No. 707,583. Patented Aug. 26, 1902.

T. D. GREENE.

TIME RECORDER.

(Application filed Apr. 6, 1901.)

(No Model.) 2 Sheets—Sheet 1.

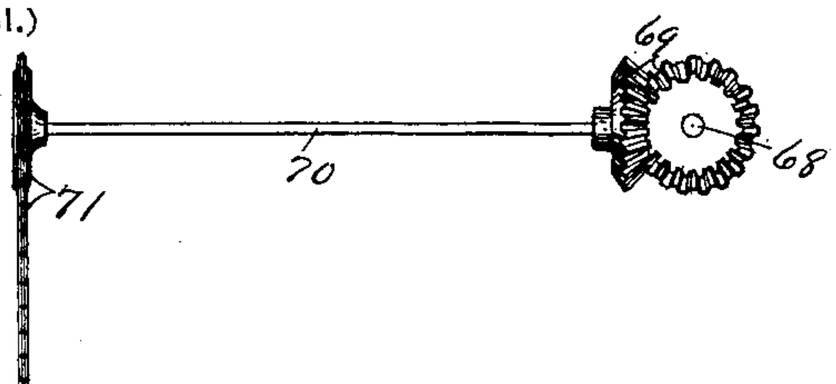
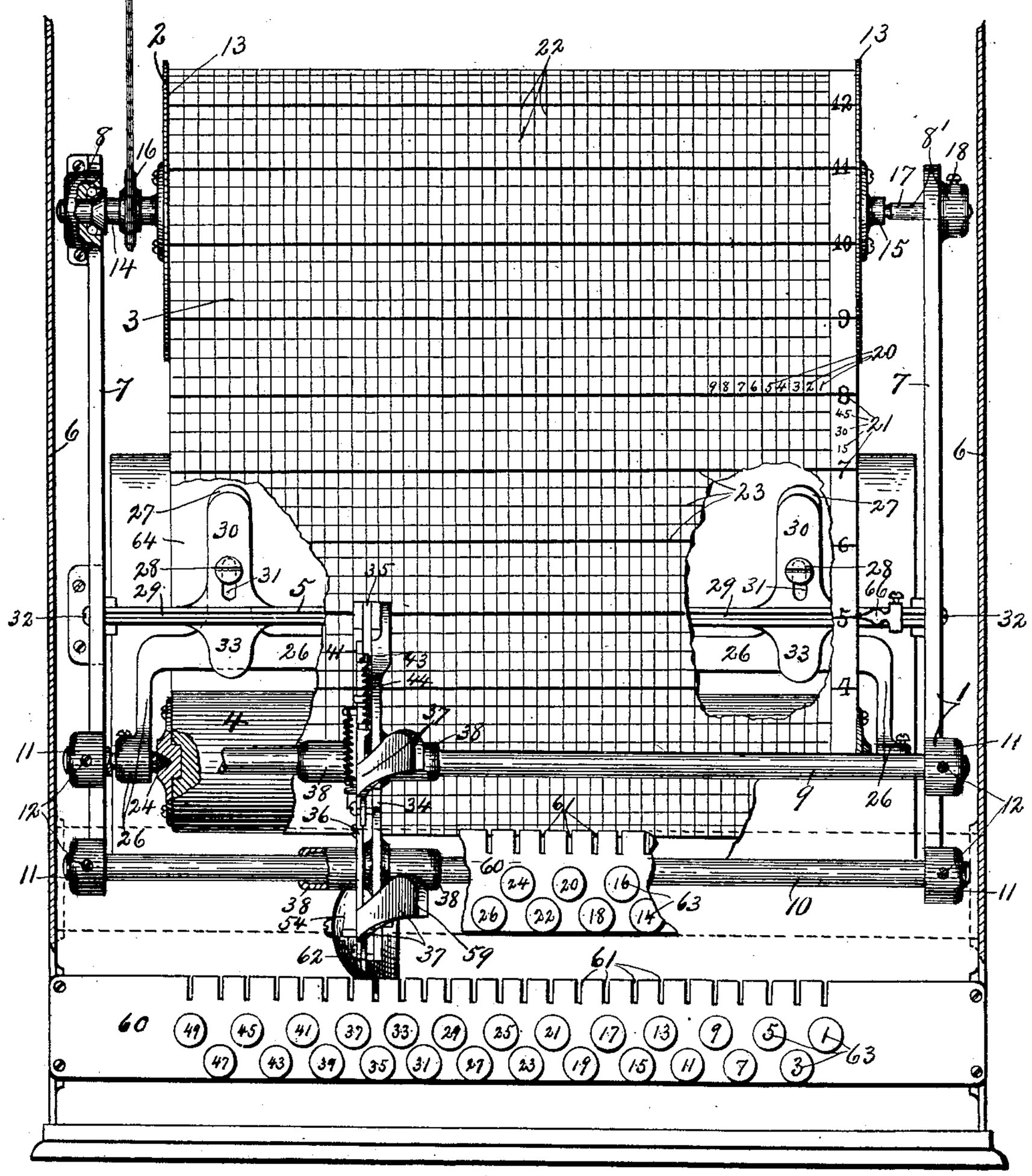


