Sept. 2, 1941. C. D. LAKE 2,255,010

TIME RECORDER

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FIG. 1.

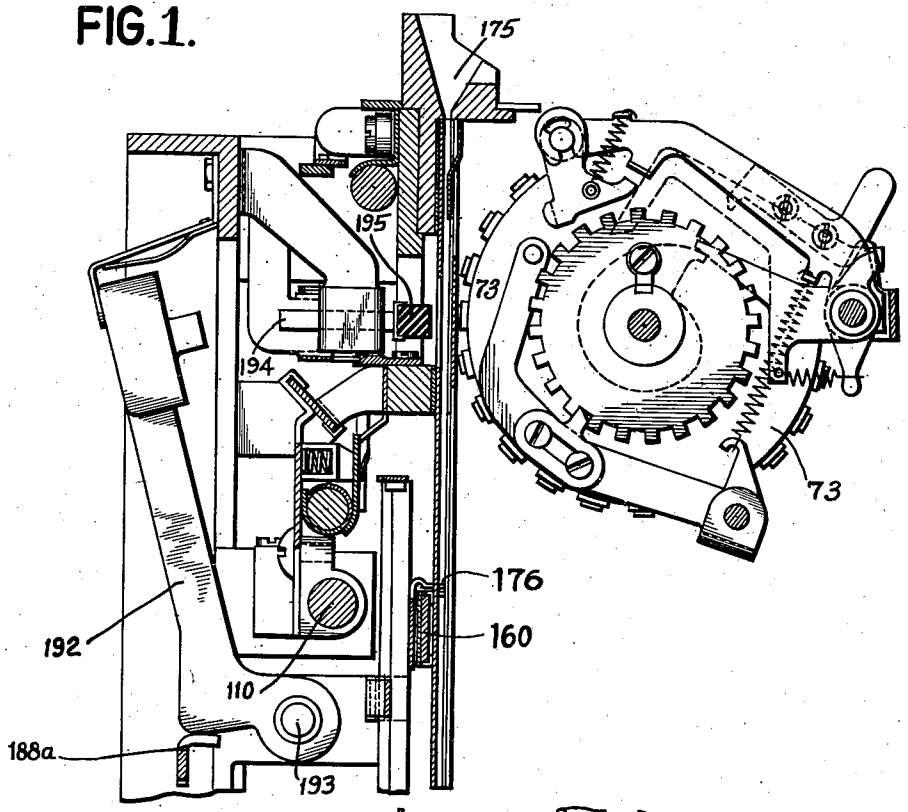
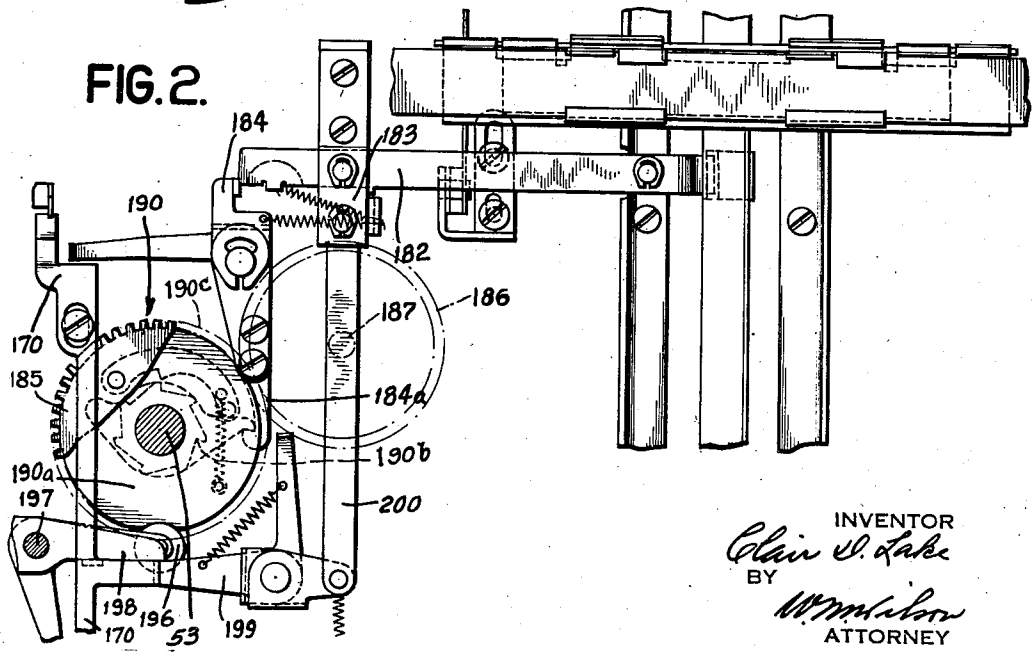


FIG. 2.



