Dec. 21, 1937. E. G. WATKINS 2,102,771

WORKMAN'S TIME RECORDER

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Fig. 1.

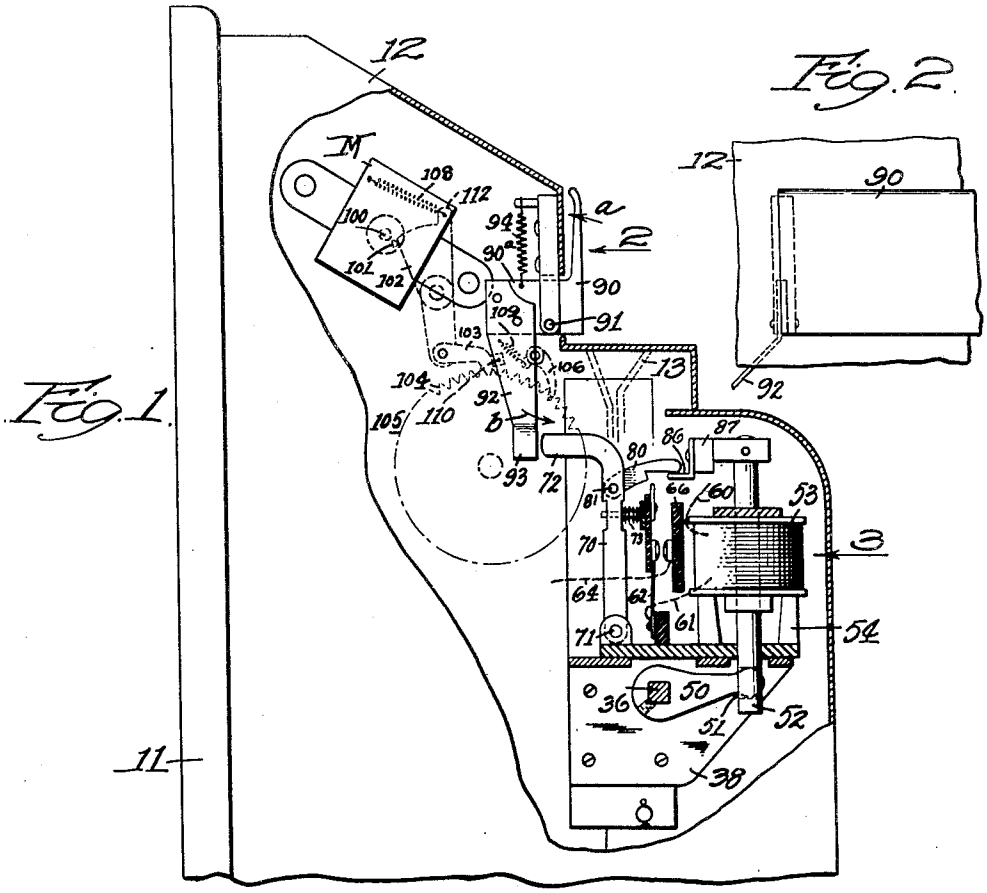


Fig. 2.

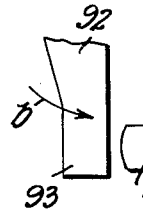


Fig. 8.

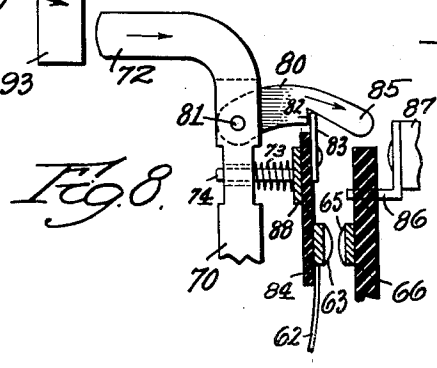


Fig. 9.

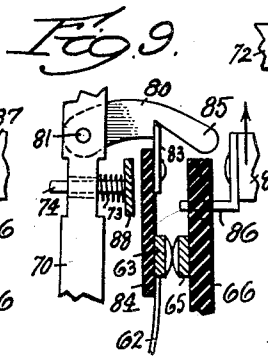


Fig. 10.

