

No. 875,393.

PATENTED DEC. 31, 1907.

F. J. TRAN & F. CAIS.
WORKMAN'S TIME RECORDER.

APPLICATION FILED JAN. 24, 1906.

4 SHEETS—SHEET 1.

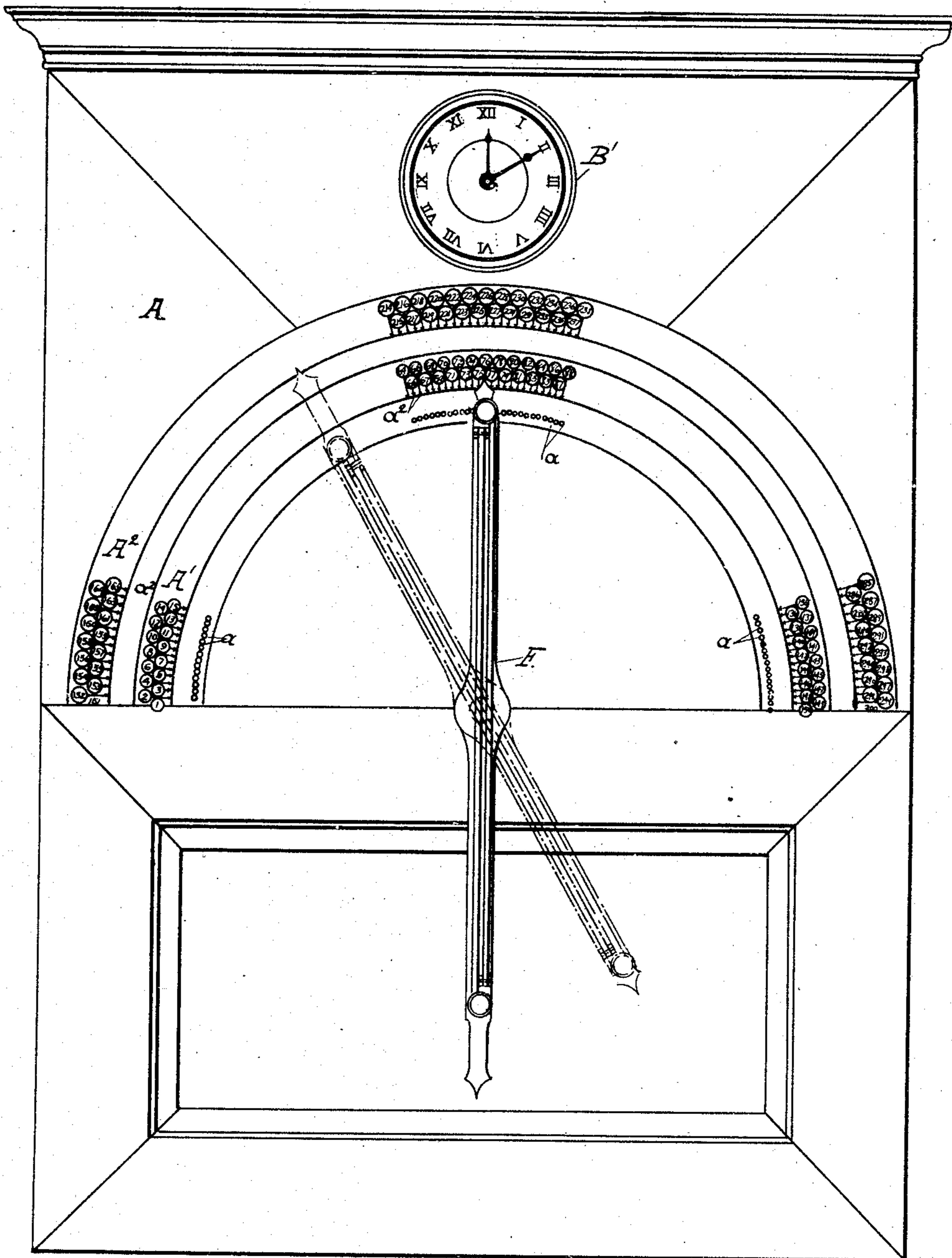


Fig. 1

