No. 632,907. Patented Sept. 12, 1899.

E. L. THURSTON.

WORKMAN'S TIME RECORDER.

(Application filed June 9, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 2.

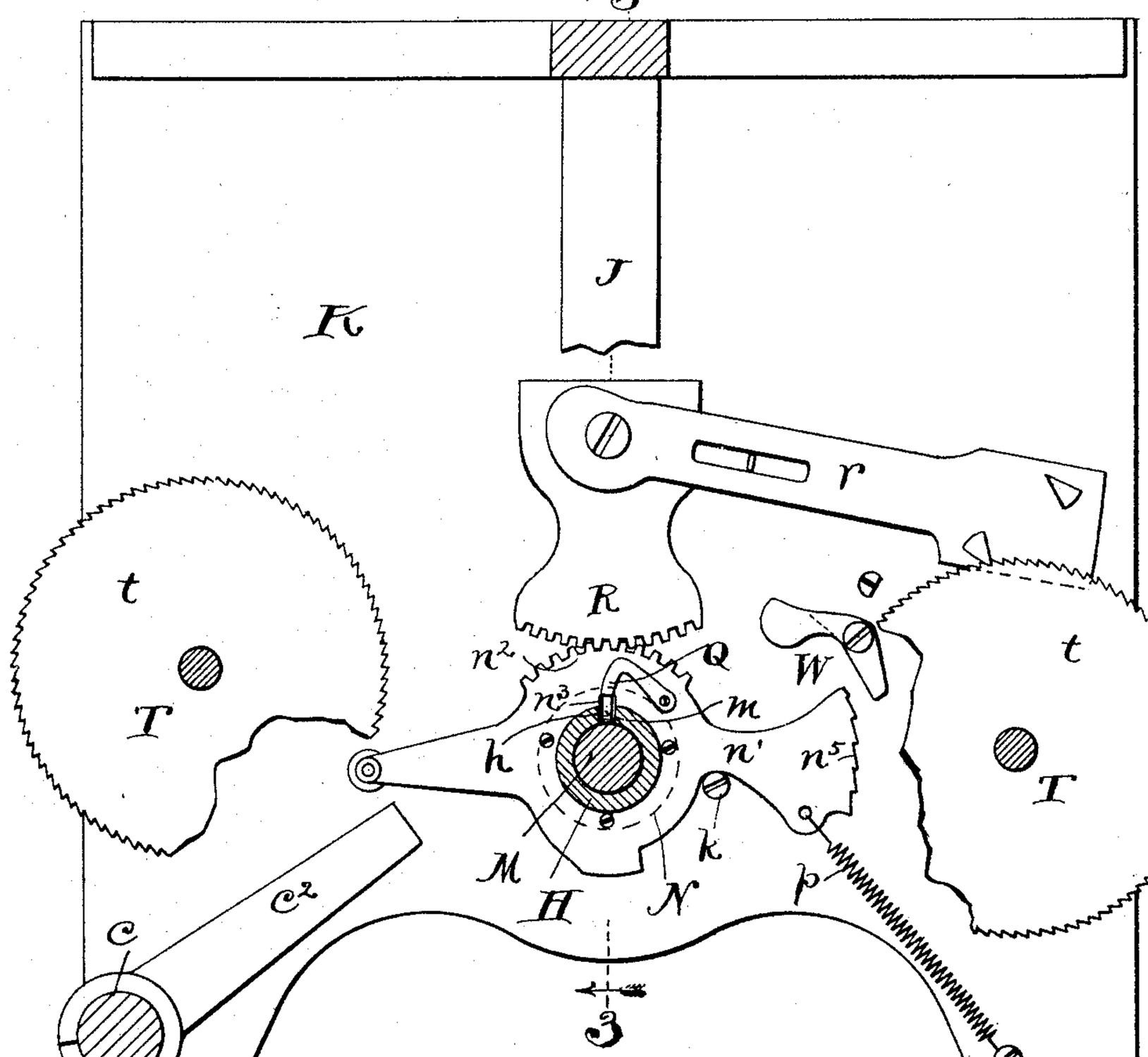
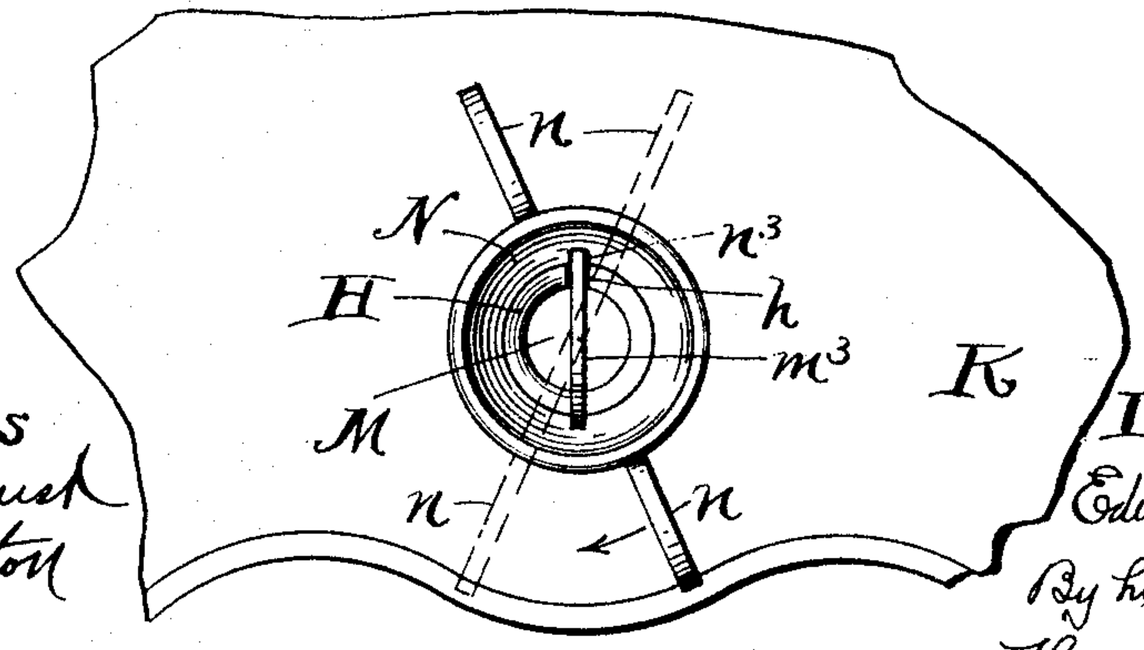