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WORKMAN'S TIME RECORDER

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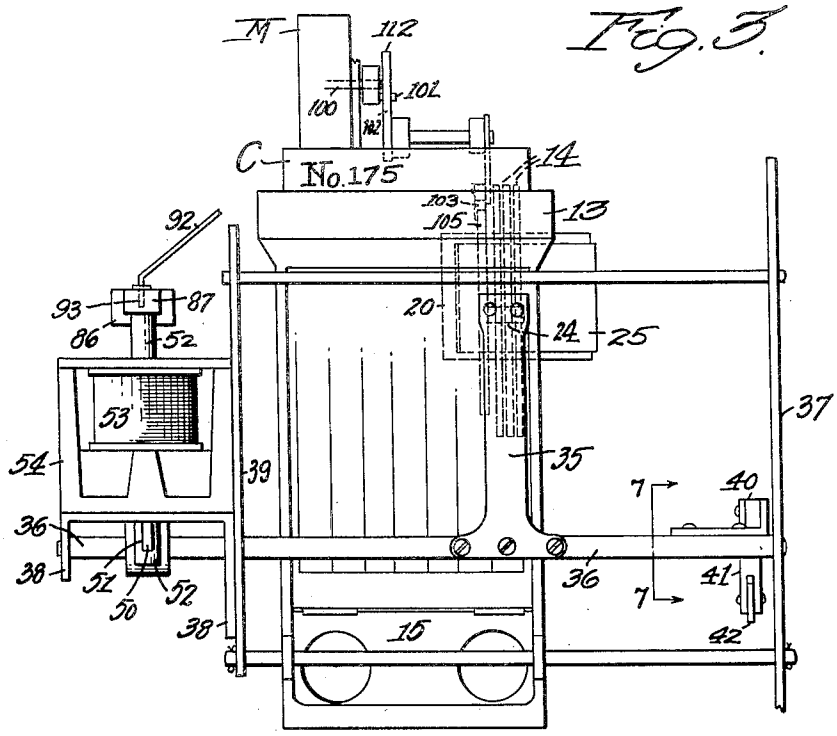


Fig. 3.

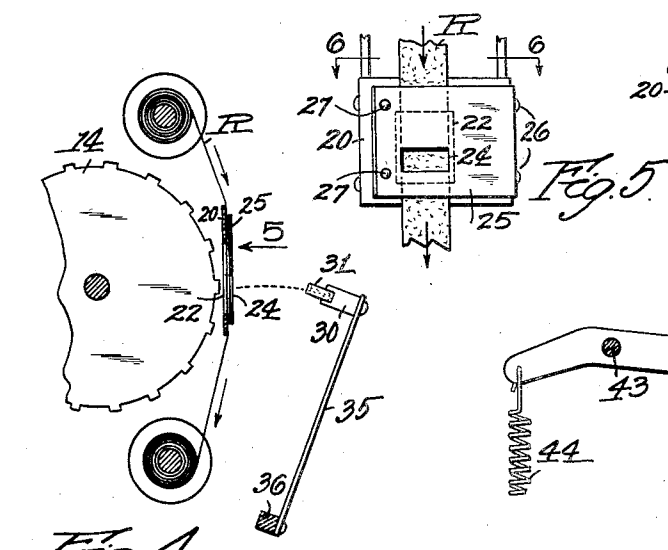


Fig. 4.

Fig. 5.

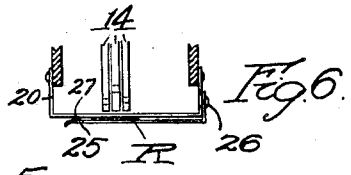


Fig. 6.

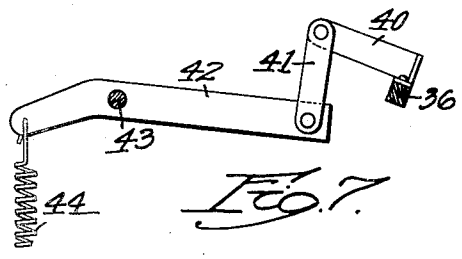


Fig. 7.

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UNITED STATES PATENT OFFICE

2,102,771

WORKMAN'S TIME RECORDER

Edward G. Watkins, Gardner, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass., a corporation of Massachusetts

Application May 7, 1935, Serial No. 20,140

2 Claims. (Cl. 101—298)

This invention relates to a workman's time recorder of the type in which the weekly record of each workman is stamped on a separate record card.

It is the general object of my invention to improve the construction and operation of such time recorders, to the intent that they may be more easily and quickly operated and may be more satisfactory in use.

To the accomplishment of this general object, I provide novel electro-magnetic means for actuating the stamp element or hammer by which the card is forced against the type wheels to make an impression.

I also provide improved means for shielding the ribbon and type wheels except at the record point, and for holding the type ribbon definitely in operative position while permitting convenient and easy removal thereof.

