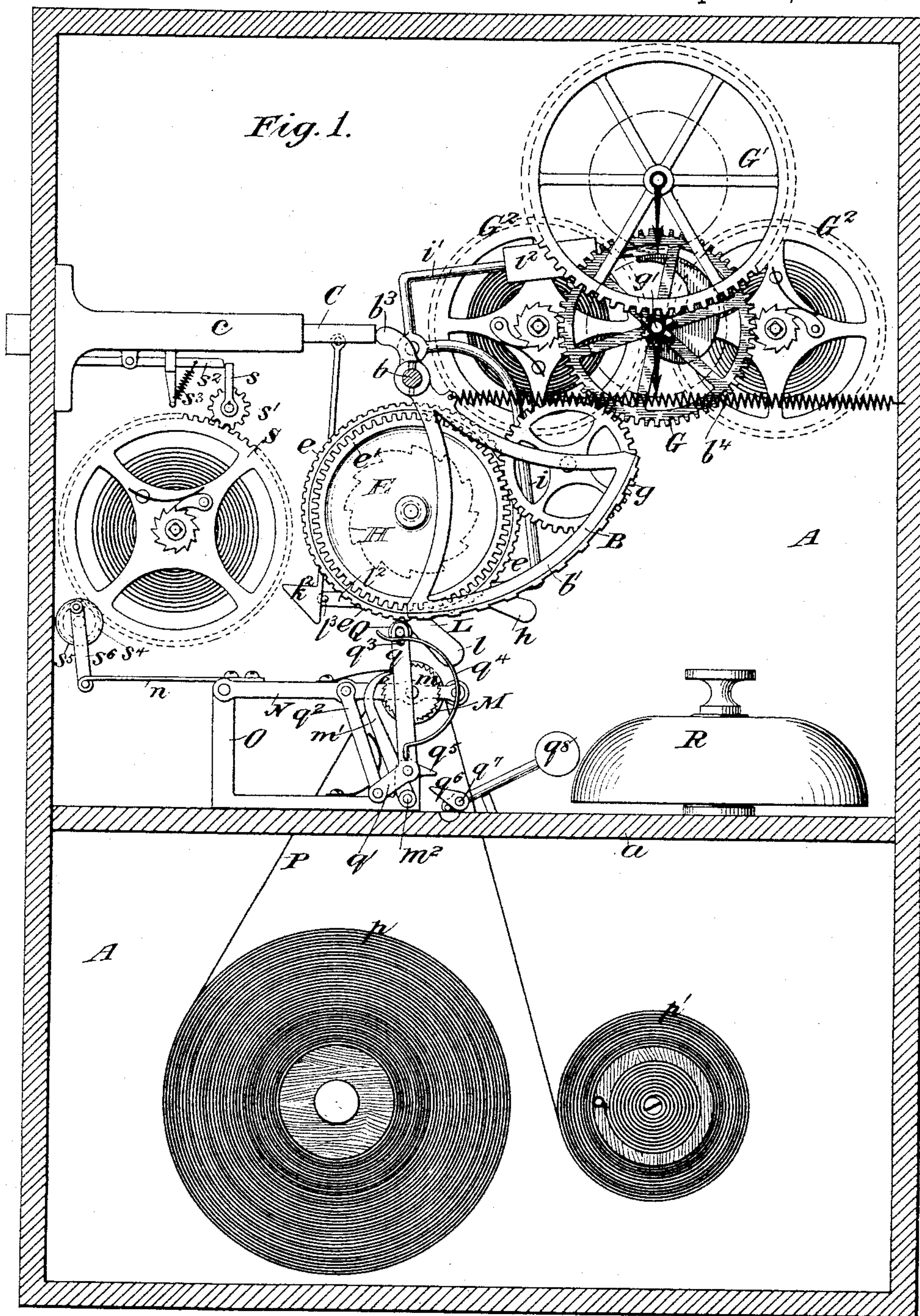


J. C. ENGLISH.
WORKMAN'S TIME RECORDER.

No. 450,617.

Patented Apr. 21, 1891.



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Fig. 2.