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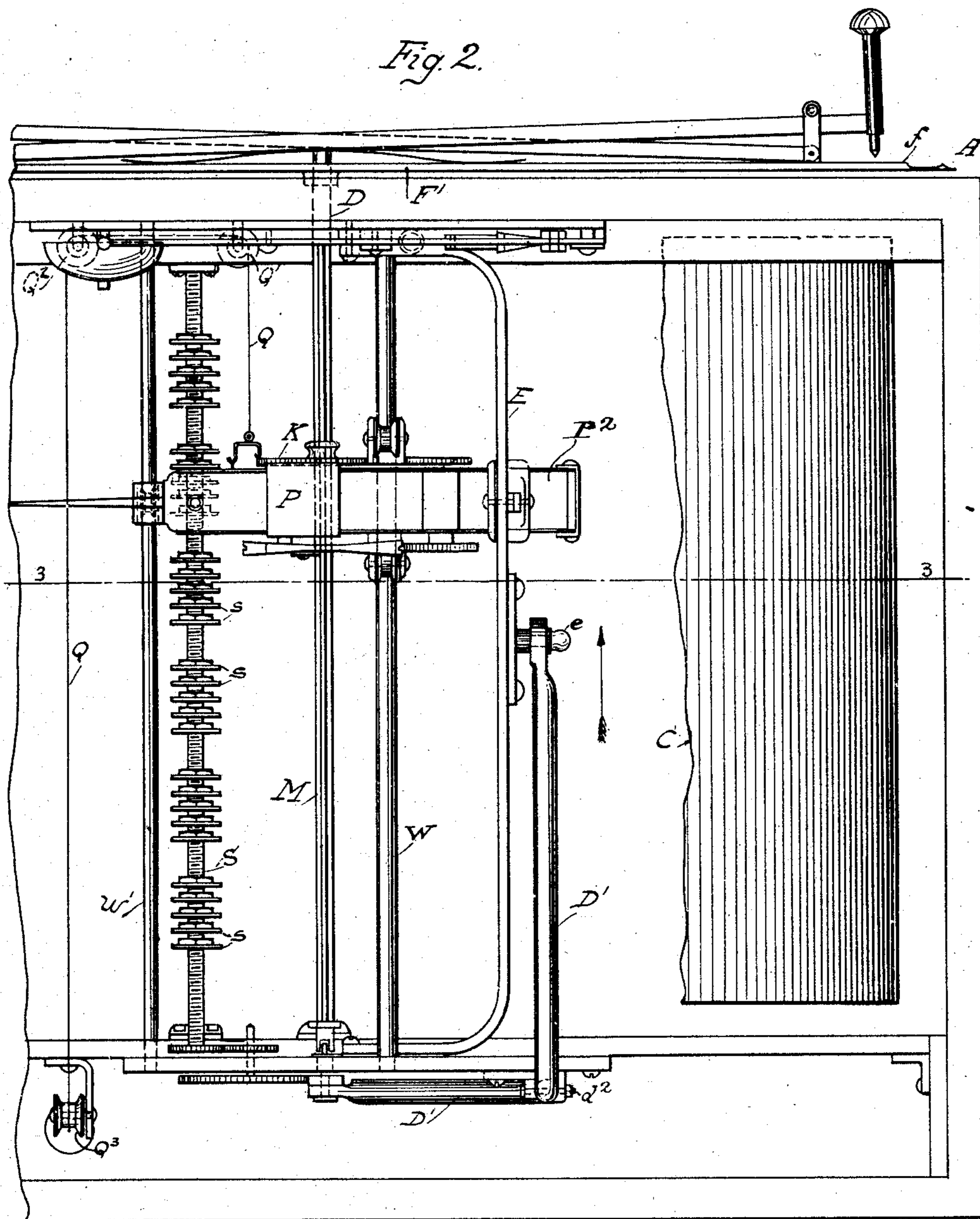
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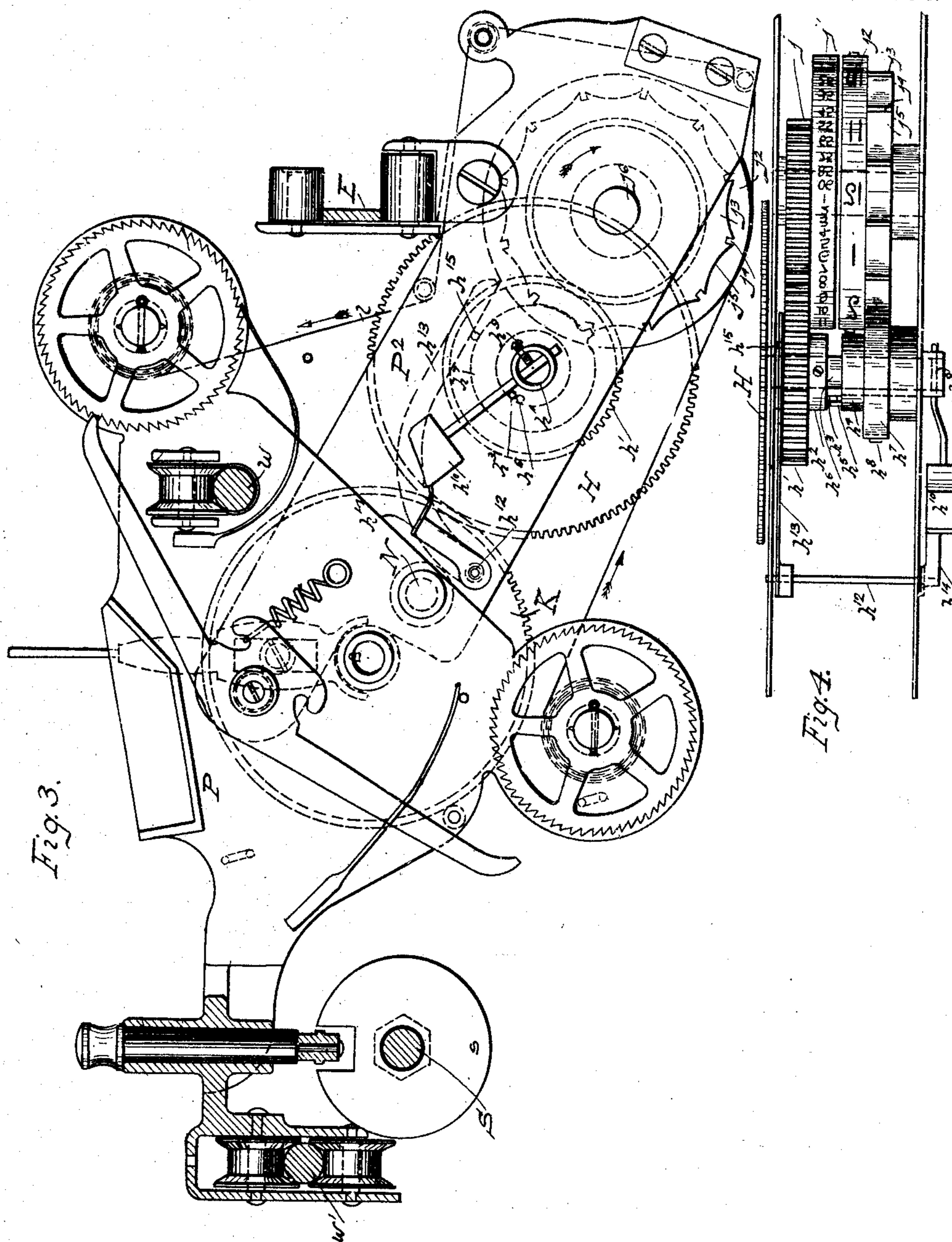
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 8.

