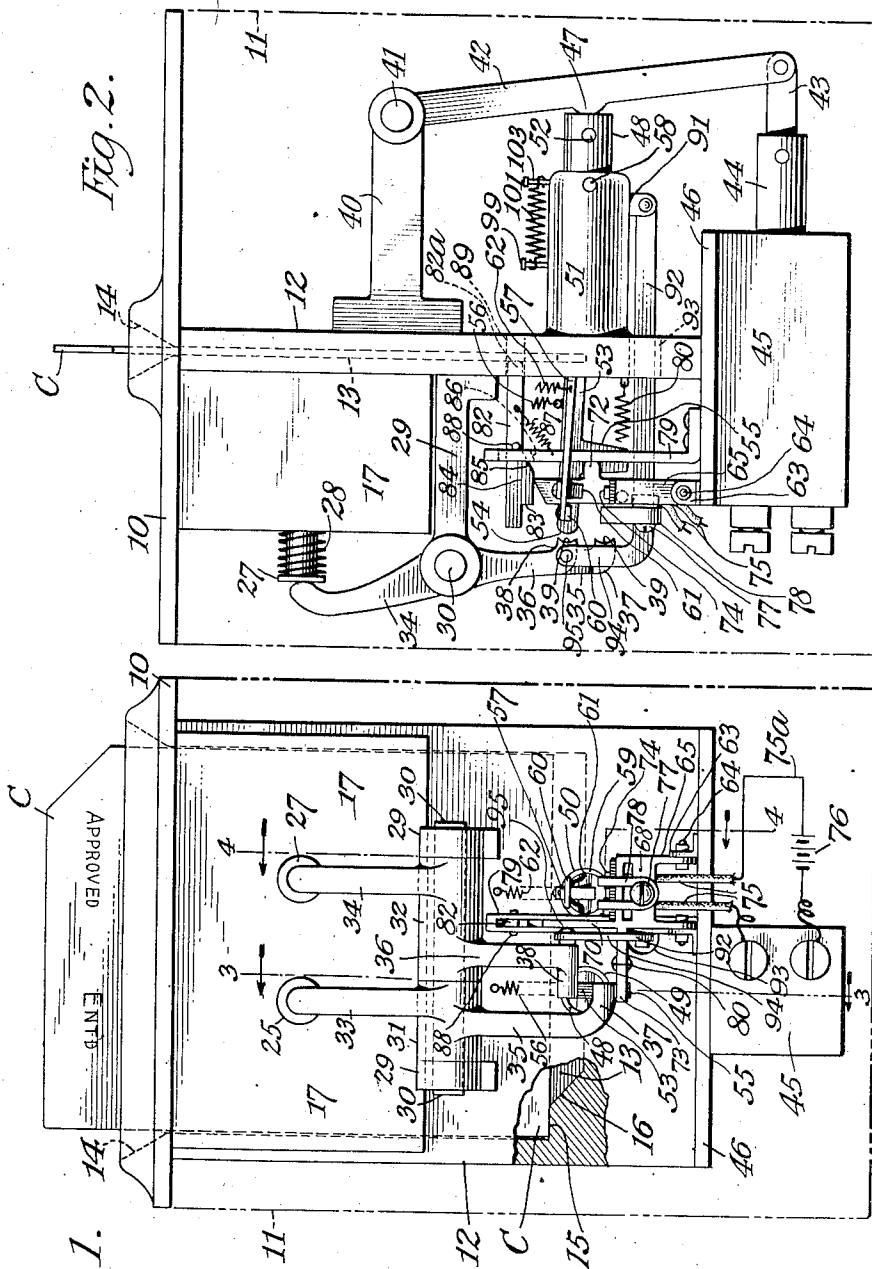


Fig. 1.

Fig. 2.

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3 Sheets-Sheet 2

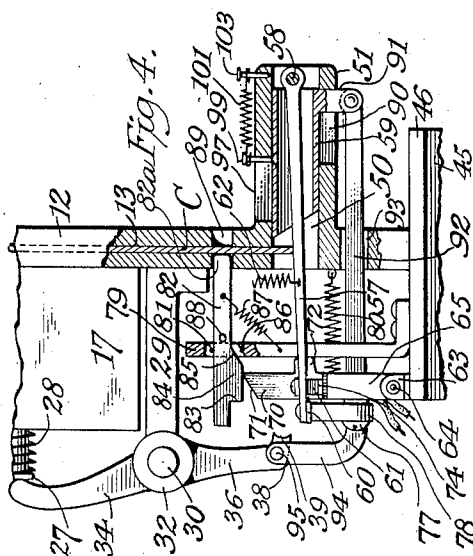


Fig. 3.