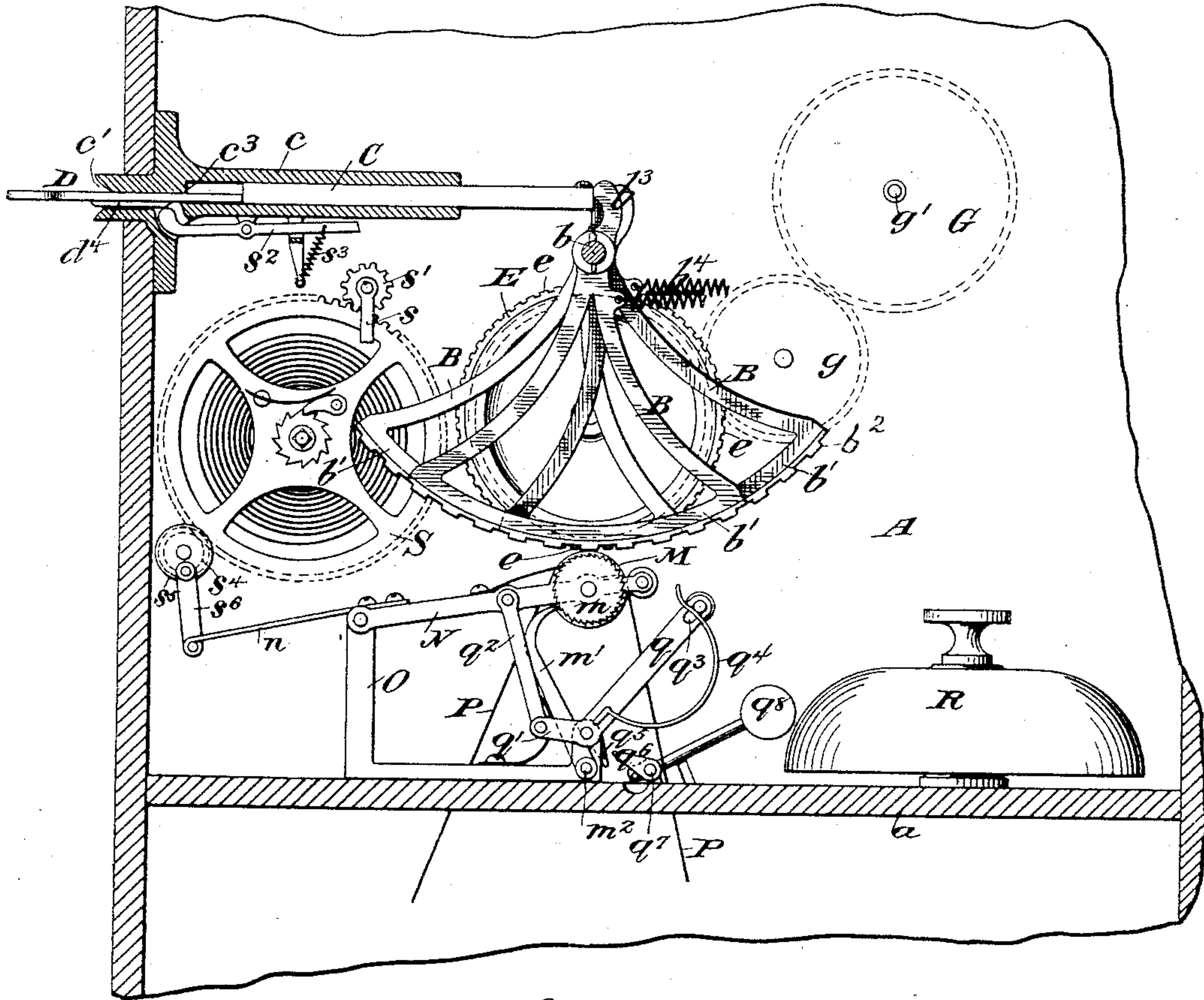


Fig. 3.

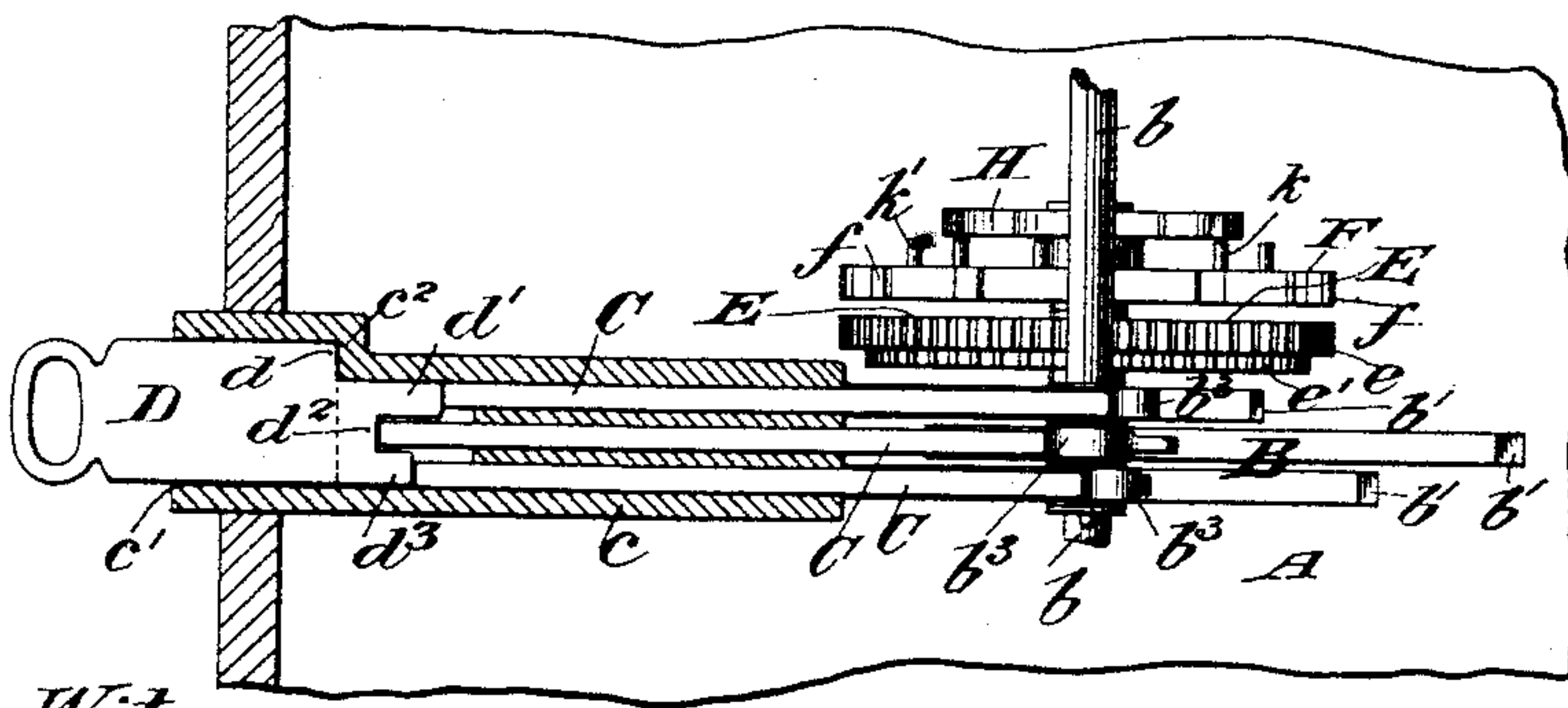
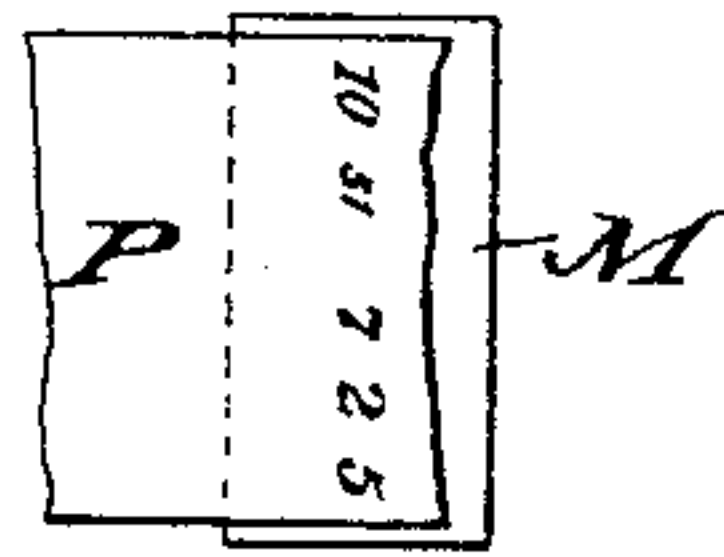


Fig. 4.



