

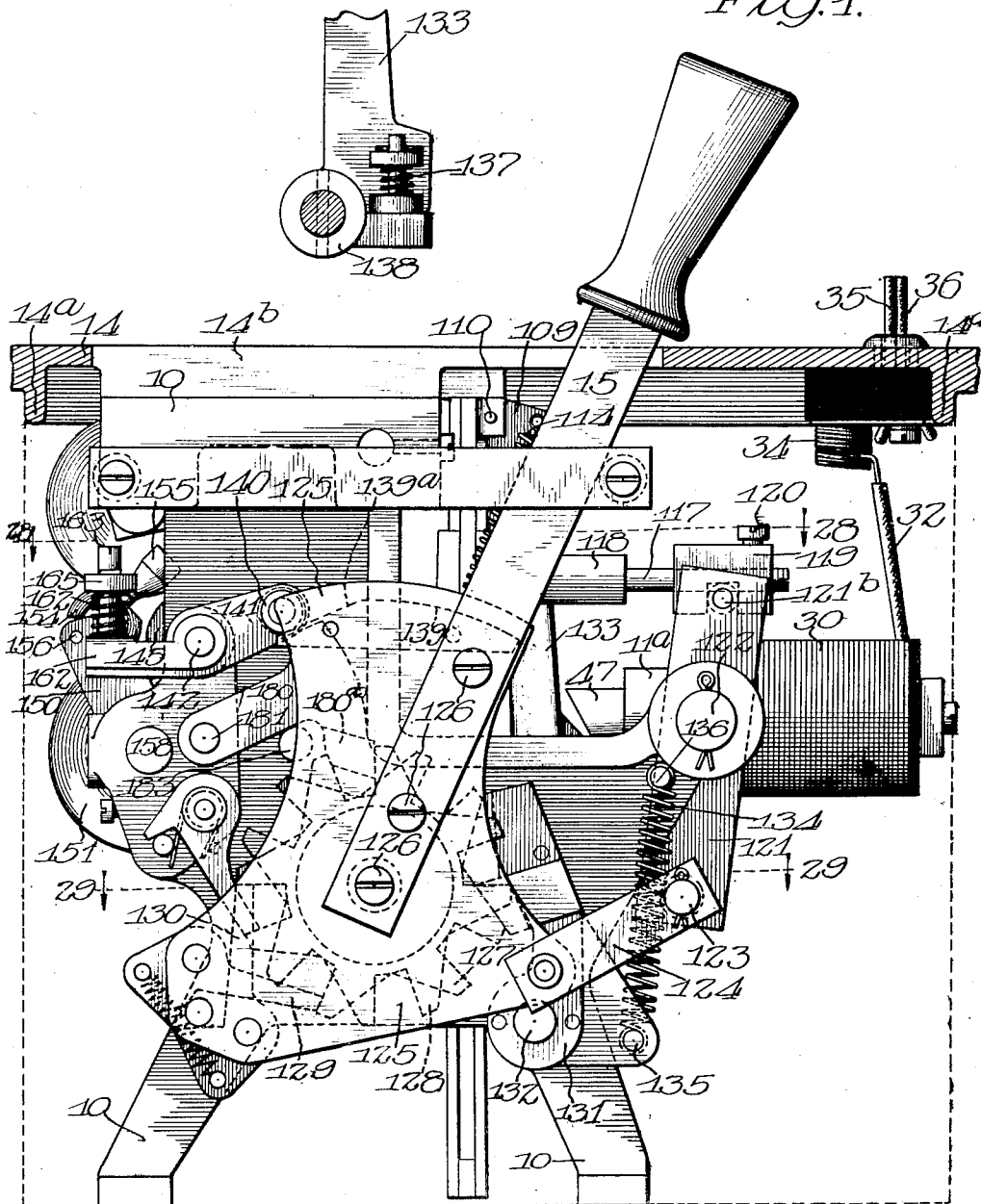
1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 1.

FIG. 30.

FIG. 1.



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Herbert Hahn.

Inventor:
Horace B. McCabe
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Patented June 3, 1913.

10 SHEETS--SHEET 2.,

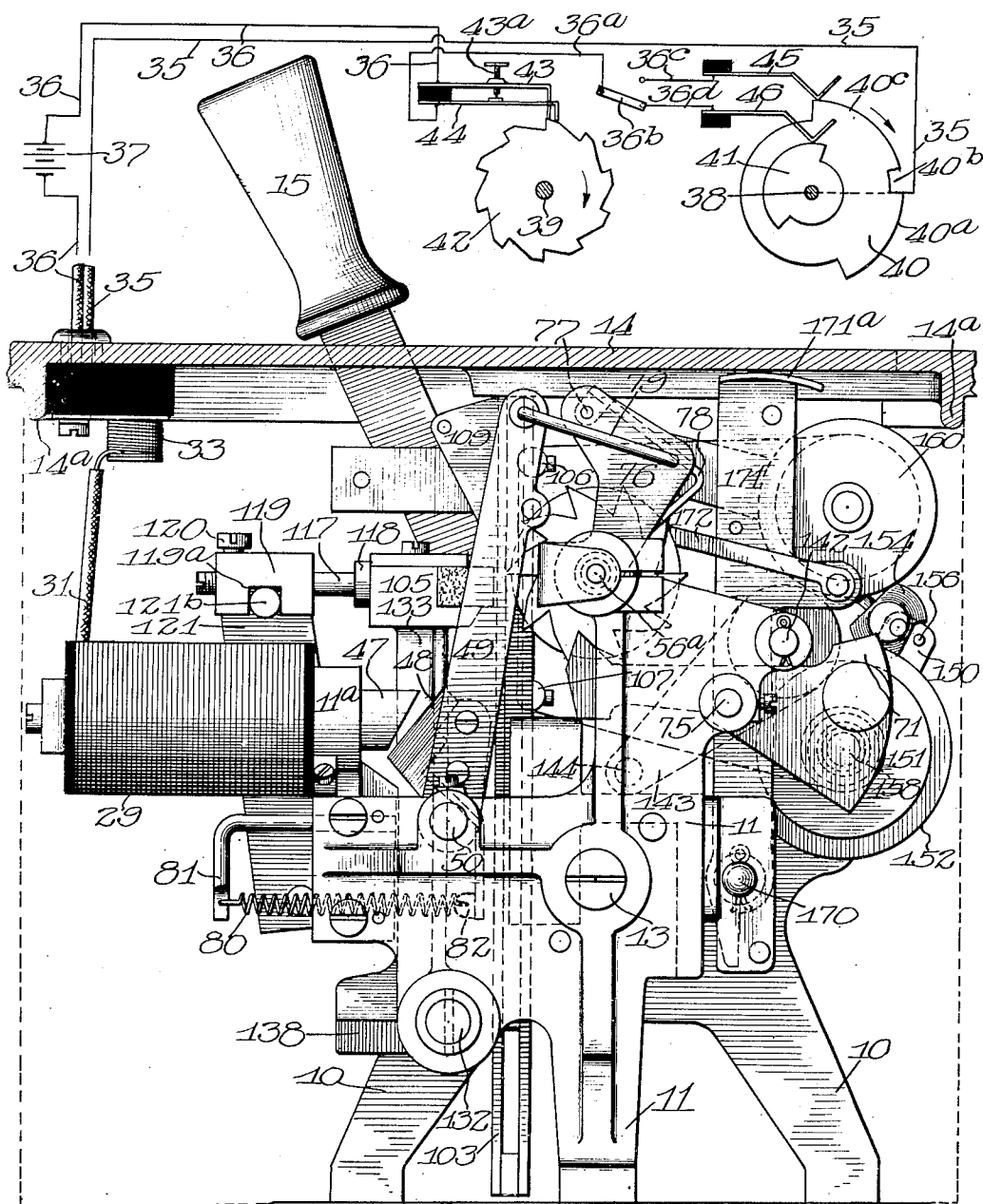


Fig. 2.

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By: Brown Hopkins
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1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 3.

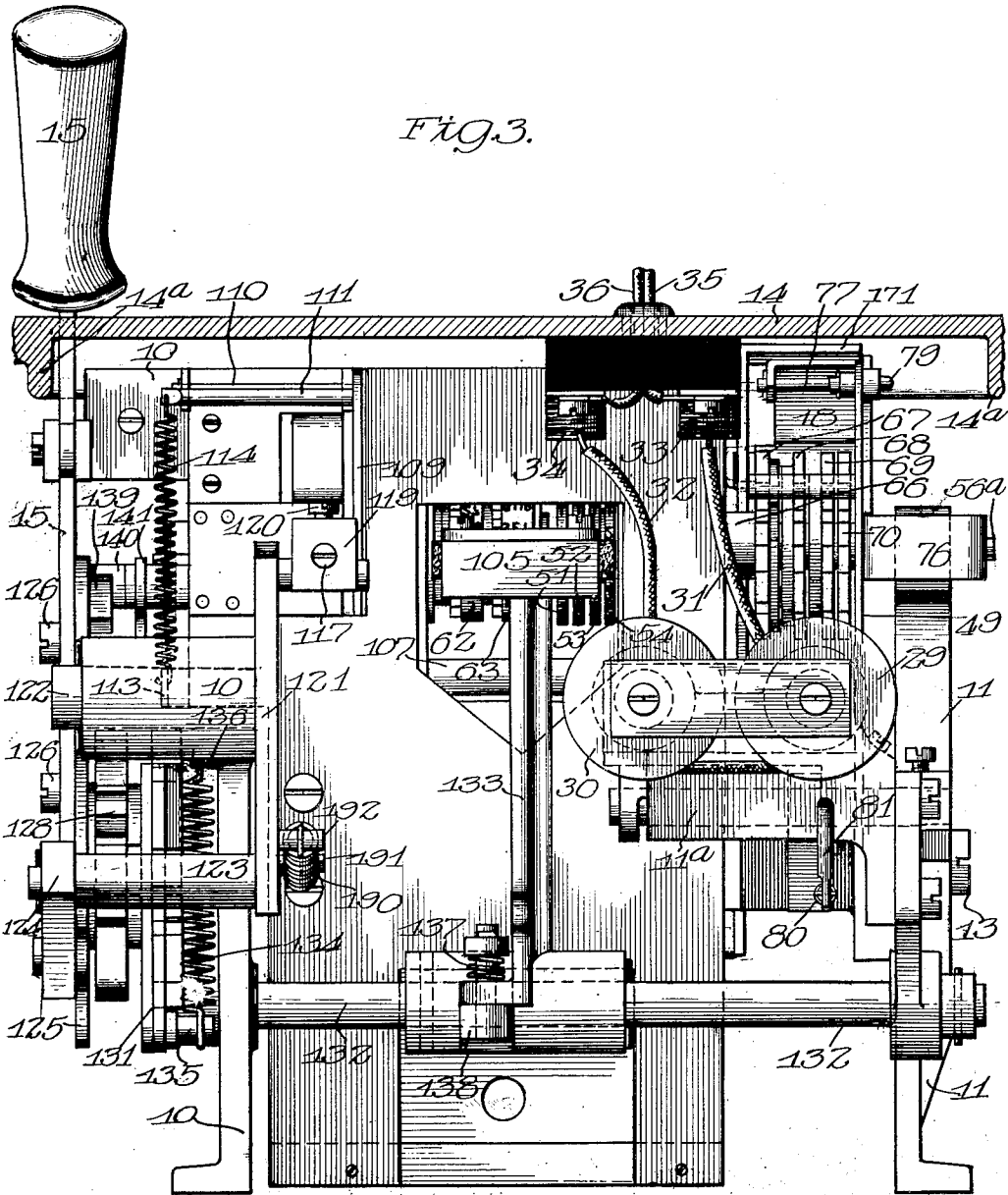
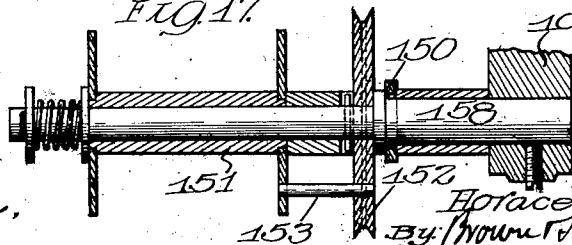


Fig. 17.