Fig. 1.



WITNESSES:
F. E. Arthur,
H. E. Chase,

INVENTOR
Thomas D. Greene
BY
Smith & Davidson
ATTORNEYS.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

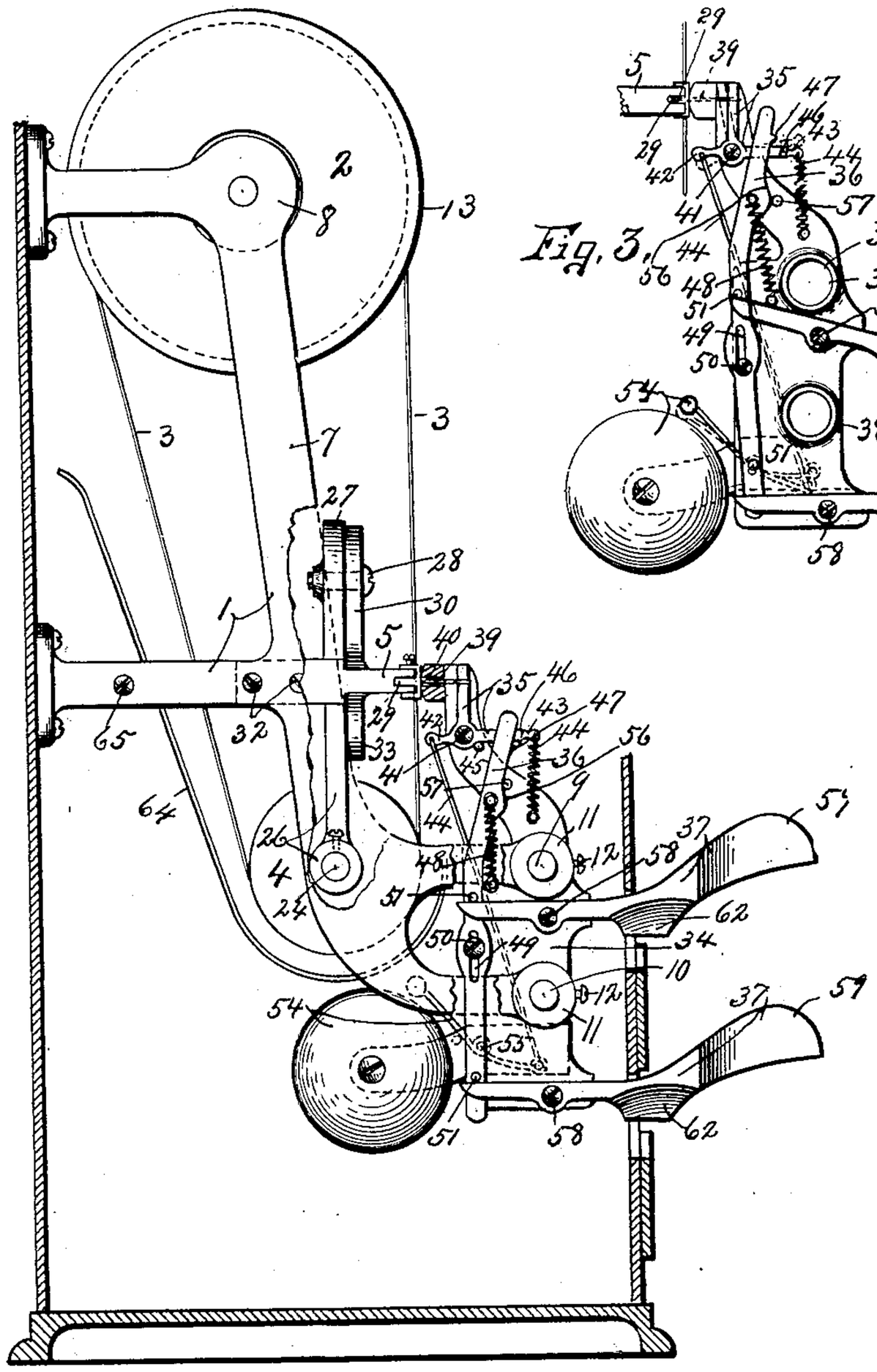

Fig. 3.

WITNESSES:
F. E. Arthur,
H. C. Chase

INVENTOR
Thomas D. Greene
BY
Smith & Dewidson
ATTORNEYS.

UNITED STATES PATENT OFFICE.

THOMAS D. GREENE, OF SYRACUSE, NEW YORK.

TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 707,583, dated August 26, 1902.

Application filed April 6, 1901. Serial No. 54,621. (No model.)

To all whom it may concern:

Be it known that I, THOMAS D. GREENE, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Time-Recorders, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in time-recorders, and more particularly to that class in which an employee may register upon a suitable moving record-sheet the time of beginning and also the time of leaving work.

The object of this invention is to produce a simple and practical time-recorder which may be manufactured at a minimum cost and in which the actual working time of any number of employees may be recorded upon a suitable time-sheet by a single manually-operated mechanism.

A further object of this invention is to provide an endless record-sheet and to support the same in such manner that the portion of the sheet upon which the puncturing or marking device operates is maintained in a smooth substantial firm position.

A still further object of this invention is to provide a suitable alarm carried by the supporting-frame of the puncturing or marking mechanism for indicating the operation of said puncturing or marking mechanism.

To this end the invention consists in the combination, construction, and arrangement of the parts of a time-recorder, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a front elevation, partly broken away and partly in section, of my improved time-recorder and clock-actuated means for rotating the drum. Fig. 2 