

(Model.)

2 Sheets—Sheet 1.

E. H. FLINT.

Time Lock.

No. 229,992.

Patented July 13, 1880.

Fig. 1

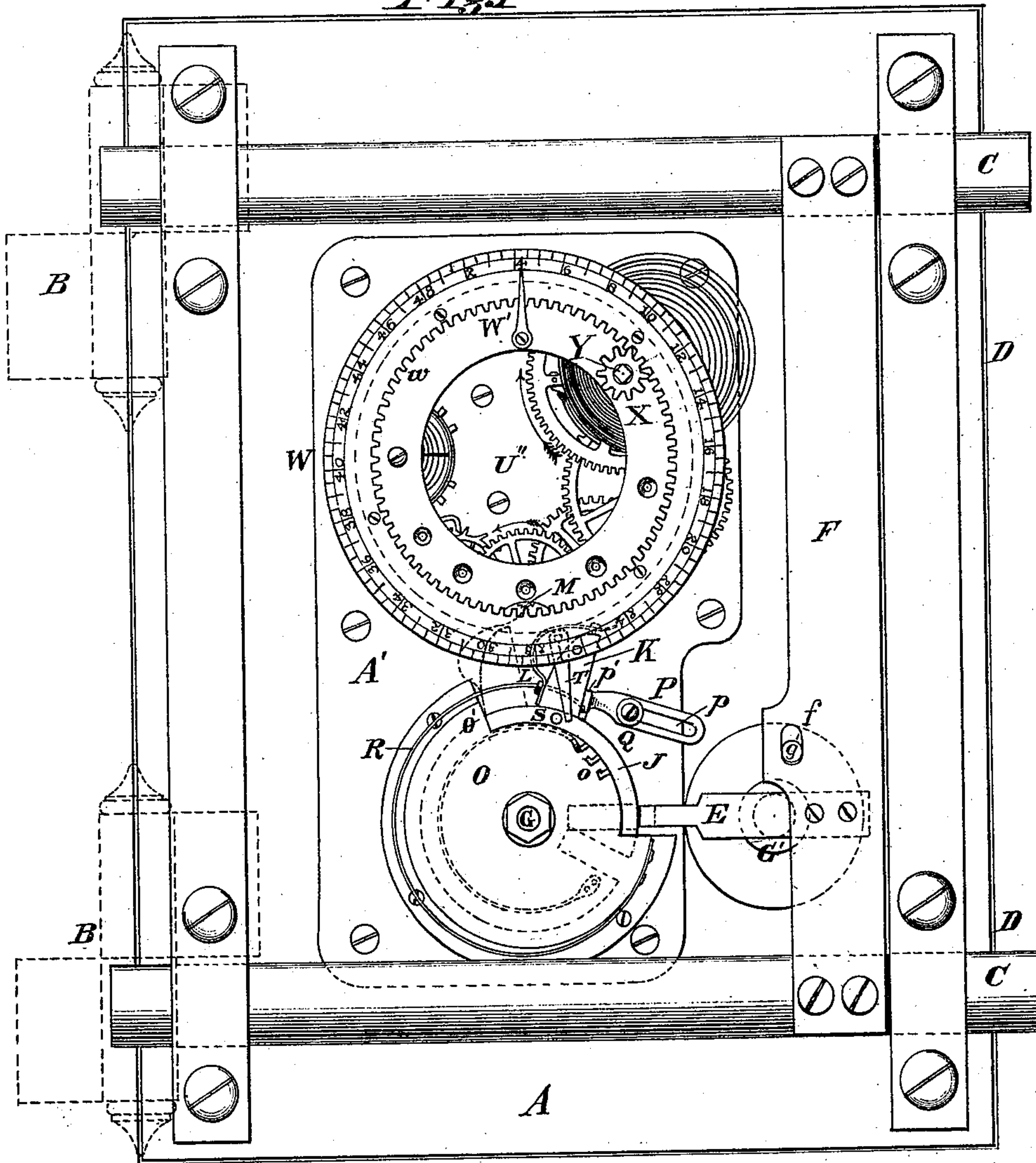
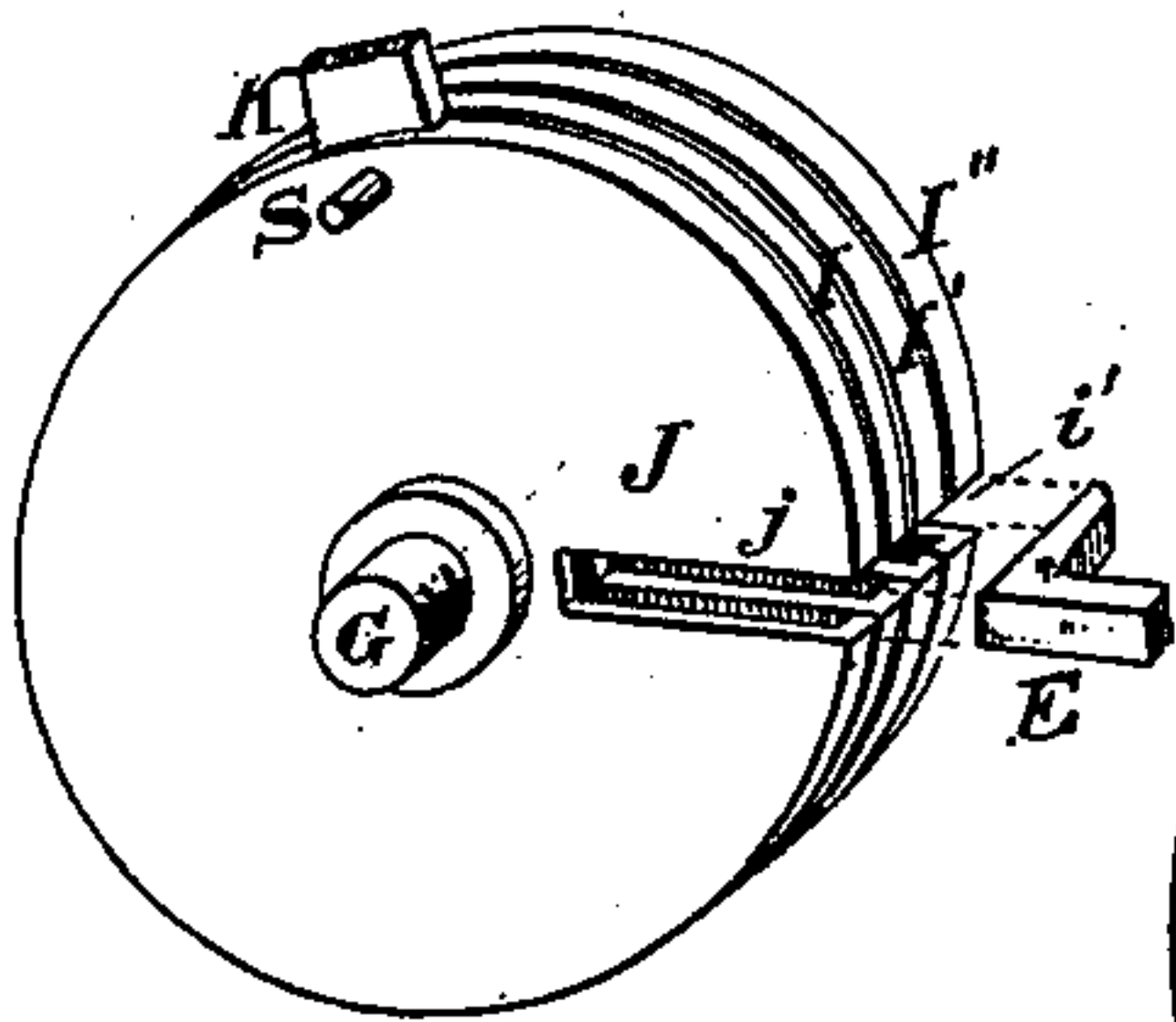