Witnesses:
G. W. Farnsworth,
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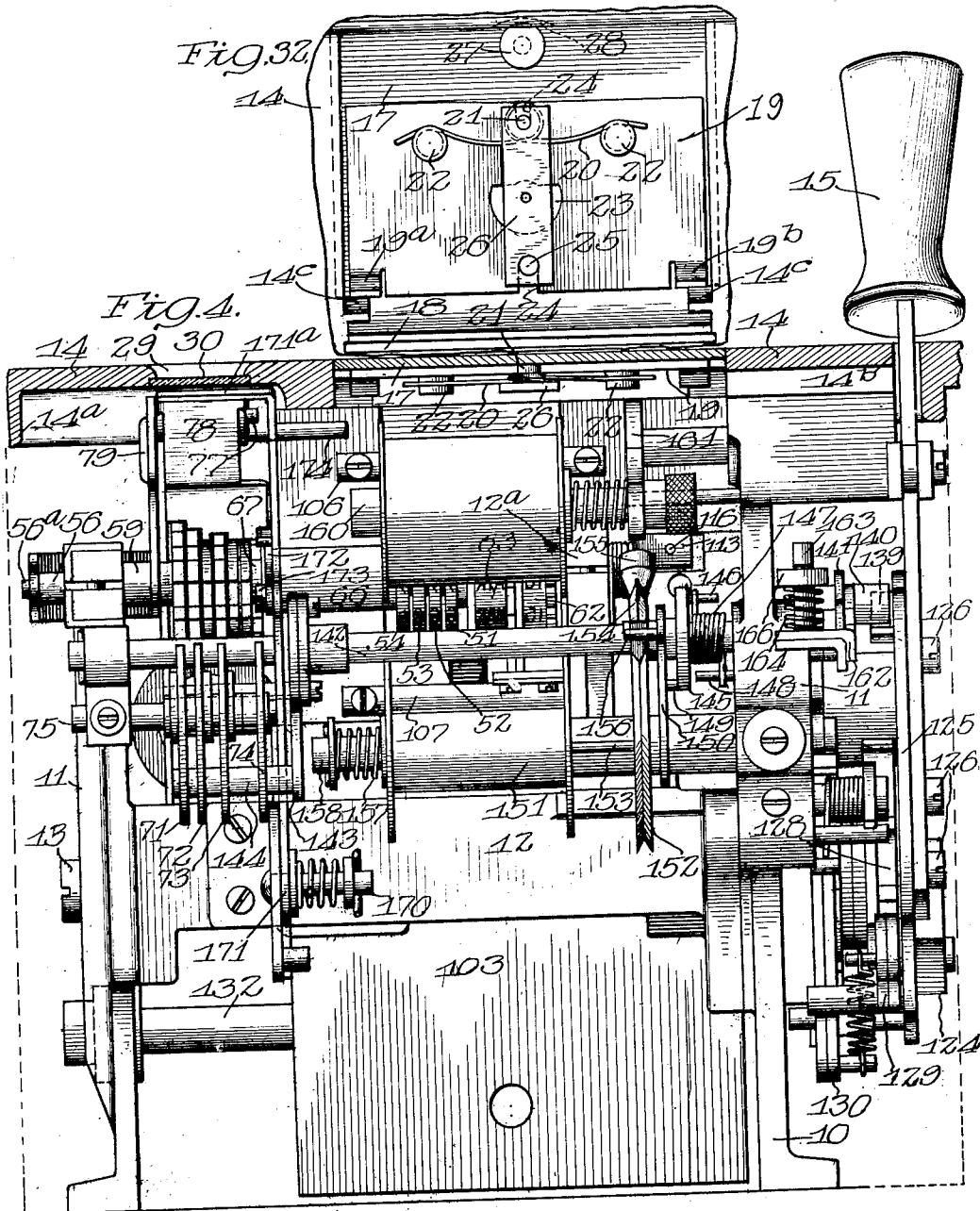
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TIME RECORDING REGISTER.
APPLICATION FILED NOV. 8, 1911.

Patented June 3, 1913.

10 SHEETS—SHEET 4.

1,063,272.



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1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 5.

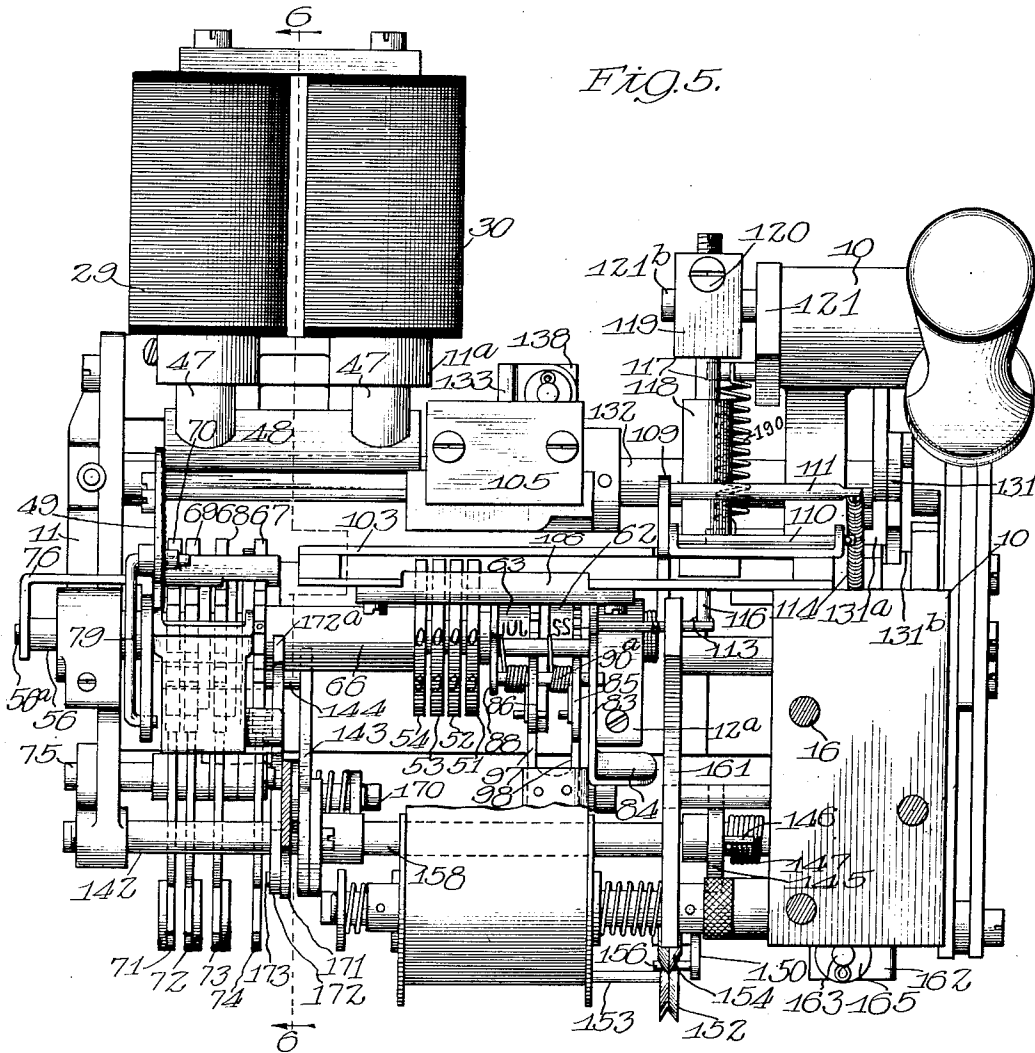
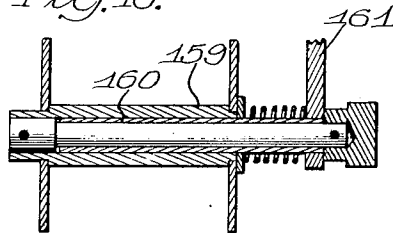


Fig. 16.



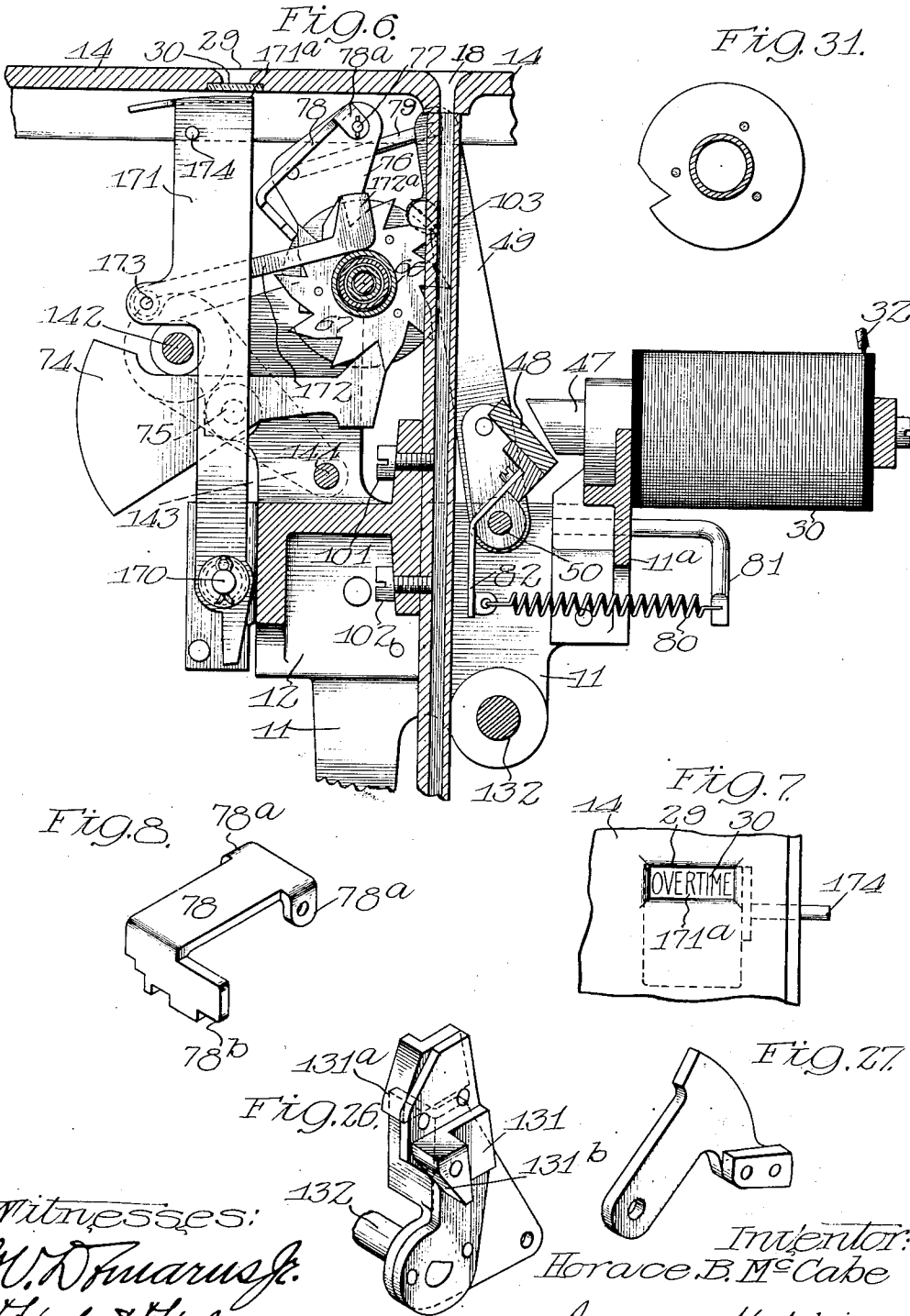
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1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 6.



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1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 7.

Fig. 9.