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(No Model.)

3 Sheets—Sheet 3.

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WORKMAN'S TIME RECORDER.

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Fig. 7.

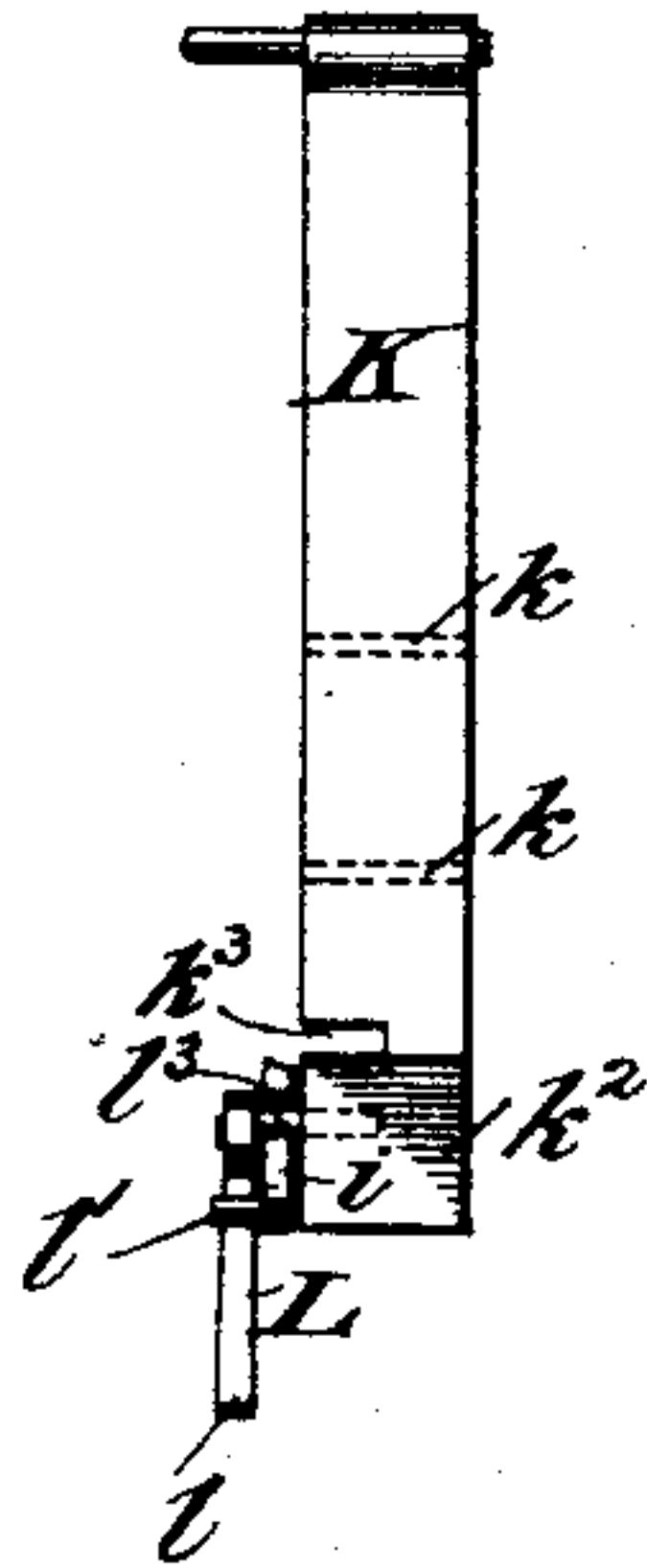


Fig. 5.

