No. 825,303. PATENTED JULY 10, 1906.

P. J. DARLINGTON.

RECORDING MACHINE.

APPLICATION FILED DEC. 7, 1904.

5 SHEETS—SHEET 2.

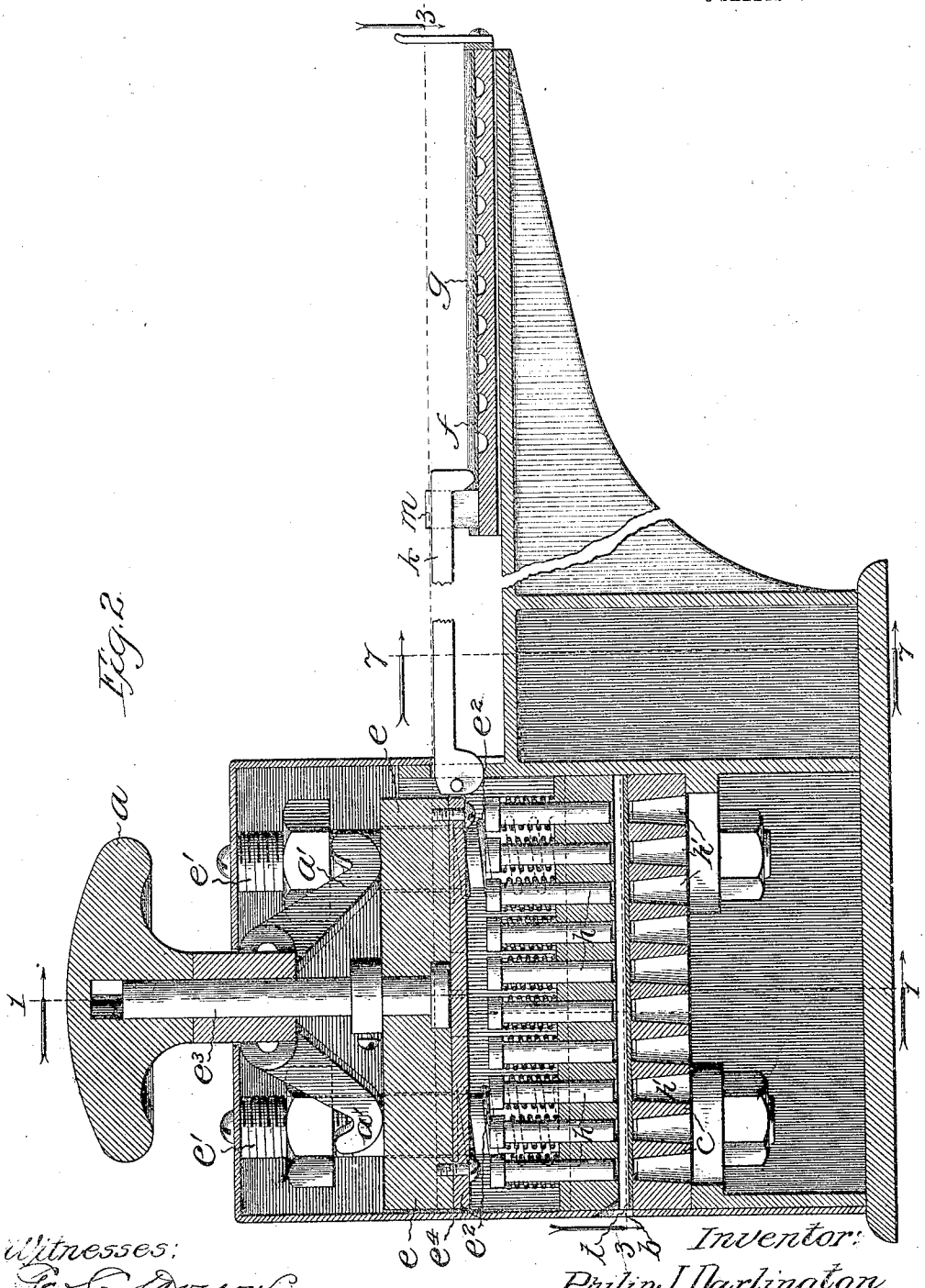


Fig. 2.

Witnesses:
Geo. C. Dorsey
A. H. Moore.

Inventor:
Philip J. Darlington,
By Barton & Sommer
Attys.

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5 SHEETS—SHEET 1.