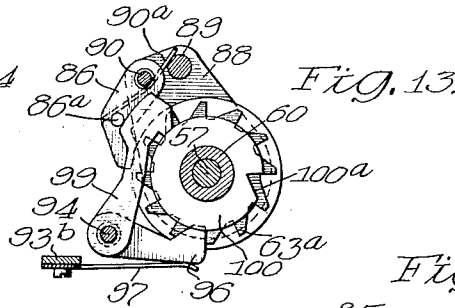
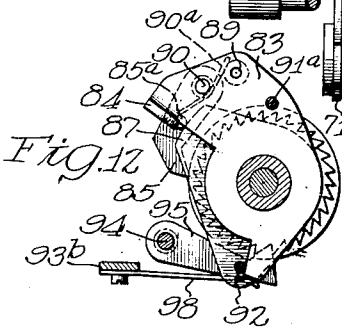
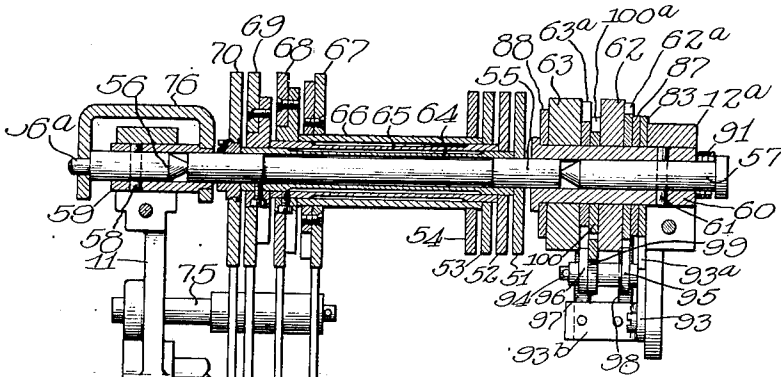


Fig. 14.

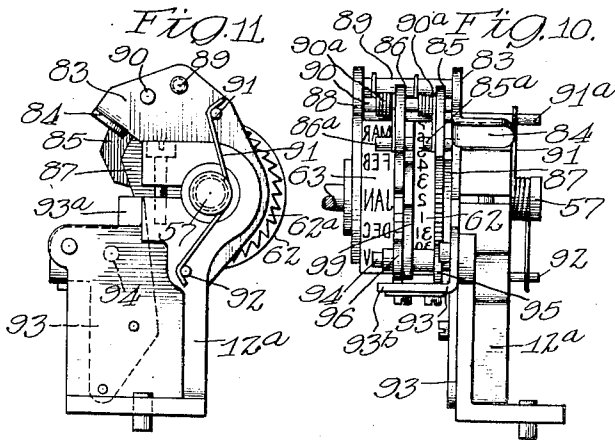
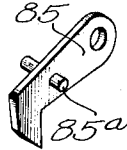


Fig. 15.



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1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 8.

Fig. 29.

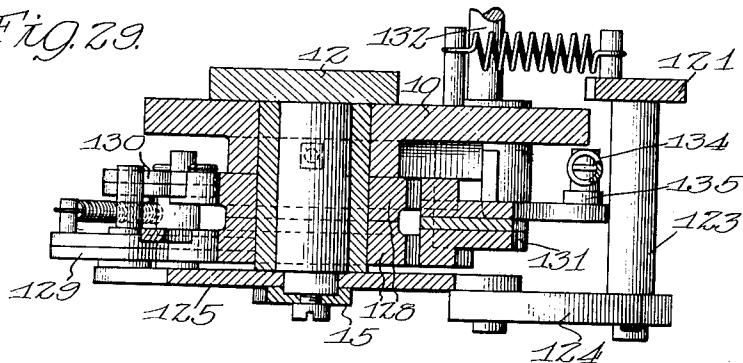


Fig. 28.

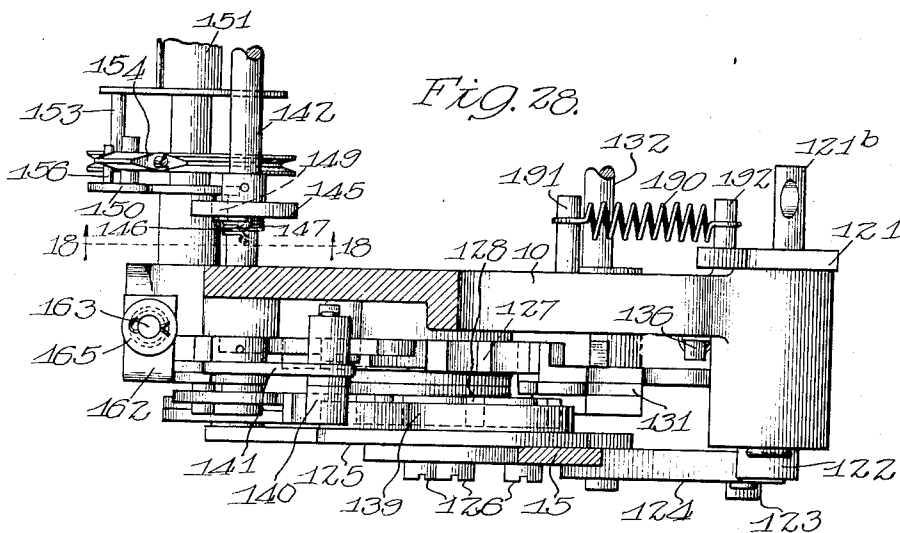


Fig. 19.

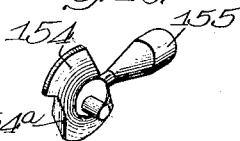


Fig. 18.

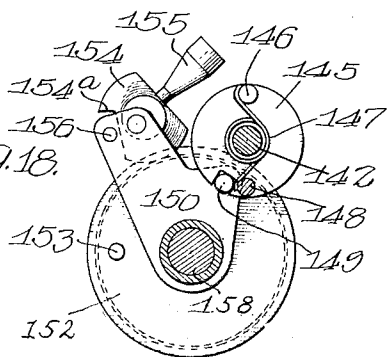
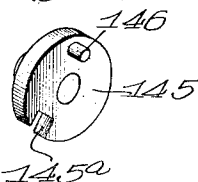


Fig. 20.



Witnesses:

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H. A. T. Walen.

Inventor:

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1,063,272.

Patented June 3, 1913.

10 SHEETS—SHEET 9.

NAME			
ORDER NO.			
STOP			
START			
STOP 13 JUN 1384			
START 10 JUN 1284		100	
TOTAL		100	
RATE		.025	
COST OF LABOR		\$250	

Fig. 23

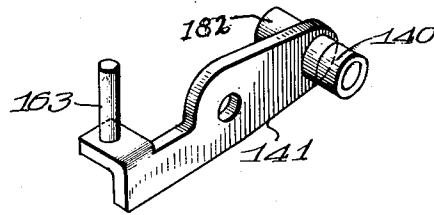


Fig. 21.

Fig. 22.

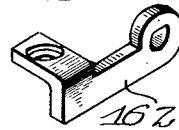


Fig. 25.

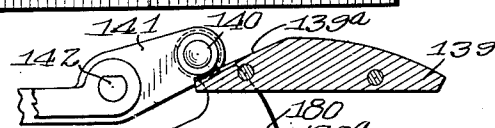
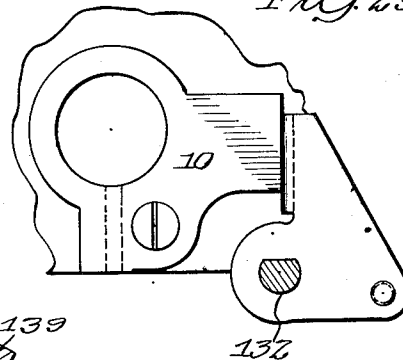


Fig. 24.

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Inventor:
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By: Arthur Hopkins
Attys.

Patented June 3, 1913.

10 SHEETS—SHEET 10.

1,063,272.

Fig. 33.

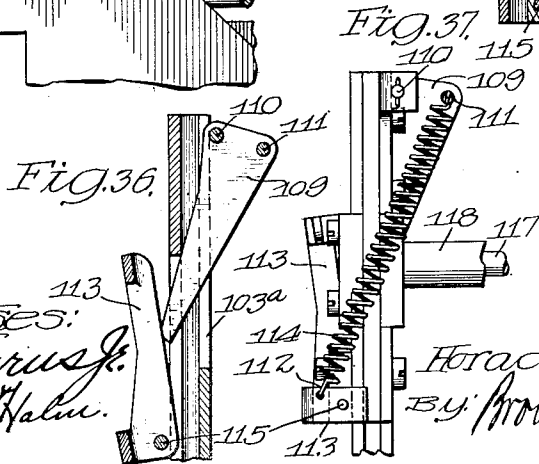
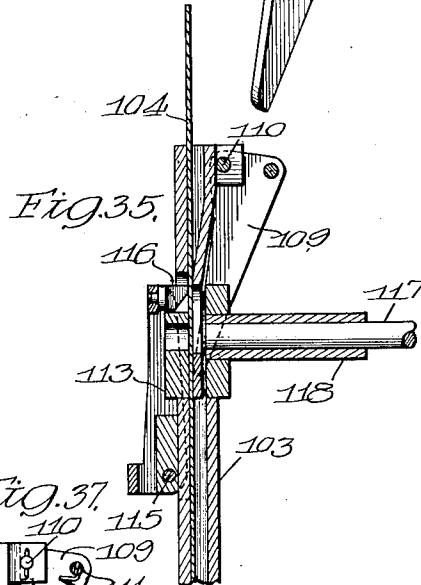
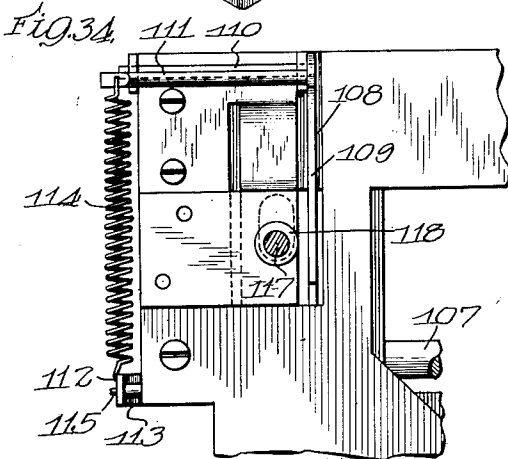
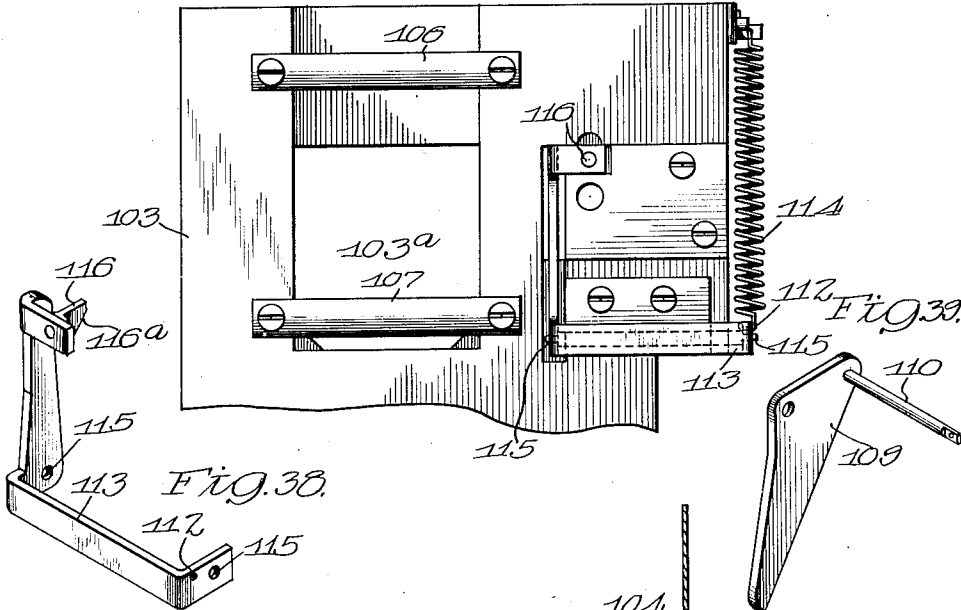


Fig. 37.

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UNITED STATES PATENT OFFICE.

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TIME-RECORDING REGISTER.

1,063,272.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed November 8, 1911. Serial No. 659,125.

To all whom it may concern:

Be it known that I, HORACE B. McCABE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Time-Recording Registers, of which the following is a specification.