is an end view, also partly broken away, of the mechanism seen in Fig. 1, the inclosing case being shown in section. Fig. 3 is an end view of the detached supporting-frame and operating mechanism for the puncturing or marking device, the alarm connected to said frame, and portions of the record-sheet and platen for the puncturing device, said puncturing mechanism being shown in its operative position for puncturing the record-sheet.

Similar reference characters indicate corresponding parts in all the views.

As shown in the drawings, my invention consists of a supporting-frame 1, a feed-drum 2, carrying the record-sheet 3, an idler or roller 4, suspended by the record-sheet, a platen 5, mounted on the frame, and a manually-controlled mechanism for puncturing the record-sheet when desired.

The invention further consists in a suitable alarm, the action of which is controlled by the puncturing mechanism.

The frame 1 may be of any desired form, size, or construction, is preferably mounted in a suitable inclosing case 6, and preferably consists of upright brackets 7, secured to the rear wall of the inclosing case and provided at their upper ends with bearings 8 8′, in which is journaled the feed-drum 2, presently described. These brackets 7 are preferably arranged in close proximity to the side walls of the case at opposite ends of the feed-drum 2 and are connected at their lower ends by suitable parallel transverse bars 9 and 10, which are removably secured at their opposite ends in suitable bearings 11 by any desired fastening means, as set-screws 12. These guide-rods 9 and 10 are usually arranged one above the other in fixed relation to each other, are preferably of circular cross-section, and serve as a convenient means for supporting the movable head which carries the puncturing device and its operating mechanism, said bars also serving to stiffen the frame 1 and form practically a part of said frame when assembled.

