

S. T. J. BYAM.

STEM WINDING AND SETTING WATCH.

No. 360,415.

Patented Apr. 5, 1887.

Fig. 1

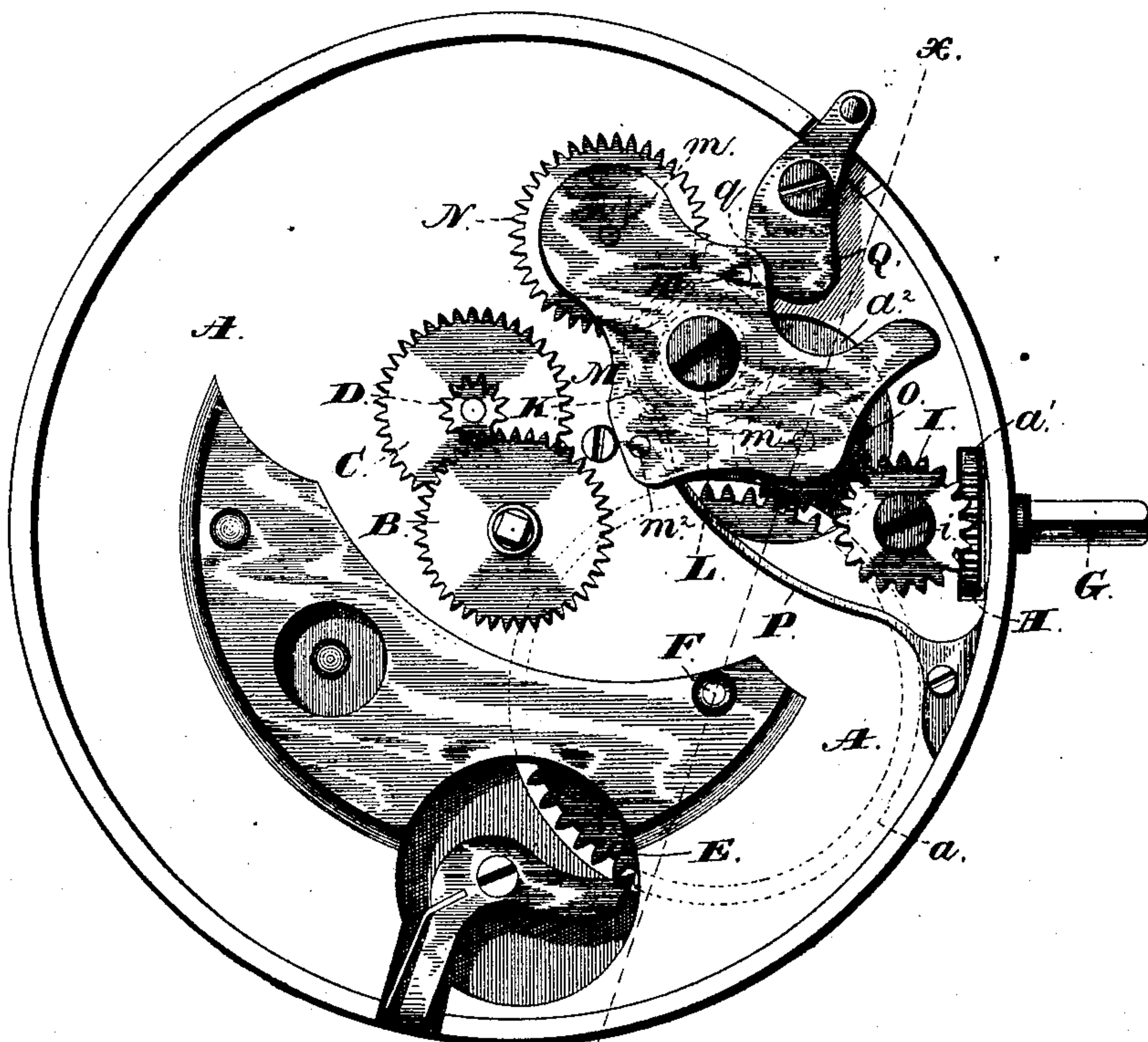
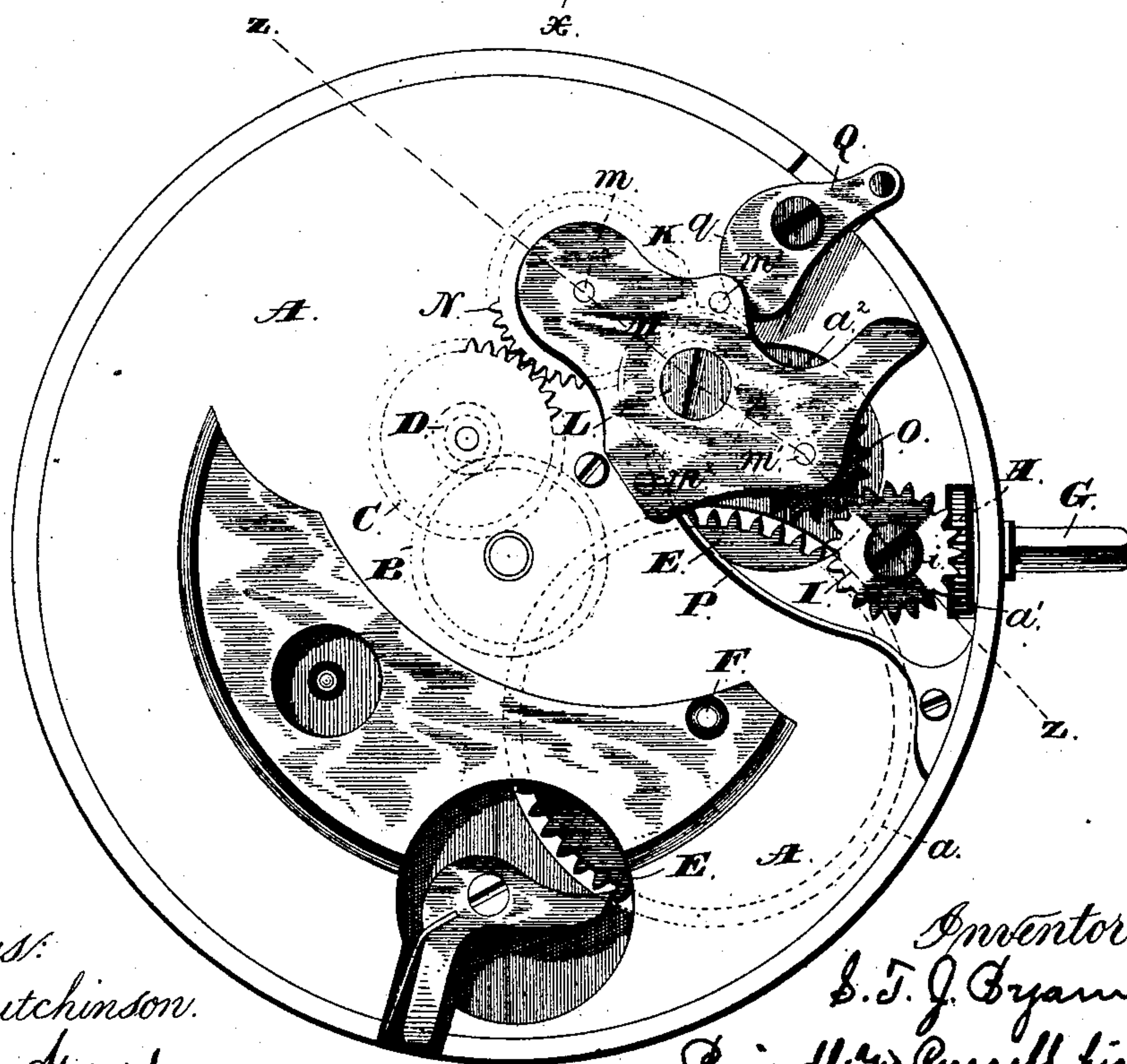