Fig. 8

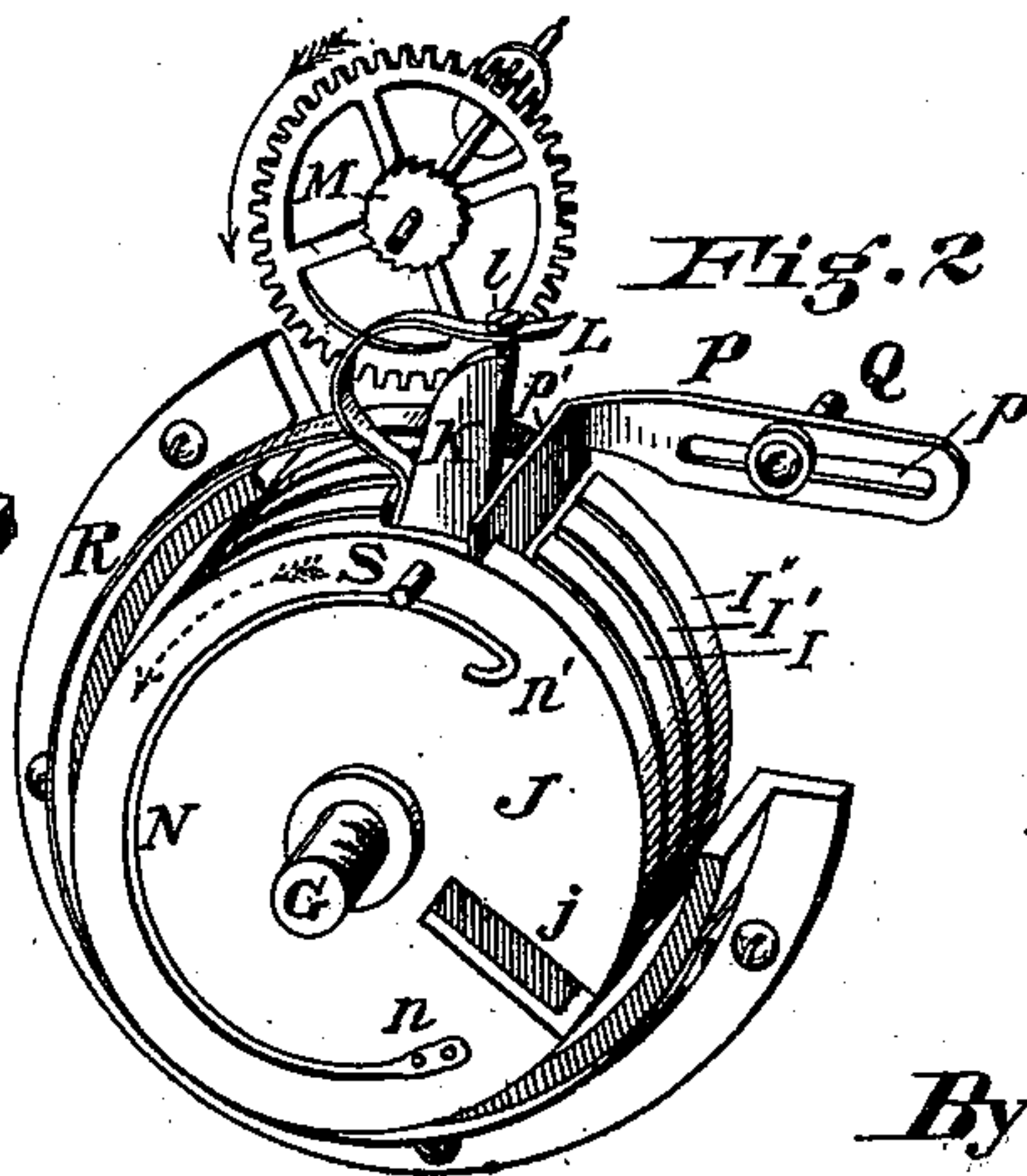


Attest

Edgar J. Gross

H. Knight

Fig. 2



Inventor

Edwin H. Flint

By Knight Bros.