DATE WHEN COMMENCED	OCCUPATION	DEPARTMENT	IND OF TEMP.	QUIT	DISC.	TRANSFERRED	RESIDENCE	NAME	RATE PAID PER WEEK
									1
									2
									3
									4
									5
									6

Fig. 7.

THURSDAY	FRIDAY	SATURDAY	MONDAY	TUESDAY	WEDNESDAY	AMOUNT DUE
AM M PM IN OUT	AM M PM IN OUT	AM M PM IN OUT	AM M PM IN OUT	AM M PM IN OUT	AM M PM IN OUT	1
						2
						3
						4

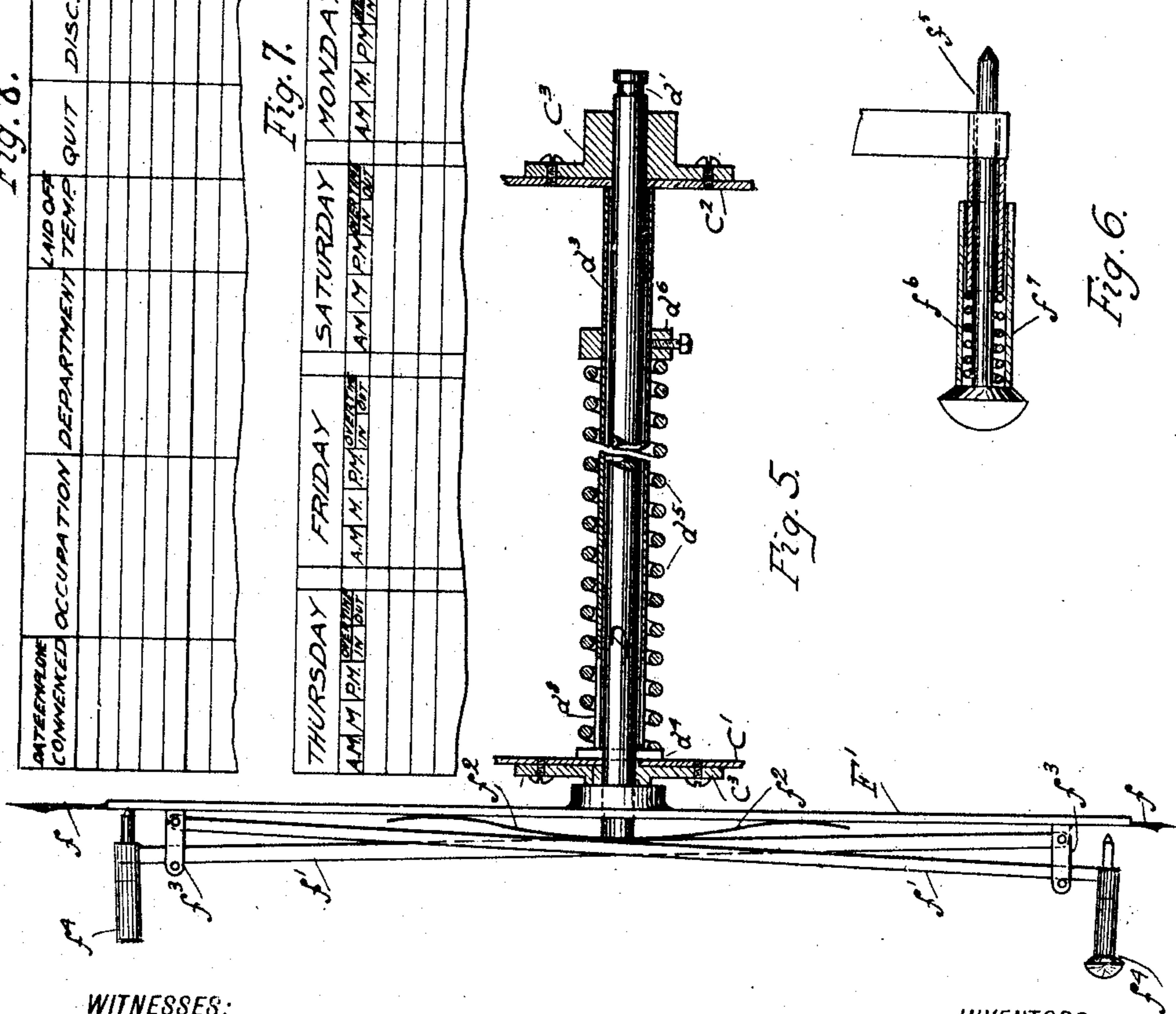


Fig. 5.

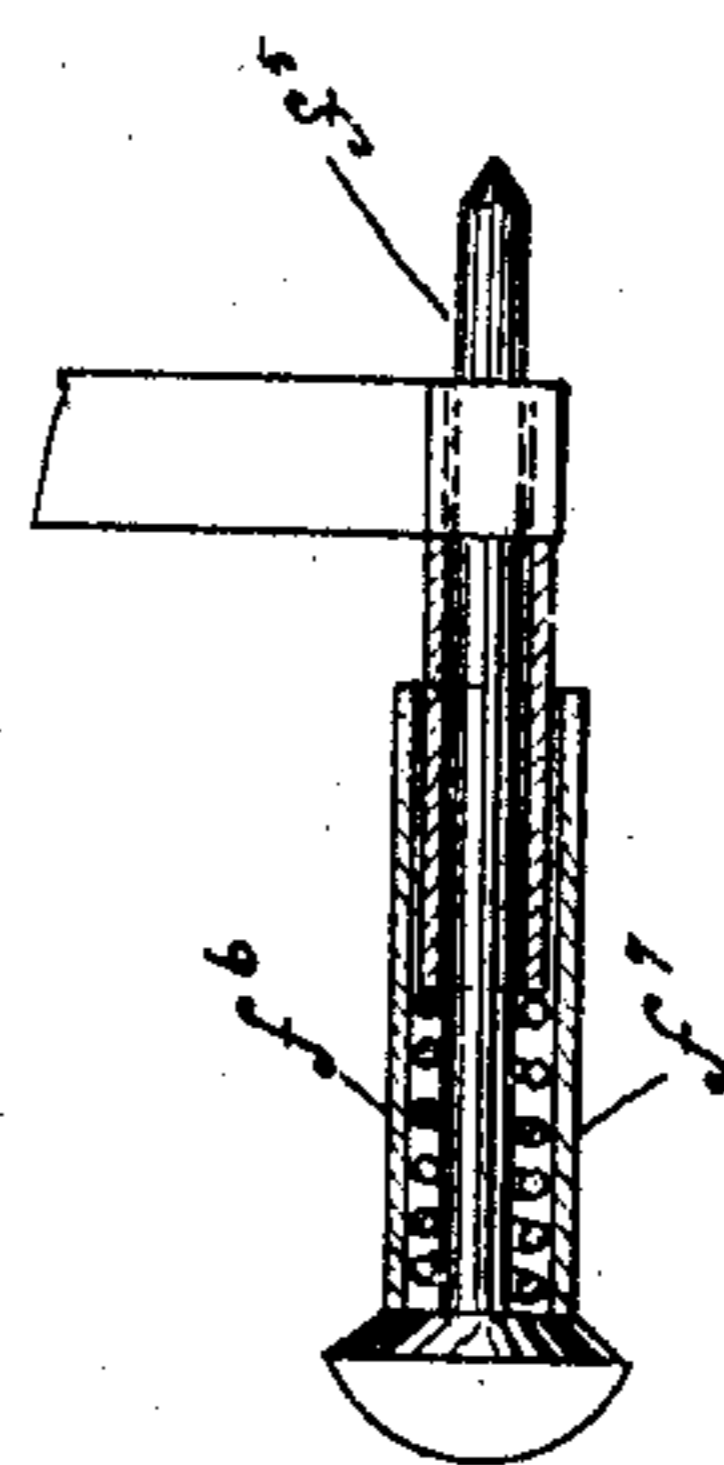


Fig. 6.

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UNITED STATES PATENT OFFICE.

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WORKMAN'S TIME-RECORDER.

No. 875,393.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed January 24, 1906. Serial No. 297,560.