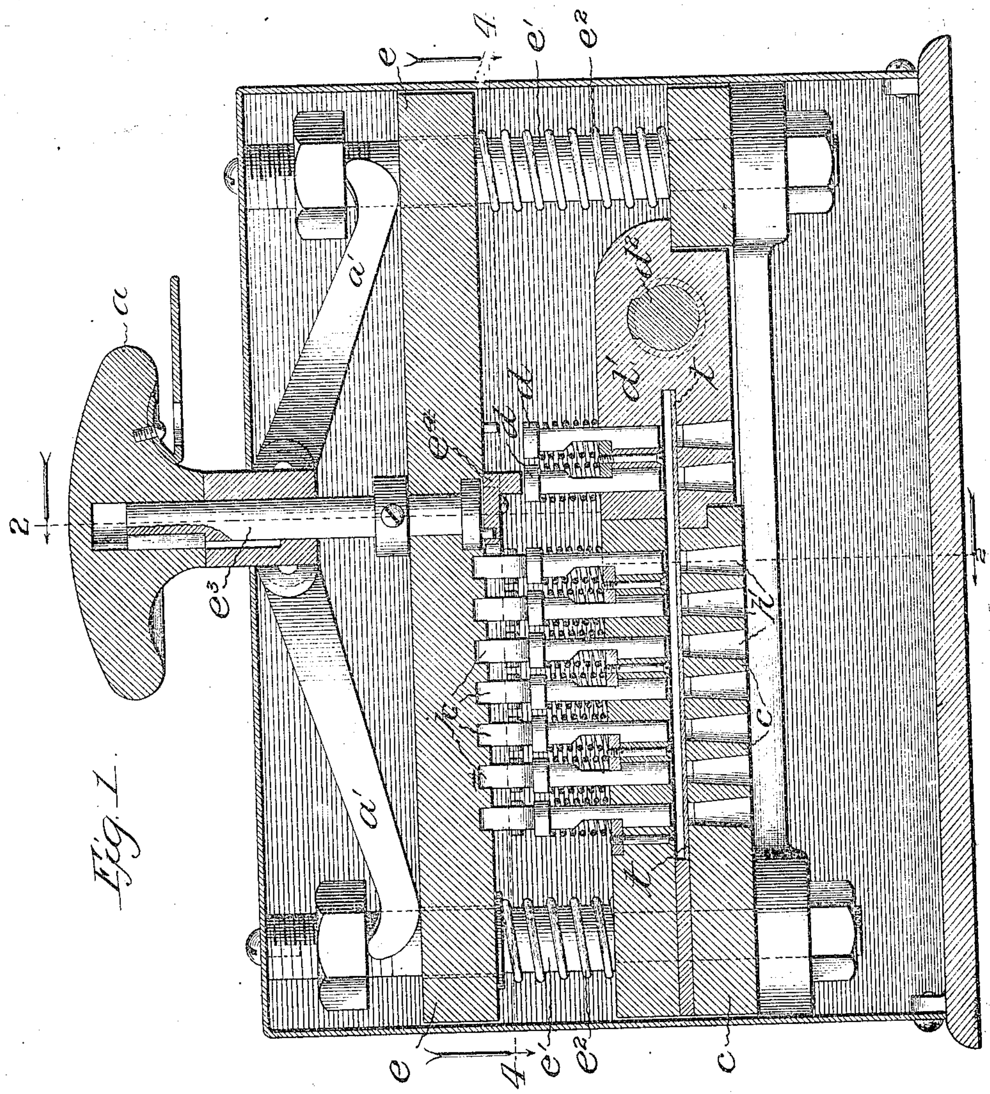


Fig. 1.

Witnesses:
Geo. C. Dowson.
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5 SHEETS—SHEET 3.