The feed-drum 2 may be of any desired length and preferably consists of a hollow cylindrical roller having flanged ends 13 for holding the record-sheet in position from lateral movement and is provided at its opposite ends with suitable trunnions 14 and 15, one of which, 14, is provided with a gear 16 and is journaled in the adjacent bearing 8, which is preferably a ball-bearing, the other end trunnion 15 being provided with a conical socket in which is mounted an adjusting-screw 17, secured to the other bearing 8′, said adjusting-screw being provided with a conical end arranged in said socket and is held in its adjusted position by a set-screw, as 18, engaged with the threaded aperture in the corresponding bearing 8. It is evident that any wear incidental to the rotation of the

feed roll or drum 2 upon its bearings may be readily taken up by means of the adjusting-screw 17, it being understood that the trunnion 14 is provided with a cone-bearing at the inside of the ball-bearing, so that the bearings for both trunnions may be simultaneously adjusted by the screw 17.

The record-sheet 3 preferably consists of an endless belt of paper or other flexible material mounted upon the feed-drum 2 and formed of substantially the same width as the distance between the flanges 13 in order that there may be no lateral movement of the record-sheet during its rotation upon the drum 2. This record-sheet is provided with employee and time designating characters 20 and 21 and divisions 22 and 23, the divisions 22 for each employee being arranged lengthwise of the paper, or rather being extended in the direction of its movement, and the time-designating divisions 23 being arranged transversely across said paper or at substantially right angles to the employee-designating divisions 22, the characters 20 being usually numbered consecutively from right to left, as seen in Fig. 1, and the divisions 23 are also characterized by numerals representing the hours of time, said numerals being arranged in a vertical column at the extreme right of the record-sheet and numbered in this instance from "1" to "24," inclusive, representing a period of twenty-four hours. As previously stated, this record-sheet consists of an endless belt, being suspended from the feed roller or drum 2, and the roller or idler 4 is supported within and upon the depending loop of the belt or record-sheet, whereby the gravity of the idler serves to tighten the record-sheet and to maintain a smooth surface throughout. The roller 4 is mounted upon suitable bearings 24, which preferably consist of adjustable screws mounted in threaded apertures in a vertically-movable yoke or bar 26. Said bar being of slightly greater length than the idler 4 is arranged in a plane above said idler, and the adjusting screws or bearings 24 are mounted in arms depending from the opposite ends of said bar 26.

In order to permit the vertical movement of the yoke 26 and still retain the same in substantially the same vertical plane, I preferably provide said yoke with upwardly-extending arms or ears 27, which are arranged in proximity to the opposite ends of said yoke and are provided with threaded apertures for receiving suitable clamping-screws (or rather guide-shoulders) 28.

The platen 5 is mounted upon the brackets 7 between the rollers 2 and 4, is arranged substantially parallel with said rollers, and is provided with a lengthwise slot 29 in its front face, and is also formed with upwardly-projecting ears 30, alined with the upwardly-projecting arms or ears 27 of the yoke 5. These upwardly-projecting arms 30 are arranged adjacent to the front faces of said upright ears 27 and are provided with vertical slots 31, which receive the clamping-screws or guide-studs 28, said studs being provided with heads or annular shoulders of greater width than the slots for preventing displacement of the yoke during its vertical movement. The platen 5 is formed of substantially the same length as the distance between the upright brackets 7, is secured to said brackets by a suitable fastening means, as screws 32, and is provided with depending ears or lugs 33, alined with the upwardly-projecting ears 30 for forming an additional guide or bearing surface for the vertically-movable yoke 26. The slot 29 of the platen 5 is formed of equal or greater width than the record-sheet 3 and preferably extends from end to end for the purpose of facilitating the formation of said groove, said groove being arranged to receive the puncturing-pin, presently described.