Fig. 2.



Witnesses:  
Jas. C. Hutchinson.  
Henry C. Hazard.

Inventor.  
S. T. J. Byam, by  
Grindle & Russell, his Attys.

(No Model.)

4 Sheets—Sheet 2.

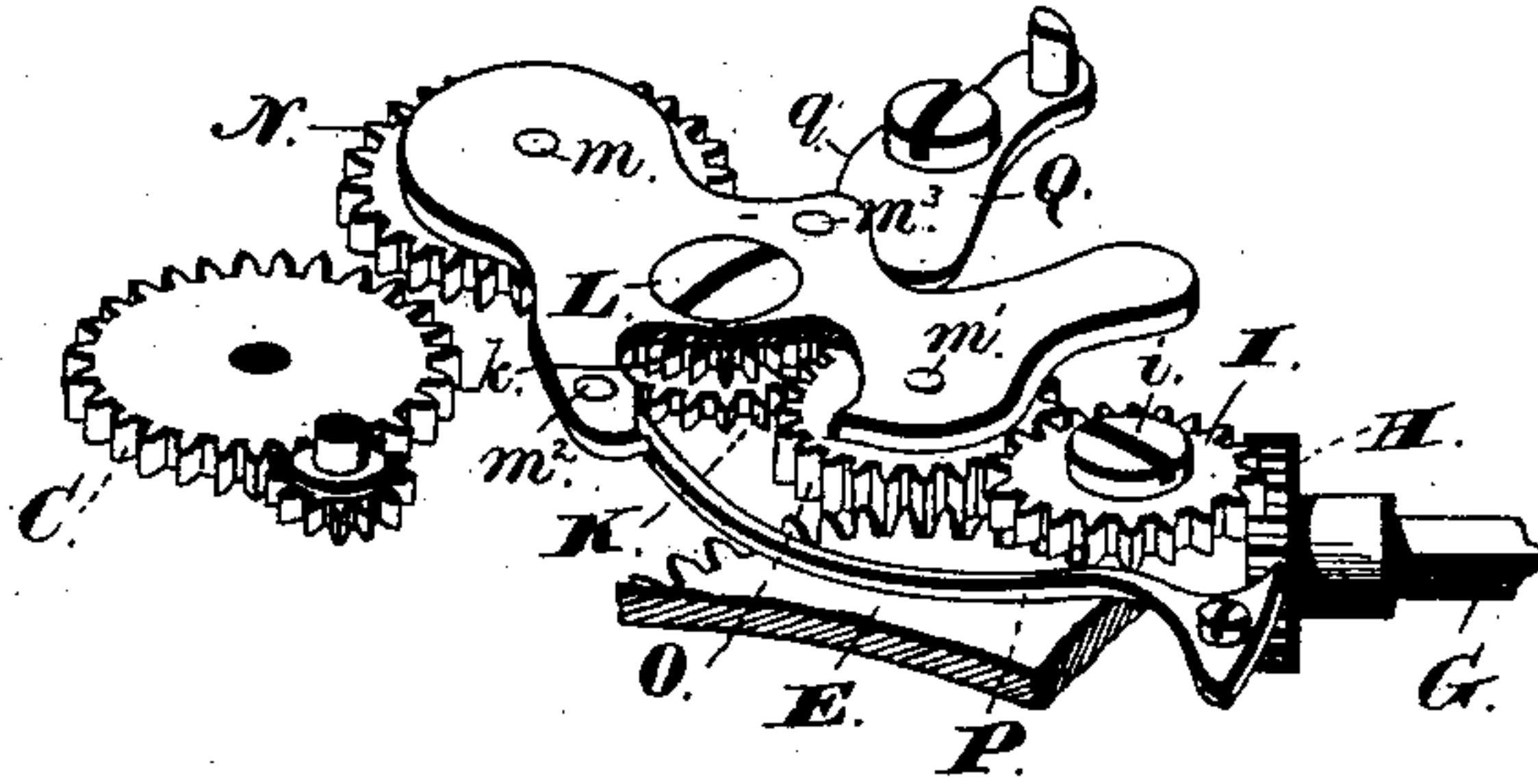