The invention relates to recording registers or time stamps in which the recording type changes periodically, being electrically controlled by a master clock, and adapted to be used for recording time consumed by workmen, thereby facilitating the determination of the cost of such labor.

The present device is an improvement on other devices heretofore invented and patented by me, particularly the time recording register of my Letters Patent of the United States, No. 946,858, dated Jan. 18, 1910.

The object of the invention is to provide certain improvements in a recording register of the class described, comprising among others improved mechanism for positioning and printing the record card, improved mechanism for controlling the ribbon feed, improved means for adapting the machine to be used for recording overtime, and improved means for setting the date stamping mechanism.

Other objects of the invention are directed to the improvement of various details of the machine, chief of which are an improved construction for elastically controlling the impression hammer, an improved means for locking the type printing wheels against movement until after the impression is taken, and improved means to insure the proper operation of the mechanism even though the operator be careless about moving the operating lever to the end of its stroke in either direction.

Other features of novelty are hereinafter shown, described and claimed.

A desirable embodiment of my invention is shown in the drawings herewith, in which the reference characters of the specification indicate the corresponding parts in all the figures.

Figure 1 is a side view of the device with the walls of the casing broken away to disclose the interior mechanism. Fig. 2 is a view in elevation with casing broken away, the view being taken on the reverse side from the view shown in Fig. 1. Fig. 3 is a rear

view in elevation of the device with the casing removed. Fig. 4 is an elevation view taken from the front or on the opposite side of the machine from the view of Fig. 3. Fig. 5 is a top plan view with casing including top cover removed. Fig. 6 is a vertical sectional view taken on line 6—6 of Fig. 5, showing among other details the over-time device. Figs. 7 and 8 are enlarged detail views of parts associated with the over-time device shown in Fig. 6. Fig. 9 is a detail sectional view through the period and date printing wheels and associated mechanism. Figs. 10 to 15 inclusive are detail views of the date printing and setting mechanism. Figs. 16 to 20 inclusive are detail views of the ribbon support and feed mechanism. Figs. 21 and 22 are detail perspective views of parts used in locking, printing wheel ratchets driving ribbon feed mechanism from the main operating lever and cam of the machine. Fig. 23 illustrates a card of the preferred form upon which an impression is designed to be made by the printing mechanism. Figs. 24 to 27 inclusive are detail views of parts associated with the main operating lever and cam for imparting movement to the various operative parts of the device. Figs. 28 and 29 are sectional views taken approximately on lines 28—28 and 29—29 of Fig. 1, showing in detail the construction of the principal parts receiving movement from the main operating lever and cam. In Fig. 28 a portion of the ribbon feed mechanism is also shown. Fig. 30 is a broken detail view illustrating the manner of attachment of the hammer arm with its operating shaft. Fig. 31 is a sectional view showing the construction of one of the circular guide plates attached to the ratchets which control the period printing wheels. Fig. 32 is a broken view on the under side of the top plate showing the details of construction of the top plate and the removable portion which covers the ribbon supporting and the printing mechanism. Figs. 33 to 39 inclusive show the detailed construction of the card positioning and punching mechanism and the ribbon guide.

In the present embodiment of the invention the preferred manner of constructing the supporting frame work for the various mechanisms is illustrated. This consists of the two irregular end supporting members indicated by the reference characters 10 and

11 into which the principal operating shafts of the device are journaled. Frame members 10 and 11 are more or less irregularly shaped to adapt them to their purposes of supporting the various mechanisms, the former being provided preferably with two supporting feet as illustrated and the latter with one depending member or foot serving as a support. End frame members 10 and 11 are connected by a suitable cross member 12, the latter member being secured to the end members of the frame, by one or more screws, as indicated, for example, at 13, in the side member 11, there being similar fastening means in the side member 10 although the same is not shown in the drawing. The entire supporting frame consisting of the members 10, 11 and 12 may be cast in an integral piece, although on account of convenience in mounting and assembling the various operative mechanisms, it is preferred that the frame work be cast in separate pieces as described. On the top of side member 10 of the main frame an enlarged portion is provided to furnish a means for securement to the frame of the top cover plate, the said plate being indicated by the reference character 14. Top cover plate 14 is of a form adapted to cover the top of the mechanism, and is provided with a peripheral depending flange as indicated at 14^a, adapted to cooperate with suitable side walls of a casing when desired for furnishing a closure for the mechanism. The casing is not shown since it forms no part of the present invention. Top plate 14 is provided with numerous openings, as, for example, the elongated slot 14^b, through which the operating handle 15 of the device is extended. Other openings are provided in this plate for the insertion of screws as indicated at 16, Fig. 5, by which this plate is secured to the enlarged upper portion of main frame member 10. For permitting access to the interior mechanism beneath the top cover plate 14 an opening of some size is provided in the frame, preferably rectangular in form, as shown in detail in Fig. 32. This opening is covered by a detachable plate indicated by the reference character 17. At the side of this opening next the center of the cover plate a slot, as indicated at 18, Fig. 32 is formed, extending through the cover plate, being bounded on one side with the material of the cover plate and on the other side by the forward edge of the removable plate 17. This slot 18 is adapted to permit the insertion of record cards into the printing device beneath the cover plate. Any suitable means may be provided for detachably securing the plate 17 to the top plate 14. A convenient device for this purpose is illustrated in Fig. 32, and consists of plate 19 slidably mounted in the under side of plate 17, being provided at its forward

ward extremity near the corners with two angular projections indicated at 19^a, 19^b adapted to engage on the under side of suitable projections cast integral with top cover plate 14, as indicated by the reference character 14^c. When the detachable plate 17 is in position over the opening in cover plate 14, it is desirable that plate 19, carrying the locking projections, should be advanced toward the side of the plate adjacent the card receiving slot, and at the same time in order to operate the plate 19 carrying these projections from the outside of the top cover plate 14 suitable means should be provided for passing through removable plate 19 to accomplish this purpose. The spring indicated by the reference character 20 secured to a post 21 in plate 17 is shown, the ends of this spring bearing against pins 22, secured to movable plate 19, the action of the spring tending to advance the plate 19 to cause projections 19^a—19^b to normally engage the cooperating locking projections 14^c on the top cover plate 14. One means of operating the plate 19 is shown, consisting of providing the plate 19 with an irregular opening as indicated at 23, registering with the key hole not shown in plate 17, the plate 19 being operated against the action of spring 20 by the use of a suitable key. As a guide for plate 19 same is slotted as indicated at 24, and posts 21 and 25 cooperating with these slots are secured to plate 17. In order to secure the spring 20 in position as well as the movable plate 19, a keeper plate 26 is secured over the plate and held in position by pins 21 and 25. For the purpose of further securing removable plate 17 in the top plate 14 a pin or projection provided with an enlarged head, as indicated at 27, may be provided at the side of the plate 17 opposite the card slot, the same cooperating with groove 28 in the cover plate shown in dotted lines in Fig. 32. Top cover plate is also provided with an opening 29 preferably having a glass or other transparent cover 30 to permit the over-time mechanism, which will presently be described, to be visible to the operator through the cover plate.

The card or object on which the time record is to be printed or stamped is preferably of the form illustrated in Fig. 23. As in the device of my former patent above referred to, suitable printing or stamping mechanism is provided on the interior of the machine beneath the top cover plate 14, the same being preferably electrically operated by a master clock to indicate a record upon the card, consisting of the date, that is, the day, month and year when an impression is taken or a record made upon the card together with the number of definite periods of time of any desired or convenient length. I prefer to measure the time in

periods consisting of fractions of an hour. In my former patent referred to is shown mechanism adapted to register periods in quarter hours lengths. In the present case I show a machine adapted to register one-tenth hour periods, which I find in some respects to be more convenient than quarter hour periods. In the former use of the device it was intended that a workman shall stamp his record each time that he starts and each time that he stops working on a particular piece of work during normal working hours only, no record being taken at the close of the day's work or at the beginning of the day's work unless there shall be a change in the character of work upon which the workman is engaged, since in the former use of the machine the mechanism which was under the control of a master clock with which it was connected by an electric circuit, was so arranged as to have the circuit broken at the close of a working day and remain open until the beginning of the next working day or working period. In Figs. 2 and 3 are shown the details of the electrically controlled device for operating the card printing mechanism, a diagram of the electric connections of the mechanism with a master clock being shown in Fig. 2. The specific mechanism within the recording register for operating the printing mechanism does not differ essentially from the mechanism shown and described in my former patent. Two coils are employed, as indicated by reference characters 29—30, the same being connected with insulated binding posts through wires 31, 32, and the binding posts secured to but insulated from the top plate, being indicated by the reference characters 33, 34. Leading from binding posts 33, 34 the circuit passes through wires 35, 36, which are diagrammatically shown after passing beyond the cover plate in Fig. 2, a battery for energizing the circuit being indicated at 37. In the diagrammatic representation of the preferred form of the device at the top of Fig. 2, 38 indicates a shaft connected with and rotated at one half the speed as the shaft or arbor upon which is mounted the hour hand of a master clock, the shaft 38, therefore, making one complete rotation in twenty four hours. 39 is the arbor or a shaft rotated at the same speed as the arbor of the minute hand of the master clock, the same, therefore, making one complete rotation in every hour. Mounted upon and rotated by the arbor or shaft 38 are two mutilated cams 40, 41, the former of which may be designated the day working cam because it is designed to close the circuit during the usual day working hours, which will extend, for example, from seven o'clock in the morning until twelve o'clock noon, and from the period following the noon hour lunch, until

closing time, for example, at six o'clock in the evening. The mutilated cam 41 also secured to the arbor 38 may be designated the over-time cam, and is designed to assist in closing the circuit when it is desired to work over time, as, for example, for a certain number of hours after six o'clock in the evening. Interposed in the circuit at the terminal of the wire 36 is the period device for closing and opening the circuit at intervals corresponding to the periods of time desired for the unit of measurement, as, for example, quarter hours or one tenth hours. In the present embodiment of the invention the device is shown adapted to register periods of one-tenth hours, and to this end upon the arbor of the minute hand 39 or upon a shaft connected therewith and rotated at the same speed as the arbor for the minute hand of the master clock is a ten toothed wheel indicated by the reference character 42. The wire 36 of the shaft terminates in the spring contact 43, the free end of which is designed to contact normally with the toothed portion of the wheel 42; in contact with toothed wheel 42 is another spring contact 44 positioned close to the spring contact 43 and preferably approximately parallel therewith. Connected with the spring contact 44 is a portion of a wire circuit 36^a leading to the switch 36^b which is adapted to connect the wire 36^a of the circuit with either of the wires 36^c, 36^d, the former of which terminates in the spring contact 45 coöperating with mutilated cam 40, and the latter terminating in spring contact 46 adapted to coöperate with mutilated cam 41. The coils 29, 30 may be wound in the usual or any desired manner, and within the same are the usual cores of soft metal indicated by the reference character 47. These forward extremities of the cores 47, which are adapted to be inductively energized by the current passing through the coils 29, 30, are in close contact to a plate 48 secured to the lever 49, which is pivoted to the side frame member 11 at 50, and carries at its upper extremity suitable mechanism for operating the ratchet wheels for controlling the time period printing mechanism to be presently described.

It will be apparent that the mechanism connected with arbor 39 is adapted to close the circuit and to energize the magnets 47 to operate the period indicating mechanism, and to this end the rotation of the toothed wheel 42 on arbor 39 in making a complete revolution once every hour will result in closing the circuit ten times an hour during normal working hours or during over time periods. The switch 36^b may be thrown to establish electrical connection between that portion of the circuit indicated by 36^a and that portion designated 36^c in order to establish electrical connection through the cam

40 for normal working hours, and when it is desired to work overtime, that is, after 6 P. M., the switch 36^b must be thrown to establish electrical connection between that portion of the circuit designated at 36^a and 36^c in electrical connection with spring contact 46 and over-time cam 41. On spring contact 43 there is an adjustable contact screw designated at 43^a the lower extremity of which is adapted to contact with spring contact 44 to establish electrical connection between that portion of the circuit designated 36 and the portion 36^a. By referring to the illustration of these parts in Fig. 2, it will be seen that both the downwardly deflected extremities of spring contacts 43, 44 normally engage the periphery of the toothed wheel 42, the deflected portion of the contact 44 being in advance of 43 the cams will normally be held in position to open the circuit, but upon a toothed portion passing beneath them in the direction indicated by the arrow, the extremity of spring contact 43 will be the first passed beyond the toothed portion of the wheel periphery, and being under spring pressure will quickly drop between the teeth and cause the lower extremity of contact screw 43^a thereon to engage spring contact 44 and close the circuit. The spring contacts 43, 44 will be caused to separate and the circuit broken when the deflected forward extremity of spring contact 44 also enters the depression between the two teeth on the toothed wheel 42 and the circuit will remain broken until both contacts rise upon the upper crest of another tooth to repeat the foregoing operation of closing the circuit, which will be repeated as many times as there are teeth upon the wheel 42, which in the present instance, is ten, and the circuit will therefore be closed ten times each hour during normal working hours, or during designated over-time periods, and the period printing mechanism will therefore be operated to indicate one-tenth hour periods.