Attys

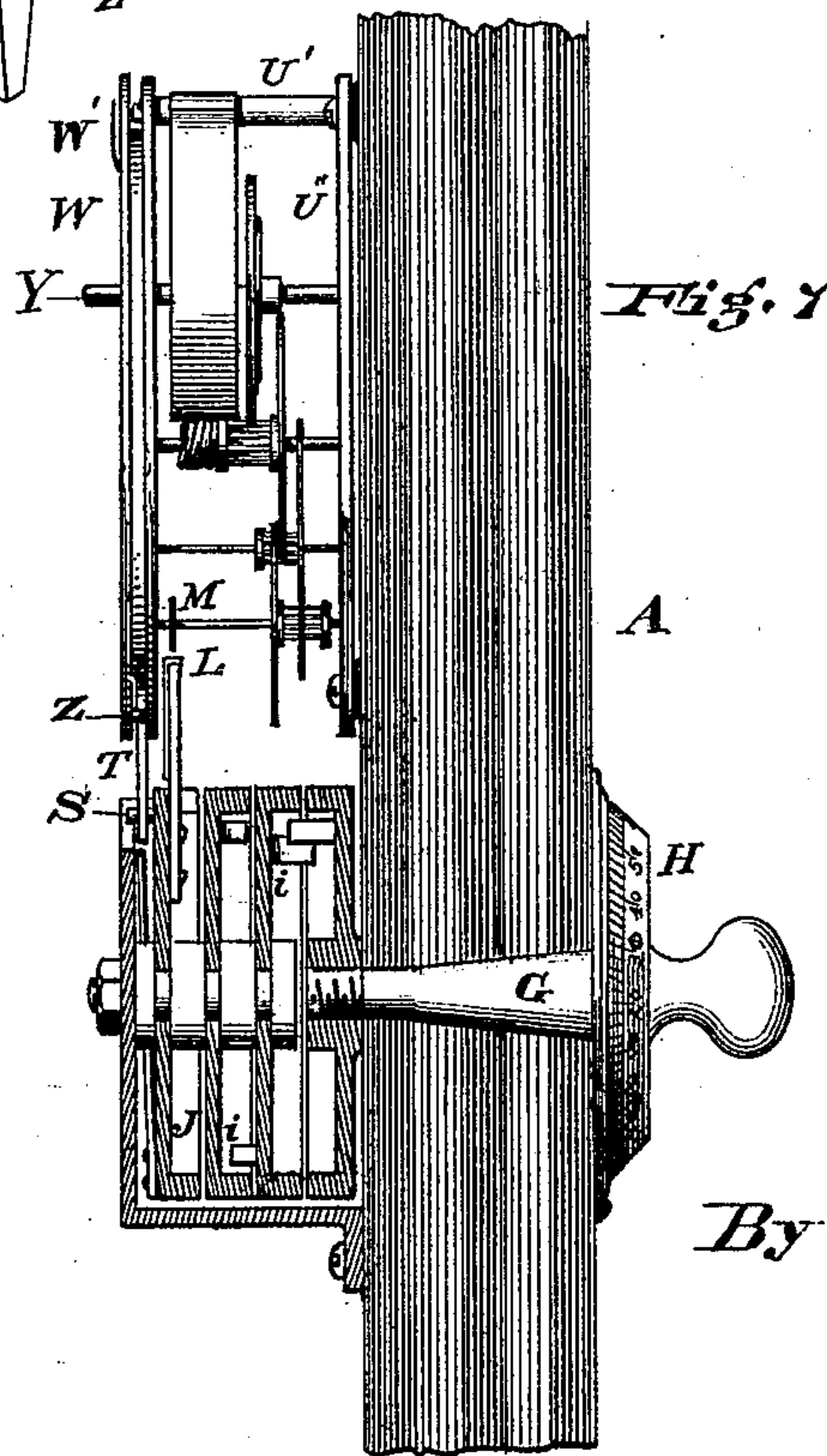
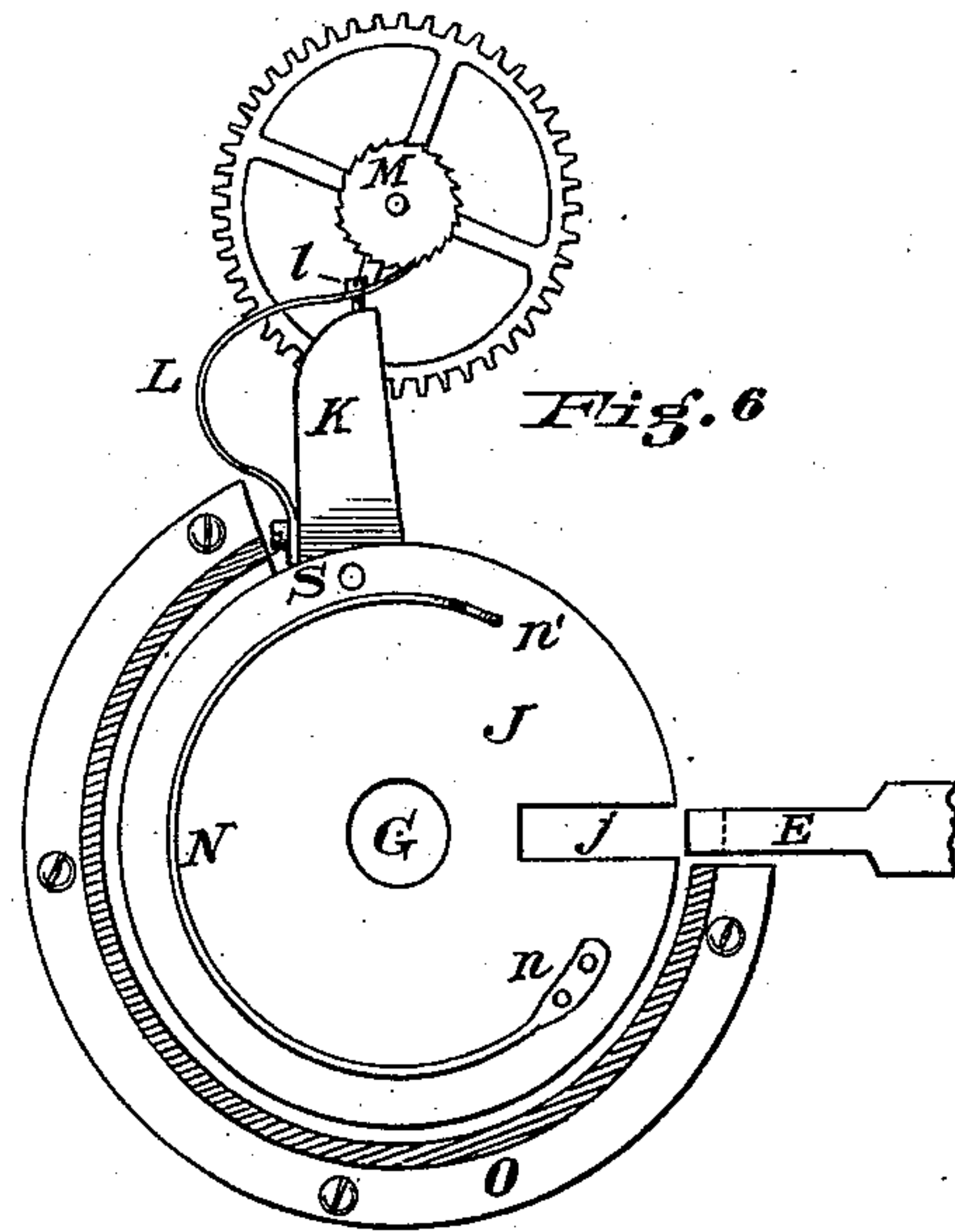
