

April 3, 1928.

1,664,523

J. W. MILES

IN AND OUT MACHINE

Filed Feb. 23, 1924

6 Sheets-Sheet 1

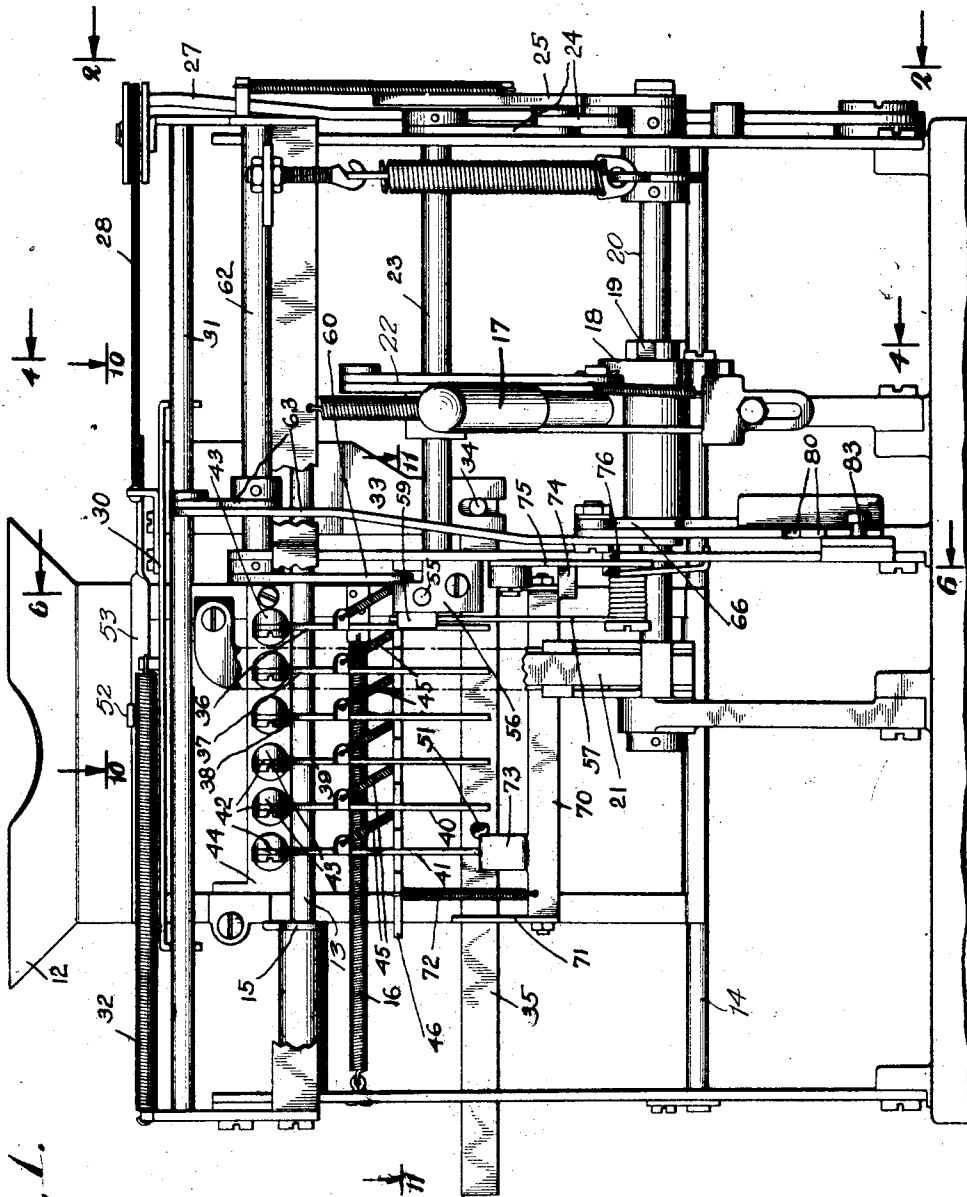


Fig. 1.

Inventor
Joseph William Miles
By his Attorneys
Cooper, Kerr & Dunham

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6 Sheets-Sheet 2

Fig. 3.