INVENTOR
Clair D. Lake
BY
W. M. Watson
ATTORNEY

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FIG. 5.

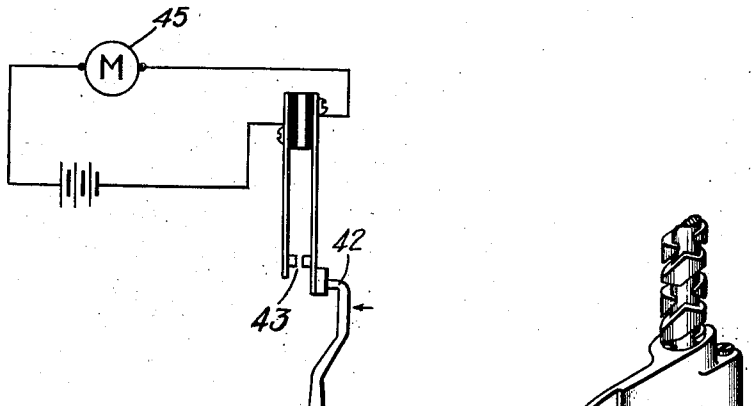
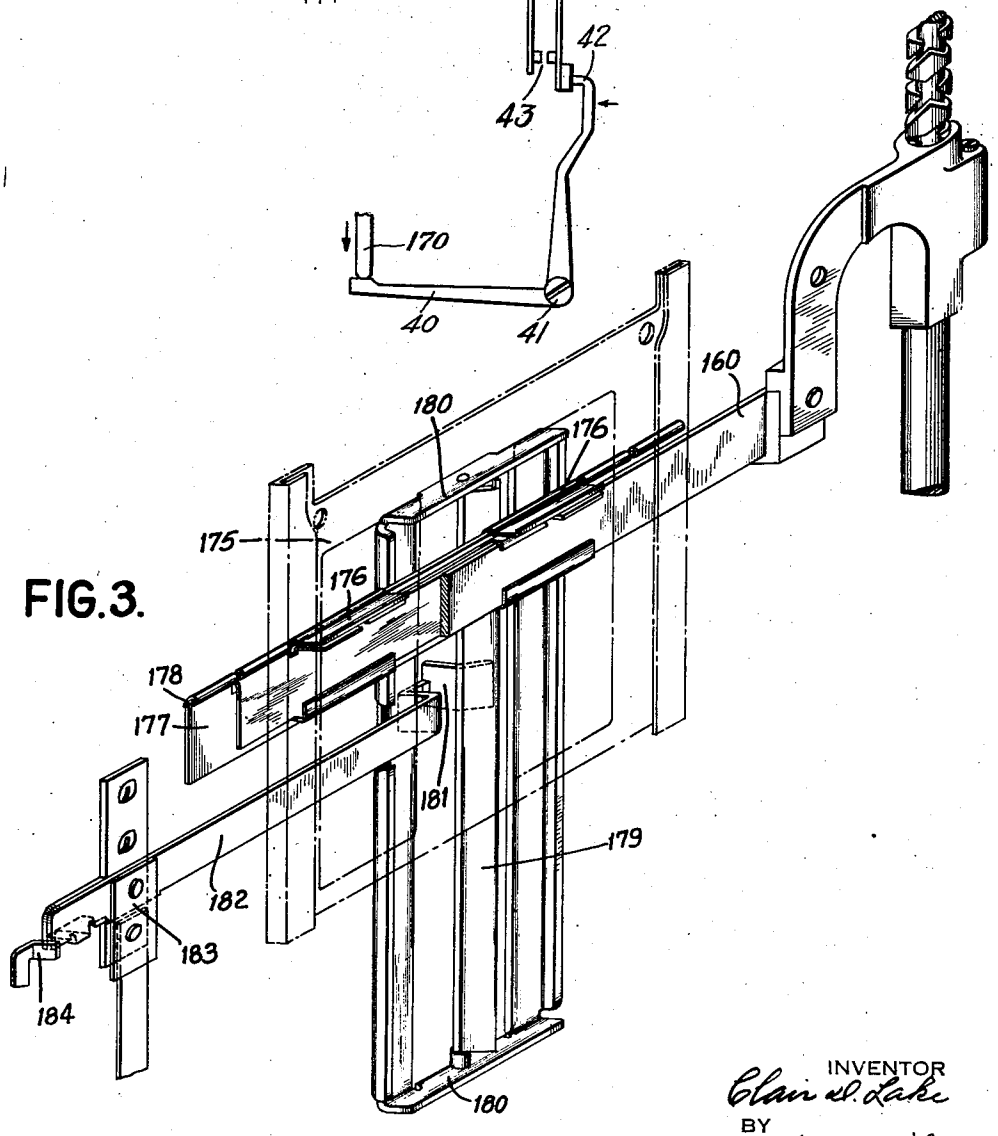


FIG. 3.