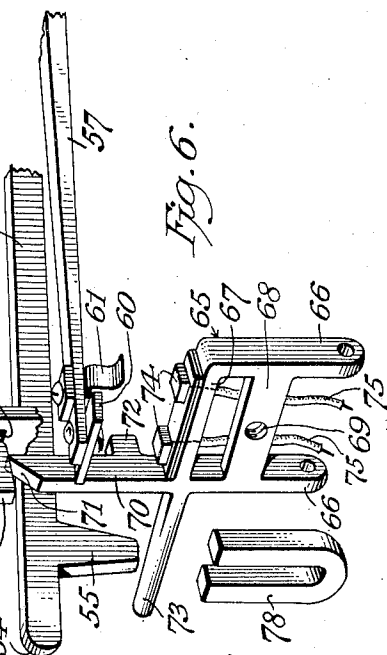
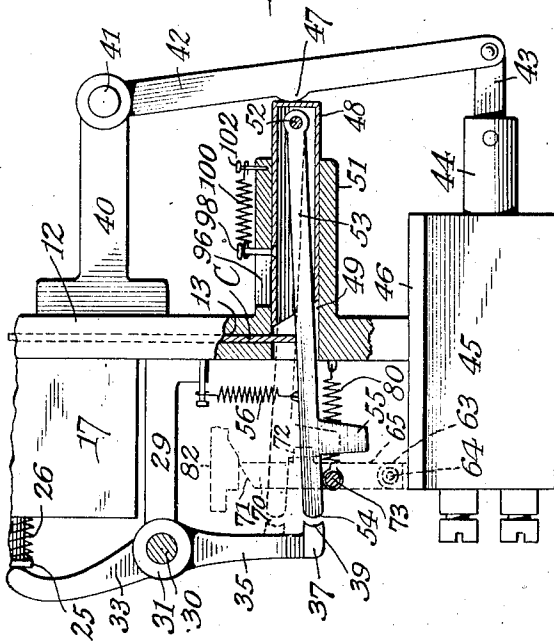


Fig. 6.

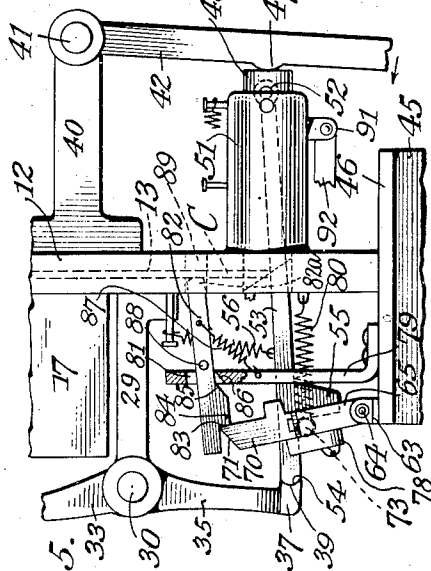


Fig. 5.

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3 Sheets-Sheet 3

Fig. 9. c

EMP. NO.	NAME	DEPT.	JOB NO.	STARTING TIME
ELAPSED				
HRS.	MINS.			
9	22			
ASSIGNMENT:				
JUN 16, PM.				
HRS. RATE AMT.				
150				
APPROVED				
ENTD				

Fig. 8. c

EMP. NO.	NAME	DEPT.	JOB NO.	STARTING TIME
ELAPSED				
HRS.	MINS.			
9	22			
ASSIGNMENT:				
JUN 16, PM.				
HRS. RATE AMT.				
150				
APPROVED				
ENTD				

Fig. 7. c

EMP. NO.	NAME	DEPT.	JOB NO.	STARTING TIME
ELAPSED				
HRS.	MINS.			
ASSIGNMENT:				
JUN 16, PM.				
HRS. RATE AMT.				
150				
APPROVED				
ENTD				

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UNITED STATES PATENT OFFICE

1,930,265

TIME RECORDER

Paul M. Farmer, Maplewood, N. J., assignor, by
mesne assignments, to International Business
Machines Corporation, New York, N. Y., a
corporation of New York

Application September 5, 1930. Serial No. 479,892

20 Claims. (Cl. 234—43)

This invention relates to improvements in time recorders which may be employed for a number of purposes, but as herein embodied, is shown to function for recording elapsed time consumed by an employee in finishing an assignment or job, such as a machine shop job i. e. making a tool, boring a cylinder, etc.