The operation of the mechanism for controlling the circuit for both normal working hours and overtime will now be described.

The normal working period and the over-time cams 40, 41 respectively also rotate in the direction indicated by the arrow, that portion of the periphery of the mutilated cam 40 designated by the reference character 40^a may be termed the forenoon cam, while the break designated at 40^b in the periphery of cam 40 is designed to open the circuit during the noon hour, and that portion of the periphery of the cam designated at 40^c may be termed the after-noon period cam being designed to close the circuit following the noon period and extending until normal closing time. In the present embodiment of the invention the normal work-

ing period cam 40 is arranged for a ten hour working period; that is, the cam surface 40^a is adapted to close the circuit from 7 a. m. until 12 m., the broken portion 40^b to open the circuit one hour for the noon intermission and the cam surface 40^c to close the circuit following the noon intermission until 6 p. m., when in the absence of over-time work, the circuit will remain open and the recording mechanism out of electrical contact with the master clock until the following morning at 7 a. m., when the regular day period begins. The circuit may therefore be traced beginning with the terminal wire 35 on the device, passing through wire 35 indicated on the diagram, to the shaft 38, through cam 40, spring contact 45, 36^c through switch 36^b when connected with binding post of 36^c, through 36^a to spring contact 44, thence at one-tenth hour intervals through contact screw 43^a on spring contact 43, and to the wire 36.

When it is desired to use the device for overtime work an operator will throw the switch 36^b to the position indicated in Fig. 2, and since the cam 41 is preferably placed in a relative position with respect to cam 40, as illustrated, just before 6 p. m., the active face of cam 41 will come in contact with spring contact 46 and the circuit will pass through wire 35, hour hand shaft 38, cam 41, spring contact 46, wire 36^a, switch 36^b, wire 36^a, into its spring contact 44, and thence at tenth hour intervals under control of toothed wheel 42 on the minute hand arbor the circuit will pass through contact screw 43^a on spring contact 43, and thence to the wire 36 leading to the magnet and completing the circuit.

The above described electrical connection in my improved time register with a controlling or master clock, is designed to cause the period recording mechanism to be operated during all proper working hours, whether showing the day working period or whether for over-time periods, and in the present embodiment of the invention the periods recording mechanism is designed to record periods consisting of one-tenth hours, starting from zero and continuing (unless the mechanism be otherwise set) until the limit which the device is adapted to record has been reached, when the register will be returned to zero and the recording action begin anew. On the present period recording register the machine is provided, as illustrated, with four recording and printing wheels provided with numbers on their peripheries, each wheel containing numbers from zero to nine inclusive, and the combined total which the four wheels are adapted to register being, therefore, 9999, when the register will be returned to zero in a well-known manner. These period recording wheels are indicated on the drawings

herein by reference characters 51 to 54 inclusive. Period printing wheel 51 is secured to rotate with shaft 55, the same being pivotally mounted in relation to the main frame of the machine on the end pivot bearing pins 56, 57, the former being secured against rotation by means of the pin 58, with which it is secured to the sleeve 59, which latter is supported in a bearing at the upper extremity of the side frame piece 11 on the main frame of the machine. The pivot pin 57 is likewise secured to sleeve 60 by pin 61, which sleeve serves as a support for the day and month printing wheels 62, 63, the same being rotatably journaled on sleeve 60, the latter being supported upon an upwardly extending branch of the cross piece 12 of the main frame, which is designated on the drawing as 12^a.

On shaft 55 are loosely telescoped three sleeves adapted to rotate each independently of the other and independently of the shaft 55, said sleeves being indicated by the reference characters 64, 65 and 66. The sleeve 64 is the longest of the three telescoping sleeves, and has secured to its end adjacent the period type printing wheel 51 the type print wheel 52. Likewise the sleeves 65 and 66 have the type printing wheels 53 and 54 respectively secured to them at the same relative ends in order to bring the units, tens, hundreds and thousands period type printing wheels together. At their opposite extremities each of the three telescoping sleeves 64, 66 inclusive are pivotally mounted and have secured to them ratchet wheels indicated by the reference characters 67 to 70 inclusive. These ratchet wheels each consist of toothed portions and cam portions adapted to cooperate with suitable pawl mechanism in imparting the desired movement to the ratchets and through them to the telescoping sleeves, the shaft 55 and the period type printing wheels controlled thereby. The details of construction and the mode of operation of the period type printing wheels and ratchets controlling them is very similar to the construction of these parts shown in my prior patent already referred to, and reference may be had thereto for further description except to say that as in the former patent the ratchet wheels 67 to 70 inclusive are prevented from retrograde movement by reason of the gravity pawls 71 to 74 inclusive, which are pivotally mounted on the main frame 11 at 75. The outer extremity of the pivot pin 56 has a reduced portion as at 56^a, which, together with the inner extremity of the sleeve 59, serves to pivotally support a rocker arm 76, the lower extremity of which is branched to accommodate itself to the journal bearing before mentioned for the purpose of furnishing it with a substantial pivotal support. The upper extremity of

the rocking member 76 carries a gravity pawl pivotally secured thereto by pin 77, passing through the bearings 78^a of the pawl, which is indicated by the reference character 78. This pawl at its forward extremity is provided with a depending portion preferably of greater width than the shank of the pawl, which extended portion is provided with a plurality of operating faces of different depths adapted to cooperate with the various ratchet wheels 67 to 70 inclusive, and the controlling cam surfaces thereon in the manner described in my former patent, in order that the units wheel 67 may be operated one step or one-tenth of a revolution at each operation of the gravity pawl 78, the tens ratchet wheel 68 to be operated one step at every tenth movement of same, the hundreds ratchet 69 to be operated at every one hundredth movement of the pawl, and the thousands ratchet wheel 70 to be operated one step for every thousand movements of the pawl. Gravity pawl 78 and its supporting rocker arm 76 are adapted to be operated by the link 79 pivotally connected thereto at one end and at its other end to the upper extremity of the hereinbefore described member 49, pivotally mounted at 50 under the control of the magnet cores 47. The member 49 is normally adapted to be rocked to the position shown in Fig. 6 by means of a tension spring 80 secured at one end to a bracket arm 81, mounted on a branch 11^a of the side frame 11, and secured at its other extremity to the lower end of a member 82 secured to the pivoted member 49.

From the foregoing description of the means for closing the electric circuit connecting the recording mechanism with the master clock, and for energizing the magnetic coils at given periods, as on the expiration of each one-tenth hour, the control of the time period recording wheels 51 to 54 inclusive will be apparent, particularly in view of the complete description of the operation of the similar mechanism in my former patent, to which reference is made herein.

At the same time that an impression is to be taken upon a card from the period recording wheels 51 to 54 inclusive, it is desired that the card shall be likewise imprinted with the date printing wheels 62, 63, the former of which indicates the day of the month and the latter the month during which the impression is taken. These day and month printing wheels 62, 63 are not automatically operated in the present embodiment of the invention, but are shown as adapted to be set by improved means accessible through the top cover plate 14, when the before described portion 17 adjacent the card slot is removed. This setting means is designed to furnish a single means to be

operated in setting the register wheels for both month and days at a single operation, and to do this it will be apparent that means must be provided which operate the day recording wheel 62 each time it is operated but will operate the month register wheel 63 only once each month. The day printing wheel as illustrated is provided with numbers on its periphery, running consecutively from 1 to 31 inclusive, while the months register wheel is provided on its periphery with characters designed to designate or print the twelve calendar months of the year from January to December successively, and to do this the months may be written out, or if preferred and shown they may be abbreviated in the usual manner. The day and month recording wheels 62, 63 being rotatably journaled on sleeve 60 on the same center as the periods type printing wheels, it will be apparent that they are supported from the branch frame 12^a of the frame which forms a part of the cross portion 12 of the main frame. The views shown in Fig. 5 and in Figs. 9 to 15 inclusive illustrate the detail of the special mechanism for setting the day and month recording register wheels 62, 63, by referring to which it will be seen that the single movable element for operating the day and month registers is indicated by the reference character 83, which is pivotally mounted on sleeve 60 concentrically with the day and month printing wheels 62, 63. The member 83 is of irregular form as shown, and is provided with a laterally projecting member as indicated at 84, adapted to be engaged by the finger of the operator or by a pencil or other blunt instrument placed in contact therewith through the opening in the top cover. The member 83 forms a portion of a movable frame, supporting pawls 85, 86 for operating the ratchet portions of the day and month register wheels 62, 63, these ratchet portions being indicated by the reference characters 62^a, 63^a, respectively. The ratchet wheels 62^a, 63^a are provided with a plurality of teeth adapted to be engaged by the pawls 85, 86 respectively, the ratchet 62^a on the day wheel being provided with 31 teeth corresponding to the maximum number of days in any one month, while the ratchet 63^a on the month indicating register is provided with 12 teeth corresponding with the 12 calendar months of the year. The pivoted member 83 is interposed between the upright branch 12^a of the main frame on the bearing 60 and the ratchet 62^a of the day recording register wheel 62. There is, however, interposed between the pivoted member 83 and the ratchet wheel 62^a a stationary cam indicated at 87 (see Figs. 9, 10 and 12). The member 87 is provided with a cam surface of a regular contour, adapted to hold the pawl 85 out of

contact with its cooperating ratchet wheel for a portion of the reciprocatory stroke of the pawl. This is made necessary by the fact that it is desired to operate both the day and the month printing wheels from the same movable element carrying the operating pawls, and because of the fact that the ratchet wheel operating the day indicating wheel must be provided with 31 teeth, whereas the ratchet wheel operating the month indicating wheel will be provided with only twelve teeth. Since the peripheries of these ratchet wheels must of necessity be approximately the same, the reason for varying the effective length of the stroke of the pawls for operating the day and month recording wheels will be apparent. The pivoted member 83 comprises only a portion of the means for carrying the pawls 85, 86, the remainder of which consists of another plate indicated by the reference character 88 on the outside of the month registering wheel 63 and the two connecting cross pins 89, 90, the former of which serves chiefly as a strengthening means while the pawls 85, 86 are pivotally mounted on the latter and elastically controlled by suitable coil springs indicated at 90^a, supported on the last mentioned pin and having one extremity engaged with suitable lugs on the pawls remote from their pivotal connection with the supporting pin and having their other extremities in engagement with the cross pin 89. The entire pawl carrying frame consisting of the pivoted members 83 and 88 and the cross connections 89, 90 may thus rock together to impart an oscillating movement to pawls 85, 86 in relation to their cooperating ratchet wheels, and this frame is normally held in its upper and inoperative position by means of a coil spring shown more clearly on Figs. 10 and 11 and designated by the reference character 91, which is supported on the outer extremity of the large pivot pin 57 and has one of its extremities extending beyond the coil in engagement with a pin designated at 91^a on the member 83 of the pawl carrying frame and the other extremity of the spring engaging a pin 92 on the upright branch 12^a of the main frame. Secured to the upright branch 12^a of the frame, in line with the pivoted portion 83 of the pawl supporting frame is a bracket member 93, which is provided with a stop as indicated at 93^a, adapted to engage a portion of the rocking member 83 adjacent the portion 84 to stop the downward movement of the same.