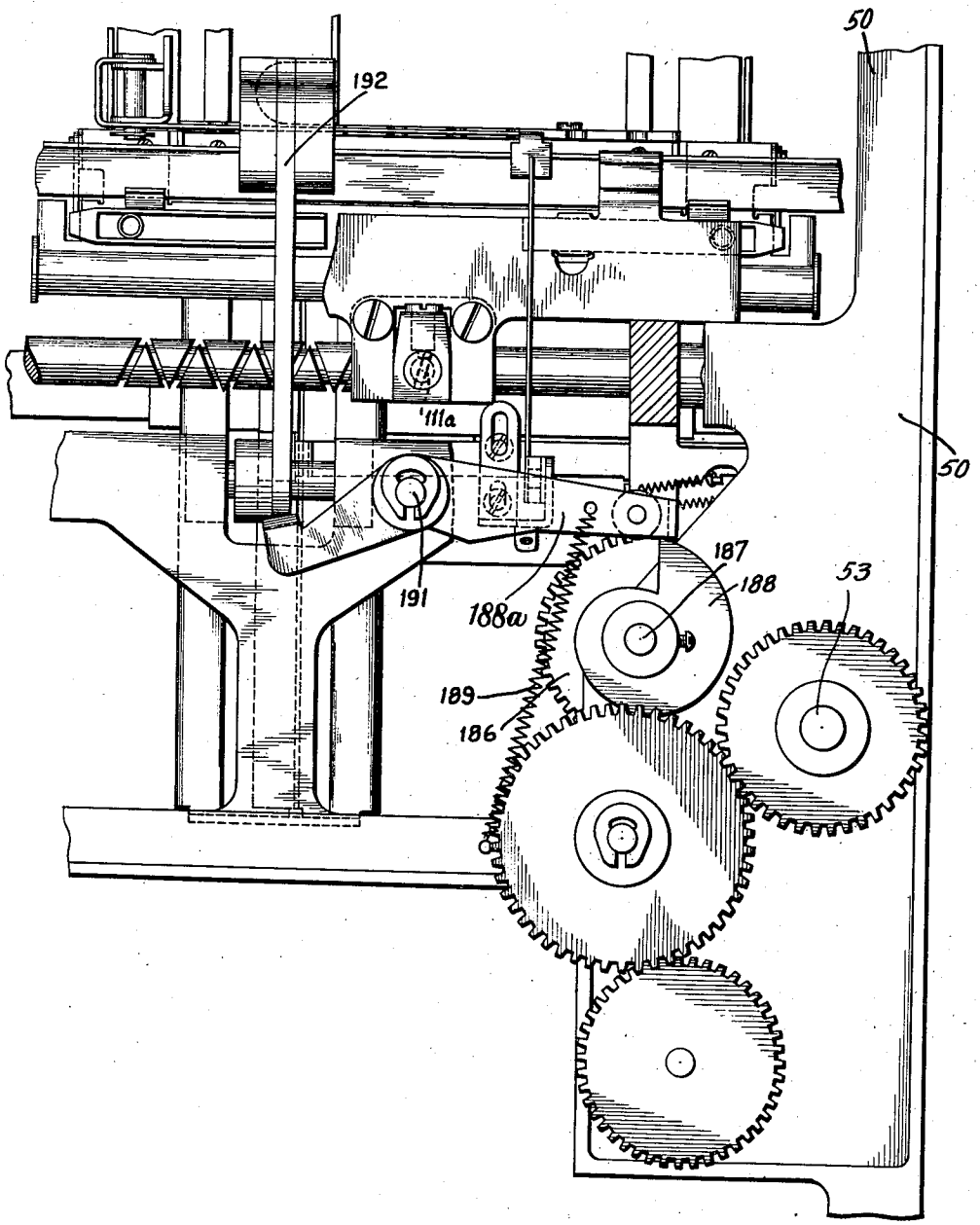
INVENTOR
Clair D. Lake
BY
W. M. Nelson
ATTORNEY

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FIG. 4.