An object of the invention is to provide an automatic device of the character set forth for recording individual elapsed time, or other measurable quantity on any number of independent cards, tickets and the like.

Another object of the device is to provide means operable by contact with a time card when inserted in said device, for printing and notching or punching said card automatically, the functions occurring simultaneously.

Another object is to provide a recording device for automatically selecting the action required for each separate stage of completing the record, the selecting action being controlled by the card to be stamped.

An important use for devices of this character is for recording the time of individual workmen on various tasks for cost accounting purposes, and as the workmen may receive different rates of pay, the device would be supplied with means for making time records in hours and minutes, or in hours and tenths or hundredths. When used in business places where a fixed hourly rate is charged, such as in billiard parlors, the device would be time actuated but the records would be made in dollars and cents; the amount being the product of elapsed time and rate per hour.

Various variations and modifications may be employed for accomplishing the results above set forth and I reserve the right to all such variations and modifications as may fall within the scope of the invention claimed.

In the drawings, I have illustrated a preferred embodiment of my improved time recorder including card operated selecting devices and punch operating switches, and have employed similar reference characters to designate corresponding parts throughout the several views, in which:

Fig. 1 is a front elevation of the improved time recorder, a part of the structure being broken away to show a time card inserted upside down and resting on a lock-out ledge which prevents further travel to the bottom of the card pocket, thus no operation can take place; the parts of the device being in the normal inoperative position;

Fig. 2 is a side elevation of the time recorder shown in Fig. 1;

Fig. 3 is a partial sectional fragmentary side elevation of the device with a time card in the card pocket and resting on the bottom thereof and in contact with and depressing a selector bar to the position for recording the starting time on the cord, and for punching the first notch in the lower edge thereof, the section of the parts being taken about on the line 3—3 of Fig. 1;

Fig. 4 is a partial sectional fragmentary elevation, the line of section being generally indicated as about on the line 4—4 of Fig. 1, and showing the card depressing a contact bar to establish an electric circuit for operating a punch for cutting the said first notch in the bottom edge of the card;

Fig. 5 is a fragmentary side elevation showing the parts at the end of the recording and punching operation, these functions occurring simultaneously.

Fig. 6 is a fragmentary perspective view of some of the principal parts of my device, in the normal inoperative position;

Fig. 7 is a face view of a time card employed in association with the time recorder shown and before the recording operation;

Fig. 8 shows the same card as initially stamped and notched, when a job has been started;

Fig. 9 shows the same card as finally stamped and notched, when the job is finished.

I will now proceed to describe the structural parts of the improved device; the terms employed to designate said parts, being terms of description only, and not of limitation.

From a head plate or cover 10, supported on a suitable casing, here indicated by dot-dash lines 11, pends a slab-like frame 12, provided with a card receiving pocket or slot 13, having a flaring mouth 14, extending above the plate 10, and a lock-out ledge 15, in one corner thereof, here shown in Fig. 1, as the lower left corner, which has a fillet 16, sloping downwardly and inwardly from said ledge; the ledge and fillet forming an important feature of this invention.

Secured in a desired manner to the head plate or cover 10, and to the frame 12, is a box like clock casing 17 which contains old and well-known clock controlled printing mechanism for selectively printing on a time card C, said card being illustrated in Figs. 7 to 9 of the drawings.

The printing mechanism (not shown) required to print a time card with cost accounting data as shown in Fig. 9, may consist of an elapsed time recorder operating on a well known princi-

pie wherein a spring driven or an electrically driven clock, drives three shafts in timed relation to each other.

One of these shafts carries a printing wheel 5 of more or less conventional clock form, for printing the time of day indicated by a dial 5 and pointers 23 and 24, see Figs. 8 and 9. The second of these shafts may carry a printing dial wheel which is marked off in divisions of sixty minutes and rotates once in sixty minutes. The third shaft may carry a printing dial wheel which is marked off in divisions of eight hours and rotates once in eight hours.

The second and third shafts described, are for printing the elapsed time as shown at 9 on the time card C, in Figs. 8 and 9 of the drawings, subsequent to printing the dials 19 and 20 thereon.