Pawls to prevent backward rotation of the ratchet wheels 62^a and 63^a are pivoted on pin 94, supported by bracket 93, these pawls being indicated by the reference characters 95, 96, respectively, the former cooperating with the ratchet wheel 62^a and with the ratchet wheel 63^a. These pawls are con-

trolled by similar lead springs designated by reference characters 97, 98, both being secured by suitable means to a laterally extending portion on bracket 93 as indicated at 93^b. Both pawls 85 and 86, the former coöperating with the day ratchet wheel and the latter with the month ratchet wheel are similar in construction, as illustrated in Fig. 14, and are provided with cross pins 85^a and 86^a, the ends of which extend on either side of the pawls. On one side the ends of these pins 85^a 86^a are engaged by the free ends of the coil springs 90^a for controlling the pawls, and at their opposite ends they are adapted to engage cam surfaces, the pin on pawl 85 being adapted to engage the cam surface 87 during a portion of its normal movement to hold it out of engagement with the ratchet wheel 62^a on the day indicating wheel to prevent the stroke of the pawl, which is of the same length as the stroke of the pawl for operating the months ratchet from rotating the ratchet and the day indicating wheel too far, and by this means as described the latter part only of the stroke of the pawl is effective to rotate its coöperating ratchet and the amount of rotation imparted to the ratchet and the days indicating wheel may of course be determined by the amount of effective cam surface on the cam plate 87. Special means must be provided as will be apparent to prevent the pawl 86 which operates the months indicating wheel ratchet from engaging its coöperating ratchet wheel more than once during each 31 oscillations imparted to the day indicating wheel by its operating pawl 85. To accomplish this result a pawl 99 is pivotally mounted on the pin 94, said pawl being provided on under side of its forward extremity with a depending tooth adapted to engage the peripheral surface of a circular plate secured to and rotatable with the day register wheel 62, said member being indicated by the reference character 100, as shown more clearly in Fig. 13. The periphery of the cam member 100 is circular, but is provided with a depression at 100^a. The pawl 99 at its forward free end on the upper side thereof is also provided with a cam surface of sufficient length to engage the cross pin 86^a in the month register wheel operating pawl 86 and hold the said pawl normally out of engagement against the action of the spring 90^a with the teeth on the month register wheel ratchet 63^a, which will be done as long as the forward extremity of the pawl rides on the peripheral surface of the cam member 100, but when depression 100^a registers with the pawl it will permit the pawl 86 to drop into engagement with a tooth on the month registering wheel ratchet 63^a and move the same one space or one oscillation of the pawl 86, whereupon the further rotation of the cam

100 moving with the day registering wheel 72 will have carried the depression 100^a to a point where the pawl 99 will again ride upon the peripheral surface of the cam and the cross pin 86^a will therefore hold the months register operating pawl out of engagement with the teeth on ratchet wheel 63^a, and the months register wheel will therefore remain in a fixed position until the day indicating wheel will have made a complete revolution and registered all of the days of the month when the position of cam 100 will again permit the pawl 86 to shift the months recording wheel in the manner described.

One of the special features of the present invention resides in the improved card-positioning means which will now be described, reference being had particularly to Figs. 5 and 6 and Figs. 32 to 39 inclusive. In Fig. 32 is shown an opening in the top plate through which the card to be printed is designed to be introduced, the same being designated by the reference character 18. Secured to the connecting member of the frame 12 is a card chute or frame, which preferably may be detached by removing the screws 101, 102 by which it is secured to the frame member 12, and this chute is designated by the reference character 103, being located vertically on the interior of the mechanism adjacent the period and date recording wheels in order that a card introduced into the slot of the chute may be accessible to the period and date type wheels, access to the card being secured by providing an opening through both side walls of the chute indicated at 103^a. Into this opening the period and date printing wheels extend so that when a card, as designated by the reference character 104 in Fig. 35, is introduced into the chute the printing wheels will contact with the face of the card. Both walls of the chute are cut away to allow the impression hammer, which is designated by the reference character 105, to strike the card and cause it to forcibly contact with the period and date recording wheels. This impression hammer, except for the construction of the shank thereof, is of the same form shown in my former patent referred to and will not be herein further described. On the printing wheel side of the card chute 103 over the opening 103^a therein the ribbon guides 106, 107 are placed in order to guide an impression ribbon over the date and period printing wheels and between said wheels and the card when placed within the chute.

In the device of my former patent referred to a card chute was provided for a similar purpose, but in the present invention one of the principal objects is to provide improved means not only for positioning the card correctly for each successive

insertion therein in relation to the type printing wheels, but also to provide improved means to prevent the inversion of the card, that is, to prevent the wrong end of the card being inserted when the card is first introduced into the slot.

To insure that the proper end of the card shall be first inserted into the card chute I use a card of a particular design, preferably as illustrated in Fig. 23, although cards of various shapes may be employed, it will be apparent, by varying the design of the card chute in relation to the various cooperating elements described. In the embodiment of the invention shown the card at the bottom is provided with two perforations designated at A and B, which are wholly within the material of which the card is formed. These perforations A and B are formed in the card at the time the cards are made up. By referring to the illustration of the card in Fig. 23 it will be seen that the cards are printed with blank spaces following the words "start" and "stop" in each of the rectangular spaces on the card, each separate space being provided to record the total amount of time continuously spent on the particular job at any one time. For example, in the illustration it will be seen that the work on the job was started on the 10th of June, the period register indicating 1284, which latter number indicates the lapse of 1/10 hours since the period recording mechanism began recording at zero. It will be further noted that work on the job as illustrated on this particular card was stopped on June 13th, the period recording register indicating 1384. It will also be noted that it is preferred to stamp the time of starting on the card below the time that the continuous work on the job is stopped in order to expedite computations, as for example, the difference between 1284 and 1384 is 100, which may be extended in the total column as indicated and totaled if there be more than one extension in this column, afterward to be multiplied by the rate for the period to indicate the total cost of the labor for the various periods consumed on the job. In order to carry out the use of the card as designed it is desired that the card shall be inserted into the chute in its inverted form, with the face adapted to receive the impressions from the period indicating and date indicating wheels of course turned toward those wheels. In order to insure that the card may not be inserted except with the top side first as indicated, the perforations A and B are provided. One of the walls 103 is slotted as indicated at 108, and a pivoted member 109 mounted on pivot pin 110 extends into this slot and into the card slot of the chute, as shown in Figs. 34 and 36, the member 109 being normally retained in this position by a tension spring

secured at one end to pin 111 on the member 109 and at its other end attached at 112 to an oscillating member 113, this spring being indicated by the reference character 114. The oscillating member 113 is pivotally secured at 115 and is provided with an upright branch carrying at its upper extremity a projection or pin 116 adapted to extend to a perforation in one of the walls of the card chute. The upright branch of the oscillating member 113 is inserted opposite the pivoted member 109 so that they are normally in contact with each other under the action of tension spring 114, as illustrated in Fig. 36. The tension exerted by the spring 114 on the pivoted member 109 by reason of the leverage is greater than the effect of the tension on oscillating member 113, so that the normal positions of these parts are as indicated in Fig. 36. When, however, an operator attempts to insert a card within the chute with the end containing the perforations A, B entering the chute first, the pressure of the card as it wedges against the pivoted member 109 will be sufficient to force that member on its pivotal center 110 out of the card chute and increase the pull on spring 114, which will tend to cause the rocking member 113 to be rocked inwardly and the upright branch thereon carrying the projection 116 will be held against the surface of the card with considerable elastic pressure.

The perforations A and B are purposely so located that one of them will pass in the path of the projection 116, and when it reaches this member the projection 116 will enter the perforation and prevent further ingress of the card in the slot. The lower surface of the pin is beveled as indicated at 116^a to allow the card to be withdrawn from the slot, but the upper surface of this projection is horizontal or approximately so and will not permit the card to be pressed further into the slot without mutilating it. If, on the other hand, the card be inserted with its upper end first, this end not having perforations in it, the material of the card as before will upon entering the slot and passing into contact with the pivoted member 109, rock said member as before and cause the frame 113 to be rocked under the action of the tension spring 114, which will cause the projection 116 carried thereby to contact as before with the surface of the card. The pressure, however, of this projection on the card is not sufficient in the absence of perforations to create more than slight friction and will not impede the inward progress of the card so that the card if it has not before been inserted into the machine may pass downwardly into the chute until it reaches the extreme lower end thereof, which should bring the last space at the normal bottom of the card exactly

opposite the printing line of the date and period register wheels. When the card is in this position with the face of it adjacent the printing wheels with the ribbon interposed lever 10 in the manner hereinafter described and as already shown and described in my prior patent referred to, which will automatically lock the period registering means against being shifted for the time being by the master clock and will cause the impression hammer 105 to strike the back of the card and force it upon the date and period printing wheels with the ribbon interposed between them in order to make an impression upon the face of the card, after which the card may be withdrawn. When it is desired that the workman shall again insert the card in the machine to be stamped, that is, when he has stopped work on this particular piece or job to which the card refers, the card must again be inserted with its printing face toward the type wheels and with the normal top of the card first to enter the slot, since the perforated lower end of the card may not at any time be inserted for the reasons already set forth. In the absence of special mechanism to position the card upon its next insertion or upon succeeding insertions, it will be apparent that the card may again if the proper end be inserted be caused to enter the slot until the normal upper extremity of the card contacts with the bottom of the slot as before, which would bring the printing line opposite the word "start" to its first position opposite the period and date type printing wheels; but it is desired that the second insertion of the card to print the date and number of periods of time elapsed opposite the word "stop" on the card. In order to thus position the card on the second and succeeding insertions I utilize the mechanism hereinbefore described for preventing the incorrect insertion of the card with respect to its upper and lower extremities. In the vertical plane of the projection 116, which acts to stop the card when the wrong end is inserted as before described, and just below the same, I provide a punch which is indicated by the reference character 117. Mechanism which will be hereinafter described is provided for operating the punch 117 to cause it to perforate the card 104 at a point in the body thereof opposite the punch almost simultaneously with the striking of the card by the impression hammer 105. The punch 117 is positioned just one printing space below the normal position of the stop projection 116, and the beveled under portion 116^a of the same will permit the card to be withdrawn after being perforated by the punch as described. Such a perforation is shown on the card in Fig. 23 opposite the first impression made thereon and is indicated by the reference char-

acter C. It will be apparent that upon the second insertion of the card, since the perforation C is in line with the spring controlled projection 116, when the perforation is opposite the projection 116 the same will be caused to enter the perforation and stop the further ingress of the card, which on the second insertion will bring the first "stop" printing line in position opposite the period and date printing wheels. During the operation of recording the time of stopping, another perforation opposite the word "stop" as indicated at D on the card shown in Fig. 23 will be produced, which perforation in the manner described will upon the succeeding insertion position the card so that the printing wheels will register with that portion opposite the word "start" in the second inclosed space from the bottom of the card. This mode of operation of the device will continue as often as the card is inserted, each succeeding perforation in the body of the card causing it to be stopped one printing space nearer the top until all the printing space thereon is exhausted.

The punch 117 is positioned to reciprocate through a sleeve 118 supported on the wall of the card slot. Reciprocation is imparted to the punch 117 through the block 119 secured to the outer extremity thereof by screw 120, the block 119 being provided with a slot on the lower side thereof as indicated at 119^a, there being a pin 121^b passed through the said slot and secured to the upper extremity of lever 121, which is pivotally mounted in a branch of the side frame member 10, the pivot pin thereof being indicated by the reference character 122. The lever 121 is rocked through pin 123 secured to the lower extremity thereof, one end of which is connected with link 124, which in turn is connected with large cam plate 125, to which is secured the main operating lever 15. The cam plate 125, to which the lever 15 is secured by suitable screws as indicated at 126, is pivotally mounted concentrically with two ratchet wheels indicated by the reference characters 127, 128. These ratchet wheels are provided with teeth and are adapted to be driven in opposite directions by spring-controlled pawls 129, 130, on plate 125, in a manner similar to the driving mechanism shown and described in my former patent herein referred to, and the same need not be further herein described. The hammer 105, heretofore referred to, is driven from these ratchet wheels 127, 128, which are caused to rotate in opposite directions as the operating lever 15 oscillates one of the spring-controlled pawls 129, 130 engaging the ratchet wheels at each oscillation of the lever. In Fig. 26 is shown the details of an arm designated by the reference character 131, which is pivotally secured to the

frame 10 at 132 and is provided with beveled contact faces 131^a and 131^b adapted to cooperate with the teeth on the two ratchet wheels under the control of the operating lever 15 in order that the hammer arm 133 supporting the hammer portion 105 may be rocked at each cycle of movement of the operating lever 15. The member 131 and the shaft 132 which it controls are held normally in contact with the ratchet wheels by means of spring 134 of the tension form secured at one end to pin 135 on member 131 and at its other extremity to pin 136 on the machine frame. The hammer arm 133 is pivotally mounted in relation to shaft 132, but is not rigidly secured thereto, being elastically held in relation to the shaft by a spring 137, which is interposed between a projection near the lower extremity of hammer arm 133 and a projection 138 rigidly secured to shaft 132. This spring being interposed between the hammer arm and the shaft allows a certain amount of play and renders the action of the hammer more effective and satisfactory in striking the card to produce an impression thereon.