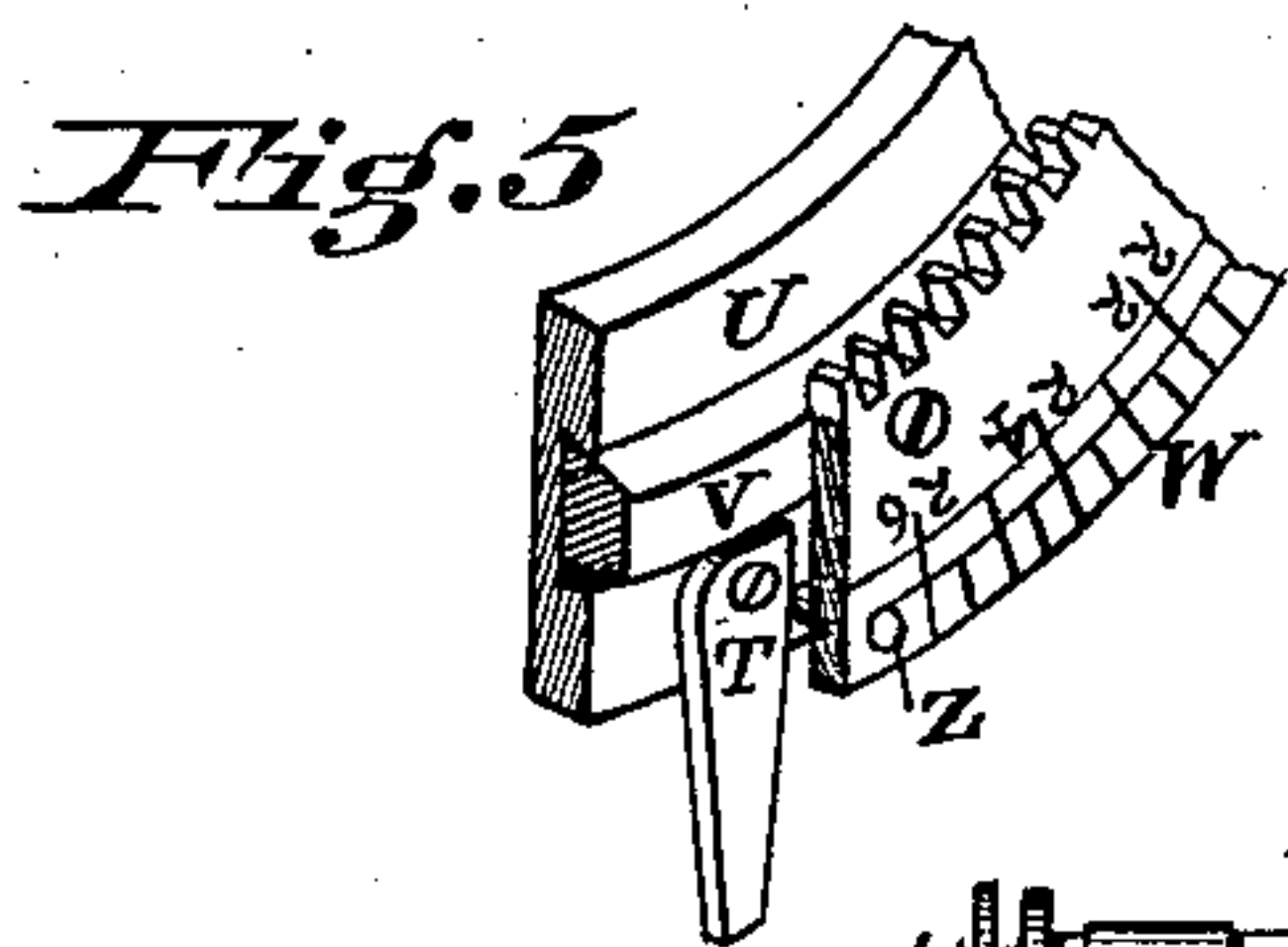
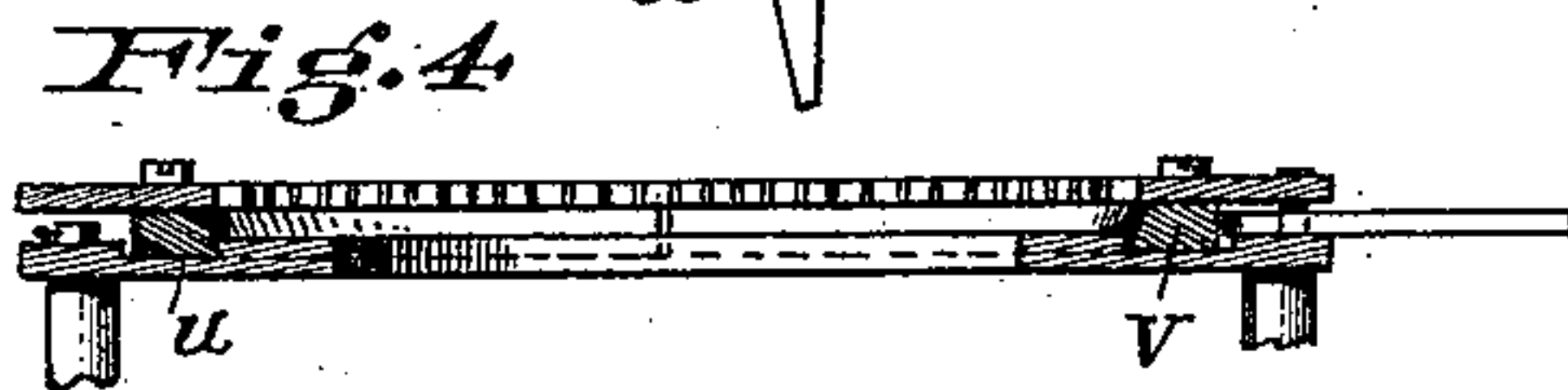