Fig. 1.



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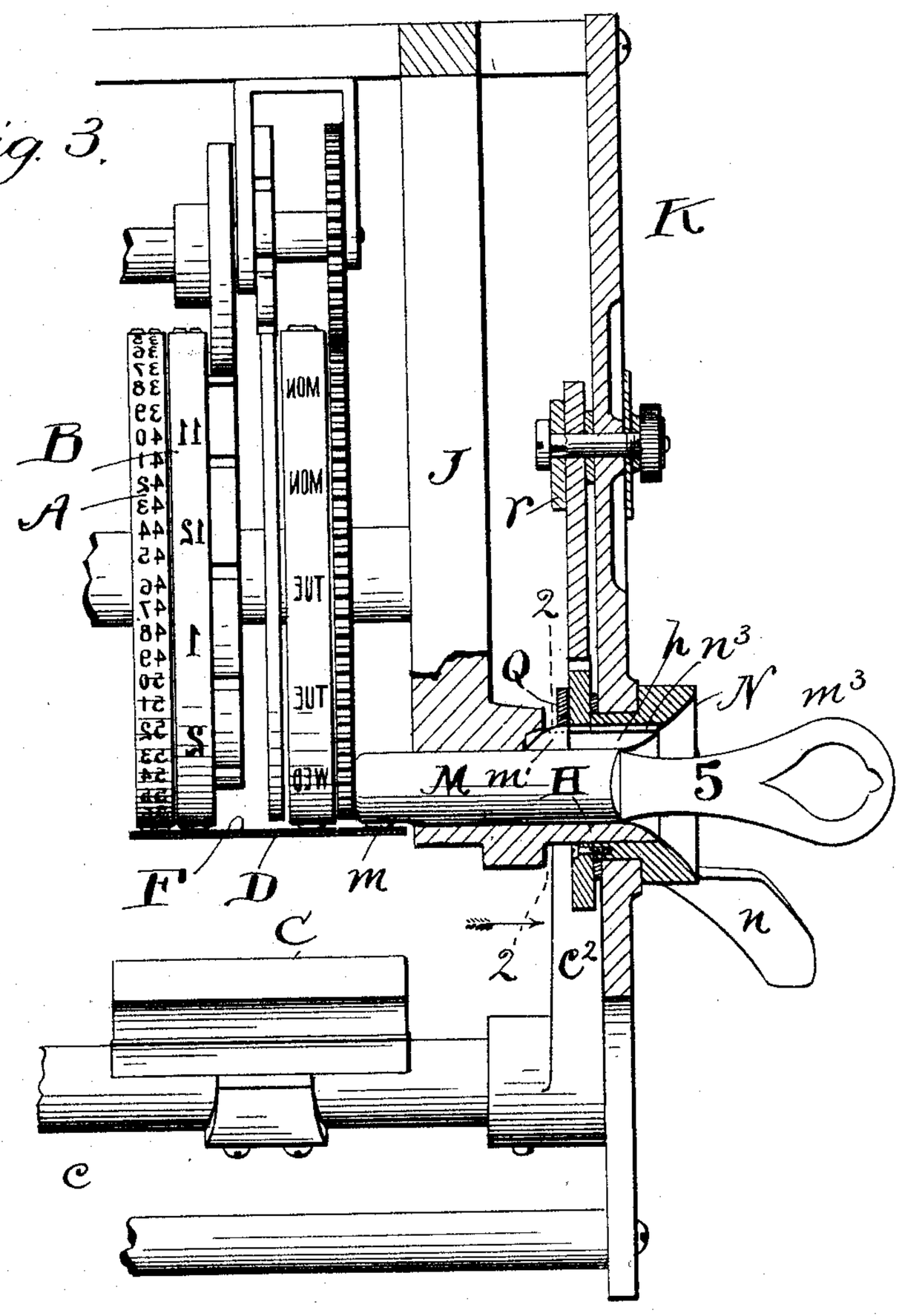
(No Model.) 3 Sheets—Sheet 2.

Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

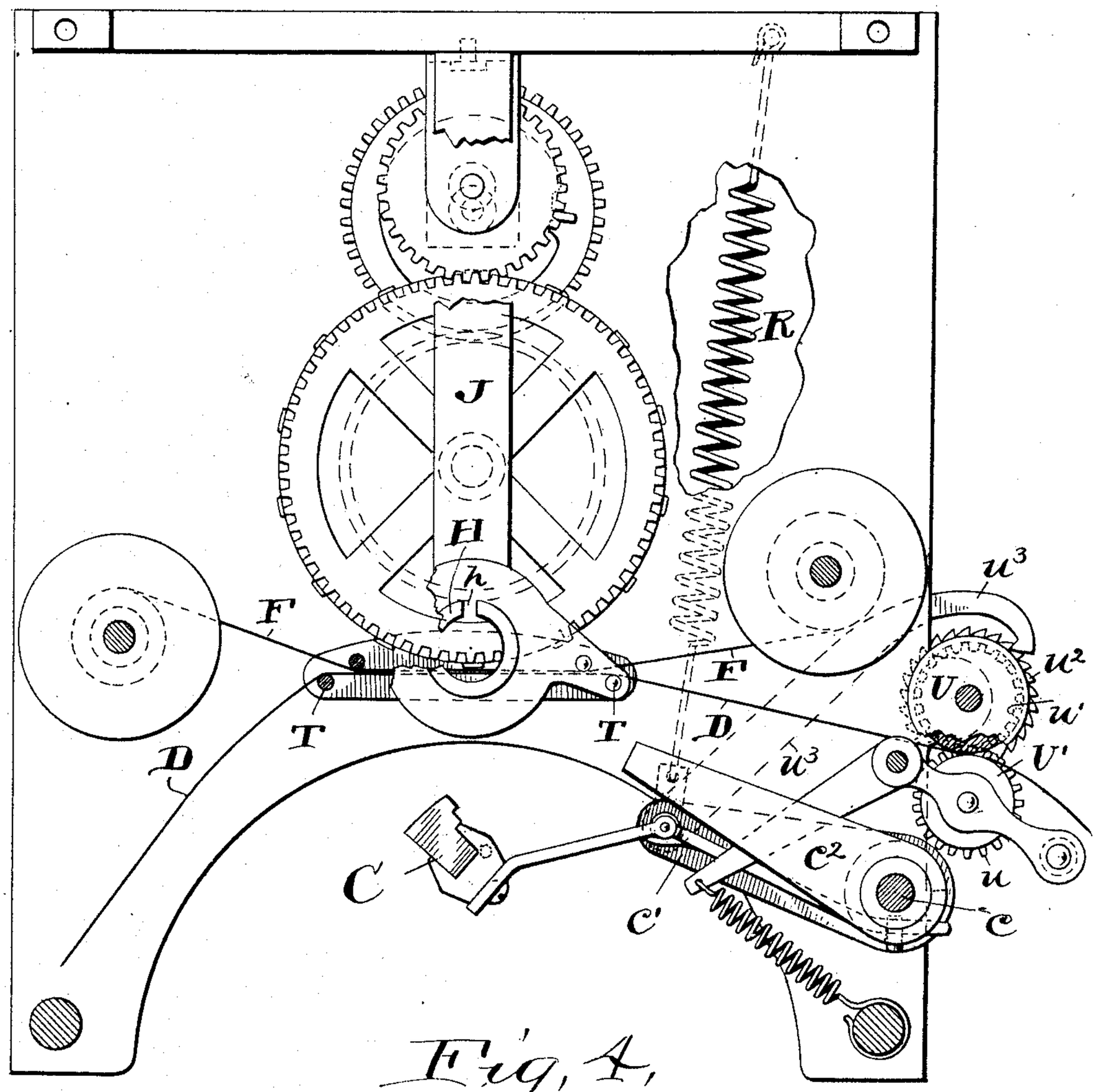

Fig. 4.

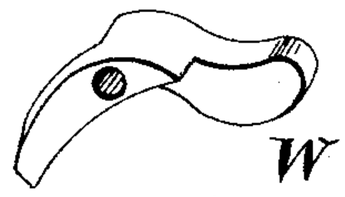

Fig. 5.

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UNITED STATES PATENT OFFICE.

EDWIN L. THURSTON, OF CLEVELAND, OHIO.

WORKMAN'S TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 632,907, dated September 12, 1899.

Application filed June 9, 1899. Serial No. 719,912. (No model.)

To all whom it may concern:

Be it known that I, EDWIN L. THURSTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Workmen's Time-Recorders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The chief merit of the present invention results from the fact that the machine in which it is embodied is adapted for use with keys of the simplest, cheapest, and most durable construction. The term "key" is here used in a colloquial sense, because the so-called "keys" which are adapted for use in said machine are not keys in the sense in which that term is commonly used in this art. They perform no function in the actuation of the recording mechanism or of the mechanisms for feeding either the inking-ribbon or recording-tape. They are merely metal rods each having on one side near its end a cameo type, which by the mere insertion of the so-called "key" into the machine is brought into alinement with the time-wheels, whereby the impression-hammer when actuated by other means will cause said type to be printed on the tape together with the type on the recording-wheels.

Another merit of the machine is that in and of itself it is somewhat cheaper than the other machines of similar character which are now on the market. Notwithstanding this fact its records are equally accurate and may be made by the different workmen as rapidly as with other machines.

The invention consists in the combination, in a machine of this character, of a fixed tubular key-holder which is shorter than the key and has a slot or its equivalent with a hub which is rotatably mounted upon said key-holder and has upon its outer end a wing or wings wherewith it may be turned and upon its inner end mechanism for actuating, either directly or indirectly, the impression-hammer and the mechanisms for advancing the recording-tape and the inking-ribbon.

It also consists in the more specific combinations of parts shown and described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a front view of the key-holder and the parts adjacent thereto. Fig. 2 is a sectional view of the plane indicated by line 2 2 of Fig. 3 and looking in the direction of the arrow. Fig. 3 is a central vertical transverse section in the plane indicated by 3 3 of Fig. 2. Fig. 4 is a vertical sectional view in the plane indicated by line 2 2 of Fig. 3, but looking in the opposite direction to that in which the arrow in said figure points. Fig. 5 is a perspective view of the gravity-pawl W, viewed from the opposite side to that which is shown in Fig. 2.