The manually-operated mechanism for controlling the movement of the puncturing-pin consists of a movable supporting-head 34, a bell-crank or rock-arm 35, a reciprocally-movable pawl 36, having an independent rocking movement, and one or more hand-levers 37, said bell-crank, pawl, and hand-levers being mounted upon the movable head 34. This supporting-head 34 is mounted upon and movable lengthwise of the guide-rods 9 and 10, being provided with elongated bearings 38 for receiving said guide-rods. The bell-crank or rock-arm 35 is provided with a puncturing-pin 39, which is movable in a slotted way 40 at the upper extremity of the head 34, said bell-crank or rock-arm being pivoted to the head 34 at 41 and is provided with oppositely-extending arms 42 and 43, the arm 42 being connected by a suitable link 44 to an alarm mechanism hereinafter described, and the arm 43 is connected to the head 34 by a spring 44, which normally holds the puncturing-pin 40 out of the path of moving record-sheet 3. A suitable stop-pin 45 is arranged in the path of movement of the arm 43, and the spring 44 normally holds said arm in engagement with said stop-shoulder. This arm 43 is also provided with an engaging shoulder 46, which is adapted to be engaged by a tooth 47 upon the pawl 36 as said pawl is moved vertically by one of the hand-levers 37. The tooth 47 is normally disposed in a plane beneath the shoulder 43, the pawl being held downwardly by a spring 48, having one end secured to the head 34 and its other end connected to the pawl for drawing said pawl downwardly, although it is evident that said pawl may be arranged to move by gravity to its normal inoperative position. This pawl is provided with a lengthwise slot 49, in which is inserted a suitable stud or screw 50, having its inner end secured to the movable head 34 and its outer end provided with a head of greater diameter than the slot for preventing lateral displacement of the pawl during its vertical or sliding movement. This pawl is also provided with lat-

erally-projecting shoulders 51, normally disposed above and resting upon the inner ends of the hand-levers 37, whereby when the outer ends of either of the hand-levers are depressed the pawl is forced upwardly for engaging the tooth 47 with the shoulder 43, and thereby elevating the arm 45 against the action of the spring 44 and at the same time forcing the puncturing-pin toward and through the record-sheet into the slot of the platen 5. It is desirable to provide means whereby the pawl 36 will automatically disengage the shoulder 47 from the shoulder 43 at about the same time that the puncturing-pin 39 enters or passes through the record-sheet for the purpose of actuating a suitable alarm 54, here shown as consisting of a bell and hammer, said hammer being pivoted at 55 and having one end connected to the link 44. This release of the pawl from engagement with the bell-crank 35 is effected by means of a cam 56 upon the pawl, which is arranged to engage a shoulder or pin 57 at about the same time that the puncturing-pin passes through the record-sheet, this cam-surface and pin coacting to disengage the tooth 47 from the shoulder 43, whereupon the spring 44 automatically returns the puncturing-pin to its normal position and at the same time actuates the hammer of the bell to indicate that the paper or record-sheet has been punctured. The hand-levers 37 may be of any desired form or size, being pivoted to the head 34 at 58 and having their inner ends extended beneath the shoulders 51 of the pawl 36 and their outer ends extended through the inclosing case and provided with hand-engaging portions 59, which are arranged out of alinement with the body of the levers in order that the numerals or other employee-designating characters upon the case may be readily seen. These numerals or employee-designating characters are usually printed or otherwise secured to one or more suitable plates 60, mounted upon the front portion of the case in proximity to and preferably beneath the outer ends of the hand-levers 37, the upper edges of said plates being provided with a series of notches or cutouts 61 for receiving suitable ears 62, which serve to aline the puncturing-pin with the lengthwise division of the record-sheet corresponding to the like numerals or their employee-designating characters upon the plate or plates 60, said ears 62 also serving to hold the sliding head and puncturing-pin carried thereby from lateral movement during the operation of puncturing the paper or record-sheet. It will be noted that these plates are arranged substantially parallel with the guide-rods, that the numerals or other designating characters 63 are arranged in staggered relation to each other in alinement with the notches or cut-outs 61 in order that as many numerals may be placed upon a single plate as possible.