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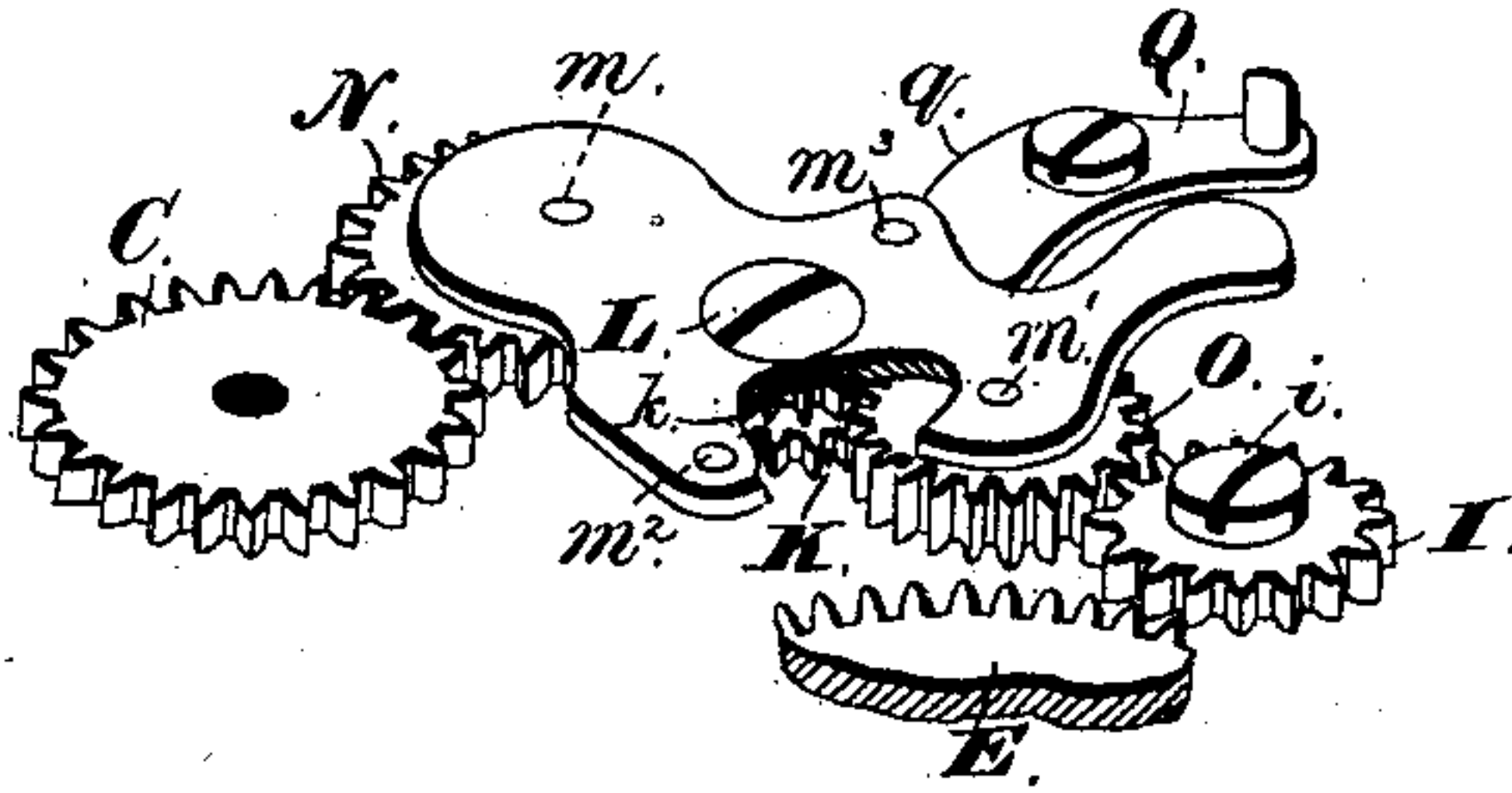
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*Fig. 3.*