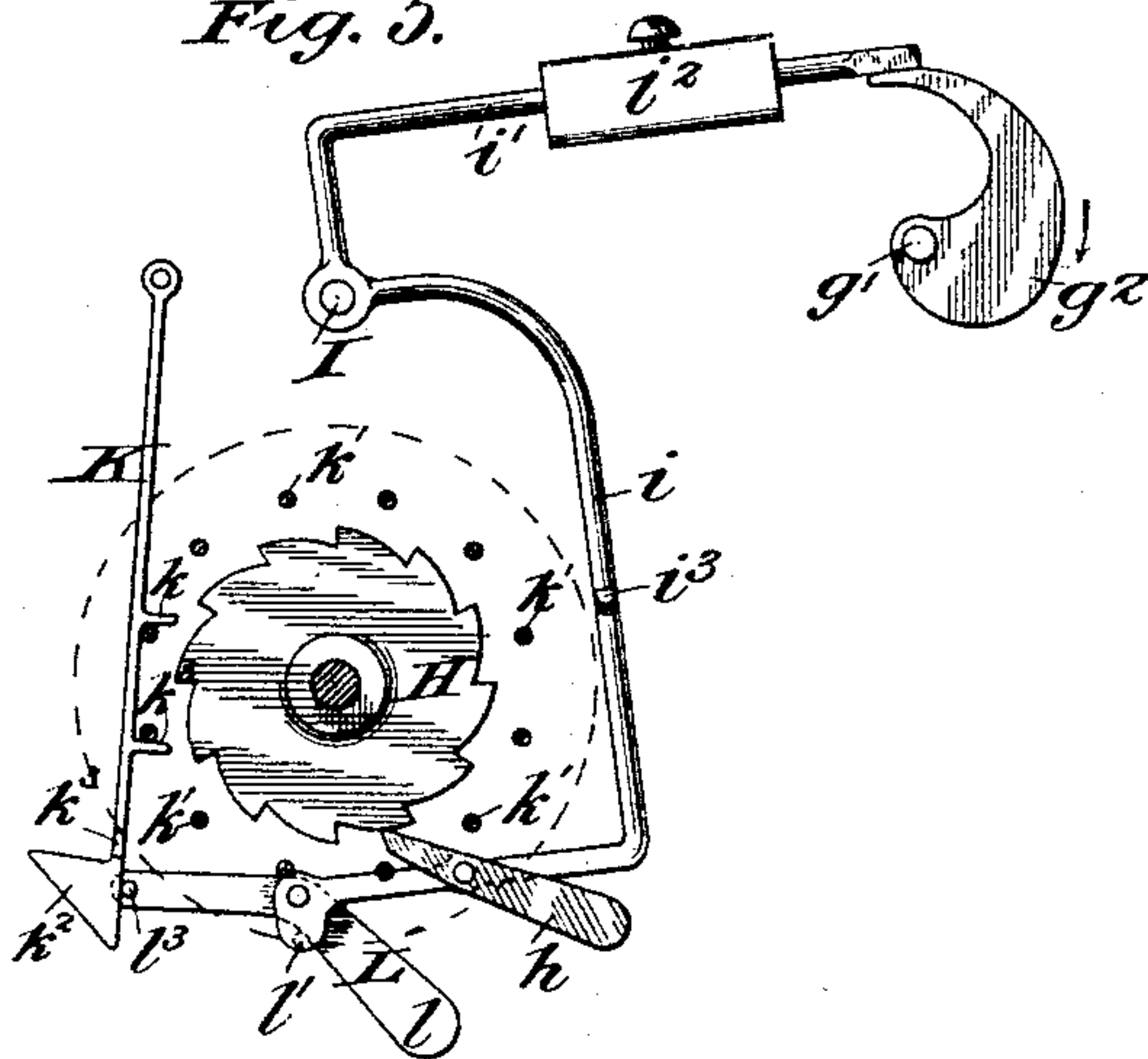


Fig. 6.

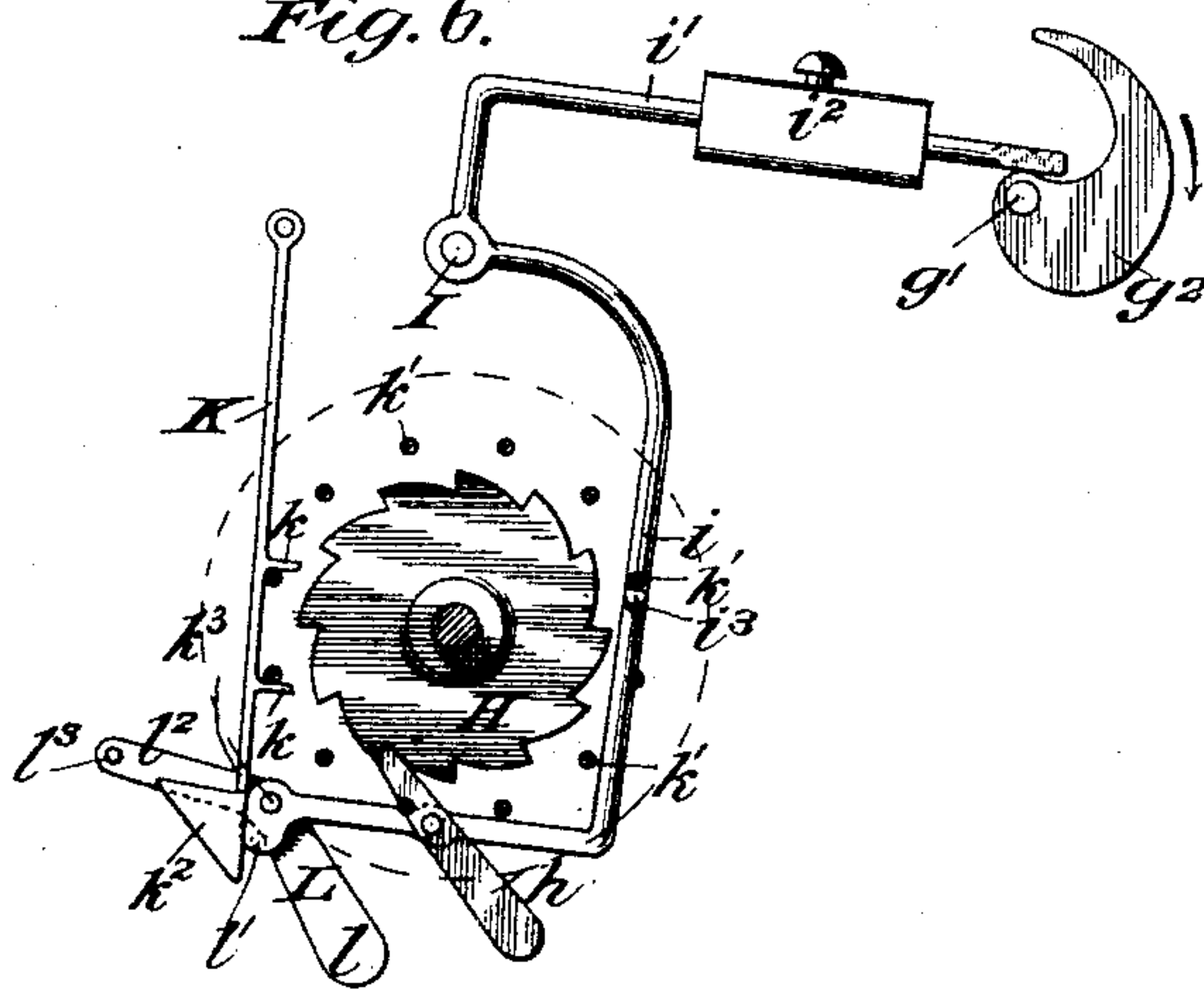
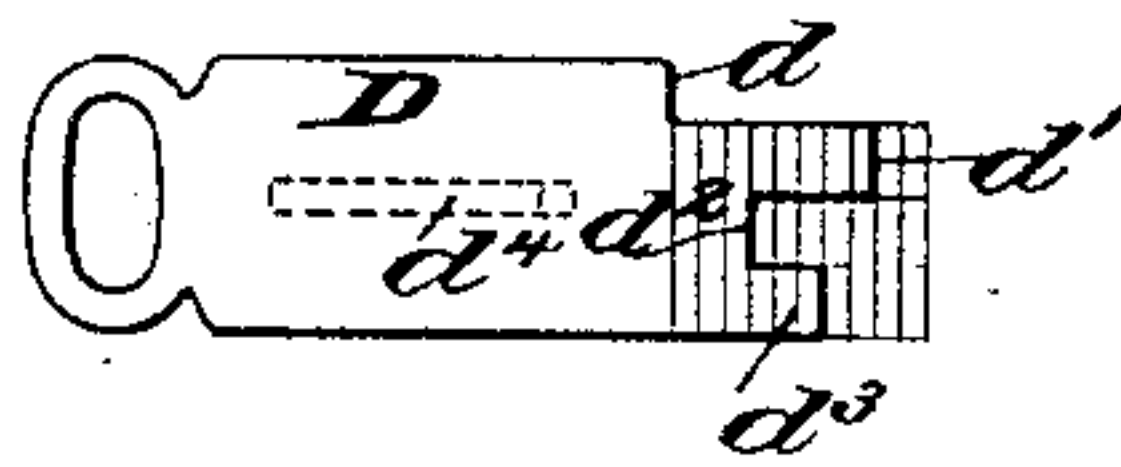