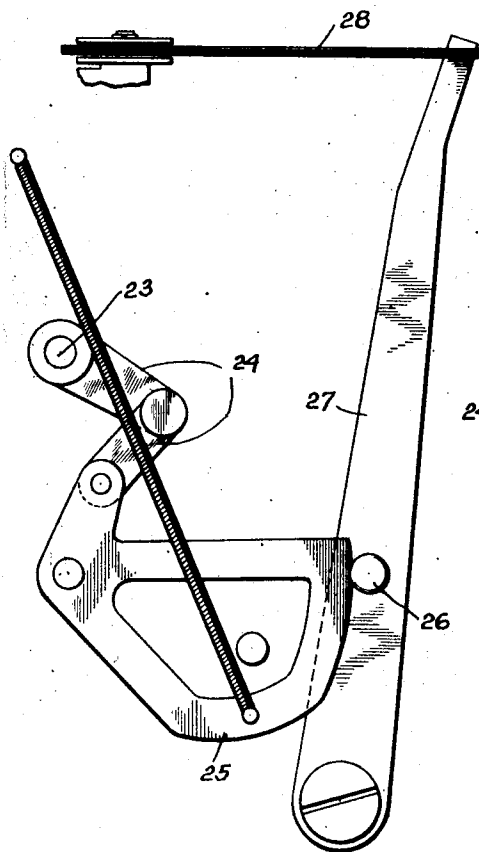
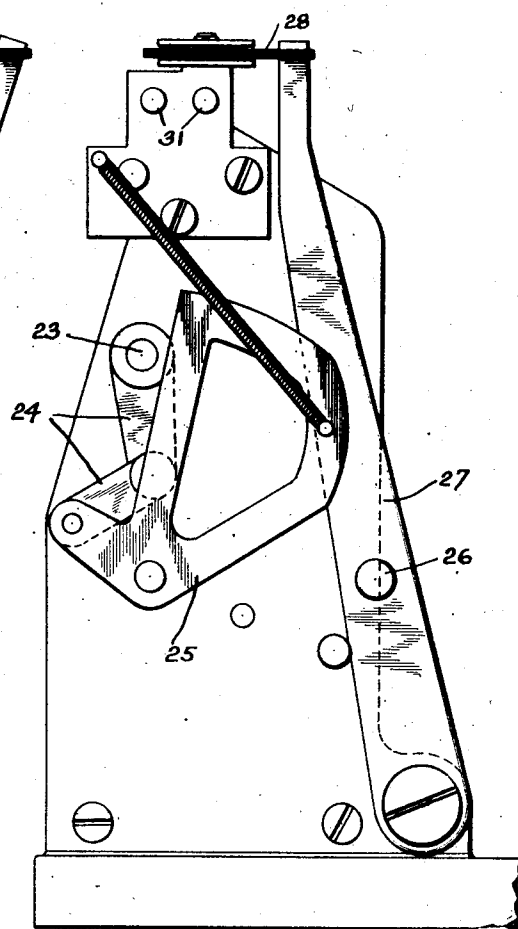


Fig. 2.