INVENTOR
Clair D. Lake
BY
W. M. Wilson
ATTORNEY

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UNITED STATES PATENT OFFICE

2,255,010

TIME RECORDER

Clair D. Lake, Binghamton, N. Y., assignor to International Business Machines Corporation, New York, N. Y., a corporation of New York

Application July 6, 1938, Serial No. 217,685

4 Claims. (Cl. 101—297)

This invention relates to improvements in time recorders and, more particularly, to recorders of the type used in printing a time registration upon the insertion of a card.

The present recorder is designed to reduce the time necessary for each employee to get his time of arrival or departure recorded on his card by the provision of novel automatic printing means which operates immediately when the employee inserts his card in a card receiver and exerts a slight downward pressure on the card. Also, means are provided for printing on the side of the card facing the operator so as to eliminate the time wasted in turning the card around to check the recording thereon, this time becoming of consequence when there is a long line-up of employees at the recorder around the noon hour or at closing time.

According to the invention, as a time card is fully inserted in the card holder, a spring-driven impelling means for the printing hammer is suddenly released to cause the hammer to coact with the type elements to print on the card. The action is sufficiently rapid to prevent the employee from "beating the print," that is, from withdrawing his card to any appreciable extent before the printing occurs. A motor is employed as the driving means and is energized as the card is fully inserted. During printing operations the motor drives a cam which has a gradual rise extending around its periphery and a deep step from the high point to the low point of the rise. The print hammer impelling means normally rests at the edge of the deep step of the cam so that it is released with the first movement of the cam by the motor. The cam is driven through one cycle, during which time the impelling means is restored by the cam to its normal position at the edge of the deep step of the cam ready to be tripped for the next printing operation.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a vertical section of the printing mechanism.

Fig. 2 is a sectional view of the card operated trip mechanism.

Fig. 3 is a perspective view of a large portion of the mechanism shown in Fig. 2.

Fig. 4 is a rear view of the drive mechanism for effecting a printing cycle.

Fig. 5 is a fragmentary view of the motor contact operating mechanism, together with a simple diagram of the motor circuit.

That part of the applicant's machine with which the present application is concerned deals merely with the card operated printing means, the remainder of the machine structure and its operations being described in detail in my co-pending application (divisional) Serial No. 320,024, filed February 21, 1940.

Accordingly, in the description presented herein the machine will be considered from the operator's standpoint, that is, when an employee manually inserts his time card into a card receiver 175 (Figs. 1 and 3) and lowers it towards an abutment member 160 until its bottom edge forces a pair of bail operating ears 178 down so as to rock bail 177 carried by the abutment member 160 to the rear about its pivot shaft 178, an automatic printing operation is initiated as follows: Bail 177 operates another bail 179 which is pivoted at each end to a support generally designated 180 and is positioned at right angles to bail 177. Motion is transmitted through an attachment 181 on bail 179 to carry horizontal arm 182 to the left. Arm 182 slides in a guide 183 and rests against the upper tip of a latching arm assembly 184 (Fig. 2). Consequently, as arm 182 is moved to the left, latching arm assembly 184 is rocked in a counterclockwise direction so that the lower end 184a moves to the right and trips the print clutch assembly generally designated 190 which is mounted on a motor driven shaft 53. Shaft 53 is normally idle but is rotated whenever a pair of control contacts 43 (Fig. 5) are closed to energize a drive motor 45 which is connected to the shaft in any suitable manner (not shown). Contacts 43 are mounted so as to cooperate with the upper end 42 of an L-shaped arm 40 pivoted at 41. A vertical arm 170 abuts arm 40 in such a manner that downward movement of arm 170 causes counterclockwise rotation of the L-shaped arm to close contacts 43. Upon energization of the motor, shaft 53 drives the clutch ratchet 190b with which a spring biased pawl 190c carried by clutch disk 190a is caused to engage when arm 184 is actuated. Latching arm 184 also causes arm 170 to move down at this time to close the motor contacts to start the motor. A gear 185 mounted on the face of clutch disk 190a, engages with a gear 186 which is fixed to a shaft 187. Shaft 187 protrudes through a portion of

the frame 50 (Fig. 4) and has a cam 188 fixed to its rear extremity. A cam follower 188a rides on cam 188 and is urged in firm contact with the cam by a spring 189. Immediately after cam 188 begins to rotate, cam follower 188 drops off the high point of the cam under the urging of spring 189. The cam follower being pivoted on a stud 191 the other end of the cam follower will move up sharply against the base of the hammer 192 causing the top portion of the hammer to fly toward the front (Fig. 1). The hammer is pivoted on a shaft 193 and strikes a blow on a plunger 194 to force a platen 195 toward the type wheel 73 to effect a printing operation on the card.