To all whom it may concern:

Be it known that we, FRANK J. TRAN and FRANK CAIS, citizens of the United States, and residents of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Workmen's Time-Recorders and Record-Sheets for Use with Same, of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

Our invention relates to the class of time recorders used in factories, stores, and similar establishments, where it is found desirable to register the time of arrival and departure each day, or several times each day, of a large number of employees.

Such invention more specifically relates to several improvements in a workman's time recorder of the type described in our pending application, Serial No. 265,201, filed June 14, 1905.

It furthermore includes a record sheet which we have devised for use in connection with recorders of this kind.

Said invention consists of means hereinafter fully described and specifically set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, said disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings: Figure 1 represents a front elevation of a complete time recorder embodying our improvements; Fig. 2 represents the arrangement of the parts of such recorder as viewed from above, the top of the case and the clock mechanism being removed, and only a portion of the rotary platen being included; Fig. 3 shows in enlarged side elevation the time-printing device forming a part of such recorder; Fig. 4 is a plan view of a portion of the same; Fig. 5 represents the hollow spindle of the rotary platen in longitudinal cross-section and the operating shaft, which fits within such spindle, in elevation; Fig. 6 in an enlarged cross-sectional view of a detail of the operating handle; Fig. 7 shows a portion of the sheet which is designed to be removably attached to the platen to receive the record; and Fig. 8 is a similar representation of a

permanent sheet designed for use in connection with such record receiving sheet.

The main features of the recorder, which forms the basis of our present invention, are a case A, Fig. 1, within which is revolvably mounted a drum or platen C, shown in part in Fig. 2; a time-printing device adapted to move on ways W W' transversely across said platen; a clock-actuated spindle M parallel with said ways and connected to operate said time-printing device; mechanism, including a spindle S having a series of adjustably positioned slotted disks s mounted thereon, for controlling the movement of said time-printing device across the platen; and operating means, i. e. mechanism whereby said platen may be rotated so as to bring any desired portion thereof beneath the time-printing device, and the latter thereupon actuated to print on the record sheet borne by said platen.

In addition to an improved record sheet, it is to improvements in the time-printing mechanism and in the operating means that we here desire to call especial attention. Other features of the recorder will accordingly be taken up only so far as is necessary to make clear the construction and operation of these parts.

The manner in which rotary drum C is mounted is clearly shown in Fig. 5. This drum is hollow, of course, for the sake of lightness, and the circular pieces C' C² forming its ends are provided with cylindrical outwardly projecting studs C³ which turn in suitable bearings, not shown, provided in the end walls of case A. Through openings provided in these studs, and through a sleeve d³, which lies between said studs and is secured thereto so as to form, in effect, in conjunction with the same, a hollow spindle for the platen, is passed a shaft D, which we shall term the operating shaft. Such shaft D is held against rotation with respect to hollow spindle d³ by a pin or key d⁴ that passes through the shaft and registers in oppositely disposed slots d⁸ in the spindle; but longitudinal reciprocation, as is apparent, is permitted within the limits of such slots. Normally, however, a helical spring d⁵, interposed between pin d⁴ and an adjustably positioned sleeve d⁶, serves to maintain shaft D in the position illustrated, where the forward end projects beyond the corresponding stud C³.

It is readily perceived that rotation of

shaft D will effect the rotation of platen C; while the reciprocatory motion of the same just described is utilized to operate the time-printing device as will presently appear.

5 Both these movements of shaft D are produced by means of an operating handle F, Fig. 1. Handle F comprises a bar F' secured at its center to stud C^3 and having an aperture registering with the aperture in said
10 stud, the stud being made to project through the wall of case A far enough to permit of such attachment. Pointers or fingers f of unequal lengths are respectively secured to each end of such bar F' ; and disposed side
15 by side upon the bar and respectively pivotally attached thereto at its ends are two lever arms f' of equal length. The free ends of these arms are normally urged outwardly by springs f^2 mounted as shown, such out-
20 ward movement being limited, however, by suitable retaining members f^3 . Inward movement of either arm is produced manually by pressing upon a knob f^4 mounted on such free end. Since shaft D is normally
25 adjusted so as to project through the aperture in stud C^3 and attached bar F' and some distance beyond, and since arms f' lie directly in line with the end of such shaft, the effect of such inward movement of either
30 arm is seen to be a reciprocation of the shaft. The springs f^2 , of course, are assisted in returning arms f' to their normal positions by the outward thrust of spring d^5 against pin d^4 . Rotation of shaft D is also easily effected
35 by simply grasping knob f^4 of either arm and swinging it around as desired.