Inventor
Joseph William Miles

By his Attorneys
Cooper, Kerr & Dunham

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J. W. MILES

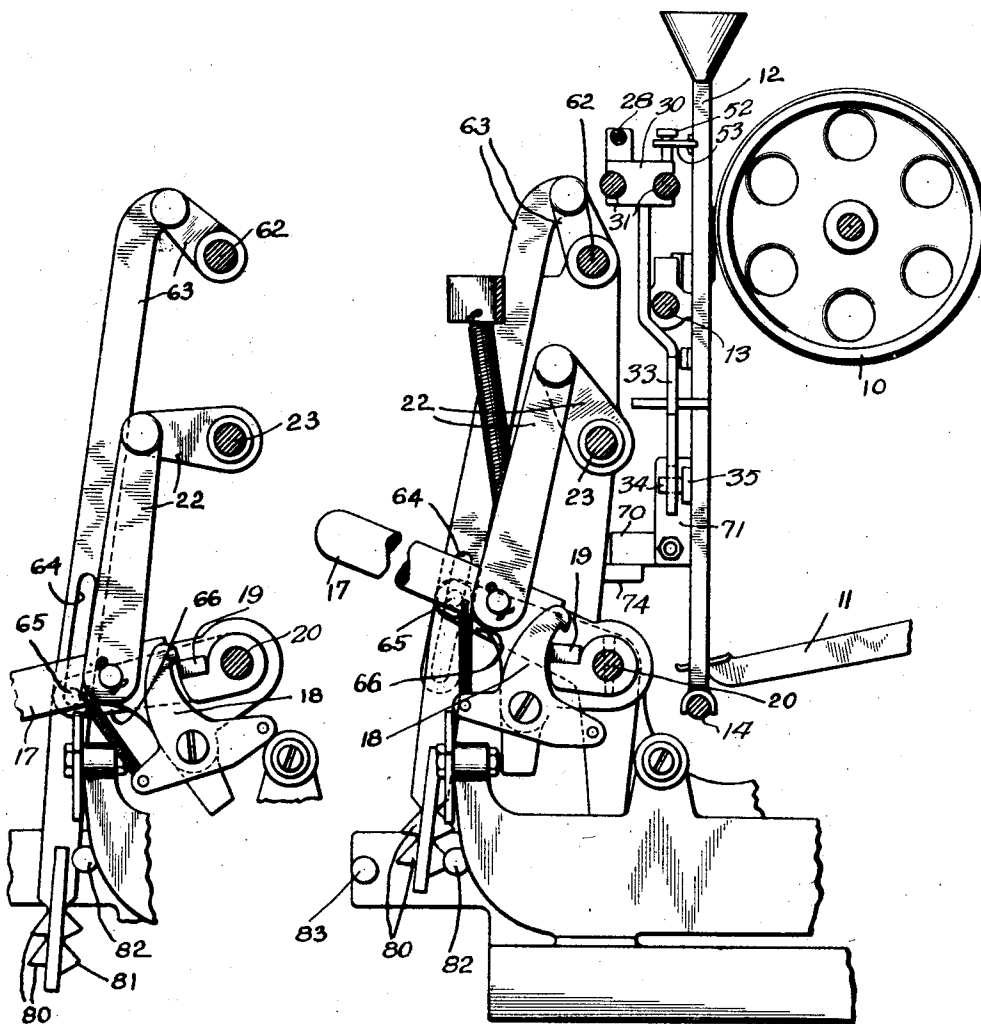
IN AND OUT MACHINE

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6 Sheets-Sheet 3

Fig. 5.

Fig. 4.



Inventor
Joseph William Miles

By his Attorneys
Cooper, Kerr & Dunham

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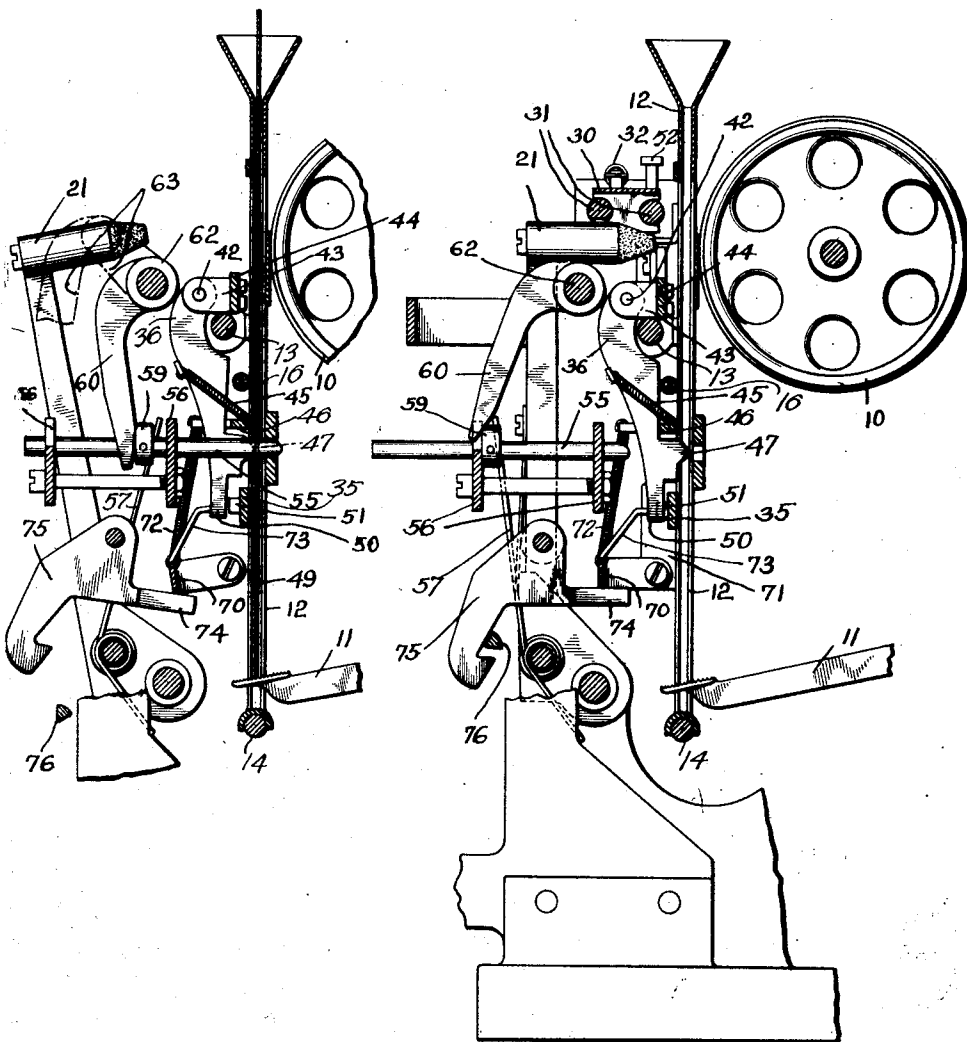
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Fig. 7.