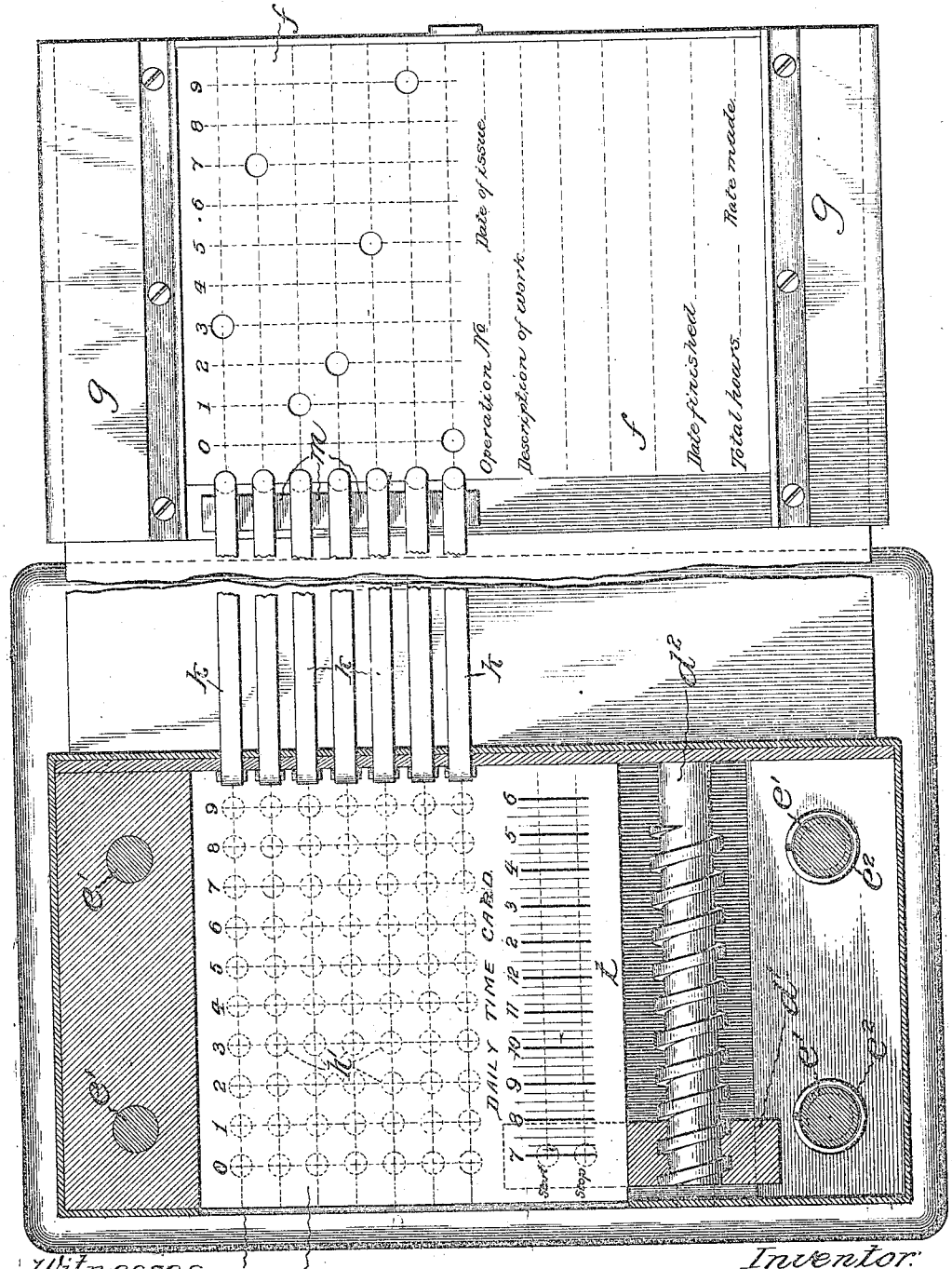


Fig. 3.

Witnesses
Geo. C. Dorion
A. F. Moore.