The detailed structure of a knob f^4 is shown in Fig. 6. Such structure, it is there seen, comprises a pin f^5 normally retained
40 within the sleeve f^6 by means of a helical spring f^7 ; the first effect of pressure applied to the knob, accordingly, is to protrude the pin, the lever arm will not be moved until spring f^7 is compressed. Arranged in a semi-
45 circle on a dial of the form and disposition shown in Fig. 1, is a series of apertures a , equal in number to half the total number of individual records that the instrument is designed to keep. The pin f^5 of either knob f^4
50 is designed to register in any of such apertures. Obviously, the registering of the pin of one knob f^4 with any aperture a will correspond with the printing position of any space on one half of the platen's surface; similarly
55 the registering of the pin of the other knob will correspond with the printing position of any space on the other half of the platen's surface.

To indicate the correct position of the
60 knob of the arm bearing the short pointer f in order to make a record on any desired space on the corresponding half of the platen, numbers corresponding to the numbers A' of such spaces are arranged in the form of a
65 semi-circle on a radius of a length equal to

that of such short arm. For use with the arm bearing the long pointer a second series A^2 of numbers arranged in the form of a semi-circle concentric with the first semi-
70 circle is provided, such numbers of course designating spaces on the other half of the platen. Where there are a great many employees, to avoid crowding on the dial the numbers in each series are preferably ar-
75 ranged in staggered relation with each other, as shown, lead lines a^2 being provided to assist in the picking out of any particular number.

By the foregoing construction the numbers designating positions on the platen are much more compactly arranged, and the
80 operation of the handle thus made more convenient for persons differing in height since the instrument can be placed so as to bring all parts of the dial within easy reach of a
85 man of average height. By having the pin in the knobs by which the handle is operated retractile, the platen has to be positioned and there locked before the operating lever f' is thrust in far enough to move shaft D. The
90 knob at the end of the handle bearing the long pointer should differ slightly in appearance from that at the other end, so as to avoid delay in choosing the proper arm for numbers either on the outer or inner semi-
95 circle.

The time-printing device, as has been stated, is movable transversely across the platen on ways $W W'$. Such movement is effected by means of a cord Q passing around
100 pulleys Q^1, Q^2, Q^3 , and having a weight (not shown) attached at its free end. Such movement is controlled, so as to take place at predetermined moments for predeter-
105 mined amounts by means of suitable regulating mechanism described in the pending application to which reference has been previously made.

The time-printing device here shown, Fig. 3, is also substantially the same as the one therein described, and its structure need be
110 here set forth only so far as is necessary to explain the operation of a new element which we have found it advantageous to employ. Such device comprises two members, the first P^1 of which is movably supported upon
115 the aforesaid ways W, W' , the second P^2 of which is pivotally attached to said first member by a pin N so as to be vertically movable with respect to the same. The before-mentioned clock-actuated spindle M
120 passes through suitable openings in the sides of carriage member P^1 and a gear-wheel K mounted in such member and feathered on said spindle is connected to drive the print-
125 ing mechanism proper, which is mounted in the free end of the second, pivotally attached, carriage member P^2 , the time-printing type-wheels being adapted upon the depression of such free end of carriage-member P^2 to contact with the portion of the
130

platen lying directly thereunder. Carriage-member P^2 is normally retained out of such contacting position by means of a helical spring not shown, which connects it with first carriage-member. Depression thereof and consequent record of time on the platen is effected by means of a rocking frame E, to the straight portion of which the free end of the carriage is slidably attached, Figs. 2 and 3. This frame E is adapted to be rocked by means of a bent lever D' , Fig. 2, fulcrumed on a pin d^2 in brackets secured to the frame of the clock. The upper arm of the lever lies along the frame E and is secured to it near its mid-point by the pin e . The other arm of the lever is disposed downwardly and engages a notch d' in the end of spindle D. Reciprocation of such spindle, it is evident, will actuate lever D' to depress frame E which carries with it carriage-member P^2 and the time-printing type-wheels. These type-wheels are two in number, one j' bearing upon its periphery characters for printing the minutes, the other j^2 the hours, upon the record sheet. Rotation of the minute wheel is effected by means of suitable gear wheels H, h' and j , connecting it with drive gear wheel K. Rotation of the hour wheel j^2 is intermittently effected by means of a star wheel j^3 fixed thereto and rotating therewith, provided on its periphery with the proper number of concave sections j^5 and intervening notches j^4 and the toothed wheel h^7 provided with a single tooth h^8 , which is adapted to engage such notches j^4 , and thus effect the rotation of wheel j^2 one type space for each rotation of wheel h^7 . The convex portions of the periphery of wheel h^7 , by fitting successively in the concave portions of the periphery of star wheel j^3 , prevent any vibration of the hour wheel during the process of printing.