Fig. 6.



Inventor
Joseph William Miles

By his Attorneys
Cooper, Kerr & Dunham

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6 Sheets-Sheet 5

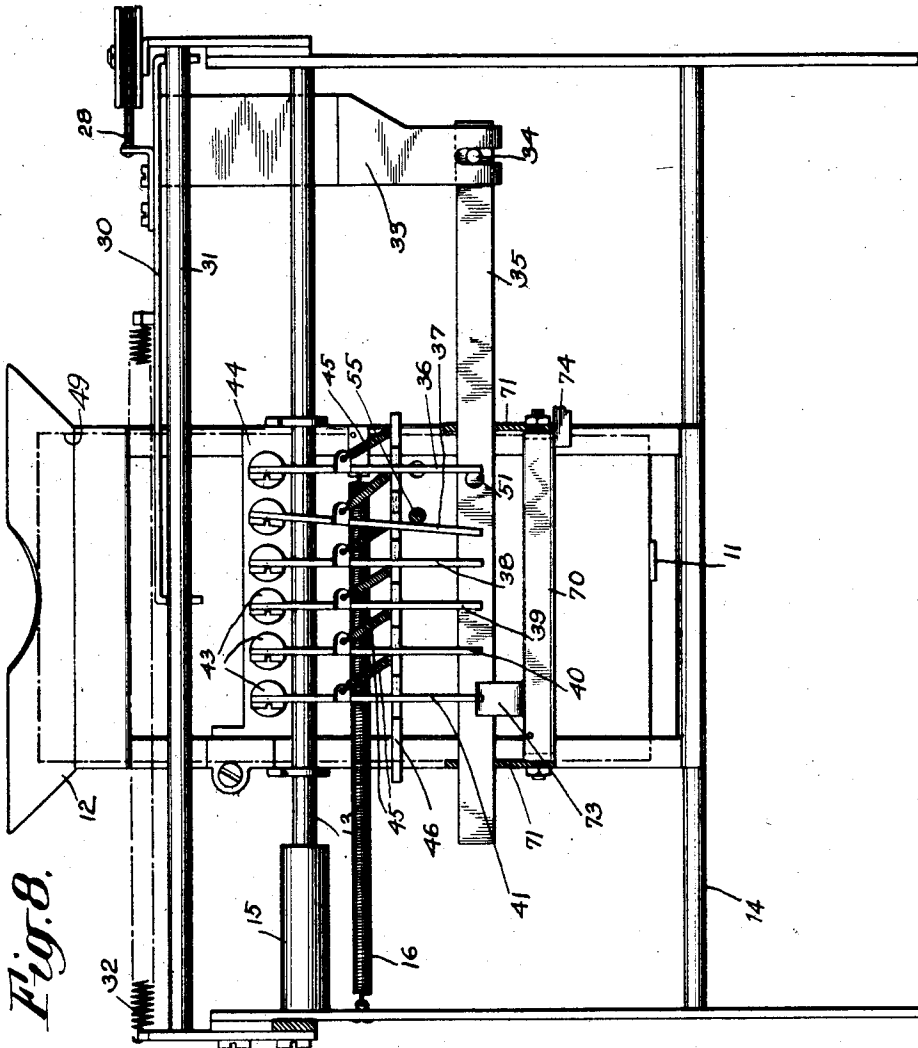


Fig. 8.

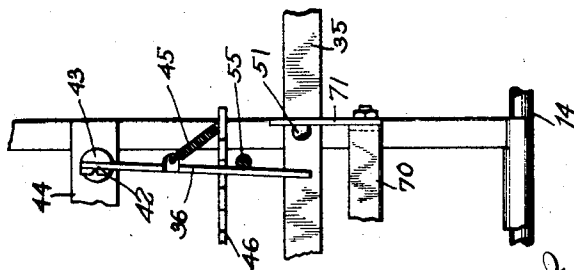


Fig. 9.