Inventor:
Philip J. Darlington,
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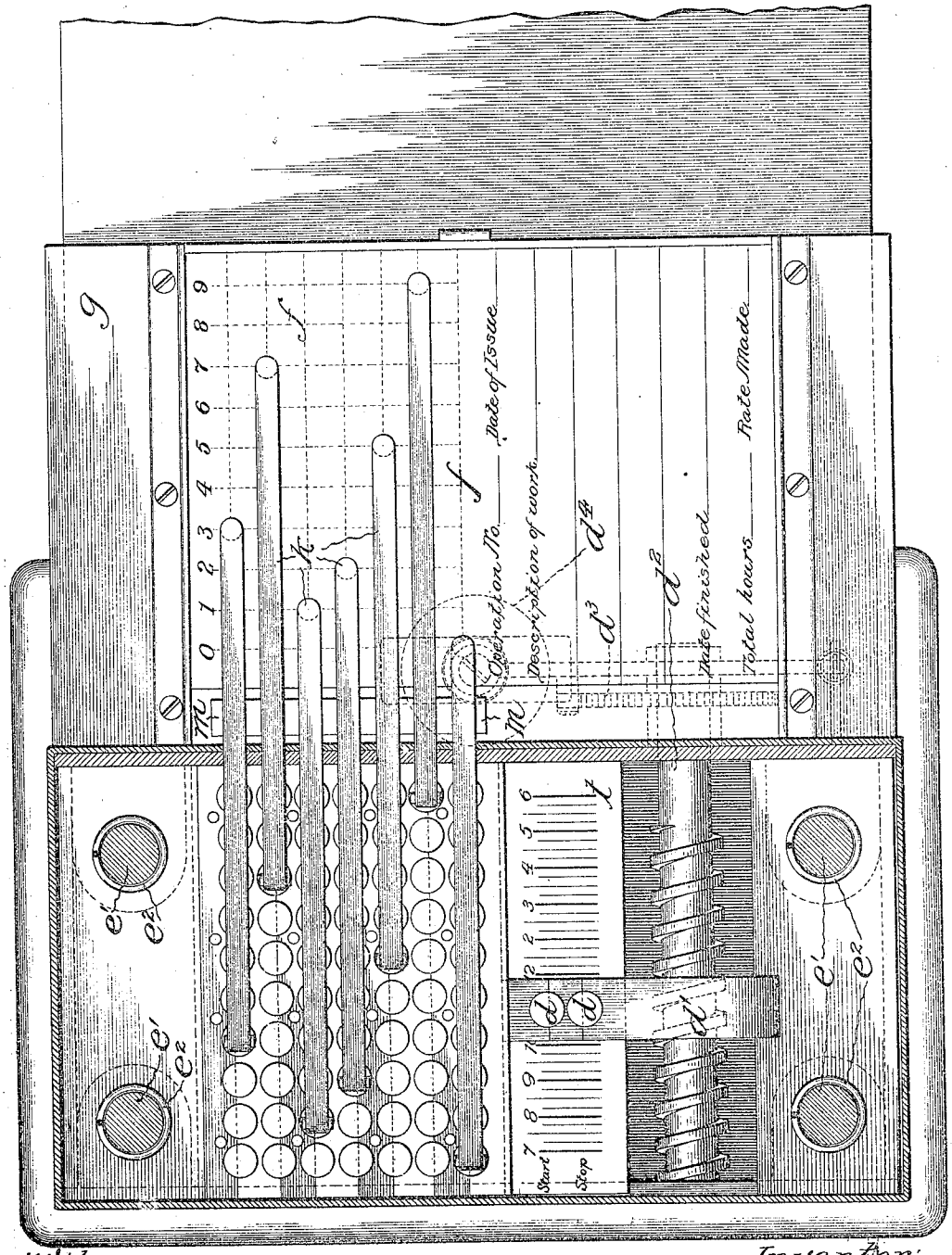
No. 825,303. PATENTED JULY 10, 1906.

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RECORDING MACHINE.

APPLICATION FILED DEC. 7, 1904.

5 SHEETS—SHEET 4.



Witnesses:
Fred C. Dennison
A. H. Moore

Fig. 4.

Inventor:
Philip J. Darlington
By Barton & Sanner
Attys.

No. 825,303. PATENTED JULY 10, 1906.

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RECORDING MACHINE.

APPLICATION FILED DEC. 7, 1904.

5 SHEETS—SHEET 5.

Fig. 5.

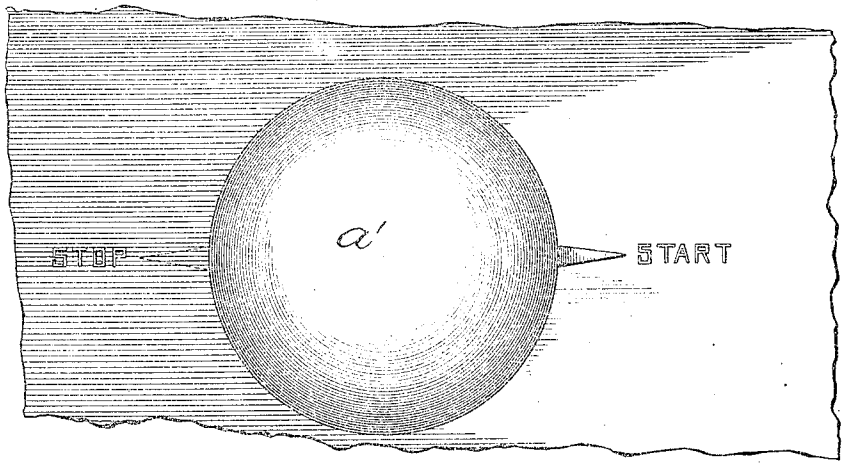


Fig 6.