In addition to the dial printing wheels above described independently controlled elements for printing the pointers 21 and 22 are employed.

The pointer printing elements rotate at the same speed as their companion dial wheels and normally point to the zero mark on said wheels. If therefore the dials 19 and 20 be printed at the beginning of a period to be measured, and the pointers printed at the end of the period, they will indicate how far the mechanism has advanced in the interim, the result being the elapsed time.

The printed impressions may be made through an inked ribbon of approved type.

Referring to Figs. 1 and 2 of the drawings, and for the purpose of the following detailed description of the structural features of the time card controlled mechanism, we may assume the printing of the dials 19, 20 and the clock dial 5 and pointers 23 and 24 is controlled by depressing a plunger bar 25, against the thrust of a restoring spring 26, while the printing of the pointers 21 and 22 is controlled by the depression of a plunger bar 27 against the thrusting action of a restoring spring 28, (Figs. 3 and 4). A mechanism suitable for actuating the printing dials is disclosed in the U. S. patent to H. Abbott, No. 583,320 of May 25, 1897.

Located directly beneath the clock casing 17, and supported on the frame 12, are outwardly directed bracket arms 29 for supporting a horizontal shaft 30, which carries a pair of rock sleeves 31 and 32 each having an upwardly directed arm 33 and 34 respectively for operating the respective plunger bars 25 and 27, and each of said sleeves 31 and 32 is further formed with a downwardly directed arm 35 and 36 respectively, the ends of said arms 35 and 36, having inward, vertically aligned extensions 37 and 38, respectively, which are provided with sockets or recesses 39 so that either may be engaged selectively by a selector bar, hereinafter described.

Secured to the rear or opposite side of the frame 12, is a backwardly extending bracket 40, for supporting a shaft 41, from which an oscillatory lever or bar 42 is pivotally suspended, its lower end being connected by a cross pin, to a link 43, which in turn is pivotally connected to a core or armature 44, of an electro-magnet 45 attached to a platform 46 fixed to the frame 12. Midway of its length, the lever 42, is formed with an arcuate lug 47, which rests against the outer closed end of a tubular punch member 48, slidably received in one of two parallel cylindrical bores 49 and 50, provided in a rearwardly extending boss 51, constituting a part of the frame 12, the bores 49 and 50 being at right angles to the card pocket 13 in the frame 12, and the

horizontal bottom line of said pocket being in alinement with the central or axial line of said bores.

Having its rear end pivoted on a cross pin 52, within the tubular punch 48, is a selector bar 53, which extends forwardly through the said punch and outwardly through the bore 49, and terminates in a rounded end 54, close up to the sockets 39, at the ends of the arms 35 and 36, and this selector bar has a limited vertical swinging movement in line with the said sockets in said arms, as will presently appear.

The selector bar is provided with a depending lug 55, rearward of its free end for the purpose hereinafter described and the forward end of said bar is normally held in an elevated position opposite the socket 39 in the arm 36, by a pull spring 56. This raised position being shown in Figs. 1 and 2, of the drawings, and indicated by dotted lines in Fig. 3, but when a time card C is dropped into the pocket and is pressed to the bottom of said pocket, the outer end of the selector bar 53 will be urged downward against the pull of the spring 56, to the position shown in Figs. 3 and 5, with its rounded end opposite the socket 39, in the end 37, of the arm 35.

In its passage to the bottom of the pocket 13, the time card C will also engage a contact bar 57, which is pivoted on a pin 58, extending across the rear end of the second bore 50 of the frame 12, and said contact bar extends forwardly and centrally through a second tubular punch 59, and the said bore 50, and at its free end the contact bar carries an armature 60, of magnetic material, and a resilient insulated electric contact device 61, said contact bar being maintained in and restored to its normal raised position by a spring 62.

Mounted at the forward edge of the platform 46, to oscillate between spaced perforated ears 63, on pivot bolts or pins 64, is a frame 65, (see Fig. 6) preferably constituted by side legs 66, connected by a table bar 67 and a lower cross bar 68, provided with a tapped bore 69. One of said legs 66, the inner leg, is extended upwardly to provide a trip bar 70, having a tapered nose 71 and a backwardly directed lug 72. The frame 65 is further provided, about in alinement with the table bar 67, with a laterally extending bar or pin 73, against which the lug 55 of the selector bar 53 impinges in its outward movement, thus swinging said frame 65 forwardly or outwardly to break certain circuits hereinafter described.