The toothed wheel h^7 rotates independently on the same axis h^6 as the gear wheel h' , and is rotated thereby through the agency of two disks h^4 and h^2 . These disks are respectively provided on their contiguous faces with projecting lugs h^5 and h^3 , which are adapted to contact in the course of rotation of the disks; except when such lugs are thus in contact, disk h^4 , with attached wheel h^7 , is free to rotate about its axis, being normally held with its lug at a particular angle by a weighted arm h^{10} secured to that portion h^{11} of the common hub of the disk and wheel h^7 which projects without the side plate P of the carriage. In the course of the rotation of the disk h^2 lug h^3 thereon contacts with lug h^5 on disk h^4 in its normal position, and by its continued rotation carries such disk with it and raises the weighted arm h^{10} . When the weighted arm h^{10} is raised to a vertical position over the axis, a slight additional movement will carry it beyond its center of gravity and it will fall to its normal

position at once, effecting thus practically instantaneously the completion of the rotation of disk h and attached wheel h^7 . The relative positions of the lugs on the disks h^2 h^4 , of the concave portions and notches on star wheel j^3 , and of the tooth on wheel h^7 are all such that this instantaneous rotation of the disk h^4 occurs exactly upon the completion of one rotation of the minute-printing wheel, and a new type space on the hour-printing wheel is thus advanced into position for printing.

It has been found in practice that a slight jar, such as manipulation of the operating mechanism by an employee engaged in registering, will sometimes cause weighted arm h^{10} to drop a minute, or so, too soon, that is, the hour-printing wheel will be advanced one space while the minute wheel is still at 58 or 59. The result is that, instead of printing *e. g.* 6:58, the device will print 7:58. To remedy this defect we mount a rock-shaft h^{12} in carriage-member P^2 so as to be parallel with the spindles upon which the type and other wheels rotate. This shaft is intermittently rocked by means of an arm h^{13} extending forwardly so as to lie flat against one side of gear wheel h' upon which is mounted a projecting lug h^{15} adapted to engage and raise such arm in the course of the wheel's rotation. Upon the other end of the rock-shaft is mounted a second forwardly extending arm h^{14} disposed normally to intercept weighted arm h^{10} after it begins to fall and before it has turned far enough to actuate the hour-wheel. Such arm does not release weighted arm h^{10} until arm h^{13} has been raised to the highest point by the lug h^{15} on wheel h' and this lug is so placed as not to effect such movement until the revolution of the minute wheel j' is complete. Thus there is no possibility of the hour wheel being rotated in advance of the completion of a full turn by the minute wheel, and an absolutely accurate registration of the time is assured.

The record sheet, of which a portion is shown in Fig. 7, may be attached to the platen in any approved fashion. Where the platen is large it is desirable to use more than one such sheet, since a single sheet large enough to go entirely around the drum would be inconvenient to handle. Each such sheet is similarly ruled, being divided into a number of equal transverse divisions consecutively numbered in a column at one side, the right as shown, the numbers corresponding with similar numbers assigned to the several employees who are to use the recorder. Vertical lines further divide the sheet and form columns corresponding to intervals of time, as days. Of these there may be any number up to the capacity of the machine, which ordinarily would provide for six working days as shown. These columns are suit-

ably headed with the names of the appropriate days, and the mechanism controlling the movement of the time-printing device across the platen is adjusted to cause such device to print in one column within such daily column the hour and minute for each arrival within a given interval of time, as between 6:00 a. m. and 7:30 a. m.; in a second column, the time of return at noon, the time of departure being in most establishments uniform for all and hence not recorded individually; and in a third column the time of departure in the evening. Other columns for work overtime may be provided, or the arrangement just described varied to suit local conditions. A final column is set apart after each daily column in which to mark the actual time spent in labor on that particular day. At the right of the sheet other extra columns are provided; in one of these, marked "Total time," may be placed the sum of the several periods noted at the conclusion of each day; in another, the amount of wages due on the basis of the time thus added up; and in yet another, remarks, etc.

To facilitate the calculation of the amount of wages, which is an exceedingly laborious operation by any method at present in vogue, we have devised a "permanent sheet" for use in connection with the record sheet just described. This sheet, Fig. 8, is divided into equal transverse divisions in size exactly the same as those of the record sheet. These divisions are numbered to correspond with the divisions on such record sheet, and on the same side of the sheet. In columns immediately preceding this column of numbers, space is provided for indicating the "Rate per week", and "Rate per hour" of each employee, the name of such employee being written in another column provided for that purpose immediately to the left of these. Still further to the left other columns are provided in which to note the "Age", "Residence" and other items of information, or identification, which it is desired to preserve concerning employees. To use such "permanent sheet" the time of each employee on the weekly record sheet is first footed up and placed in the proper column at the right of such sheet; then the permanent sheet is superimposed upon such record sheet so as to bring correspondingly numbered transverse divisions into alinement, the right edge of the "permanent sheet" being moved up to the column on the record sheet in which the total time is recorded. Disregarding the miscellaneous items noted to the left on the permanent sheet, it is evident that the name of an employee, the rate which he is being paid, his number, the total time worked, a blank column in which to note the amount due, and his number again, will appear in consecutive order. It is accordingly a very simple matter to calculate the amount due

on the basis of the rate of wages and time worked which appear side by side, and to mark the result in the column provided therefor. Possibility of error by confusing two employees' records is made very remote by the arrangement of the numbered columns since any mistake in alinement would at once put the numbers awry and hence be at once detected. When the column for "Amount due" has been thus filled out on the record sheet, or sheets, where more than one are employed, the latter may be gathered into a suitable binder and thus put in convenient form for the use of the paymaster, or other official, as well as for preservation. The permanent sheet may be used over and over again, any changes in the force of employees, or in their rate of wages, etc., being readily made thereon without requiring any alteration in the arrangement of the record sheet.