Another feature of my invention relates to the provision of an improved driving mechanism by which a continuously rotating motor will intermittently advance the type wheels.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a partial side elevation, partly in section, of my improved time recorder;

Fig. 2 is a partial front view, looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is a front elevation of the recording and stamping mechanism, looking in the direction of the arrow 3 in Fig. 1;

Fig. 4 is a detail sectional side elevation of certain parts;

Fig. 5 is a detail front elevation, looking in the direction of the arrow 5 in Fig. 4;

Fig. 6 is a detail sectional plan view, taken along the line 6—6 in Fig. 5;

Fig. 7 is a side elevation of certain parts to be described;

Fig. 8 is an enlarged side elevation of certain circuit-controlling devices shown in Fig. 1, and Figs. 9 and 10 are views similar to Fig. 8 but showing the parts in different positions.

Referring to the drawings, I have shown portions of a time recorder including a supporting structure 11, a removable cover 12, a card chute 13 and a set of type wheels 14. The card C is inserted in the top of the card chute 13 and the position of the lower end of the card is determined by a movable support 15.

The recorder shown in the drawings is designed to produce a record in which a separate vertical column is provided for the time records of each day of the week. Suitable automatic devices (not shown) are provided for shifting the card chute 13 to the right in Fig. 3 one space each twenty-four hours, and for gradually raising the card support 15 during each working day. The sidewise shift of the card chute and the downward return movement of the support 15 to initial position occurs approximately at midnight.

In order to protect the type wheels 14 from injury or misplacement, and to expose the desired type characters only for printing, I provide a saddle 20 mounted between the type wheels and the type ribbon R, said saddle having a slot 22 (Figs. 4 and 5) opposite the operatively positioned type on the type wheels. The slot 22 is rectangular and is preferably substantially larger than the slot 24 (Fig. 5) provided in a spring plate 25 which is mounted in front of the saddle 20 and which is secured in position at one end only, as by fastening devices 26 (Fig. 5). The opposite side edge of the spring plate is left free and is preferably outturned as indicated in Fig. 6 to facilitate insertion or removal of the ribbon R, which runs between the saddle 20 and spring plate 25.

Lugs 27 may be rearwardly projected from the spring plate 25, which lugs engage the saddle 20 and hold the parts 20 and 25 spaced to provide a free runway for the ribbon R. A hammer 30 is mounted in front of the saddle 20 and spring plate 25 and is preferably provided with a rubber hammer block 31 which engages the card C and forces it, together with the ribbon R, rearward to engage the type and to thereby receive an impression.

It will be understood that the parts 20 and 25 are shown in Figs. 4 and 6 as much exaggerated in thickness for the sake of clearness. As a matter of fact, both of these parts 20 and 25 are made of very thin sheet metal. These parts, together with the ribbon, take so little room that they readily permit a sharp impression to be made by the type wheel on the card, while at the same time the ribbon R is covered by the plate 25 so that the card will be marked only by the type wheels.

The hammer 30 is mounted on a spring arm 35 which in turn is secured to a rectangular cross bar 36 pivotally mounted in a side frame member 37 (Fig. 3) of the recording mechanism, and

in the outer end of a bracket 38 secured to an opposite side frame member 39.

An arm 40 (Fig. 7) is secured to the bar 36 and is connected by a link 41 to a lever 42 mounted on a fixed pivot 43 and connected at its rear end to a tension spring 44. The spring 44 acts to hold the hammer 30 normally in the position shown in Fig. 4 and out of contact with the type wheels 14.

An arm 50 (Fig. 1) is secured to the bar 36 near its opposite end and the rounded end of this arm 50 extends into a transverse slot 51 in the lower end of a solenoid plunger 52, which is vertically slidable in a solenoid coil 53 which is mounted in fixed position on a stand 54 secured to the bracket 38 previously described.

When the solenoid coil 53 is energized, the plunger 52 is drawn upward, carrying with it the arm 50 and causing the hammer 30 and hammer block 31 to move abruptly toward the record card and type wheels, as indicated by the dotted line in Fig. 4.

Special provision is made for closing and thereafter opening the circuit of the solenoid coil by which the hammer is operated.

The solenoid coil 53 is provided with outwardly leading wires 60 and 61 (Fig. 1). The wire 60 may be connected to one side of any suitable operating circuit and the wire 61 is connected through an insulated spring plate 62 to a contact or button 63. A third wire 64 connects the outside circuit to a second contact or button 65 mounted on a plate of insulating material 66.

With these connections, it will be obvious that the solenoid circuit is closed only when the contacts or buttons 63 and 65 are in direct engagement as shown in Fig. 9, and that the circuit is broken when the contacts 63 and 65 are separated as shown in Figs. 8 and 10.

For closing the circuit, I provide a lever 70 (Fig. 1) pivoted at 71 and having a rearwardly offset upper end 72. A spring 73 surrounds a stud 74 (Fig. 8) which extends through an opening in the lever 70. The spring 73 normally forces the lever 70 rearward to the position shown in Figs. 1 and 10.