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN C. ENGLISH, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
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WORKMAN'S TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 450,617, dated April 21, 1891.

Application filed November 1, 1890. Serial No. 370,043. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. ENGLISH, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Workmen's Time-Recorders, of which the following is a specification.

My invention relates to an improvement in workmen's time-recorders in which provision is made for obtaining a record of the number by which each workman is designated and the time in hours and minutes at which such workman entered upon or left his duties.

The invention broadly contemplates one or more movable type-carriers subject to the operation of a number of varying keys to adjust them into varying positions corresponding to the number or character by which the party holding the key is designated and a time-printing mechanism subject to a time-keeping mechanism, the time-printing mechanism being arranged to conform to the printing portion of the movable type-carriers and mechanism for receiving the impression, the latter being set in motion at the time of the inserting of the key.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the recorder in side elevation, a portion of the casing being removed to show the operative parts in assembled adjustment. Fig. 2 is a partial view in side elevation, showing the parts in the act of making a record. Fig. 3 is a partial plan view showing the position of the key and certain of the parts immediately operated thereby. Fig. 4 is a view of a portion of the strip upon which the record is made and the impression-roller, showing one of the records. Fig. 5 is an enlarged view in detail of the mechanism for advancing the hour-printing wheel at intervals of each hour. Fig. 6 is a view of the same, showing the parts in another position. Fig. 7 is a view in front elevation of the swinging stop shown in side elevation in Figs. 5 and 6, together with the parts which operate it; and Fig. 8 is a plan view of one of the keys, a diagram being shown in connection therewith for the purpose of more clearly illustrating the number of different keys that

may be formed within convenient limits to record different numbers in the recorder.

A represents a casing of any suitable size and shape conveniently provided with a cross partition or bar *a* for supporting certain parts of the recorder. Within the casing one or more movable type-carriers B are supported. In the present instance I have shown three type-carriers B mounted upon or suspended from a cross-shaft or stud *b* and having their lower faces *b'* arc-shaped and provided with a series of type *b²*, projecting therefrom at regular intervals. The type with which I have here provided the carriers is intended to represent on each carrier the series of numerals from 0 to 9, inclusive. The carriers are arranged side by side upon the shaft *b*, as clearly shown in Fig. 3, and their upper ends project a short distance above the shaft, as shown at *b³*, and serve as operating handles or bars for swinging the carriers on the shaft.

Several horizontally-sliding push rods or bars C, one for each carrier, are supported by a bracket or other suitable support *c*, fixed to the casing in such position that their inner ends will engage the upwardly-projecting ends *b³* of the carriers, and when the said rods are pushed inwardly will serve to rock the carriers. The outer ends of said push-rods project into an opening *c'* through to the outside of the casing for the reception of the key D. The latter is preferably formed of a thin plate of metal, and is provided on its inner end with a shoulder *d*, which is adapted to abut against a shoulder *c²* within the opening *c'* and limit the thrust of the key within the casing. The inner end of the key is provided with tongues *d'*, *d²*, and *d³* of the same or varying lengths, (here shown as of varying lengths,) which, when the key is thrust in to its full extent, will rock the type-carriers B more or less, so as to bring certain type carried thereby into alignment transversely to a certain point in their paths of movement—in the present instance the lowermost point. If, therefore, a key have a tongue sufficiently long to rock one of the type-carriers B a full stroke—that is, sufficient to carry it from the position with its type 0 lowermost to a position with its type 9 lowermost—such tongue when the key is inserted will bring the type-carrier into position

to print 9. Various differences in the length of the tongue will of course swing the type-carrier sufficient to bring various other figures between 0 and 9 to the lowermost point, or in position to print. It will therefore be readily seen that a key provided with three tongues used in connection with the three swinging type-carriers B may by varying the lengths of the tongues operate the swinging type-carriers so as to bring into alignment the requisite figures to print the numbers from 0 to 999, inclusive. It will further be seen that there will need be but slight variation in the lengths of the tongues upon the key in order to swing the type-carriers the distance between one type and the next succeeding because of their acting upon the short end b^3 of the swinging type-carrier. I have denoted in a diagram in connection with Fig. 8 the different lengths of the tongues on the key, which correspond to the distances between the two types, and have indicated in heavy lines thereon the lengths of three tongues corresponding, respectively, to the types 7, 2, and 5, and a key constructed with the tongues corresponding to those numbers is shown in position with its tongues engaged with the push-rods in Fig. 3. It is intended that when the parts are in their normal positions the outer ends of the push-rods will lie flush with the shoulder c^2 , against which the key abuts, and the line upon the key drawn as a continuation of the shoulder d will denote the 0 line—that is, when the tongue does not project beyond the shoulder d the type 0 upon the carrier B will be in position to print.