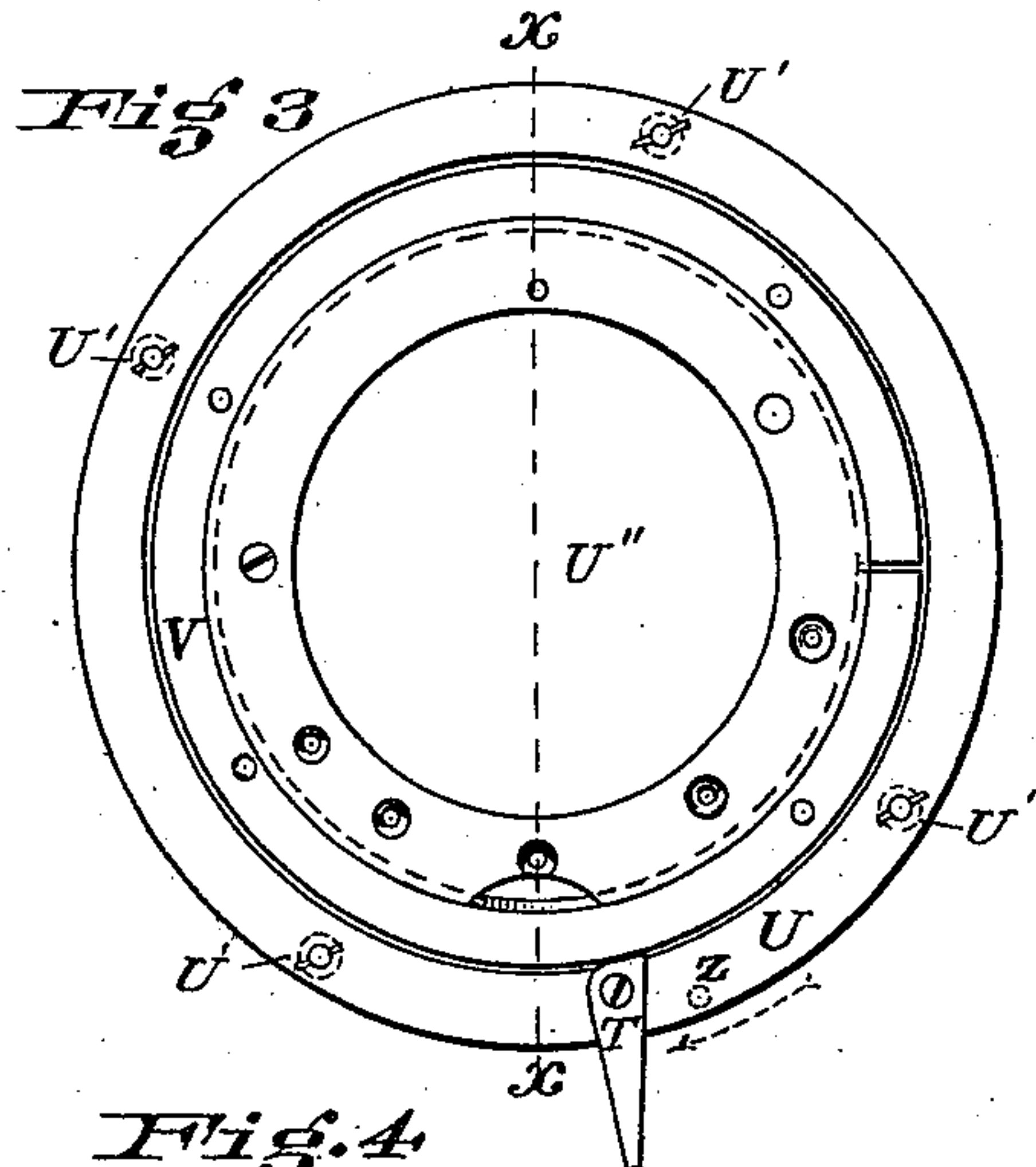
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