*Fig. 4.*



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(No Model.)

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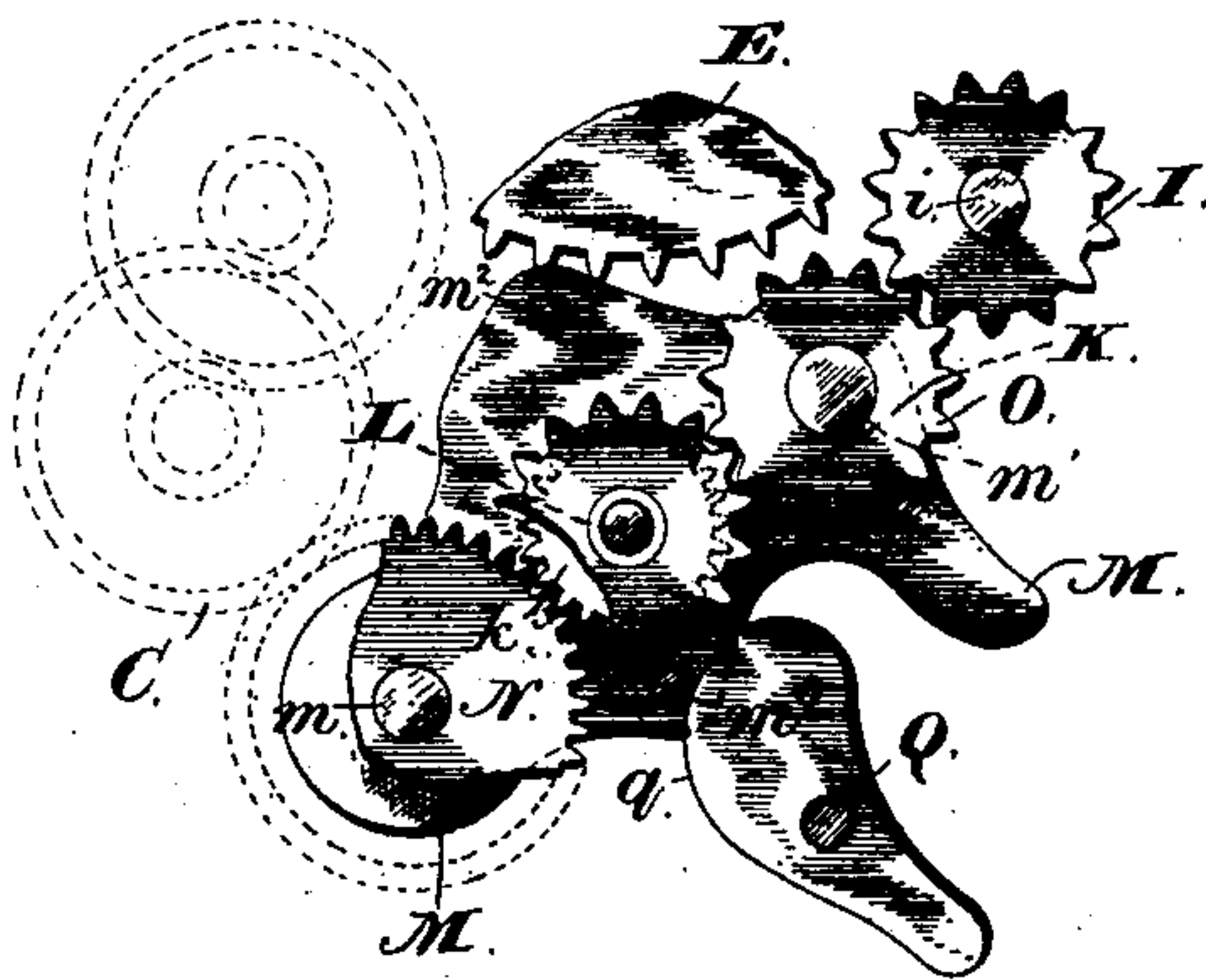
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*Fig. 5.*



*Fig. 6.*



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(No Model.)

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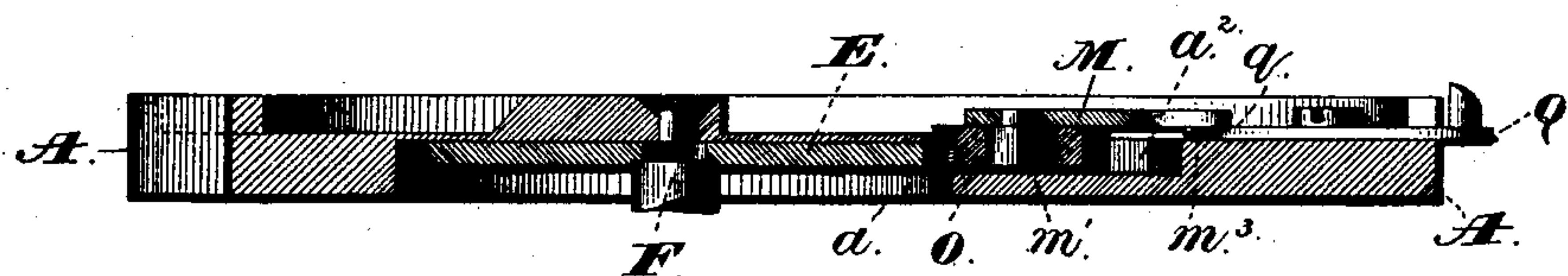
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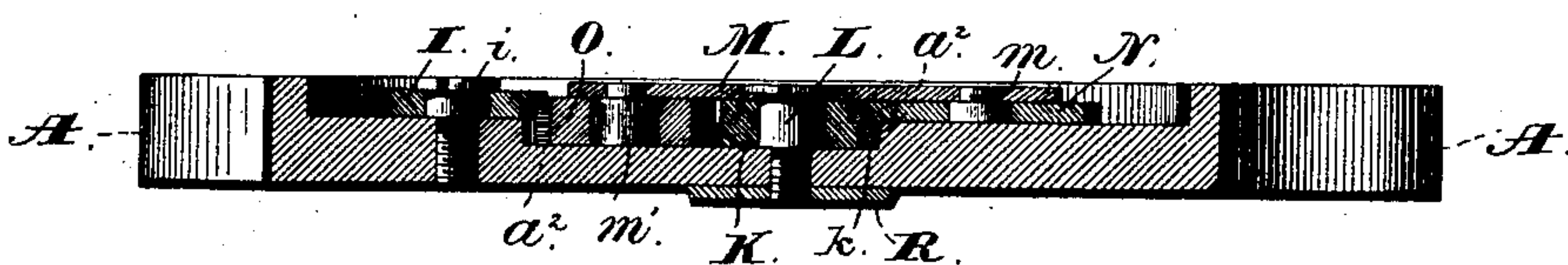
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*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