The swinging type-carriers B are held normally swung back in the position shown in Fig. 1, in the present instance by means of springs b^4 , and because of their engagement at their upper ends with the ends of the push-rods the said push-rods are by the same means held normally in forward adjustment flush with the shoulder c^2 in the key-opening, and are prevented from an outward movement beyond such position by means of shoulders c^3 . (Clearly shown in Fig. 2.)

The mechanism as thus far described is that by which each one of a number of workmen provided with the key corresponding to the number by which he is identified may by the insertion of the key bring a series of type into position for printing his number. In connection with such mechanism I have provided means for presenting the number of the hour and minute of time in position to be printed simultaneously with the number which identifies each workman. The particular mechanism which I have adopted in the present instance is a wheel E, loosely mounted upon the shaft b , and provided upon its periphery with a series of type e at regular intervals apart and indicating the minutes from 0 to 59, inclusive. Loosely mounted upon the same shaft b and in proximity to the minute-printing wheel E, I provide an hour-printing wheel F, provided on its pe-

riphery with type f , located at regular intervals and indicating the hours from 1 to 12, inclusive. The hour and minute printing wheels F and E are actuated by means of a time mechanism, essentially a clock, so that the hour and minute denoting the time of day will be at all times indicated by the type on the hour-printing wheel, and the type on the minute-printing wheel which occupies the lowermost point of their path or in alignment with the lowermost type upon the swinging type-carriers B. This is accomplished in the present instance as follows: The minute-printing wheel E has fixed to rotate therewith a toothed wheel e' , preferably a sixty-toothed wheel, caused to rotate in unison with the minute-hand wheel G of the clock-work by the intermediate dummy-gear wheel g . The distance between any two successive types upon the minute-printing wheel is so small that the said minute-printing wheel may be caused to rotate continuously without interfering with the successful operation of printing. The hour-printing wheel F is, however, given a step-by-step motion each hour to change the type printing the previous hour to the one for printing the present or next successive hour. To accomplish this a twelve-toothed ratchet-wheel H is secured to rotate with the hour-printing wheel F. A pawl h , preferably a gravity-pawl, as here shown, is pivotally secured to the arm i of a rocking lever in such position that its free end will engage the teeth of the wheel H, and will be automatically held in engagement with the periphery of the wheel, because of its weighted end. The rocking lever, which carries the pawl h , is pivoted upon a suitable support—as, for example, a stud I—and its upper arm i' , or that opposite the arm i , extends over the arbor g' , carrying the minute wheel and hand of the clock. (See Figs. 1, 5, and 6.) The arm i' of said rocking lever is weighted, so as to hold the said arm depressed, and the arm i thereby rocked forward, tending to force the pawl normally toward the most advanced limit of its stroke. I have here shown the arm i' provided with an adjustable weight i^2 . A snail-cam g^2 is fixed to rotate with the minute-wheel G upon the arbor g' and forms a bearing for the end of the arm i' of the rocking lever. From this it follows that as the cam g^2 rotates each hour in the direction denoted by the arrows in Figs. 5 and 6 the end of the arm i' of the rocking lever will drop from the extremity of the cam, as shown in Fig. 5, onto the innermost portion, as shown in Fig. 6. The cam g^2 is so located with respect to the time mechanism that the end of the arm i' will reach the extremity of the cam at the end of each hour, and therefore the lever will be rocked at the end of each hour, and by the engagement of the pawl h with the ratchet-wheel H will force said ratchet-wheel and the hour-printing wheel fixed thereto forward one step, bringing the next hour-type in position to print.

line of type, and a series of operating-bars, each having an independent engagement with one of the swinging type-carriers and being under the control of varying keys to swing the type-carrier into position to print, of an impression device and means for operating it, substantially as set forth.

3. The combination, with a series of spring-actuated swinging type-carriers located side by side and each provided with a curved line of type, of a series of sliding operating-bars, each having an independent engagement with one of the swinging type-carriers, the operating-bars being under the common control of varying keys to swing the type-carriers into position to print, and means for receiving an impression from the type, substantially as set forth.

4. The combination, with the swinging type-carriers and the sliding operating-bars adapted to engage the type-carriers to rock them into position to print, said bars projecting within the key hole or seat, of an impression device, mechanism for actuating the impression device, and a trip device adapted to set in motion the impression-actuating mechanism, the said trip device projecting within the key hole or seat and adapted to be operated together with the bars for operating the type-carriers when the key is thrust home, substantially as set forth.

5. The combination, with the swinging type-carriers and the means for operating them, of the impression device, a vibrating lever upon which the impression device is mounted, an actuating-wheel held under tension by a tripping device, and intermediate mechanism engaged with the actuating-wheel and vibrating lever for imparting motion to the vibrating lever when the actuating-wheel is tripped, substantially as set forth.

6. The combination, with the type-carriers and the means for operating them, of a vibrating lever, an impression device carried by the lever, a lever-actuating wheel, a pinion in gear with the actuating-wheel, a trip-lever in position to lock and release the pinion, a second pinion in gear with the actuating-wheel, and a pitman connected at one end eccentrically to the axis of the second pinion and at the other end to the vibrating lever, substantially as set forth.

7. The combination, with the type-carriers and means for operating them, of a vibrating lever, one arm of the lever being formed of resilient material, a lever-actuating device connected with the resilient arm of the lever, and an impression device carried by the other arm of the lever, substantially as set forth.