Disposed on the table bar 67 of the frame 65, are spaced insulated contacts 74, from which, conductors 75, extend into a circuit 75a, which connects a source of electrical energy 76, to the opposite poles of the electro-magnetic device 45, see Fig. 1.

Attached to the cross bar 68 of the frame 65, by a screw 77, is a preferably horse-shoe magnet 78, arranged with its poles slightly higher than the spaced contacts 74 and to which the magnetic bar or armature 60 is attracted when the contact bar 57 is depressed, at which time the two ends of the resilient contact device 61, will be in engagement with the spaced contacts 74 on the frame 65; the magnet 78 and its armature 60 at this time functions to maintain positive electrical contact between the elements 61 and 74, to energize, through the circuit 75a, the electro-magnetic device 45, to operate the punches 48 and 59, as will presently appear.

Secured to the platform 46, is a vertical bracket 79, against which the lug 72, of the swingable frame 65, is normally held by a pull spring 80, 150

anchored at one end to the frame 12 and secured at the opposite end to the lateral bar 73 of said frame. The bracket 79, near its top has a slot 81, through which a lock-bar 82, having an inner or tail end 82a operates. This lock-bar as shown in Figs. 2, 4, 5 and 6 has a shoulder 83, near its front end which forms the front wall of a head portion 84 which terminates rearwardly in a cam face 85 which engages, in an operative step of the mechanism, with a cam face 86, at the bottom of the said slot 81, see Figs. 4 and 5.

Tensioned between the lock-bar 82 and the upright bracket 79, is a spring 87, acting to draw the said lock-bar forwardly, the movement being limited by a stop pin 88, normally resting against the rear face of the bracket 79. The rear end of the lock-bar rests loosely in a cross slot 89, extending through the frame 12 and across the card well or slot 13, as shown in Fig. 4.

Depending through a slot 90, in the boss 51, is a perforated ear 91, to which is pivoted a link 92, which extends forwardly through a slot 93 in the frame 12 and has an upturned forward end 94, which is pivoted at 95, to the lower end of the arm 36.

The wall of the boss 51, over the bores 49 and 50, is provided with longitudinal slots 96 and 97 respectively, in which operates pins 98 and 99, extending upwardly from the tubular punches 48 and 59 respectively, and to these pins, the ends of tensioned springs 100 and 101 respectively are attached; the other ends of said springs, being secured to fixed pins 102 and 103 on the rear end of said boss, see best Figs. 3 and 4.

The operative action of the lock-bar and coacting elements may be more clearly described as follows:

The spring 87, tends to hold the lock-bar 82 in the position best shown in Fig. 4, with the head portion 84 resting, with some tension on the nose 71 of the trip bar 70, with the stop pin 88, pressing against the rear face of the bracket 79. In the normal position shown, the inner or tail end of the lock-bar is barely clear of the card well or slot 13, so that it does not interfere with the insertion of a card into the said slot. The shoulder 83 engages the nose 71 of the trip bar should it be swung forward as above stated, and if there is a card in the slot to resist the thrust of the lock-bar, produced by the pull of the spring 80, through the thrust of the trip-bar's nose on said shoulder 83, the parts will remain in the position shown in Fig. 5, but should there be no card in the slot 13, the inner or tail end 82a of the lock-bar 82 is free to move backwardly in said slot 89 past the card slot 13, until the said trip-arm 70 is drawn back to its normal position with its lug 72, resting against the upright bracket 79.

In this movement, the cam face 85 of the lock-bar 82, rides up the cam surface 86 of the slot 81 in the bracket 79, and into and through said slot 81, thus raising the outer end of said lock-bar so that the shoulder 83, thereof clears the nose 71, of the trip-bar 70, after which the spring 87, will restore the lock-bar to its normal position for another notching operation.

The general operation of the time recording device may be described as follows:

The blank cards C, are first printed with desired indicia 150, and preferably the lower left corner of each is cut away to produce a corner notch 110, this is to prevent operation of the recorder when the card is inserted incorrectly. If the card be inserted in any but the correct position, a corner will engage the ledge 15 of the

card slot 13, and said card cannot be pressed to the bottom of the slot, which is the correct operative position. When inserted correctly, the notched corner 110 clears the ledge 15, permitting the card to be pressed to the bottom of the slot.