Inventor
Joseph William Miles

By his Attorneys
Cooper, Kerr & Dunham

UNITED STATES PATENT OFFICE.

JOSEPH WILLIAM MILES, OF LONDON, ENGLAND, ASSIGNOR TO INTERNATIONAL TIME RECORDING COMPANY OF NEW YORK, OF ENDICOTT, NEW YORK, A CORPORATION OF NEW YORK.

IN-AND-OUT MACHINE.

Application filed February 23, 1924, Serial No. 694,525, and in Great Britain August 8, 1923.

This invention relates to time-recorders of the kind which records the time of entry or exit on separate cards, of which there is one for each employee, each card being inserted singly and a handle operated to record the time.

Successive entries and exits must be recorded in the correct places on the cards, and attempts have been made to ensure this by providing a shifting mechanism operated either manually by means of a pointer working over a dial, or automatically from the clock. In the first case, however, the risk of personal error was always present, and in the second case the automatic operation did not provide for employees entering and leaving at the same time or at overlapping times.

The present invention provides means whereby the successive times of entering and leaving are automatically recorded in their correct positions on the card without any attention on the part of the employee and without regard to the time of day previous to the end of a daily time period at which the successive recording operations are performed.

According to the present invention controlling means are provided which comprise means for punching a hole in the card during each time-recording operation, a series of fingers or feelers co-operating with the card in such a manner as to be selectively located by the holes punched in the card, and card-positioning means co-operating with the selectively located feelers whereby the card is brought into a different predetermined position at each time-recording operation.

Conveniently the fingers or feelers, which may be pivoted spring-pressed feelers, are mounted on a movable card-carriage and an actuator, operatively connected to the hand-lever of the time recorder, is caused to move in a path which misses those fingers or feelers not engaged with holes in the card but which encounters the fingers or feelers engaged with the hole last punched.

In order to prevent operation of the time-recorder when a card placed therein has the full number of time records for the day (or other period) impressed thereon, there is preferably provided a latch operatively connected with the last of the series of fingers or feelers in such a manner that said

latch is moved into position to prevent operation of the time-recorder when the said last finger or feeler is located in a punched hole in the card.

Since the fingers or feelers must be exactly in register with the holes in the card, and therefore exactly in the path of the punch, means are provided for moving each finger or feeler in turn out of the path of the punch. Such means preferably comprise a stop in the path of the fingers or feelers so disposed as to be missed by the fingers or feelers already engaged in holes in the card but to be encountered by the first of the fingers or feelers not so engaged, and thereby to move it a sufficient distance to clear the punch.

I have illustrated a practical form of my invention in the accompanying drawings, in which

Fig. 1 is a front view of the machine,

Fig. 2 is a side view showing certain of the operating cams, this view being taken substantially on lines 2—2 of Fig. 1 looking in the direction of the arrow,

Fig. 3 is a view of the parts shown in Fig. 2 showing same in moved position,

Fig. 4 is a detail sectional view taken substantially on lines 4—4 of Fig. 1 showing the platen and punch actuating mechanism,

Fig. 5 shows some of the same parts of the machine in moved position,

Fig. 6 is a sectional view taken on line 6—6 of Fig. 1 showing the punching mechanism and the selecting mechanism for controlling the extent of lateral shift of the card,

Fig. 7 shows the same parts in moved position,

Fig. 8 is a view similar to Fig. 1 but with the card receptacle shift and the punching being effected in the second position,

Fig. 9 is a detail showing certain of the parts illustrated in Fig. 8,

Fig. 10 is a top plan view taken on line 10—10 of Fig. 1 showing certain of the connections to the carriage,

Fig. 11 is a sectional view taken on line 11—11 of Fig. 1.

Fig. 12 is a view of the record card.

In the practical embodiment of the invention, where it is required to print six time-records per day successively in a horizontal row, a card carriage or receiver 12 is mounted

to slide horizontally within the time-recorder, past the printing position, the printing being performed as usual by clock-controlled type-drums 10 against which the card is pressed by a rubber pad 21 operated by a hand-lever 17. There is also a punch, 55, some distance vertically beneath the rubber pad 21, and operated by the hand-lever 17 to pierce a hole in the card when the time-record is printed.