8. The combination, with the type-carriers and means for operating them, of an inking-roller located in position to engage the type, a swinging support for the inking-roller, an impression device under the control of the type-carrier-operating means, a reciprocating support for the impression device, and a connection between the support for the impres-

sion device and the support for the inking-roller, whereby the reciprocating movement of the impression-device support rocks the inking-roller support, substantially as set forth.

9. In combination, the type-carriers, means for operating them, the impression device under the control of the type-carrier-operating means, means for moving it toward and away from the type, an inking-roller support having a swinging movement under the control of the means for moving the impression device, and a signal under the control of the swinging inking-roller support, substantially as set forth.

10. The combination, with one or more swinging type-carriers, each provided with a curved line of type and varying keys having a sliding movement toward and away from the type-carriers for bringing them into position to print, of a minute-printing wheel under the control of a time mechanism, an hour-printing wheel under the control of a time mechanism, the said minute and hour printing wheels being arranged with their type indicating the hour and minute of time to correspond with the printing position of the type on the said swinging carriers, and means for receiving the impression, substantially as set forth.

11. The combination, with the swinging type-carriers and the varying keys having a sliding movement toward and away from the type-carriers for operating them, of a minute-printing wheel having a continuous movement under the control of a time mechanism, and an hour-printing wheel having a step-by-step movement under the control of the time mechanism, and means for receiving the impression, substantially as set forth.

12. The combination, with the hour-printing wheel and the time mechanism, of a series of abutments corresponding to the hours and secured to rotate with the hour-printing wheel, a rocking weighted lever, a device carried by the lever for engaging the abutments to rotate the hour-printing wheel, and a snail-cam carried by the time mechanism for rocking the lever, substantially as set forth.

13. The combination, with the hour-printing wheel and the time mechanism, of a series of teeth corresponding to the hours and secured to rotate with the hour-printing wheel, a rocking weighted lever, a pawl carried by the lever and adapted to engage the teeth to rotate the hour-printing wheel, and a snail-cam actuated by the time mechanism and having an engagement with the rocking lever to operate it, substantially as set forth.

14. The combination, with the hour-printing wheel provided with a series of stops, a series of teeth corresponding to the hours and secured to rotate with the hour-printing wheel and the time mechanism, of the rocking lever, a pawl carried by the lever and adapted to engage the teeth when swung in one direction, a swinging stop adapted to en-

gage the stops on the hour-printing wheel, a device carried by the rocking lever in position to release the swinging stop, and a device upon the time mechanism adapted to
5 operate the rocking lever, substantially as set forth.

15. In combination, the hour-printing wheel provided with a series of stops, a toothed wheel secured to rotate with the hour-print-
10 ing wheel, a rocking lever, a swinging pawl carried by the rocking lever and adapted to engage

the toothed wheel, a swinging stop adapted to engage the stops in the hour-printing wheel, a swinging dog carried by the rocking lever and adapted to release the swinging
stop, time mechanism, and a cam carried
thereby for operating the rocking lever, substantially as set forth.

JOHN C. ENGLISH.

Witnesses:

FREDK. HAYNES,
K. E. PEMBLETON.

For the purpose of locking the hour-printing wheel in position during the hour and while the pawl h is being gradually carried by its rocking-lever support into position to again advance the wheel, I provide a depending stop K, provided upon its shank with a pair of short laterally-extending arms or lugs k , adapted to engage the opposite sides of two successive pins k' , projecting laterally from the side of the hour-printing wheel F and corresponding to the number of hour-printing types, and hence to the number of teeth upon the wheel H. The lower end of the stop K is provided with a beveled face k^2 for the purpose of allowing the end of the stop-operating dog L to pass it upon its return movement. The stop-operating dog L is pivotally secured in the free end of the arm i of the rocking lever, and is provided with a weighted end l , which tends to hold it normally in engagement with the stop k' on the end of the lever. The operating end l^2 of the dog is provided with a laterally-projecting stud or pin l^3 , which, when the arm i of the rocking lever advances, will engage the lower end of the stop K and release it from the pins k' on the hour-printing wheel, and thereby leave the said wheel free to be rotated under the impulse of the pawl h . The stop K is provided a short distance above its lower end with an opening k^3 , which, when the stop has been swung forward out of engagement with the pins k' , will be brought into alignment with the stud l^3 on the dog L and will allow the said stud to pass through, and the stop K will thereby be left free to return into position to engage the next succeeding pin k' . The gradual change of the stud l^3 from its position upon the stop (shown in Fig. 5) to a position in alignment with the opening k^3 during the swinging of the rocking lever is caused by the distances between the centers of the arcs in which the free end of the arm i of the rocking lever and the free end of the stop K swing. As it is essential that the stop K shall be thrown out of engagement with the pins k' in advance of the engagement of the pawl h with the tooth on the ratchet-wheel H, the lever which supports the pawl h is given a rocking movement sufficient to carry the operating end of the pawl beyond the tooth which it is to engage, as clearly shown in Fig. 5. As the lever carrying the pawl h and the dog L is gradually returned by the action of the cam q^2 , the stud l^3 on the dog L will take under the inclined face k^2 of the stop, and the dog L being free to swing in one direction the said stud l^3 will travel along down the inclined face and past the stop into the position shown in Fig. 5, ready for again operating the stop when the change of hour shall again be required. A notch i^3 on the arm i of the rocking lever engages one of the pins k' and holds the wheel temporarily against displacement until the stop K swings back into engagement with the pins.

The parts of the time mechanism not here-

inbefore particularly referred to may consist of an hour-wheel G' , provided with a suitable hand and geared with the minute-wheel so as to make a one-twelfth revolution while the minute-wheel makes a complete revolution, as is usual in clock-work, the said wheels being actuated by one or more spring-actuated wheels G^2 , as is common.