In this downward movement of a correctly inserted card, the bottom edge thereof will engage the selector bar 53 and contact bar 57 and move them down to the lower limits of their travel, as hereinbefore described and as shown in Figs. 4 and 5 of the drawings respectively.

Depression of the selector bar places its outer rounded end opposite the socket in the lower end of the arm 35. Depression of contact bar 57, closes the electrical and magnetic circuits above described; the closing of the electrical circuit energizes the electro-magnet 45, to draw its core 44 inwardly, thus drawing the lower end of lever 42 through link 43, to the left as best shown in Fig. 5 of the drawings:

This action forces the punch 48 forward, punching a semi-circular piece from the lower edge of the card to form a starting notch 111. In its movement the punch 48 carries with it the selector bar 53, which forces the arm 35 outwardly on its pivot 30, which causes the upper arm 33, on sleeve 31, to depress the plunger bar 25, which causes the recording mechanism to print the clock face 5 and its pointers 23 and 24, thus showing the starting time, and the two dials 19 and 20 only, for recording elapsed time; and near the end of its travel, the lug 55, on the selector bar 53, contacts with the lateral bar 73 on the frame 65 and swings it forward breaking the electrical contacts and deenergizing the electro-magnet 45.

The pulling action of spring 100 returns punch 48, lever 42 and core 44 to the normal position. The card being notched out over the selector bar 53, it will also be returned to its normal position by the up-pull of the spring 56.

If the card be now removed, it first removes pressure from the contact bar 57 which will be raised or restored to its normal position by the spring 62, and as the bottom of the card C is raised above the cross slot 89 in the frame 12, it removes the thrust support from lock-bar 82 permitting the frame 65 and its associated parts to resume their normal positions as above described.

The card will be found upon removal from the device to be notched and printed as in Fig. 8 of the drawings for beginning the period to be measured.

If at the end of the period to be measured, the card be again properly inserted in slot 13 and pressed until the lower edge reaches the bottom of said slot, it will now have no effect on selector bar 53, since the arc of the notch from the previous or starting operation clears it, but the card does however depress contact bar 57, thereby bringing about the same cycle of operation as previously described, except that selector bar 53 is left in its normal raised position with its rounded end opposite the socket 39 of the arm 36, so that when the electro-magnetic device 45 is again operated, to force the selector bar forwardly, the arm 34, on the sleeve 32 with the arm 36, will depress plunger bar 27 and print the pointers 21 and 22 on the card, which completes the record of elapsed time.

At the time the lower part of arm 36 is forced outwardly, it carries the connected link 92 with it, thus drawing the punch 59 with it to cut a

notch 112 above the said contact bar, this second notch being the finishing notch, and the last operation.

The above operations complete the time card according to my invention, and as punched or notched, the card cannot again be employed for further operation of the recording device, so that perfect cards properly inserted must at all times be used, preventing inaccurate recording and providing perfect cost accounting records.

What I claim is:

1. In a device for making records on cards, consisting of a frame having a card receiving slot therein and a slot crossing said card slot; punches operating across the card slot; printing means; a contact bar also extending across said card slot; a power device; a power circuit connected therewith; a movable frame having electrical contacts thereon; means controlled by the insertion of a card in said card slot to energize said circuit and power device for operating the punches and printing means and for moving said frame to break said circuit; a lock-bar having its rear end resting in said cross slot and against the card in said card slot for holding the circuit open, and means when said card is removed from said cross slot, for returning the movable frame and lock-bar to the normal position.

2. In a card record printing device having a slot for the reception of cards; operating means actuated by said cards; selector means also actuated by said cards; and punching means selectively operable by said operating means for punching a card to render said card incapable of again actuating the said operating and selector means.

3. In a card record printing device having a slot for the reception of cards; operating means in said slot actuated by said cards; selector means in said slot also actuated by said cards; and punching means associated with said selector means and selectively operable by said operating means for punching a card to render said card incapable of again actuating the said operating and selector means.

4. In a card record printing device having a slot for the reception of cards, operating means actuated by said cards; selector means also actuated by said cards; and punching means selectively operable by said operating means for punching a piece from the end of said cards; said operating means comprising an electro-magnet, said operating means crossing said slot in the path of movement of said cards in said slot.

5. In a time recorder having a card receiving slot; operating means actuated by cards in said slot; a selector means also actuated by cards in said slot; and means selectively operable by said operating means for punching curved recesses in the outer ends of the said cards for making a record in said cards, and for rendering said cards incapable of further use as an actuating element for the operating and selector means.