EDWIN H. FLINT, OF CINCINNATI, OHIO.

TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 229,992, dated July 13, 1880.

Application filed April 6, 1880. (Model.)

To all whom it may concern:

Be it known that I, EDWIN H. FLINT, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Time-Locks, of which the following is a specification.

My invention relates, primarily, to an improvement in those bank-safe locks whose bolt-work, when protracted, is capable of being placed under the separate and independent custody of both a "combination-lock" and of a time mechanism; and my invention relates more particularly to a device whereby one in possession of a secret formula different from that whereby the "combination" is ordinarily opened is enabled, in the event of the time-movement failing to discharge its functions, to employ the ordinary tumblers or combination-wheels to remove the time-obstruction, and thus allow the bolt-work to be retracted and the door to be opened.

The leading feature of my invention is a mechanical contrivance whereby a gated wheel, called the "time lock-bolt," which, while the time-movement is in running order, operates independently of the combination-lock, and wholly subject to the time mechanism, (of which it then constitutes a part,) is, on the premature stoppage or suspension of the time functions, made capable, by the manipulation of the combination arbor and tumblers, in conformity with a secret formula, of being placed and held "in gate" with the safe bolt-work, so that on the gating of the combination-tumblers the safe bolt-work may be retracted as freely as if said time lock-bolt had been "gated" in the ordinary and proper way by the time-movement itself.

The arrangement of the device is furthermore such that in the event of the time mechanism being in running order its continued revolution operates to release the said time lock-bolt before the tumblers proper can be set up in gate with the safe bolt-work, and by so doing relegates the latter to the control of the time mechanism.

I am aware that the opening of a "locked-out" safe has been sought to be accomplished by Wm. L. Bass, as described in his Patent No. 8,603, December 23, 1851, and also by other

inventors; but I believe the means employed by me possess useful novelty over all of these.

Among distinguishing and valuable characteristics of my improvement may be cited the marked relative simplicity and compactness of my lock, owing to the employment of my said time lock-bolt or gated wheel, operating in the herein-described mechanical association with the same angle-bar which is associated with the tumblers proper of the combination-lock, and with the described retractile spring and spring-catch. Furthermore, the relative arrangement and construction of my supplementary releasing mechanism is such as, in the event of the time mechanism being running, to aid rather than retard its movement.

In this specification the expressions below recited are used with the following significations, respectively: By "safe-bolt" or "safe bolt-work" is meant the bolt or system of bolts or bars which, by engaging within or behind the jamb, fasten the safe-door, such bolt-work in various forms being old, and the fact of its being either simple or multiple being of no significance. By "time mechanism" is meant a device whereby it is made possible to subject the protracted bolt-work to the control, for any desired period, of clock-work within the safe. The expression "combination-tumblers" or "tumblers proper" refers to a series of gated wheels, by which the person in charge can, through the instrumentality of an arbor that extends through the safe-door, withdraw an obstruction from the safe bolt-work and open the door, providing the time mechanism has concluded its functions, or its lock-bolt has by other means been placed in gate. By "time lock-bolt" is meant a notched wheel which constitutes the last or most exterior member of the train of devices which connects the clock-work proper with the safe bolt-work, and which, with said clock-work, constitutes the time mechanism. By "secret combination" is meant a formula for setting up the tumblers to remove the time-mechanism obstruction, and which is not known to the ordinary custodian of the safe.