In more detail, and referring to the drawings, the invention as here shown is applied to the well known type of card clock now on the market and inasmuch as the details of such clocks are well known they will not be described herein. It is sufficient to state that suitable time wheels indicated diagrammatically at 10 in Figs. 6 and 7 are provided, which time wheels are driven in the usual manner by the time train. 11 designates a variable card abutment which is adapted to be displaced from time to time, i. e. day to day, under control of the time train mechanism to vary the depth of insertion of the card in the card receiver. The card receiver generally designated 12 is of conventional form and is slidable as a unit on transverse shafts 13 and 14. Normally the receiver is retained in a left hand position against shoulder 15 by means of a tension spring 16. The mechanism for printing on the record card which is inserted in the card receptacle is of the usual form and includes the printing manual 17 (Fig. 4), which manual, when depressed, is adapted to lower the usual platen dog 18, and through shoulder 19 eventually rocking the platen shaft 20 against that tension of the platen spring until the dog 18 trips off the block 19 and allows the platen 21 (Fig. 6) to move from the retracted position of Fig. 7 forwardly into contact with the record card. This platen mechanism is of the well known form and requires no further description. The movement of the printing manual is utilized to effect the shifting of the card receiver at each operation of the machine as will now be described.

The printing manual 17 through a linkage 22 connects with a rock shaft 23 (Figs. 4 and 5). This rock shaft 23 extends to the outside of the frame of the machine and there through linkage 24 (Figs. 2-3) connected with a pivoted spring retracted cam 25. Upon the rocking of the manual this cam is rocked from the position shown in Fig. 2 to the position shown in Fig. 3, thereby contacting with a pin 26 on a rock lever 27 and displacing this rock lever as shown in Fig. 3. The rock lever is pivoted at its lower end and at its upper end is connected to a flexible chain 28 which passes over a suitable pulley which is vertically pivoted on the frame of the machine and connects at its opposite end to a slide piece 30 (Figs. 1, 8 and

10). The slide piece 30 is guided for a transverse sliding movement across the machine upon rods 31. This slide piece is normally maintained in a position to the left as is shown in Fig. 1 by means of a tension spring 32. Extending and depending downwardly from the slide piece 30 is a plate 33 notched at its lower end to receive a pin 34 carried upon one end of the transversely extending bar 35. It will be understood that upon actuation of the printing manual 17 the slider piece 30 will move to the right from the position shown in Fig. 1 and will likewise displace the bar 35 to the right, as indicated in Fig. 8. The movement of this bar 35 is utilized for effecting the automatic shifting movement of the card carriage and the record card carried therein.

Briefly, it may be explained that upon the first printing operation on any record card on a given day an imprint is made and a punching is also made in the card. This first punching controls the subsequent positioning of the card carriage. A suitable finger mechanism is provided which is adapted to engage the hole or holes in the record card and when thus engaged in the holes this finger mechanism controls the extent of displacement of the card receptacle. Thus if one hole is engaged by one selector finger, the card receptacle will move one step. If there are two holes in the card and two selector fingers in said holes the card receiver will move two steps. This mechanism will now be described.

In the present machine I have shown six selector fingers respectively marked 36, 37, 38, 39, 40 and 41. These fingers are pivoted at 42 in trunnion pieces 43 (Fig. 6), which pieces in turn are pivotally mounted in a cross-bar 44 which is fixed to the card receptacle as shown in Fig. 1. The selector fingers are adapted for an in and out pivotal movement (see Figs. 6 and 7), and also, by reason of the trunnion mounting of pieces 43, they are also adapted for an angular rocking movement as best shown in Fig. 9. Normally the fingers are kept in substantially vertical position and are yieldingly pressed forward against the record card by means of individual springs 45 which are attached to a suitable notched cross-bar 46 fast to the card receptacle 12. Each selecting finger is provided with a bevelled portion 47 (Fig. 6), which normally is disposed in the path of the card plane in the card receptacle 12. Upon the insertion of a card in the receptacle all of the fingers will first be rocked rearwardly, the part 47 serving as a cam to cam the fingers outwardly by the card against the tension of the springs 45. Upon the passage of a hole in a card under the nose 47 the finger will again rock in the anticlockwise direction. Fig. 11 shows the finger 36 in this position with

nose 47 rocked forward through the perforation 48 in the record card 49. When the finger 36 is in this position a depending tail or shoulder portion 50 upon the finger is displaced into the path of a lug 51 which is carried by the bar 35. Subsequently, upon the movement of the bar 35 to the right the stop 51 will contact with the shoulder 50 and thereafter the card receptacle will move as a unit to the right in unison with the movement of the bar 35. It will be understood that the bar 35 has a fixed extent of movement and that consequently if the finger piece 36 drops into position in a hole in the card the card receiver will move one step to the right. If finger 37 has engaged a hole the card receiver will move two steps, if finger 38 has engaged a hole it will move three steps and so on. Fig. 11 shows the card receiver 12 on the dotted lines at its original position and in full lines at its final position.