The machine shown, like other machines of this class, has hour and minute type-wheels A and B, which are connected with clock mechanism, whereby they are moved synchronously therewith, an impression-hammer C, mechanism for guiding and advancing a recording-tape D, which lies between the impression-hammer and the type-wheels, and mechanism for guiding and advancing an inking-ribbon F, which lies between the tape D and the recording-wheels. The impression-hammer and the mechanism for operating it and the mechanisms for advancing the recording-tape may be of any suitable construction—as, for example, that which is shown in the drawings. This particular mechanism includes as an important element a rock-shaft *c*, which carries the impression-hammer C. This rock-shaft has an arm c', to which one end of a contractile coiled spring R is secured, the other end of said spring being attached to the frame of the machine. It has another arm c^2, which is adapted to be engaged by certain mechanism to be presently described, whereby the rock-shaft is turned a short distance in opposition to its spring and then suddenly released. The recording-tape D passes over suitable guide-bars T, whereby it is held below and close to the inking-ribbon F in proper relation to the type to be printed and between the inking-ribbon F and the impression-hammer. This recording-tape then passes between two feed-rollers U U′, which carry the meshing pinions u u', whereby the rotation of one roller causes a corresponding rotation of the other in the opposite direction. A ratchet u^2 is attached to one of the feed-rollers, and a pawl u^3, which is pivotally connected with the arm c' of the rock-shaft *c*, engages with this ratchet. When, therefore,

the rock-shaft has been turned by the mechanism to be presently described in opposition to its spring, this pawl is moved, and it in turn turns the ratchet, whereby the feed-rollers are turned a short distance in the feeding direction, thereby advancing the recording-tape. When the arm c^2 is suddenly released by the mechanism by which it is moved, the shaft c is suddenly returned to its normal position by the action of the spring R. This causes the impression-hammer to be thrown up into contact with the recording-tape, which is thereby forced against the inking-ribbon, and the inking-ribbon F is forced against the characters in the impression-line, whereby said characters are printed upon the recording-strip.

So much of the mechanism as is above described is old and well-known in this art, both in the precise form shown and in various equivalent forms.

H represents a horizontal tubular key-holder. It is fixed to a depending post J and extends therefrom forward toward the front face-plate K of the machine, through which it may pass, as shown. This key-holder has a longitudinal slot h in its front end. The key M, which is adapted to be used with this machine, is simply a metal rod shaped to fit the hole through the key-holder. It is longer than the key-holder, and when inserted as far as it should be its end projects beyond the key-holder. On this projecting end and on the lower side thereof is a cameo type m, which when the key has been properly inserted is in alinement with the figures on the type-wheels A and B, which indicate the time. On the key is a fin m', which prevents the key from being inserted into the keyhole in any position except that in which the type m is on its lower side. When the key is in the proper position relative to the key-holder, this fin enters the slot h, and when the key has been inserted far enough this fin engages with the end of said slot and is stopped.

N represents a hub which extends through the face-plate K and surrounds the key-holder. It is adapted to turn upon its axis, although it does not matter whether it has its bearings upon the key-holder or in the face-plate K. The part of said hub which is in front of the face-plate has one or two wings n, whereby it may be turned. The part of the hub which is behind the face-plate has an arm n', to which a contractile coiled spring p is attached, and this spring exerts its force to move the arm into engagement with a fixed stop-pin k and to hold it there until a superior force is applied. This hub has inside the face-plate K another arm n^2, which engages with the arm c^2 on the rock-shaft c, whereby the turning of the hub upon its axis causes that actuation of the rock-shaft which results in the operation of the impression-hammer and the advancement of the recording-tape. The hub has also an upwardly-projecting arm in the form of a gear-segment n^3, which meshes with another gear-segment, which is pivoted on the inner side of the face-plate K. This gear-segment carries above its pivot a long pawl-arm r, which engages with a ratchet l on the shaft T, to which is attached the reel upon which the inking-ribbon is to be wound.

It will be understood that the construction of the hub behind the face-plate may be varied at will to adapt it to coöperate with the mechanism of the particular machine in which it is used, and any form of impression-hammer or its equivalent and of the operating mechanism therefor may be adopted, and so, also, may any form of the mechanisms for advancing the recording-strip and the inking-ribbon, provided suitable intermediate mechanism is provided whereby the turning of the hub when a key has been inserted into the machine will result in the actuation of said mechanisms.