SEWALL T. J. BYAM, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE  
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## STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 360,415, dated April 5, 1887.

Application filed March 4, 1886. Serial No. 194,017. (No model.)

*To all whom it may concern:*

Be it known that I, SEWALL THOMAS JEFFERSON BYAM, of New Haven, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Stem Winding and Setting Watches; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my watch-movement with the stem-driven train in engagement with the winding-wheel. Fig. 2 is a like view of the same with said train in engagement with the dial-wheels and disengaged from said winding-wheel. Fig. 3 is a perspective view from the upper side of the gearing of said train separated from the yoke and pillar-plate and occupying the relative positions seen in Fig. 1. Fig. 4 is a like view of the same when occupying the relative positions shown in Fig. 2. Figs. 5 and 6 are plan views from the lower side of said train and its connecting parts separated from the pillar-plate and occupying the relative positions seen in Figs. 3 and 4, and Figs. 7 and 8 are sections upon lines *xx* and *zz* of Figs. 1 and 2.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to increase the efficiency and to simplify the construction of watch-movements in which the mainspring is wound and the hands set by and through the stem-arbor; and to this end my said invention consists, principally, as an improvement in stem winding and setting watches, in the combination, with a winding-wheel and a stem-driven wheel which is pivoted upon the movement-plate, of an intermediate wheel that is constantly in engagement with the latter, is pivoted upon an independent support which is adapted to move upon a pivotal bearing located at one side of the axes of the stem-driven wheel and winding-wheel, whereby the intermediate wheel may be moved into and out of engagement with said winding-wheel, substantially as and for the purpose hereinafter specified.

It consists, further, as an improvement in

stem winding and setting watches, in the combination, with a winding-wheel and a stem-driven wheel which is pivoted upon the movement-plate, of an intermediate wheel that is constantly in engagement with the latter, is pivoted upon an independent support which is adapted to move upon a pivotal bearing located at one side of the axes of the stem-driven wheel and winding-wheel, whereby the intermediate wheel may be moved into and out of engagement with said winding-wheel, and a spring that operates to hold said intermediate wheel with a yielding pressure normally in engagement with said winding-wheel, substantially as and for the purpose hereinafter shown.

It consists, further, as an improvement in stem winding and setting watches, in the combination, with a winding-wheel and a stem-driven wheel which is pivoted upon the movement-plate, of an intermediate wheel that is constantly in engagement with the latter, is pivoted upon an independent support which is adapted to move upon a pivotal bearing located at one side of the axes of the stem-driven wheel and winding-wheel, whereby the intermediate wheel may be moved into and out of engagement with said winding-wheel, a spring that operates to hold said intermediate wheel with a yielding pressure in engagement with said winding-wheel, and a cam-lever that is adapted to move said intermediate wheel from and to lock it out of engagement with said winding-wheel, substantially as and for the purpose hereinafter set forth.

It consists, further, as an improvement in stem winding and setting watches, in the combination, with the dial-wheels and with a stem-driven wheel which is pivoted upon the movement-plate, of a second wheel pivoted upon said plate, a yoke pivoted at the axial center of said second wheel and having pivoted upon one end an intermediate wheel which is constantly in engagement with said stem-driven wheel and said second wheel, and may be moved into engagement with said winding-wheel, and upon its opposite end has pivoted another intermediate wheel that is in constant engagement with said second wheel and by a movement of said yoke is adapted to be engaged



with one of the dial-wheels, substantially as and for the purpose hereinafter shown and described.

It consists, further, as an improvement in stem winding and setting watches, in the combination, with the wheels of a stem-driven train, of a wheel which has two series of peripheral teeth that adapt it for engagement with wheels having teeth of different sizes, substantially as and for the purpose hereinafter specified.