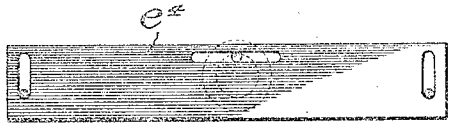
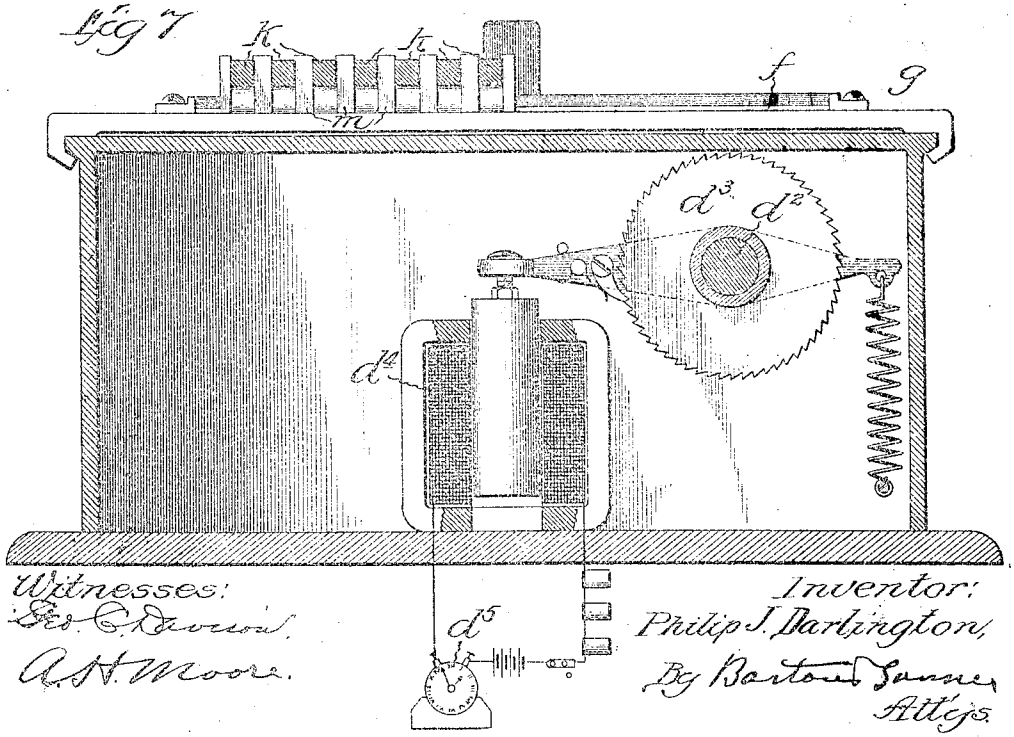


Fig 7



Witnesses:
Geo. C. Davison.
A. H. Moore.

Inventor:
Philip J. Darlington,
By Barton & Sumner
Attys.

UNITED STATES PATENT OFFICE.

PHILIP J. DARLINGTON, OF CHICAGO, ILLINOIS.

RECORDING-MACHINE.

No. 825,303. Specification of Letters Patent. Patented July 10, 1906.

Application filed December 7, 1904. Serial No. 235,850.

To all whom it may concern:

Be it known that I, PHILIP J. DARLINGTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Recording-Machines, of which the following is a full, clear, concise, and exact description.

My invention relates to automatic mechanism for recording numbers or other similar distinguishing-marks which are placed upon cards, tickets, or the like, my invention being especially useful in connection with workmen's time-recorders for the purpose of automatically and accurately identifying the workman and the nature of the work being done by him in addition to recording the time spent on such work.

It is a common practice in large workshops to issue to each workman an "operation-ticket" for each piece of work assigned and to require him to keep a record of the time spent on each such job, this record being used as a basis for computing the shop cost of the work, as well as the workman's compensation. It has been customary for the workman to make this record upon a daily time-report, which is handed in each day, the report showing the name or number of the workman, the number or other identification of the job, and the time spent. It has been found, however, that much confusion and loss has occurred owing to mistakes in transcribing the numbers or other data upon the time-report, as well as to inaccuracies in keeping account of time.

By a series of inventions which I wish to patent I have endeavored to perfect a system by which an accurate record may be kept of the time spent by each workman upon each job without relying upon the memory, honesty, or care of the workman and without loss of time. This system involves the use of the operation-ticket given to the workman for each job assigned and the daily time-report which is handed in each day until the job is finished, the workman being required to return each ticket before another is given to him, and, further, involves the use of a machine which will automatically transfer to a blank time-card the job number and workman's number borne by the operation-ticket, which is inserted in the machine with the time-card when the latter is stamped, said machine also recording upon such time-card the time when the machine is operated. Thus the time-card will be inserted in the machine and stamped once when the work is commenced and again when it is stopped, the presence of the operation-ticket being necessary in each case to control the identification-marks placed upon the time-card. No care or thought is required on the part of the workman, error in transcribing the numbers is rendered impossible, and the record is made instantly without loss of time.

The present invention relates to the recording-machine, the preferred form of which will be described in detail by reference to the accompanying drawings, and in the appended claims I will point out the parts, improvements, and combinations considered to be novel.