Secured to the upper extremity of cam plate 125 is a cam 139 cooperating with a roller 140 on one end of lever 141, which is secured to the extremity of shaft 142. When the cam 139 is rocked, lever 141 will be rocked and will impart its motion to shaft 142, which carries a lever 143, described in my prior patent herein mentioned, having at its forward extremity a pin 144 adapted to lock the gravity pawls 71 to 74 inclusive and so prevent the operation of the period recording registers during the interval of time consumed by the workman in stamping the time of stopping a job on one card and starting a job on another card. This is a feature that was fully explained in my former patent herein referred to. On the shaft 142 in the present invention, however, is secured a disk 145, provided with a pin 146 to which is secured one end of a coiled spring 147, the other extremity of which is in engagement with a pin 148 on the main frame of the machine to normally rock the shaft 142 to hold the lever 143 and the pin 144 thereon out of contact with gravity pawls 71 to 74 inclusive. This disk 145 serves the double function of operating an improved ribbon feed, which is one of the special features of the present invention, 149 being a pin secured to the side of the plate 150 pivotally mounted independently of but concentrically with ribbon spool 151 and a grooved disk 152 operatively secured to the said spool by means of a pin 153 secured to one of the flanges of the spool and detachably entering a hole in the side of the grooved disk 152. The member 150 carries pin 149 engaging a slot 145^a in disk 145, and the rocking movement of

shaft 142 against the action of spring 147 will therefore rock the member 150 which carries an eccentrically mounted segment of a disk 154, the edge of which is adapted to engage a peripheral groove formed in disk 152 controlling ribbon spool 151. The member 154 is provided with a gravity arm 155 adapted to keep the disk portion of 154 normally in contact with the groove on disk 152, and as this gravity controlled member 154 is rocked on the member 150 in one direction it will impart movement to the disk 152 to operate the ribbon spool 151, and when moved in the opposite direction it will merely pass over the groove in the disk without operating it. The disk portion 154 of the gravity friction pawl is notched or mutilated as indicated at 154^a, the said notched portion being adapted to engage a pin 156 on member 150 to secure the gravity pawl 154 in its inoperative position. The ribbon spool 151 is loosely journaled on its supporting shaft and is pressed toward friction disk 152, by which rotation is imparted to it by means of a spring 157 interposed between the same and the extremity of the fixed shaft 158, upon which it is mounted.

The companion ribbon spool beyond the upper side of the type wheels is designed to act as an idle roller or support and is indicated by the reference character 159, being supported upon hollow stationary shaft 160 which is secured in an arm 161 pivotally secured in the main frame of the machine in order that the idle ribbon spool 159 may be rocked to a vertical position away from the proximity of the type printing wheels in order to afford convenient access to the registering mechanism. The shaft 142 heretofore referred to, operating the ribbon feed and the interlocking mechanism for controlling the printing wheel ratchets, has preferably an elastic connection with its operating lever 141 controlled by the main operating cam and lever, the same consisting of an arm 162 secured to the outer extremity of rock shaft 142 adjacent one extremity of lever 141 beyond its pivotal connection with shaft 142, there being a pin 163 secured to the adjacent extremity of lever 141 extending through an opening in the outer end of lever 162 and the parts secured elastically together by means of the coiled spring 164 which is interposed between the top of the lever 162 and a washer 165 secured to pin 163. This construction avoids sudden shocks to the ribbon feed and to the mechanism for locking the printing wheel ratchets against movement between two successive stampings at the completion of one job and the beginning of another by a workman.

Another feature of the present invention and which will now be described is the special mechanism provided for adapting my

improved recording register to be used for recording over time work, that is, work after the regular factory hours, as for example after 6 p. m. In order to operate the device after 6 p. m. it has heretofore been observed that the switch 36^b must be operated to establish the circuit through the overtime cam 41 on the master clock, as illustrated in Fig. 2. When the device is to be used for recording over time it is desired that provision be made to record such over time without affecting the reading of the entire register mechanism. Since the number of hours usually worked at any one period outside of the usual working hours, as for example after 6 p. m., is not great the number of hours to be recorded will not require the use of more than the units and tens register wheels, keeping the totals for the period below 99. In order therefore that only the units and tens recording wheels may be operated means is provided to this end, consisting of what may be called an over time lever pivoted to the main frame at 170, and having the upper extremity thereof terminating near the under side of the top cover plate, but free therefrom in order that this lever, which is designated by the reference character 171, may be vibrated to the position shown in Fig. 6 to bring the member 172 pivoted thereto at 173, to a position where the cam portion on the member 172 registers with the periphery of one of the printing wheel ratchets, preferably near the units ratchet wheel, the cam portion of the member 172 as indicated at 172^a being adapted to come in contact when this operated with a lateral projection on gravity pawl 78, as indicated at 78^b, Fig. 8. The height of the cam portion 172^a is sufficient to prevent the gravity pawl 78 from dropping low enough to contact with the teeth on the hundreds and thousands ratchet wheels, but at the same time will permit the units and tens wheels to be operated. Secured to the over-time lever 171 at one side thereof and extending into the opening for the detachable cover plate 17 is an arm or pin 174, which may be grasped by the operator to move the over-time lever 171 and rock it on its pivotal connection 170 with the main frame. In the view shown in Fig. 6 the over-time lever 171 is in its normal working position, causing the pivoted cam member 172 to cooperate with the gravity pawl 78 to prevent acting upon anything but units and tens registers. It is preferred that the upper end of the lever 171 be formed with a flat portion as indicated at 171^a, on which may be placed the word "Overtime," which will show through the glass of the side opening 30 in the top cover plate when the device is adjusted to register over time. When, however, it is desired to use the device during regular working hours

access will be had to the over time lever through the removable cover plate and the operator by grasping pin 174 will rock the lever and the pivoted cam member 172 to a position which is indicated by looking toward the right of the view in Fig. 6, which will position the cam 172^a out of reach of the gravity pawl and will enable the register device to resume its normal functions at the beginning of the next regular working day. Over-time records may be made upon special over-time cards, as for example, cards of another color. Since the over-time cam 41 is shown of a character adapted to close the circuit between the master clock and the recording mechanism for exactly 10 hours or one hundred of the one-tenth hour periods, it will be apparent that regardless of the number of hours of overtime actually worked the master-clock will continue to operate the period printing register through one hundred periods when the cam 41 will operate to break the circuit, leaving the period recording wheels all in exactly the same position as at 6 p. m. in the evening before the overtime work began, because the hundreds and thousands wheels have not been disturbed and the units and tens wheels have been returned to their original reading. Therefore at the beginning of the succeeding working day the switch 36^b may be thrown to close the day circuit and the day recording mechanism will become operative at 7 a. m. under control of cam 40.

Another important feature of the improvements which I have applied to the mechanism described herein is to be found in connection with mechanism for operating shaft 142 which controls the ribbon feed mechanism and the locking lever 143 and pin 144, which latter engages the pawls locking the ratchets 67 to 70 inclusive, which control the period time printing wheels 51 to 54 inclusive. In my former patent referred to and in the preceding description of the present invention I have described this locking mechanism and have heretofore referred to the cam 139 on the hand lever cam plate 125. By reference to Fig. 24 and others it will be seen that the cam track 139 is provided with a beveled or depressed portion as indicated at 139^a, which permits the roller 140 on lever 141 operating shaft 142 to be lifted gradually until the roller 140 rides upon the upper crest of the cam track. This permits the shaft 142 to be operated gradually. But on the reverse movement, this is when the cam track 139 passes from under the roller 140 on lever 141, it is desired that the shaft 142 controlled by lever 141 shall be held in an approximately inoperative position until the cam track 139 has passed almost from beneath the roller in order to sustain the locking pin 144 in its operative position beneath pawls 71 to 74 in-

clusive. In other words, it is desired that the locking mechanism shall be operated to lock the periods recording wheels and their operating ratchets until the operating lever cam plate carried thereby shall have almost
 5 reached the extreme limits of the stroke carrying cam plate 139 away from the roller 140 in order to insure that the mechanisms shall have been operated to cause the im-
 10 pression hammer to strike upon the type wheels over the impression ribbon in the manner described. This is desirable and essential in order that the periods recording
 15 type wheels shall be securely held in position in order that they may not shift at the time immediately following the impact of the hammer thereupon, which would result
 20 in securing an imperfect impression due to the faulty alinement of the impression characters on the type wheels, and also prevents the releasing of the period printing wheel
 25 ratchets between succeeding impressions desired to be taken by the same workman between the cessation of one job and the beginning of another, to which reference has
 30 already been made. In order to accomplish this result, namely, causing the roller 140 on lever 141 to follow the beveled contour
 35 of cam plate 139 as the roller 140 rides upwardly thereon and to cause the roller 140 and the lever 141 to be sustained in its open
 40 position after the cam plate 139 has passed from beneath the roller, I provide a pawl 180, which is pivoted at 181 to the side frame of the machine. This pawl is pro-
 45 vided with an engaging lip or tooth at 180^a in engagement with the teeth of the inner ratchet wheel 127, and in this manner is adapted to be lifted by the beveled surfaces
 50 of the teeth of this ratchet wheel. The pawl 180 is provided with an upper or raised surface as shown adapted to engage a roller 182 or enlargement upon the pin
 55 supporting roller 140 or an extension of the same. The pawl 180 is limited against excessive downward movement by an engaging pin 183 on the side frame 10 to which the pawl is pivotally secured. As the hand
 60 lever is operated to shift its cam plate and the cam track 139 thereon to cause the roller 140 to ride upwardly upon the beveled surface 139^a of the cam track, the pawl 180 will be at the lower extremity of its
 65 pivotal movement resting upon pin 183 by reason of the fact that its engaging tooth 180^a will rest between teeth upon the large operating ratchet wheel 127. This will permit the hand lever to rock the cam plate 125 and the cam track 139 thereon and to cause the roller 140 to ride gradually upon the beveled surface 139^a until the roller reaches the upper crest of the cam. The action of pawl 180 at the same time will lock the large ratchet wheel 127 against retrograde movement. On the reverse movement of the hand

lever the roller 140 on lever 141 will have been carried to the extremity of the cam track 139 opposite the beveled portion 139^a and the uniform or upper crest of this cam track will operate the roller 140 to control the lever 141 and hold the locking lever 143 in its operated position. It will be apparent that on this return movement, however, of cam 139 without the coöperation of pawl 180 the teeth of the roller 140 would be to
 7 follow the beveled portion 139^a and to release the locking lever 143 before the cam track 139 and consequently the hand lever had reached the limit of its movement in this direction. But the release of this locking
 8 mechanism is prevented by reason of the pawl 180 just referred to, for upon this reverse movement of the hand lever the ratchet wheel 127 will be carried with the
 9 lever cam plate, and the beveled surface of a tooth upon this ratchet wheel by passing
 10 beneath the toothed portion 180^a of pawl 180 will raise it to the upper limit of its movement which will be approximately upon a
 11 plane registering with the upper crest of the cam track 139, which will hold the roller 140 in its elevated position and consequently the locking lever in its locked position until
 12 cam track 139 has reached the extreme limit of its described direction even though it is
 13 not supported at this time by reason of the beveled portion 139^a of the cam track passing from beneath it. When the cam track has
 14 reached the limit of its movement or approximately so, the tooth upon the ratchet
 15 wheel 127 which has been holding the same in its elevated position will pass from beneath it and it will drop by gravity, releasing
 16 roller 140 on lever 141 and consequently releasing the locking lever controlling the pe-
 17 riods printing wheel ratchets.