6. In a card record printing device having a slot for the reception of cards, operating means actuated by said cards in said slot; selector means also actuated by the cards in said slot, and punching means selectively operable by said operating means for punching a piece from the end edge of said card for making a record, one punch of said punching means being directly associated to move with said selector means.

7. In a card record printing device having a slot for the reception of cards, operating means including a contact device crossing said slot and

actuated by said cards; selector means in said slot also actuated by said cards; and punching means associated with said selector means and said contact device for punching a card to render said card incapable of again actuating the said operating and said selector means.

8. In a card record printing device having a slot for the reception of cards, and circular bores extending perpendicularly to and through said slot, the axis of said bores being on the bottom line of said slot; operating means actuated by said cards and extending through one of said bores; selector means also actuated by said cards and extending through the other of said bores; and punching means movable in said bores, selectively operable by said operating means for punching a card to render said card incapable of again actuating the said operating and selector means.

9. In a card record printing device having a slot for the reception of cards; operating means actuated by said cards; selector means also actuated by said cards; and punching means operable by said operating means for punching pieces from the lower end edge of said cards.

10. In a card record printing device having a slot for the reception of cards; operating means actuated by said cards; selector means also actuated by said cards, and punching means associated with said selector means for punching a piece from the lower end of a card at its first insertion, and at the first operation of the selector and for punching a second piece from the lower end of said card at its second insertion and at the second operation of said selector to render it useless for again actuating said card record printing device.

11. In a card record printing device having a slot for the reception of cards, swingable operative means in said slot actuated by said cards; oscillatory selector means in said slot also actuated by said cards; and punching means associated and movable with said selector means and selectively operable by said operating means for punching a card to render said card incapable of again actuating the said operating and said selector means.

12. In a card record printing device having a slot for the reception of cards, vertical movable operating means actuated by said cards; pivoted and reciprocatory selector means also actuated by said cards; and punching means selectively operable by said operating means for punching a card to render said card incapable of again actuating the said operating and said selector means.

13. In a card record printing device having a slot for the reception of cards; printing means for said device; operating means in said slot actuated by said cards; selector means also actuated by said cards and operable for selecting the matter to be printed; and punching means selectively operable by said operating means for punching a card to render said card incapable of again actuating the said operating and selector means.

14. In a card record printing device having a slot for the reception of cards, operating means including electrical devices, operated by cards in said slot; selector means also actuated by said cards; punching means selectively operable by said operating means; printing means associated operatively with said selector means for selectively printing said cards simultaneously with the operation of said selector means.

15. In a card record printing device having a slot for the reception of cards, operating means including electrical devices, operated by cards in said slot; selector means also actuated by said cards; punching means selectively operable by said operating means; printing means associated operatively with said selector means for selectively printing said cards simultaneously with the operation of said selector means. 80
16. In a card record printing device having a slot for the reception of cards; operating means actuated by cards in said slot, selector means also actuated by said cards in said slot, punching means and devices selectively operable by said operating means for punching and printing the cards; said operating means comprising electrical power devices for imparting reciprocatory movements across said slot to said selector means and punches. 85
17. In a card record printing device having a slot for the reception of cards; selector means; a current actuated motive means; a depressible frame, electrical contacts thereon and forming part of the motive means circuit, said frame extending across the card slot, and operable by downward pressure by said cards in said slot, for establishing a circuit through said motive means for operating said selector means to complete a time card printing cycle. 90
18. In a card record printing device, means for making a record on a card in several stages and in which a slot is provided for the reception of cards, a mechanism in said device for causing operation of said record making means; and electrical devices in said slot, actuated by the cards in said slot for selecting automatically the action of said mechanism required for each stage of making a record on said cards. 95
19. In a card record printing device having a slot for the reception of cards, operating means actuated by cards in said slot; selector means also actuated by said cards in said slot; and tubular punches selectively operable by said operating means for carrying one punch across the card slot in one operation of said selector means, and then carrying both punches across the card slot at its next operation, to complete a time card. 100
20. In a card record printing device, having a slot for the reception of cards and bores extending across said slot; pivoted operating means actuated by said cards and extending through one of said bores; pivoted selector means also actuated by said cards and extending through another of said bores; and punching devices selectively operable through said bores by said selector and operating means. 105
- PAUL M. FARMER.
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