Figure 1 shows the recording-machine in sectional elevation. Fig. 2 is a transverse sectional view on line 2 2 of Fig. 1. Fig. 3 is a sectional plan view on line 3 3 of Fig. 2. Fig. 4 is a similar plan view on line 4 4 of Fig. 1. Fig. 5 is a detail plan view of the operating-handle. Fig. 6 is a detail plan view of a sliding bar by which the time-recording punches are operated, and Fig. 7 is a transverse sectional view of the machine on line 7 7 of Fig. 2.

The same reference-letters designate the same parts wherever used.

The machine illustrated is intended to punch a series of holes in a daily time-card, which holes by their relative positions will indicate the workman's number, the job number, and the time of starting or stopping work. The time-indicating mechanism is distinct from the numbering or identifying mechanism, and the form of either mechanism may be varied without affecting the other, although I prefer to arrange both mechanisms in the manner illustrated to be operated simultaneously by the handle *a*.

The time-card *t* is intended to be inserted in the machine through a horizontal slit *b* in the side thereof, and when in place said card rests upon a bed-plate *c*, which is provided with perforations or die-holes registering with the punches *h h*, hereinafter to be described.

At the bottom of the time-card is a time-

scale or series of lines which may be marked off, as shown in Figs. 3 and 4, to indicate, say, ten hours time, and a traveling punch or, preferably, a pair of punches *d d* is arranged to be moved over this hour-scale by suitable time-controlled mechanism, which is started, for example, at seven o'clock in the morning, arrested for an hour at noon, and finally stopped at six o'clock in the evening. Whenever the traveling punch is operated during the working day, therefore, the position of the punch-mark upon the time-scale will indicate the time of such operation. By providing two punches traveling together in parallel paths and arranging said punches to be selectively operated a distinction may be made between the punch-marks indicating "starting" and those indicating "stopping" work.

The traveling punch shown consists of two pins or dies *d d*, mounted in a suitable carrier *d'* above the card *t* and a die-plate portion of said carrier below the card, having holes registering with said punch-pins, the carrier being arranged to be advanced by a worm-shaft d^2, having screw-thread engagement therewith. Said worm-shaft is arranged to be turned step by step by a ratchet-and-pawl gear d^3, which is operated by means of a solenoid d^4 in the electric circuit of a switch which is periodically closed by clock mechanism d^5.

For operating the punch-pins a plunger-plate *e* is arranged to slide vertically upon uprights *e' e'* and is normally held up by springs e^2 e^2. Said plate is arranged to be operated by the handle *a*, acting upon four cam-levers *a' a'*, which engage said plate near the corners thereof. The handle *a* is adapted to turn and is splined to a vertical shaft e^3, carried by said plunger-plate, said shaft being provided with a crank-pin at the bottom engaging a sliding block e^4, interposed between the bottom of the plunger-plate and the heads of the punch-pins *d d*. By turning the handle *a* in one direction or the other the block e^4 may be brought into operative relation to either one of said punch-pins. Thus when the handle is turned to the point indicated "start" one of the pins of the time-punch is brought into gear, so to speak, to be operated when the handle is depressed, and when the handle is turned to the point indicated "stop" the other pin of the time-punch is brought into gear.

The time-stamp above described forms no part of the present invention, but constitutes the subject-matter of my divisional application, Serial No. 285,021, filed October 30, 1905.

I come now to a description of the identifying mechanism for transferring to the time-card the same number which is borne by the operation-ticket or identification-card. This card *f* (shown in plan in Figs. 3 and 4 and in section in Fig. 2) is intended to be placed in the sliding carrier *g*, and when said carrier is moved in preparatory to the operation of the time-stamp said identification-card will control or select the numbering or identification markers which are to operate upon the time-card. As shown in the drawings, said operation-ticket or identification-card *f* may be provided with a series of punched holes in definite relation to indicate numbers. Thus there are on the card seven horizontal lines, each line indicating a digit and each line having ten positions thereon for punch-holes numbered "0" to "9," inclusive. The first three lines may be considered as the space for the workman's number, which may be any number from "0" to "999," and the other four lines may be considered as the space for the job number, which may be any number from "0" to "9999." The ticket illustrated is shown as punched with the workman's number "371" and the job number "2590." The function of the machine is to place upon the time-card in addition to the time-marks other distinctive marks corresponding to those upon any identification-card which may be placed in the machine, and, as illustrated, this is accomplished by a series of punches corresponding to all the number positions on the identification-card, with means for selecting for operation only the individual punches which correspond in position to the punch-marks upon said identification-card. There are, therefore, seven rows of punch-pins *h h* above the space for the time-card *t*, with corresponding die-holes *h' h'* in the bed-plate *c*, each row comprising ten punch-pins corresponding to the ten number-spaces upon the horizontal lines of the card *f*.