If there is no hole at all in the card sliding piece 30 will take its full movement to the right causing a stop pin 52 to engage a hook 53 carried by the card receptacle 12, thus displacing the receptacle slightly to the right from its normal position. This initial movement is provided to allow the lug 51 to have a slight amount of over-travel so as to clear the extreme left stop piece 41 when the parts are in normal position, and also to displace the first feeler fingers 36 out of the path of the punch.

The mechanism for effecting successive punchings in the card will now be described. The punch comprises a punch plunger 55 (Fig. 6) slidably mounted in a punch frame 56 and normally spring retracted by the spring 57 which presses against a collar 59 affixed to the punch plunger. A suitable finger 60 extends in the rear of the collar 59 and is affixed to a rock shaft 62. Also affixed to this rock shaft is a linkage 63 (Figs. 7 and 4). One of the links 63 of this linkage extends downwardly and at its lower end is slotted at 64 to receive a pin 65 carried in an arm 66 which is rocked counterclockwise upon the actuation of the printing manual. If the printing manual is depressed to its fullest extent the stud 65 will contact with the end of the slot in the link 63 thereby drawing downwardly on the link, rocking shaft 62 and rocking finger 60 (Fig. 7) thereby forcing the punch 55 forwardly through the record card as in the manner shown in that figure. Inasmuch as the punch is directly in line with one of the selector fingers provision must be made for getting the selector finger out of the way before the punch can engage the record card. This is effected by providing a bevel 67 (Fig. 11) on the forward end of the punch, which bevel acts as a cam to displace the finger to the left against the tension spring

45 until the finger assumes the position shown in Fig. 9.

Provision is made for preventing the operation of the printing manual until a card is inserted in the machine, and for preventing the operation of this manual after the last perforation has been made in the card and the last printing effected on the card. The means referred to will now be described.

Referring to Figs. 1, 6 and 7, bail 70 is pivoted in slide plates 71 which are suitably fixed to the card receptacle 12. This bail is drawn upward by means of a tension spring 72 and is provided with a lug portion 73 which extends over the end of the feeler finger 41 which is at the extreme left. Upon the insertion of a record card this feeler finger 41 is cammed backward by the card thereby rocking the bail downwardly. Extending under the bail is a tail 74 of a pawl 75 which is pivoted on a frame portion of the machine. This pawl is adapted to be rocked by the bail as shown in Fig. 7. Attached to the lever 66 which is rocked by the printing manual is a stop 76. The pawl 75 will intercept stop 76 if no card has been inserted in the machine and thus prevent the operation of the printing manual. If a card is inserted and the finger piece 41 displaced rearwardly to its full extent the pawl 75 will be moved out of the path of the stop thus permitting the operation of the printing manual. If a card is inserted in the machine which has its last hole perforation made therein the finger piece 41 will rock forward substantially to the position shown in Fig. 6 causing pawl 75 to be displaced to an intercepted position with respect to stop 76.

Assuming that an unprinted and unperforated card is inserted into the card-carriage 12, and the hand lever 17 is operated, the actuator-bar 30 will move to the right without encountering any of the feeler-levers, since there are no holes in the card. When it encounters the fixed abutment 53 on the card carriage it will carry the latter with it towards the right. The stop 52 is situated so as to engage each feeler-lever when the card-carriage 12 is near the end of its stroke. Owing to the fact that the feeler-levers can yield laterally, the lever so engaged will be moved to the left relatively to the card-carriage 12 sufficiently to clear the punch, which the continued movement of the hand-lever now causes to advance to pierce the card, at the same time that the first time-record is printed in the first "In" space.

The card is now withdrawn, and if at any subsequent time it is inserted into the card-carriage the right-hand feeler-lever will enter the hole punched in the first operation. When the hand-lever is operated, the actuator projection or lug 51 will encounter this right hand or first feeler-lever, which is now

nearer the card, and will consequently move the card-carriage a greater distance than before, this greater distance being equal to the desired spacing of the time-records. The first feeler-lever will miss the fixed stop, but the second lever will encounter it and will thereby be moved out of the way of the punch, which now operates, together with the printing pad, but in the next column on the card—necessarily an "Out" column.