Another feature which has been added to the machine as embodied herein is a safety device to insure that the mechanism shall be operated properly even though the operator
 110 be careless in the manipulation of the hand lever. This consists of a tension spring 190 secured to a suitable pin 191 on the side frame 10 at one extremity and at its other
 111 extremity to a pin 192 secured to the punch operating lever 121 below its pivotal connection with the side frame 10. The tendency of spring 190, it will be seen, will be to hold the punch operating lever 121 in its retracted
 120 position, and this lever may only be in its completely retracted position when its toggle connection with the hand lever will permit its retraction which will be when the hand lever has been carried to the extreme limits
 125 of its movement, this being due to the toggle connection between the punch operating lever and the hand lever heretofore described; but the relations of the parts are such that when the spring 190 is of sufficient
 130 strength the hand lever not being operated 130

to the limits of its movement as should be the case on the end of each succeeding operation, the tendency of the spring will be to continue the movement of the hand lever and cause it to reach the normal limit desired in order to properly operate all the various mechanisms related thereto.

In order that the invention might be understood the details of the preferred embodiment have been specifically shown and described, but it will be apparent that those skilled in the art may practice the invention by resorting to modifications within the spirit and scope thereof, and it is not desired therefore to be limited to the exact details shown.

I claim—

1. In a time recording register, the combination with registering and printing mechanism, a card chute adapted to position a card or other object with respect to the said registering and printing mechanism, there being an opening provided adjacent one end of the said card, and spring-controlled means within the said chute adapted to cooperate with the opening in the said card and prevent the entrance of the same into the chute unless the card shall be correctly positioned upon being presented to the chute.

2. In a time recording register, the combination with registering and printing mechanism, of a card chute adapted to position a card or other object with respect to said registering and printing mechanism, there being an opening provided within the body of the card, a detent movably mounted adjacent the card chute and in the normal path of movement of the said opening in the card, a member normally projecting into the path of the card in the chute, and a connection between the last said member and the detent whereby the engagement of the member by the card will operate the detent into the path of the card and the hole therein.

3. In a time recording register, the combination with registering and printing mechanism, of a card chute adapted to position a card or other object with respect to said registering and printing mechanism, there being an opening provided within the body of the card, a detent movably mounted adjacent the card chute and in the normal path of movement of the said opening in the card, a member normally projecting into the path of the card in the chute, and an elastic connection between the last said member and the detent whereby the engagement of the member by the card will operate the detent into the path of the card and the hole therein.

4. In a time recording register, the combination with registering and printing mechanism, of a card chute adapted to position a card or other object with respect to

the said registering and printing mechanism, there being an opening provided in the said card, a detent movably mounted adjacent the path of the card in the chute and in the path of the opening therein, a controller for the detent positioned normally within the path of the card in the chute, and means whereby the engagement of the card with the controller will operate the detent into the path of the card and the hole therein.

5. The combination with time registering mechanism being provided with a card chute, of means adjacent the chute for perforating the card entirely within the body portion upon each correct insertion thereof in the chute, and means in the chute adapted to cooperate with the perforated portions of the card to position the card with respect to the perforating and registering mechanism.

6. The combination with time registering and printing mechanism, and a card chute, of means adjacent the chute for perforating the card wholly within the card body upon each correct insertion thereof in the chute, and means in the chute adapted to cooperate with the perforated portions of the card to position the card with respect to the perforating registering and printing mechanism.

7. The combination with time registering and printing mechanism, and a card chute, of means adjacent the chute for perforating the card upon each insertion thereof in the chute, and means in the chute adapted to cooperate with the previously perforated portions of the card to position the card with respect to the perforating registering and printing mechanism, said means being also adapted to cooperate with a previously cut opening in the card to insure the correct insertion of the same, within the chute with respect to the top and bottom thereof.

8. The combination with time registering and printing mechanism, of a card chute comprising spaced plates adapted to receive the card therebetween and being provided with openings adjacent the registering and printing mechanism, perforating mechanism adapted to enter the path of the card in the chute, and card positioning means comprising a movable member and a pin adapted to enter a perforation in the card being supported to oscillate in the path of the card in the chute, and an elastic connection between the movable member and the pin support.

9. The combination with time registering and printing mechanism, of a card chute comprising spaced plates adapted to receive the card therebetween and being provided with openings adjacent the registering and printing mechanism, perforating mechanism adapted to enter the path of the card in the chute, and card positioning means comprising a movable member adapted normally to

rest within the path of the card in the said chute, and a pin adapted to enter a perforation in the card, the said pin being supported to oscillate in the path of the card in the chute, and a connection between the movable member and the said pin whereby the introduction of the card into the chute will act upon the said movable member and cause the said pin to move into the said path of the card.

10. The combination with time registering and printing devices, of a card chute adjacent thereto, means adapted to enter the said card chute to cut away a portion of the card inserted therein, means adapted to enter the card chute to cooperate with the said cut-away portion of the card to position the card relative to the said recording and printing mechanism, a member adapted to extend normally within the chute in the path of the card and to be operated thereby, and means whereby the last said member may be caused to operate the said means for entering the cut-away portion of the card.

11. In a device of the character described, the combination with time registering and recording devices, of a card chute adjacent thereto, a ribbon guide on the said card chute adjacent the said time registering and recording devices, means adapted to enter the path of the card within the chute to cut away a portion thereof, and a movable card positioning device being adapted to be operated by the entrance of the card into the chute to position the card by cooperating with a portion thereof cut away upon a previous insertion.

12. The combination with time registering and printing mechanism, of mechanism for operating and supporting a ribbon adjacent the said printing mechanism, a top cover plate for the said mechanism, and a removable plate in the said plate adjacent the said time recording and printing mechanism.

13. The combination with time registering and printing mechanism comprising means for registering and recording time periods from a master clock, date indicating and printing mechanism, means for setting the date indicating and printing mechanism, a casing for the said mechanism having a fixed top cover, and a removable cover plate in the said top cover through which access may be obtained to the said date recording and printing mechanism for setting the same.

14. In a device of the character described, the combination with a type registering and printing mechanism, a pivotally mounted lever for operating the said registering and printing mechanism, a vibrating impression hammer, means for operating said impression hammer from the said pivoted lever, a card chute adjacent the said registering and printing mechanism, means for cut-

ting the card, a pivoted member for operating the said cutting means, operative connections between the said pivoted member and the said operating lever, and a tension spring secured at one end of the said pivoted member for causing the operating lever to be moved to the extreme limit of its stroke following the operation of the impression hammer.

15. In a device of the character described, the combination with time recording and printing mechanism, of a pivoted lever for operating the said time recording and printing mechanism, a card chute, means for cutting or punching a card in said chute, means for operating the said cutting or punching mechanism from the operating lever, and elastic means operatively connected with the said operating lever for causing the same to be thrown to the extreme end of the stroke if the operator fails to do so following the operation of the time recording and printing mechanism.

16. In a time recording and printing mechanism, the combination with time controlled recording and printing means, of date recording and printing mechanism comprising two rotatable printing wheels, one containing designations for the twelve calendar months, and the other containing designations for the days of each month, and means independent of the time controlled registering and printing mechanism for setting the said date printing wheels from a single operating source.

17. In a device of the character described, the combination with time recording and printing wheels, of independent ratchets for operating each of said wheels, operating means, an impression hammer, means for moving the impression hammer from said operating means, a rock shaft, an arm secured to said rock shaft and carrying a branch adapted to engage and lock the said independent ratchets for operating the registering and recording wheels, and means for rocking the said shaft for locking the said independent ratchets for the registering wheels, said means comprising an eccentric cam track secured to the operating means and engaging an arm on the said rock shaft.

18. In a device of the character described, the combination with time recording and registering wheels, means for operating said wheels, means for locking said wheels from movement immediately before one impression is produced and retaining the same in a locked position until after a succeeding impression is produced, said means comprising a rock shaft, an arm carried thereby and being provided at its outer extremity with a lateral projection adapted to engage the pawls controlling the printing ratchet wheels, a second arm secured to the rock shaft and having one end in engagement

with the cam shaft on the operating means, and means whereby the rock shaft may be held in a locked position after the operating cam therefor has ceased to act thereupon, said last mentioned means being under the control of the means for operating the impression hammer whereby the time recording and registering wheels may be held locked from the time before one impression is produced until after a succeeding impression is produced.

19. In a time registering and printing mechanism, the combination with registering and printing wheels of an operating lever, means connected therewith and operated whereby to take an impression from the said printing wheels, time controlled mechanism for operating the said wheels at predetermined intervals, mechanism for producing printed impressions from the said wheels, and means whereby said time controlled mechanism may be rendered operative for periods of time outside of regular working hours.

20. In a time registering and printing mechanism, the combination with registering and printing wheels, of an operating lever, means connected therewith and operated thereby to take an impression from the said printing wheels, time controlled mechanism for operating the said wheels at predetermined intervals during normal working hours, mechanism for producing printed impressions from the said wheels, and means whereby said time controlled mechanism may be rendered operative under the control of the operator for periods of time outside of regular working hours.

21. In a time registering and printing machine, the combination with registering and printing wheels, means for operating said registering and printing wheels, means whereby an impression may be taken from said printing wheels, time controlled mechanism for operating the said registering and printing wheels at predetermined intervals, and means whereby said time controlled mechanism may be rendered operative for periods of time outside of regular working hours.

22. In a time registering and printing mechanism, the combination with registering and printing wheels, operating means, means for taking an impression from the said printing wheels, time controlled mechanism for operating the said wheels at predetermined intervals during regular working hours, mechanism producing printed impressions from the said wheels, and means whereby the said time controlled mechanism may be rendered operative for periods of time outside of regular working hours.

23. In a time registering mechanism, the combination with a plurality of indicating

wheels and toothed wheels connected therewith for operating them, a time-controlled movable pawl for operating said toothed wheels, and means for rendering said pawl inoperative with respect to one or more of said toothed wheels.

24. In a time registering mechanism, the combination with a plurality of indicating wheels and toothed wheels connected therewith for operating them, time controlled means for operating said toothed wheels, and means under control of the operator for rendering said time controlled operating means inoperative with respect to one or more of said toothed wheels.

25. In a time registering and printing mechanism, the combination with a plurality of indicating and printing wheels, of time controlled means for operating said indicating and printing wheels, and means for rendering said time controlled means inoperative with respect to one or more of the indicating and printing wheels, but permitting it to remain operative with respect to the remainder of said wheels.

26. In a time registering and printing mechanism, the combination with a plurality of indicating and printing wheels, of time controlled means for operating said indicating and printing wheels during regular working hours, means for automatically rendering the time controlled operating means inoperative at the close of working hours, and means under the control of the operator to render the said time controlled operating means operative with respect to the indicating and printing wheels to record overtime.

27. In a time registering and printing mechanism, the combination with a plurality of indicating and printing wheels, of time controlled means for operating said indicating and printing wheels during regular working hours, means for automatically rendering the time controlled operating means inoperative at the close of working hours, means under the control of an operator to render the said time controlled operating means operative with respect to the indicating and printing wheels to record overtime for a determined period, and means to automatically render the operating means inoperative at the close of the determined overtime period.

28. In a time registering and printing mechanism, the combination with a plurality of indicating and printing wheels, of time controlled means for operating said indicating and printing wheels during regular working hours, means for automatically rendering the time controlled operating means inoperative at the close of working hours, means under the control of an operator to render the said time controlled operating

means operative with respect to a limited number only of said indicating and printing wheels to record overtime for a determined period corresponding to a complete
5 cycle of movement of the said limited number of indicating and printing wheels to return the same to their original position before the beginning of the determined overtime period, and means for automati-
10 cally rendering the operating means inop-

erative at the close of the determined overtime period.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this third day
of November, A. D. 1911.

HORACE B. McCABE,

Witnesses:

A. L. SPRINKLE,

C. H. SEEM.