Meanwhile the printing clutch 190 continues to rotate through one revolution. A detent roller 196 (Fig. 2) rides out of the depression in periphery of the clutch disk 190a and as it does so it transmits motion through a short shaft 197 to a pair of similar arms 198 (one behind the other). The front arm of the pair bears down on arm 170 to keep motor contacts 43 closed through mechanism already described and the rear arm of the pair depresses one end of lever 199 so that the other end of this lever is moved upwardly and, through a link 200, raises arm 182 above the tip of latch arm assembly 184. The purpose of this is to keep the motor running to drive the print mechanism through one revolution and to provide means to prevent more than one printing operation for each operation of the bail 177 by the time card as previously described.

Briefly reviewing the operation of the printing mechanism, it is seen that the full insertion of the card in the card receiver causes the tripping of a one revolution clutch and the starting of a drive motor. The motor, through the clutch connection, rotates a cam with a deep step on it causing a spring-biased cam follower to drop immediately off the step. A normally retracted hammer is sent flying forward directly and rapidly, as a result of the sudden movement of the cam follower, to effect printing on the card. The printing hammer and the cam follower are restored during the remainder of the single revolution of the clutch. Means is provided for maintaining the motor contacts closed for a predetermined period after they are closed initially by the card so that the motor will remain energized long enough to drive the clutch through its single revolution, and means is provided to prevent more than one print for each active insertion of the card.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a time recorder having a card receiver into which a time card may be inserted by an operator for the purpose of obtaining a time recording, a time printing construction including therein time type elements and a device for coacting therewith to effect printing on the inserted card, means urging the device against the type elements, means normally restraining the effect of the urging means for holding the device in a restrained condition and away from the type elements, a normally deenergized motor, a one-revolution clutch associated with the motor and connected with the restraining means, a card controlled member, transmission between the member and the clutch for engaging the latter upon insertion of the card, a circuit for the motor including normally open contacts, transmission between said member and said contacts rendered active by the insertion of the card concurrently with the engagement of said clutch to energize the motor for driving the clutch through one revolution, the restraining means becoming ineffective under control of the clutch substantially at the very beginning of the revolution so as to cause a rapid release of the urging means to effect printing and then becoming effective again after the printing operation during the remainder of the revolution of the clutch, and means also controlled by the clutch for maintaining the contacts closed during said revolution and for opening said contacts to deenergize the motor near the end of said revolution irrespective of the continued insertion of the time card by the operator.

2. A printing mechanism having a card receiver into which a record card may be inserted by an operator to receive an imprint, comprising, in combination, type elements on one side of said card receiver and a normally retracted platen on the other side for forcing the inserted card against the type elements to effect printing, impelling means for moving said platen toward the type elements, a movable cam in engagement with the impelling means and normally overcoming the bias thereon to hold the impelling means in a cocked position, a normally inoperative motor and a clutch associated therewith, the clutch being operatively connected with the cam, common actuating means responsive to the insertion of the card for engaging the clutch and for rendering the motor operative to drive the clutch so as to impart immediate movement to the cam to release the impelling means to effect printing at substantially the very beginning of movement of the cam and to restore said impelling means to cocked position after printing has occurred.

3. A printing mechanism having a card receiver into which a record card may be inserted by an operator to receive an imprint, comprising, in combination, type elements on one side of said card receiver and a normally retracted platen on the other side for forcing the inserted card against the type elements to effect printing, impelling means for moving said platen toward the type elements, a rotatable cam having a deep step thereon for engaging the impelling means to restrain the effect of the bias on the latter means, the normal point of engagement of the impelling means being immediately adjacent the step of the cam, a normally inoperative motor and a one revolution clutch associated with the motor and connected to the cam, common actuating means responsive to the insertion of the card by the operator for engaging the clutch and for calling in the motor for operation to transmit power through the clutch so as to rotate the cam through one revolution to cause the impelling means to drop sharply off the deep step of the cam to effect printing at substantially the very beginning of rotation of the cam and to restore said impelling means to

its normal restrained position after printing has occurred.

4. A printing mechanism having a card receiver into which a record card may be inserted by an operator to receive an imprint, comprising, in combination, a card controlled member, a normally idle motor and a one revolution clutch adjacent thereto, transmission from the card controlled member to said clutch operated by the inserted card to engage the clutch, and concurrently to call in the motor for operation to drive the clutch through one revolution, type elements located on one side of the card receiver and a normally retracted platen on the other side for forcing the inserted card against the type elements to effect printing, a normally cocked impelling means for moving said platen toward the type elements, means controlled by the clutch in the motor for releasing the impelling means from its normally cocked position substantially at the very beginning of the revolution of the clutch for effecting printing and to restore said impelling means positively to the cocked position after printing has occurred.

CLAIR D. LAKE.