It will be seen that this progressive feed of the card-carriage will occur automatically at each subsequent operation of the machine, the actuator projection always meeting the feeler-lever engaged with the hole punched during the last operation. Consequently the desired sequence of positions is automatically ensured without any attention whatever on the part of the employee, and without regard to the time of day at which the successive operations are performed.

Suitable means are also provided for preventing violent operations of the printing manual. This means include a member depending from bell crank 66 and having ratchet teeth 80 and camming edges 81, the lower cams normally engage the stud 82 fixed on the frame of the machine, and slightly spaced from the ratchet teeth 80 is a stop 83. The arrangement of the parts is such that if the printing manual is thrust downward violently the member carrying the ratchet teeth 80 will swing to such an extent as to engage one or the other of the ratchet teeth with the stop 83. On the other hand, if the manual is not manipulated violently the ratchet teeth 80 pass freely by the stop 83.

Although an arrangement has been described in which mechanical feelers are employed, and in which the feelers themselves are positively engaged for positioning the card, other arrangements are within the scope of the invention. For example, the feelers may be electric contacts which close circuits through the punched holes, the extent of feed of the card being controlled electrically by these circuits.

What I claim is:

1. In a recording machine which includes a record sheet holder adapted to receive a record sheet therein and record making devices in operative relation to said holder, with a single means for moving and positioning the sheet holder with relation to the record making devices when making a record indication on said sheet, means for eliminating said first named positioning means and interposing another positioning means when making a succeeding record indication on said sheet.

2. In a recording machine, in combination, a record sheet holder, a record sheet therein, means for printing a record and

punching a hole in said sheet, and a series of fingers each one of which one after the other is adapted in turn to engage a corresponding hole in said record sheet.

3. In a recording machine, in combination, a record sheet holder, a record sheet therein, means for printing a record and punching a hole in said sheet, and a series of fingers each of which is adapted in turn to engage a corresponding hole in said record sheet, and means cooperating with said fingers in turn for successively displacing said holder with relation to the recording means.

4. A time recorder comprising record making devices, a record sheet holder, a record sheet therein, means for differentially displacing the holder and record sheet with respect to the record making devices, said means comprising feeler fingers with camming surfaces cooperating with the record sheet and automatically displaced thereby, said fingers being arranged to successively drop into perforations in said record sheet and form differential stops for the means for displacing the holder.

5. A time recorder comprising relatively displaceable record sheet and record making devices, means for controlling said relative displacement including feeler fingers with camming projections arranged to be displaced directly by the record sheet upon its insertion into the holder.

6. A time recorder comprising a displaceable record sheet holder, a record sheet carried thereby, means for displacing the said holder and differential stop devices associated with said holder for controlling the extent of displacement of the same by the last named means, said differential stop devices comprising a plurality of feeler fingers arranged to successively drop into perforations in the record sheet.

7. In a time recorder, a record sheet holder, a record sheet therein, a plurality of feeler fingers having camming projections adapted to cooperate with the surface of a record sheet to drop into holes therein, said camming surfaces being formed to permit the fingers to be displaced into a perforation or displaced out of the perforation by the insertion or withdrawal of the record sheet and to allow free vertical movement of the record sheet.

8. A time recorder comprising in combination, a record sheet holder, a record sheet therein, a plurality of feeler fingers cooperating with the record sheet and displaced thereby upon the insertion of the record sheet into said holder, said feeler fingers assuming one position when cooperating with the surface of the record card and a different position when cooperating with a hole in the card and means controlled by the relative positions of said fingers for con-

trolling the displacement of the sheet holder relative to the record making devices.

9. In a time recorder machine having recording means for making a plurality of successive records variously located upon a record sheet, and means for preventing further recording operations after the record sheet has received its complete set of records.

10. In a record machine with a movable record sheet carrier and record making devices adapted to make records in a plurality of positions on a record sheet in said carrier, means brought into operation by the making of the final record upon the record sheet for controlling the record making devices to suppress the making of further records upon the same sheet.

11. The invention set forth in claim 10 in which means is provided for releasing the suppressing means upon the introduction of a new record sheet into the machine which

new record has not received a complete complement of records.

12. A record machine for making a plurality of records each in a different position on a record sheet and preventing the making of more than one record in the same position, comprising in combination a movable record sheet carrier with means for making records on a record sheet in the carrier and means controlled by previously made records on the sheet for selecting a position of the carrier to present a blank record receiving portion of the sheet to the record making means and means controlled by the insertion of a record sheet having a full complement of records thereon for suppressing the operation of said record making means.

In testimony whereof I hereto affix my signature.

JOSEPH WILLIAM MILES.