It will be seen that the key which is adapted to be used with this machine has no complications and cannot well get out of order, since it is subject to no strain whatever except such as it receives from the hammer; but the key may be made of such diameter that it can suffer no injury from this blow. None of the work incident to the actuation of the machine is performed by this so-called "key," which is, in fact, nothing more than an elongated type inserted into a suitable keyhole far enough to bring its character into alinement with the type-wheels. After this is done it is necessary to take hold of the hub by means of its wing or wings n and to turn it in order to operate the printing mechanism and other mechanisms. Under ordinary circumstances to require two operations for producing the record—viz., the insertion of the key and the subsequent turning of the independent hub—would occasion a loss of time. That, however, is not true with the construction shown if properly operated, for the workman may grasp the handle m^3 of the key between the thumb and forefinger and insert it into the keyhole as far as it will go and then without loosing his hold press upon the lower wing of the hub with the second finger. This will sufficiently turn the hub to cause it to perform its functions. These two acts may be as conveniently and as rapidly performed as may be the acts necessary to be performed in other machines of inserting a key as far as it is necessary and then turning said key. Moreover, the simple character of the key makes its insertion and withdrawal very easy. In fact, it will never stick in moving in either direction, but may be inserted and withdrawn with complete freedom.

In machines of this character it is at least theoretically desirable that the machine shall be so organized that it cannot be operated until a key is inserted and that when once the key is inserted and the operation of the mechanism is begun it cannot be withdrawn until the operation of the machine is completed. Both of these results are attained in

the machine embodying this invention by very simple means. The hub N is provided with longitudinal groove n^3 in its inner periphery, which groove when the hub is at rest is in line with the slot *h* in the key-holder. The fin *m* on the key is made high enough to project into this groove when it is passing into its operative position. When it reaches that position, it has passed entirely through the hub, wherefore when the operator has once begun to turn the hub the key cannot be withdrawn until the hub returns to its normal position. This return is prevented until the hub has made its complete forward movement by means of a gravity-pawl W, pivoted to the rear side of the face-plate of the machine and engaging with a ratchet n^5 on the outer periphery of the same arm to which the operating-spring is fastened. A gravity-pawl Q is pivoted to the rear end of the hub, and when the hub is in its normal position this pawl drops down into the slot *h* in the key-holder, and thereby prevents the turning of the hub. The front end of the fin *m* on the key, as the key is beveled, wherefore in being inserted it engages with this pawl and lifts it out of this slot and holds it out, whereby the hub may be turned with the results before stated. The withdrawal of the key permits this pawl to again enter said slot.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the character specified, the combination of a fixed tubular key-holder, with a hub which is rotatably mounted and embraces the key-holder and has near its outer end an arm or arms for turning it, and has also means adapted for operating the impression mechanism, substantially as specified.

2. In a machine of the character specified, the combination with a fixed tubular key-holder having a slot in its outer end, with a hub rotatably mounted upon said key-holder and passing through the face-plate of the machine and having on the front of said face-plate a wing or wings wherewith it may be turned, and having behind said face-plate an arm wherewith to operate the impression-hammer, and a spring to return said hub to its normal position, substantially as specified.

3. In a machine of the character specified, the combination with a fixed tubular key-holder having a slot in its outer end, a rotatable hub which embraces said key-holder and passes through the face-plate of the machine and has in the front of said face-plate a wing or wings wherewith it may be turned, and behind said face-plate means wherewith to operate the impression-hammer, and a spring to return said hub to its normal position, with a pawl mounted upon the hub and adapted to engage in said slot, and a key having a beveled fin which enters said slot and lifts the pawl, substantially as specified.

4. In a machine of the character specified, the combination with a fixed tubular key-holder having a slot in its outer end, a rotatable hub which surrounds said key-holder and passes through the face-plate of the machine and has in the front of said face-plate a wing or wings wherewith it may be turned, and behind said face-plate means wherewith to operate the impression-hammer, and a spring to return said hub to its normal position, a pawl mounted on the hub and adapted to engage in said slot, the hub having an internal longitudinal groove which, when the hub is in its normal position, is in line with the slot in the key-holder, with a key longer than the key-holder having a type on one side of its end and having also a beveled fin which enters the slot in the key-hole and passes through the groove in the hub, substantially as specified.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

EDWIN L. THURSTON.

Witnesses:

ALBERT H. BATES,

PHILIP E. KNOWLTON.