A latch 80 is pivoted at 81 on the lever 70 and is provided with a shoulder 82 adapted to engage a plate 83 secured to a strip 84 of insulating material, which in turn is carried by the contact spring plate 62 at its upper end. A bar 88 serves as a stop for the strip 84 and also as a support for the stud 74 and spring 73.

The latch 80 has an end portion 85 which extends into the path of movement of a member 86 which is secured to a head 87 (Fig. 1) which in turn is mounted on the upper end of the plunger 52.

A trip plate 90 (Figs. 1 and 2) extends across the front of the recorder just above and to the rear of the card chute and is provided with rearwardly extending arms pivoted at each end at 91 to the casing 12. A plate 92 is secured to a rearwardly extending portion 90^a of one of these arms, and this plate 92 is offset sidewise to bring the end 93 thereof in alignment with the end 72 of the lever 70. A spring 94 normally projects the trip plate forward.

When the operator presses the trip plate 90 rearward, as indicated by the arrow *a* in Fig. 1, the lower end portion 93 will be swung forward as indicated by the arrow *b* and will engage the end 72 of the lever 70, moving the same from the normal position shown in Fig. 8 to the operating position shown in Fig. 9. This closes the circuit through the solenoid coil 53 and causes the hammer to engage the card and effect printing of the record thereon.

As soon, however, as the plunger 52 moves upward, the member 86 carried by the plunger engages the portion 85 of the latch 80, as indicated in Fig. 10, swinging the latch upward and releasing the plate 83 so that the spring plate 62 may immediately swing the contact or button 63 rearward and break the circuit. This prevents stalling of the type wheels or blurring of the record, should the operator hold the trip plate 90 in rearward position for an extended period.

The trip plate 90 is so positioned that it may be very easily actuated by the operator after placing his card C in the card chute 13, and he may conveniently move the trip plate 90 by the same hand with which he places his card in the chute. The plate 90 is of such length and width that a portion of it may always be conveniently reached by the hand holding the card, in whatever position the card may be.

In Figs. 1 and 3 I have indicated very simple and effective driving connections between a small driving motor M which is continuously operated and the type wheels 14. For this purpose the motor M is provided with a shaft 100 (Fig. 3) which makes one revolution per minute and this shaft is provided at one end with an offset crankpin 101 positioned to engage the upper end of a lever 102.

A pawl 103 is pivoted to the lower end of the lever 102 and engages teeth 104 on a ratchet 105 rotatable with the minute wheel. A holding pawl 106 is mounted on a fixed pivot and also engages the teeth 104. A spring 108 is connected to the upper end of the lever 102 and a spring 109 is connected to the pawl 106.

As the motor M continuously rotates, the crankpin 101 engages the upper end of the lever 102, swinging the same slowly to the right as indicated in Fig. 1, and gradually withdrawing the pawl 103, while the ratchet is prevented from moving rearward by the holding pawl 106.

The pawl 103 drops into the next rearward tooth notch shortly before the crankpin 101 clears the upper end of the lever 102. When the lever is thus freed, the lever swings anticlockwise under the tension of the spring 108 and the minute type wheel is advanced one space. A suitable stop 110 limits the feeding movement of the lever 102 and also prevents overfeed of the type wheel.

It will be understood that the usual reduction gearing is provided between the minute type wheel and the other type wheels in the set. With these connections, a relatively small motor M may be used, as the motor merely has to store up enough energy in each full minute to advance the minute type wheel 14 one space when the lever 102 is released.

An upward projection 112 (Fig. 1) on the lever 102 may constitute a handle by which the lever may be drawn forward freeing the type wheel for manual adjustment when necessary.

As the operation of the different parts has been fully explained in connection with the detailed description thereof, a further statement of operation is believed to be unnecessary, as it is believed that the use and advantages of the invention will be readily apparent.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. In a time recorder wherein is provided a card chute, an impression hammer, a solenoid coil, a solenoid plunger connected to actuate said hammer, a circuit for said coil, and means to close said circuit manually, that improvement which comprises providing a removable casing for said time recorder, positioning said circuit-closing means above and to the rear of said card chute but adjacent thereto and supporting said circuit-closing means on said removable casing in such manner that said closing means is removable with said casing from operative position in said time recorder.

2. In a time recorder, an impression hammer, a solenoid coil, a solenoid plunger connected to actuate said hammer, a circuit for said coil, and means to close said circuit manually, said means including a lever and latch and a spring to hold said lever and latch in normal inoperative position, said solenoid plunger having a device mounted thereon effective to engage and lift said latch and to thereby break said circuit as said plunger actuates said hammer and before said lever and latch are released for return to inoperative position by said spring.

EDWARD G. WATKINS.