An impression-roller M is journaled in the end of a vibrating lever fulcrumed upon a suitable support O and in position to be swung into and out of contact with the lowermost line of type upon the type-carriers B and the hour and minute type-wheels. Over the roller M a strip of paper or other suitable material P passes from a supply-roll p to a receiving-roller p' , the latter, preferably under spring-tension, tending to roll the paper thereon as fast as it is fed off from the impression-roller M, but sufficiently yielding to admit of the movement of the impression-roller toward the type. The impression-roller has fixed to rotate therewith a ratchet-wheel m , with which a spring-pressed pawl m' engages, the latter being pivoted to a fixed support m^2 , so that as the impression-roller is swung toward the type the operating end of the pawl m' will travel past one or more teeth upon the ratchet-wheel m , and when the said impression-roller moves away from the type the said pawl will force the ratchet-wheel m around, and hence the strip P thereon into position to receive the next impression.

An inking-roller Q is journaled in the arms q of a vibrating bell-crank lever, the opposite arm or arms q' of the lever being connected with the impression-roller-supporting lever by links q^2 . The said bell-crank lever, which supports the inking-roller, is pivotally secured to a suitable support upon the casing at such a distance that it may swing into engagement with the faces of the lowermost type upon the several type-carriers B, and the roller itself is mounted in elongated bearings q^3 and supported yieldingly therein by means of springs q^4 . The connection of the said bell-crank lever with the impression-roller lever is such that when the impression-roller is swung toward the type the inking-roller will be swung away from the type out of the way, as clearly shown in Fig. 2. The said bell-crank lever which forms a support for the inking-roller is further provided with a toe q^5 , adapted during the movement of the bell-crank lever to engage a toe q^6 upon a rocking shaft or support q^7 , carrying the bell-hammer q^8 , so that when the impression-roller is swung toward the type and the inking-roller thereby swung away the latter will cause the hammer q^8 to be lifted away from the bell R and allow it to fall back and sound an alarm.

The insertion of the key to set the type-carriers and the hour and minute printing wheels is made to set in motion the mechanism which actuates the impression-roller lever,

as follows: A spring-actuated spur-wheel S is held against rotation when the key is not inserted by means of an arm s, fixed to rotate with a pinion s', which intermeshes with the spring-actuated spur-wheel S, the said arm s resting with its free end against the end of a rocking trip-lever s². A light spring s³ holds the end of the trip-lever s² in position to engage the end of the arm s, while the opposite end of the trip-lever extends slightly within the opening for the reception of the key, so that it will be rocked when the key is pushed home sufficiently to release its other end from the arm s. In the present instance I have shown the end of said lever projecting slightly above the bottom of the opening for the key (see Fig. 2) in position to engage the beveled end of a rib d⁴ on the under side of the key just before the key reaches the limit of its inward movement.

In Fig. 2 the key is represented as inserted to the full extent, and the lever s² is there represented as having been depressed at one end by the rib on the key sufficient to release its opposite end from the arm s, and the pinion s' being now free to rotate the spur-wheel S is also free. There is also in connection with the spur-wheel S a pinion s⁴, preferably having the same number of teeth as the pinion s', and having fixed to rotate therewith a crank s⁵, the wrist-pin of which is connected with the end of the lever N by a pitman s⁶. When the spur-wheel S is set at liberty, it will cause the rotation of the pinion s⁴ and with it the crank s⁵, and this, through the pitman s⁶, will cause the depression of the outer end of the lever N, and hence the raising of the opposite end of such lever carrying the impression-roller M, bringing the latter, with the strip P thereon, into contact with the type, and by its further movement swinging the lever N to return the impression-roller M to its depressed adjustment. In order to give the impression-roller a yielding contact with the type, I form the arm n of the lever N, to which the pitman is attached, of some suitable resilient material, spring-steel, for example.

If the key D be withdrawn after it has been thrust home, or if it be not held for a considerable time pressed home to the limit of its stroke, the lever s² will be permitted to resume its position in the path of the arm s, and after the pinion s' has completed one revolution the spring-actuated wheel S will be again arrested. As the pinion s⁴ corresponds in size with the pinion s', it will follow that there will be but one up-and-down stroke of the lever N, and hence but a single impression during the single revolution of the pinion s'. As the bell is sounded within a moment after the key is thrust to the end of its stroke, and as the impression-roller contacts with the type at about the same moment that the bell rings, there will no occasion for pressing the key a further length of time, and it will be automatically pushed partially out

of the socket by the push-rod C under the impulse of the springs b⁴, attached to the type-carriers B, so that it will no longer prevent the trip-lever s² from assuming its position to stop the pinion s', and hence the spring-actuated wheel S, after said pinion s' has made one revolution.

As the operations of the several sets of mechanisms have been so fully described in connection with the description of their construction and arrangement, it will be unnecessary to repeat the operation in detail. It may be stated, in short, as follows: The workman upon entering upon or leaving his duties inserts the key which corresponds to the number by which he is identified into the opening c' and presses it to its full extent. This will, through the push-rod C, swing one or more of the type-carriers B into position to bring the types which indicate his number in alignment in their lowermost positions and the type upon the hour and minute printing wheels, which denote the hour and minute of the day, being at all times in their lowermost position in alignment with those upon the type-carriers B, which have been brought into position by the insertion of the key, the type denoting the hour, minute, and number of the workman will be in position to print. Just before the key reaches the limit of its stroke the mechanism for operating the impression-roller is set in motion and it is brought into contact with the type and the hour, minute, and number recorded. The swinging of the impression-roller into position to receive the impression operates, as hereinbefore described, to ring the bell, and the workman is thereby warned that the record is made and he is at liberty to take his key and pass on.

In Fig. 4 I have designated a single impression which, when read from the record, would indicate that the workman identified by the number "725" recorded his presence at ten o'clock and fifty-one minutes.

It is evident that slight changes might be resorted to in the formation and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself, strictly, to the construction herein set forth; but

What I claim as my invention is—

1. The combination, with one or more movable type-carriers, varying-keys independent of the type-carriers and having a movement toward the type-carriers to bring different type into position to print, and time-printing devices under the control of time mechanism and arranged to print simultaneously with the key-controlled type-carriers, of an impression device having a movement toward and away from the type, controlled by the keys and by the time mechanism, and impression-device-actuating mechanism under the control of the keys which operate the type-carriers, substantially as set forth.

2. The combination, with a series of swinging type-carriers, each provided with a curved