In the accompanying drawings, Figure 1 is an elevation of the inner wall of a safe-door provided with a time-lock embodying my in-

vention. Fig. 2 is a perspective view of the combination-tumblers and the time lock-bolt, together with the fence or angle-bar, whereby one cognizant of the secret combination can, in event of a lock-out, by manipulation of the ordinary tumblers of a combination-lock, bring and hold, first, the time lock-bolt and afterward the tumblers, to a position in which they will be simultaneously in gate, so as to enable the retraction of the safe bolt-work. Fig. 3 is a face view of the annular journal-plates of the clock-movement and of its lever-connection with the time lock-bolt as they appear after removal of the dial. Fig. 4 is a section on the line *x x* of Fig. 3. Fig. 5 is a perspective view, showing a portion of the annular journal-plate with its pivoted lever-connection and the mode of securing the dial to said plate. Fig. 6 is a face view, showing the catch of the time lock-bolt in engagement with the time-mechanism ratchet, thus holding said time lock-bolt in gate for unlocking. Fig. 7 is a vertical section of the time mechanism, the combination-tumblers, and the safe-door in the plane of the combination-arbor. Fig. 8 represents the entire suit of tumblers and time lock-bolt set up in gate for unlocking.

A represents a portion of a customary burglar-proof safe-door, having suitable hinges B and one or more safe-bolts, C, shooting into or behind jamb D.

A' represents a plate for support of my time and combination lock works and for their attachment to the safe-door.

E shows a customary tongue projecting from connecting bar or plate F of the bolt-work. A slot, *f*, in the bar F receives a wrist-pin, *g*', that projects from and rotates with the safe-bolt-work arbor G'.

G represents the tumbler-arbor of the combination-lock, having on the outside of the door the accustomed graduated collar H.

I I' I'' represent a series of customary gated wheels or combination-tumblers, having the usual pins, *i*, for communicating motion from the innermost one, I'', to that next in front of it, I', and so on throughout the series in the well-known manner of setting up tumbler combinations.

Each tumbler has, as usual, a single peripheral notch or gate, *i'*. These notches, when grouped in the horizontal plane of the arbor, serve their customary purpose of releasing the bolt-work; but in addition to this customary use the same customary tumblers and notches thereof are, when said tumblers are set up to the secret formula, as hereinafter explained, made available for removal of the time-obstruction, no additional tumblers being required for this purpose, nor, as already stated, even additional gatings therein. In fact, all of the members above enumerated may be of ordinary and well-known forms.

My time mechanism comprises the following members, to wit: an independent gated wheel or disk, called the "time lock-bolt," J,

coaxial with and preferably of same diameter as the combination-tumblers, but without communicating pins. The time lock-bolt J has projecting radially from it an arm, K, to which is attached a spring-catch, L, capable, when the time lock-bolt is rotated to the position shown in Fig. 6, of engaging in ratchet M upon one of the shafts or spindles of the clock-work. The tension of spring L may be rendered capable of regulation by means of a temper-screw, *l*. A spring, N, fastened by one extremity, *n*, to the time lock-bolt J, and engaging by its other extremity, *n'*, in one of several notches, *o*, in tumbler-case O, restores said lock-bolt, whenever released, and holds it to its normal position. (Shown in Figs. 1 and 2.)

P is a sliding and oscillating dog, fence, or angle-bar, having a slotted shank, *p*, for a pin, Q, by which it is secured to plate A', and upon which it slides and oscillates in the manner to be presently explained.

A side projection or lug, *p'*, that projects rectangularly from shank *p* across the peripheries of the entire series of tumblers proper, is capable of engaging in the notches of the said tumblers when the latter are set up to the secret combination, so as to utilize the said tumblers proper (by employment of the same notches which in another position of the said tumblers put them off guard) to remove the time-obstruction from the safe bolt-work, as explained in the sequel.

In the position of the parts shown in Fig. 1 said angle-bar, being in its most retracted (normal) position, operates as a stop or bound to the retraction of the time lock-bolt J. In like manner the protraction of said bolt J is limited by the impact of the arm K with a shoulder, *o'*, upon case O. A spring, R, attached at one extremity to case O and at the other extremity to the angle-bar P, serves the double purpose of holding said angle-bar back to its normal position (see Fig. 1) and of causing it to drop into and occupy the gates of the tumblers proper when said tumblers are set up to the secret combination. (See Fig. 2.)

A pin, S, that projects from the face of the time lock-bolt, receives at the proper instant the impact of the lever-connection T from the time-movement. This lever-connection is pivoted to the annular plate U, which serves as the front journal-plate for the various shafts and spindles of the clock-work. Said plate U is attached by posts U' to circular plate U'', which plate constitutes the back journal-bearing.

The described and represented annular arrangement of the train of clock-work facilitates the manufacture, inspection, and oiling of the mechanism.

An annular dovetail groove, *u*, in plate U receives a severed ring, V, which, while being securely retained, is capable of revolving freely in said groove. To this ring V the dial W, which is likewise annular, is screwed. The dial W is coggged interiorly, as at *w*, to receive

a pinion, X, upon the mainspring-arbor Y. A pin or stud, Z, projecting rearwardly from the dial, enables the latter at the proper instant to discharge its functions through the instrumentality of the lever-connection T and the stud S upon the time lock-bolt J.