It consists, further, in a watch-movement in which the stem-arbor and its pinion, the wheels pivoted upon stationary bearings, the pivoted yoke carrying upon its ends the pivoted intermediate wheels, the winding-wheel, and the dial-wheels are combined with each other and with means for moving said yoke upon its pivotal bearing so as to connect said winding-wheel or said dial-wheels with and enable the same to be rotated by said stem-arbor, substantially as and for the purpose hereinafter shown.

It consists, finally, as an improvement in stem winding and setting watches, in the combination, with the pivoted yoke provided midway between its ends with the engaging-lug, of the cam-lever, which is pivoted upon the movement-plate and by a movement upon its pivotal bearing is adapted to engage with said lug and swing said yoke to and lock it at the limit of its motion in one direction, substantially as and for the purpose hereinafter set forth.

In the carrying of my invention into practice I employ a watch-movement in which at the center of the pillar-plate A is provided the usual cannon-pinion and wheels B, C, and D, respectively, and contains within a recess,  $a$ , in its lower face, a winding-wheel, E, that is secured to and rotates with a mainspring-arbor, F.

Within one side of the movement is journaled radially a stem-arbor, G, upon which, within a slot,  $a'$ , adjacent to the edge of the pillar-plate A, is a spur-pinion, H, that has such dimensions as to bring its toothed periphery just above the recessed face of said plate, where it meshes with a spur-wheel, I, which is pivoted upon the face of said plate by means of a shoulder-screw,  $i$ .

Adjacent to the wheel I the plate A is provided with a recess,  $a''$ , which has the form of a larger and a smaller intersecting circle and extends into one side of the recess  $a$  of the winding-wheel E, so as to uncover a portion of the edge of the latter. Said recess  $a''$  has such depth as to bring its bottom upon a line with the lower face of said wheel, by which arrangement the portion of the latter within said recess has its toothed periphery fully exposed.

Within the portion of the recess  $a''$  farthest from the wheel I is a spur-wheel, K, which has its lower half provided with teeth that correspond to the teeth of said wheel I, while its upper half,  $k$ , which is smaller in diameter,

has peripheral teeth that correspond to the teeth of the dial-wheels C and D. Said wheel is pivoted upon the plate A by means of a shoulder-screw, L.

Upon the screw L, above the wheel K, is pivoted centrally a yoke, M, which is cut from a flat piece of metal, in the form shown, and has such length as to cause it to extend to the rear end of the recess  $a''$  and to an equal distance in an opposite direction over the face of the plate A.

The upper faces of the wheels I and K are in the same plane and a little above the face of the plate A, so that between the latter and the projecting portion of the yoke M is sufficient space for a spur-wheel, N, that has substantially the size of the dial-wheel C, and has teeth which are adapted to mesh with the teeth of the latter and of the wheel K. Said wheel N is journaled upon said yoke by means of a stud,  $m$ , that projects from the latter downward into the axial opening of the same, and is arranged to be in constant engagement with the upper part,  $k$ , of said wheel K.

Between the wheels I and K is placed a like wheel, O, which has such dimensions as to cause it to mesh with each of the same. Like the wheel N, said wheel O is pivoted upon a stud,  $m'$ , that projects downward into its axial opening from the yoke M, the arrangement being such that said wheels N and O, while in constant engagement with said wheel K, are adapted to be moved laterally with said yoke when the latter is oscillated upon its pivotal bearing. The winding-wheel E is in such proximity to the wheel O that a slight movement of the yoke M in one direction will cause said wheels to engage, while a like movement of said yoke in an opposite direction will release them from engagement, all without interfering with the engagement of said wheel O with the wheel I. As said wheel O is released from engagement with said winding-wheel, the wheel N is simultaneously moved into engagement with the dial-wheel C, while upon reversing the position of the yoke said wheel N will be released from engagement with said dial-wheel and said wheel O simultaneously moved into engagement with said winding-wheel.

The wheel O is held with a yielding pressure in engagement with the winding-wheel, as seen in Fig. 1, by means of a spring, P, which has one end secured upon the plate A and its opposite free end in engagement with a stud,  $m''$ , that projects downward from the lower side of the yoke M, between said wheel O and the center of said plate, while to enable the release of said wheel O from engagement with said winding-wheel, and the simultaneous engagement of the wheel N with the dial-wheel C, a cam-lever, Q, having the form shown, is provided upon said plate A at its edge, with its inner rounded end,  $q$ , beneath the edge, in a line with the pivotal center of said yoke, so that said end, by a movement of said lever in one direction, will engage with a



stud,  $m^3$ , that projects downward from the former, and cause the desired movement of the same.