A longitudinally-movable selecting-arm *k* is provided for each row of punch-pins between the heads of said pins and the bottom of the plunger-plate *e*, the head of such arm being enlarged to form a distance-block, which when interposed above any punch-pin will transfer the pressure of the descending plunger-plate to that particular pin. It should be stated that ordinarily the plunger-plate will not descend far enough to operate the punch-pins unless such distance-blocks are interposed to select particular pins for operation. The arms *k* are arranged to slide in grooves in the under side of the plunger-plate, and the outer ends of said arms are provided with fingers which rest upon the surface of the identification-card *f* placed in the sliding carrier *g*. When the carrier is moved in, said arms will not be moved until the ends thereof drop into the holes of said card, whereupon the arm will thereafter be moved in with the movement of the carrier, the result being that when the carrier *g* is moved clear in the arms *k* will have been moved to such positions

that the heads thereof rest over and select for operation punch-pins *h h* corresponding in relative position to the holes in the identification-card. Now upon the depression of the handle *a* the punches so selected will be operated in addition to the time-punch for stopping or starting, as the case may be, so that the time-card will be automatically punched not only with the time, but also with the same number as that which appears upon the identification-card or "operation-ticket."

The carrier is preferably provided with a slotted guide-plate *m*, in which the arms *k* may slide to keep said arms in alinement with the lines upon the card where the holes are punched. After the punching operation, which is effected, as above described, by depressing the handle *a*, the carrier will be returned to its normal position, drawing with it the selecting-arms *k*. The ends of the fingers upon said arms are beveled, so that in the return movement of the carrier the fingers may easily rise out of the holes in the identification-card. When the carrier has been returned to its normal position, both cards may be removed.

The operation-ticket or indentification-card is of course punched by any suitable means when it is handed to the workman, and he keeps this as an identification of the work upon which he is engaged until such work is finished. Whenever the work is started, a blank time-card is placed in the recording-machine, together with the identification-card, the handle of the machine is turned to the start position, the carrier containing the identification-card is pushed in to bring into gear the punches which correspond in position to the holes in the identification-card, and the handle is then depressed by a sharp blow to operate the punches so selected and also to operate that one of the pair of time-punches which indicates starting time. Both cards are then removed (the carrier having been returned to normal position) and kept by the workman until work is stopped, whereupon they are again inserted in the machine and the stopping time punched in a similar manner. If the work takes more than a single day, a separate time-card will be handed in each evening, and this card will always correctly identify the work, because the punch-marks on the operation-ticket will be automatically duplicated. The time-card will also show both the time of starting and the time of stopping work, from which the elapsed time may easily be calculated.

It will be understood that in order to distinguish between the marks indicating starting and those indicating stopping time any differential marking mechanism may be provided. There need not necessarily be two separate marking devices if other differentiating means is provided.

It will be seen that the identifying punch-marks upon the time-card will always be in exact positions, even though there may be slight inaccuracies in the placing of the marks upon the operation-ticket, because the selecting-arm *k* need only be in approximately accurate position to operate any given punch, the punch itself being fixed. The system of time-keeping which is thus made possible by this invention possesses great advantages. It requires the least possible time of the workman, it insures the accuracy of the time-card numbers to correspond with those upon the operation-ticket, and it makes it possible to sort the time-cards mechanically by means of devices which are governed by the positions of the holes, so that all the time-cards for a given operation may be easily collected. By making a note upon the operation-ticket every time a service or time card is given out a register of all the service-cards issued for that ticket is thus available, so that accountants may be sure that no service-cards have been lost or, if lost, they may be easily traced. When it is believed that all service-cards for this ticket and this ticket only have been collected, the presence of another service-card can be instantly detected by holding the bunch of cards up to the light and noting whether the punched holes are open through the entire bundle.

It will be understood that my invention is capable of many modifications without departing from the general ideas herein set forth and that it is capable of advantageous use in other ways and for other purposes than those specifically set forth herein.

I claim—

1. In a recording-machine, the combination with a number of recording-markers, arranged in separate sets, of selectors, one for each set, said selectors being adapted to be adjusted by a movable identification-card to select for operation any of the markers of their corresponding sets.

2. In a recording-machine, the combination with a number of rows of recording-markers, of selectors, one for each row, said selectors being adapted to be adjusted along their corresponding rows by an identification-card movable edgewise and having distinctive engaging portions adapted in the movement of the card to carry said selectors to distinctive positions of adjustment corresponding to the location of said engaging portions, whereby corresponding markers from the several rows are selected, and means for operating the selected marker.