Having thus described our invention in detail, that which we particularly point out and distinctly claim is:

1. In a workman's time-recorder, the combination of a rotary platen; a dial provided with two series of designating characters, such characters corresponding with transverse portions of said platen; and two pointers of unequal lengths mounted in front of said dial and connected to rotate with said platen, such series of characters being so arranged as to be respectively indicated by the longer and the shorter of said two pointers.

2. In a workman's time-recorder, the combination of a rotary platen adapted to support a record sheet or the like; a dial provided with separate series of designating characters corresponding with transverse divisions on said platen, said characters being arranged on arcs of concentric circles; and pointers of different lengths mounted in front of said dial and connected to rotate with said platen, the arcs on which said characters are arranged being disposed so as to be respectively indicated by different pointers.

3. In a workman's time-recorder, the combination of a rotary platen provided with a record sheet having transverse divisions to correspond with individual workmen; a dial provided with separate series of designating characters arranged on arcs of concentric circles, each of said series corresponding with a series of successive divisions on said record sheet; and pointers of different lengths mounted in front of said dial and connected to rotate with said platen, the arcs on which said characters are arranged being disposed so as to be respectively indicated by different pointers.

4. In a workman's time-recorder, the combination of a rotary platen provided with a record sheet having transverse divisions to correspond with individual workmen; a dial provided with two series of designating characters arranged on concentric semicircles,

one of said series corresponding with the divisions on one-half of said record sheet and the other series corresponding with the divisions on the other half thereof; and two
 5 oppositely-disposed pointers of unequal lengths mounted in front of said dial and connected to rotate with said platen, the semicircles on which said characters are arranged being disposed so as to be respectively indicated by the longer and the
 10 shorter of said two pointers.

5. In a workman's time-recorder, the combination of a hollow spindle; a cylindrical platen mounted thereon and adapted to
 15 support a record sheet; a time-printing device adapted to print on said record sheet; a reciprocatory shaft mounted in said hollow spindle and connected to actuate said time-printing device to thus print; and two oppositely disposed levers mounted upon the end
 20 of said spindle and independently adapted to reciprocate said shaft.

6. In a workman's time-recorder, the combination of a hollow spindle; a cylindrical
 25 platen mounted thereon and provided with a record sheet having transverse divisions; a time-printing device adapted to print on said record sheet; a reciprocatory shaft mounted in said hollow spindle and connected to actuate said time-printing device to thus print; two oppositely disposed
 30 levers mounted upon the end of said spindle and independently adapted to reciprocate said shaft; a dial bearing two series of reference characters corresponding to the divisions upon respective halves of said platen; said series being arranged on concentric semicircles; and two pointers connected to move
 35 with said levers and respectively adapted to indicate characters in a different series.

7. In a workman's time-recorder, the combination of a hollow spindle; a cylindrical platen mounted thereon; and adapted to
 45 support a record sheet having transverse divisions; a time-printing device adapted to print on said record sheet; a reciprocatory shaft mounted in said hollow spindle and connected to actuate said time-printing device to thus print; a dial provided with a series
 50 of apertures corresponding with the di-

visions upon said record sheet; a lever arm mounted upon the end of said spindle and adapted to rotate said platen and to reciprocate said shaft; a knob borne by said lever; a pin mounted in said knob and adapted to
 55 register with said apertures; and a spring adapted to normally retract said pin within said knob, whereby upon depressing said knob said pin is brought into register with an aperture before said lever is actuated to re-
 60 ciprocate said shaft.

8. In mechanism of the class described, the combination with a dial provided with a series of apertures; of a lever arm movable
 65 across said dial and adapted to oscillate towards and from the same; a knob borne by said lever; a pin mounted in said knob and adapted to register with said apertures; and a spring adapted to normally retract said
 70 pin within said knob, whereby upon depressing said knob said pin is brought into register with an aperture before said lever is oscillated.

9. In a time-printing device, the combination of a minute-printing type-wheel; an
 75 hour-printing type-wheel, said wheels being mounted upon the same shaft; a drive shaft parallel with said type-wheel shaft and geared to drive said minute-printing wheel directly; a wheel loosely mounted on said
 80 drive shaft for intermittently driving said hour-wheel; means borne by said drive shaft adapted to turn said loosely mounted wheel through a partial rotation; a weighted arm connected with the latter and adapted
 85 to thereupon turn said wheel through the remainder of such rotation; a rock shaft parallel with aforesaid shafts; and two arms mounted upon said rock-shaft and respectively adapted to be oscillated upon rota-
 90 tion of said drive shaft, and to control the movement of said weighted arm.

Signed by us this 18th day of January 1906.

FRANK J. TRAN.
 FRANK CAIS.

Attested by—

JNO. F. OBERLIN,
 G. W. SAYWELL.