When the yoke M has been moved upon its pivotal bearing until the wheel N is in engagement with the dial-wheel C, as shown in Fig. 2, the cam end  $q$  of the lever Q will have such engagement with the stud  $m^3$  as to cause it to lock said yoke in such position, so as to enable the hands to be set from the stem-arbor, while upon moving said lever in the opposite direction said yoke will be released, and by the operation of the spring P is returned to its normal position, as seen in Fig. 1, after which the rotation of said stem-arbor in one direction will cause the mainspring-arbor to be revolved so as to wind the mainspring, while a rotation of said stem-arbor in an opposite direction will cause the teeth of the wheel O to slip or ratchet harmlessly over the teeth of the winding-wheel.

In order that the pivotal screw L may be securely locked in position, its threaded end projects through the plate A, and upon such projecting end is placed an interiorly-threaded washer, R, which, when turned firmly up against said plate, operates as a lock-nut.

Having thus described my invention, what I claim is—

1. As an improvement in stem winding and setting watches, in combination with a winding-wheel and a stem-driven wheel which is pivoted upon the movement-plate, an intermediate wheel that is constantly in engagement with the latter, is pivoted upon an independent support which is adapted to move upon a pivotal bearing located at one side of the axes of the stem-driven wheel and winding-wheel, whereby the intermediate wheel may be moved into and out of engagement with said winding-wheel, substantially as and for the purpose specified.

2. As an improvement in stem winding and setting watches, in combination with a winding-wheel and a stem-driven wheel which is pivoted upon the movement-plate, an intermediate wheel that is constantly in engagement with the latter, is pivoted upon an independent support which is adapted to move upon a pivotal bearing located at one side of the axes of the stem-driven wheel and winding-wheel, whereby the intermediate wheel may be moved into and out of engagement with said winding-wheel, and a spring that operates to hold said intermediate wheel with a yielding pressure normally in engagement with said winding-wheel, substantially as and for the purpose shown.

3. As an improvement in stem winding and setting watches, in combination with a winding-wheel and a stem-driven wheel which is pivoted upon the movement-plate, an intermediate wheel that is constantly in engagement with the latter, is pivoted upon an independent support which is adapted to move

upon a pivotal bearing located at one side of the axes of the stem-driven wheel and winding-wheel, whereby the intermediate wheel may be moved into and out of engagement with said winding-wheel, a spring that operates to hold said intermediate wheel with a yielding pressure in engagement with said winding-wheel, and a cam-lever that is adapted to move said intermediate wheel from and to lock it out of engagement with said winding-wheel, substantially as and for the purpose set forth.

4. As an improvement in stem winding and setting watches, in combination with the dial-wheels and with a stem-driven wheel which is pivoted upon the movement-plate, a second wheel pivoted upon said plate, and a yoke pivoted at the axial center of said second wheel and having pivoted upon one end an intermediate wheel which is constantly in engagement with said stem-driven wheel and said second wheel and may be moved into engagement with said winding-wheel, and upon its opposite end has pivoted another intermediate wheel that is in constant engagement with said second wheel and by a movement of said yoke is adapted to be engaged with one of the dial-wheels, substantially as and for the purpose shown and described.

5. As an improvement in stem winding and setting watches, in combination with the wheels of a stem-driven train, a wheel which has two series of peripheral teeth that adapt it for engagement with wheels having teeth of different sizes, substantially as and for the purpose specified.

6. A watch-movement in which the stem-arbor and its pinion, the wheels pivoted upon stationary bearings, the pivoted yoke carrying upon its ends the pivoted intermediate wheels, the winding-wheel, and the dial-wheels are combined with each other, as shown, and with means for moving said yoke upon its pivotal bearing so as to connect said winding-wheel or said dial-wheels with and enable the same to be rotated by said stem-arbor, substantially as and for the purpose shown.

7. As an improvement in stem winding and setting watches, in combination with the pivoted yoke provided midway between its ends with the engaging-lug, the cam-lever which is pivoted upon the movement-plate and by a movement upon its pivotal bearing is adapted to engage with said lug and swing said yoke to and lock it at the limit of its motion in one direction, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of March, A. D. 1886.

SEWALL T. J. BYAM.

Witnesses:

T. G. SLOAN,  
HENRY C. HAZARD.