In the ordinary operation of my time-lock the time mechanism is set to throw the time-lock obstruction off guard at any desired hour by the usual means of winding up the arbor Y of the clock-work to a point at which the zero-mark stands as many hours removed from the index W' as it is desired that the safe bolt-work shall be automatically guarded. In the illustration (see Fig. 1) the dial is shown set to discharge its functions at the expiration of four and a quarter hours. At that period the stud Z will be found to have operated, through lever-connection T and stud S, to have pushed the time lock-bolt to the position shown in Figs. 6 and 8, so as to remove the time-obstruction from the safe bolt-work. In the ordinary and proper discharge of the time-mechanism functions such release will recur regularly at the predetermined hour. It is only when these functions have from any cause failed in execution that the services of the special operator are called in requisition to remove the time-obstruction by means of my special releasing device.

The operation of my said releasing device will be readily understood from the preceding description, and may be stated briefly as follows:

The time mechanism having stopped without removing the time-obstruction from the bolt-work, the bank president, or other special operator who has been intrusted with the secret formula, sets up the tumblers I I' I'' in accordance with said formula, so as to bring them all in gate with the angle-bar P, whose portion p' then drops into the tumbler-notches, as shown in Fig. 2. The special operator then, rotating the arbor G to his right, causes the tumblers to press the angle-bar against the arm K, so as to rotate the time lock-bolt J in direction of the dotted arrow, causing the spring-catch L to engage in the ratchet M, which, being stationary in consequence of the stoppage of the clock-movement, retains the catch L and its attached time lock-bolt J in the position shown in Fig. 6, in which it will be seen to gate with the bolt-work. The tumblers I I' I'' are then set up to gate with the time lock-bolts, as shown in Fig. 8, thus enabling the bolt-work to be retracted and the safe to be opened. Such release of the bolt-work from the time-obstruction is absolutely dependent on the stoppage of the time-movement, for if the clock-work is running the rotation of its ratchet M (see strong arrow, Fig. 2) almost immediately releases the catch L, and permits the time lock-bolt J to spring back to its normal position and out of gate with the bolt-work, as shown in Figs. 1 and 2, and the safe is thus relocked long before the

most expert operator could set up the normal combination.

The special time-obstruction-releasing devices, which constitute the leading features of my invention, may be varied in non-essential particulars, and may be used in association with any customary form of accessory devices. For example, the portion p' of the angle-bar P, which, when the tumblers are set up to the secret formula, drops into the tumbler-notches instead of extending in one plane, as in the present illustration, may have a stepped form, so as to place the elements of the secret formula at unequal and uncertain distances from the corresponding elements of the ordinary (normal) formula.

The dial may be adjustable circumferentially upon the severed ring, which may itself gear to the driving-pinion, or the marked portion of the dial may have ratcheted connection to the geared portion for the same purpose.

The special safe-bolt arbor may be dispensed with, as is done in some types of bank-locks, in which the tumbler-arbor is provided with means whereby, after release of the obstructions, it becomes available to retract the bolt-work.

I claim herein as new and of my invention—

1. In combination with a time-lock and a permutation-lock, both operating to guard the safe bolt-work, the mechanism, substantially as described, operating to remove the time-obstruction and open the lock, in the event of a lock-out, through the same tumblers, set upon a secret formula, and the same gates thereof, that control the safe bolt-work in ordinary use.

2. The combination of a time mechanism and combination-lock, which operate in the manner described, to control the safe bolt-work by means of the time lock bolt or disk J, the spring-catch L, for engagement with the time-ratchet M, a series of single-gated tumblers, I I' I'', coaxial with said bolt or disk J, the angle-bar P, and tumbler-arbor G, substantially as set forth.

3. In combination with a time mechanism and a set of combination-tumblers, operating as described, to guard the safe bolt-work, the self-retracting rotary time lock bolt or disk J, whose stud S is operated by lever-connection, T, with the clock-movement in the regular discharge of the time mechanism, and whose arm K is operated by angle-bar P, under control of the combination-tumblers I I' I'', for release of a prematurely-stopped time mechanism, substantially as set forth.

4. A safe bolt-work guarded, as described, by a non-time-lock and a time mechanism through the medium of the described time lock bolt or disk J, in combination with the self-retracting and gating angle-bar P, spring-catch L, and time-ratchet M, substantially as set forth.

5. In the described combination with a combination-lock in which the same set of tum-

blers that control the safe bolt-work in ordinary use are adapted to be set up to an independent secret formula, and with the self-retracting time lock bolt or disk J, so connected
5 with the time mechanism as to have the described automatic control of the bolt-work, the self-engaging and retracting angle-bar, substantially as described.

6. In a releasable time-lock, the described
10 combination of the self-retracting rotary time lock bolt or disk J, adjustable spring-catch L, and time-ratchet M, for the purpose set forth.

7. In a time-lock, the train of clock-work arranged in grooved annular frame U, in combination with severed ring V and its attached
15 annular dial W, meshing by means of the interior teeth, *w*, with the driving-pinion X of the clock-movement, substantially as set forth.

In testimony of which invention I hereunto set my hand.

EDWIN H. FLINT.

Attest:

GEO. H. KNIGHT,
J. L. LOGAN.