In the operation of my invention the record-sheet is looped or passed around the feed drum and roller 4 and its opposite ends pasted or otherwise secured to each other to form an endless paper belt, it being understood that the roller 4 is held in its elevating position during this operation and that as soon as the ends of the record-sheet are secured together, as just described, the idler or roller 4 is released and rests within and upon the depending loop of the record-sheet, thereby tightening said sheet automatically. When the employee arrives at work, he slides the head laterally one way or the other to the proper position for alining the ear 62 with the notch or cut-out corresponding to his particular numeral or designating character and then depresses the lever into said notch or cut-out, whereupon the puncturing-pin is forced through the record-sheet and is simultaneously released therefrom by the disengagement of the pawl with the bell-crank lever, and the spring 44 automatically actuates the alarm 54, indicating that the record has been made upon the record-sheet.

In order to permit the record-sheet to be readily assembled upon the rolls 2 and 4, I provide a suitable apron 64, which is arranged at the rear side of the record-sheet and extends downwardly and upwardly a slight distance in front of the lower roller 4, said apron being secured to the brackets 1 by any desired means, as screws 65. Any desired means may be employed for actuating the feed-drum 2; but I preferably connect said feed-roller to a suitable clock train or gearing in such manner that the movement of the record-sheet will be synchronized with the minute and hour hands of the clock mechanism, or said feed-roller may be actuated by an independent motor and the motor may be synchronized with the clock mechanism in any well-known manner, not necessary to herein illustrate or describe.

In order that the record-sheet may be properly adjusted when being placed upon the drum to correspond to the exact time of the master-clock, I provide a suitable indicator 66, which is herein shown as mounted upon the platen 5 in proximity to the right-hand edge of the record-sheet, and by means of this indicator the exact time may be read upon the record-sheet as well as upon the master-clock.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that some change may be made in the detail construction and arrangement of the parts of my time-recorder as herein described without departing from the spirit of this invention. Therefore I do not limit myself to the precise construction and arrangement shown and described, and other means may be employed for connecting the gear 16 with the hour-spindle 68 of a master-clock than the gears 69, shaft 70, and sprocket wheel and chain 71.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a time-recorder the combination with a grooved platen of revolving rollers carrying a record-sheet movable across the groove of the platen, means for rotating one of the rollers, a vertically-movable yoke supporting the other roller and mounted on the platen, a head movable lengthwise of the platen, independently-movable handpieces mounted on the head, a puncturing-pin alined with the groove of the platen and adapted to puncture the record-sheet and a single pawl carried by the head and actuated by either of the handpieces for operating the puncturing-pin.

2. In a time-recorder, the combination with an inclosing case having substantially parallel slots and a series of employee-designating characters for each slot, a revolving feed-roll carrying a record-sheet, a platen, a sliding head having handpieces pivoted thereto and projecting through said slots, a puncturing-pin registered with the platen and adapted to puncture the record-sheet, and a single pawl adapted to be actuated by either of the handpieces for forcing the puncturing-pin to its operating position.

3. In a time-recorder, the combination with a moving support for the record-sheet, a fixed platen of a puncturing or marking device consisting of a rock-arm having a puncturing or marking point, a manually-operated pawl for engaging and moving said arm to its operative position, and means whereby the continued movement of the pawl releases it from engagement with the arm after the puncturing-point has been moved to its operative position.

4. In a time-recorder, the combination with an inclosing case, of a platen having employee-designating characters and recesses corresponding with said characters, a revolving feed-roll having an endless record-sheet mounted thereon and depending therefrom, an idler suspended within and upon the depending loop of the record-sheet, said record-sheet being provided with lengthwise and transverse divisions, the lengthwise divisions corresponding to the characters on the plate and the transverse divisions representing intervals of time, a fixed platen transverse of the record-sheet between the roll and idlers, a transverse bar parallel with the plate, a head mounted on and movable lengthwise of the said bar, a single movable member mounted on the head and provided with a puncturing-pin for puncturing the record-sheet between the feed-roll and idler, a pawl detachably engaged with said member for forcing the same to its operative position and a plurality of handpieces also mounted on the head for operating the pawl, and means for forcing the pawl out of engagement with said member as the pawl is moved to its operative position.

In witness whereof I have hereunto set my hand this 30th day of March, 1901.

THOMAS D. GREENE.

Witnesses:

MILDRED M. NOTT,

H. E. CHASE.