3. The combination with a number of rows of punch-pins for marking a record-card, of a selecting-finger for each row of punch-pins,

said fingers being adapted to be caught by distinctive engaging portions of a movable identification-card and carried along therewith to make operative corresponding punch-pins of said rows, and means for operating the selected punch-pins of the several rows.

4. The combination with a plurality of marking devices, of selector-fingers adapted to be caught by openings in a reciprocating identification-card and advanced by the movement of said card to render operative marking devices corresponding to the openings in said card, and means for operating said selected marking devices.

5. In a recording-machine, the combination with a plurality of marking devices for a record-card, of a reciprocating card-receiver for an identification-card, said card having openings therein, selecting devices adapted to engage said openings and be moved by the card to render operative the marking devices corresponding to the openings in said card, and means for simultaneously actuating the marking devices selected.

6. In a recording-machine, the combination with marking devices adapted to engage a record-card, of a reciprocating card-carrier adapted to receive a punched identification-card, sliding selector-arms adapted to be engaged by the punched portions of said card in the movement of its receiver, said selectors moving with the card to select marking devices corresponding to the punched portions in said card, and means for actuating the marking devices so selected to punch the record-card to correspond with the identification-card.

7. In a recording-machine, the combination with a plurality of marking devices for a record-card, of selectors adapted to be operated by an identification-card to move over said marking devices to the ones corresponding to the marks on said identification-card, and means for operating the marking devices so selected.

8. The combination with a row of marking devices, of a reciprocating plunger, and a movable selector adapted to be adjusted by a movable identification-card between said plunger and any one of the marking devices of said row, to render operative such marking devices.

9. In a recording-machine, the combination with a number of marking devices arranged in sets, of a selector for each set of marking devices adapted to be engaged and moved by an identification-card to make operative a distinctive one of the marking devices of the corresponding set, and a reciprocating plunger adapted to operate the marking devices so made operative.

10. The combination with a number of rows of punches of a reciprocating plunger, a distance-piece for each row of punches adapted to be adjusted between said plunger and any of the punches of that row, and means controlled by an identification-card for moving said distance-pieces to distinctive positions of adjustment along their respective rows.

11. The combination with a card-receiver and rows of punch-pins maintained in position above the same, the bed-plate of said card-receiver having die-holes registering with said punch-pins, a vertically-movable plunger-plate above the head of said punch-pins, distance-pieces adapted to be adjusted between said plunger-plate and said punch-pins, a receiver for an identification-card, selecting-fingers for adjusting said distance-pieces adapted to be engaged by openings in said identification-card, means for producing movement of said card to engage said selecting-fingers in the respective openings therein, said fingers being adapted to be moved under the control of said card to adjust the distance-pieces in operative relation to punch-pins corresponding to the respective locations of said openings.

12. In a recording-machine, the combination with a time-stamp, of means for reproducing the marks of an identification-card upon a time-card in stamping the time thereon.

13. In a recording-machine, the combination with a time-stamp adapted to stamp the time upon a time-card, a selector adapted to be engaged by an identification-card, a corresponding distinctive identification-marker made operative by said selector in its operation, and means for simultaneously operating the time stamp and marker, to mark said time-card.

14. In a recording-machine, the combination with a time-marker adapted to mark a time-record blank, of a plurality of identification-markers, selecting-fingers adapted to be engaged by distinctive openings in an identification-card, means controlled by said fingers for determining the operation of corresponding identification-markers, and means for simultaneously actuating the time-marker and the selected identification-markers; whereby the time-record is marked to correspond with the openings in said identification-card.

15. The combination with selector-fingers adapted to be caught by distinctive engaging portions of an identification-card movable edgewise, and carried along by said card in the movement thereof to a corresponding distinctive position of adjustment, marking mechanism governed by the adjustment of said selector-fingers, and means for operating said marking mechanism.

16. The combination with a plurality of marking devices, of selector-fingers adapted to be caught by punched portions of an iden-

tification-card movable edgewise, and to be moved by said card to render operative marking devices corresponding to the punched portions in said identification-card, and means for operating the selected marking devices.

17. In a recording-machine, the combination with means adapted to reproduce upon a record-card the marks upon an identification-card, of means for simultaneously marking the time on said record-card in reproducing said marks thereon.

In witness whereof I hereunto subscribe my name this 3d day of December, A. D. 1904.

PHILIP J. DARLINGTON.

Witnesses:
DE WITT C. TANNER,
W. W. LEACH.