

(No Model.)

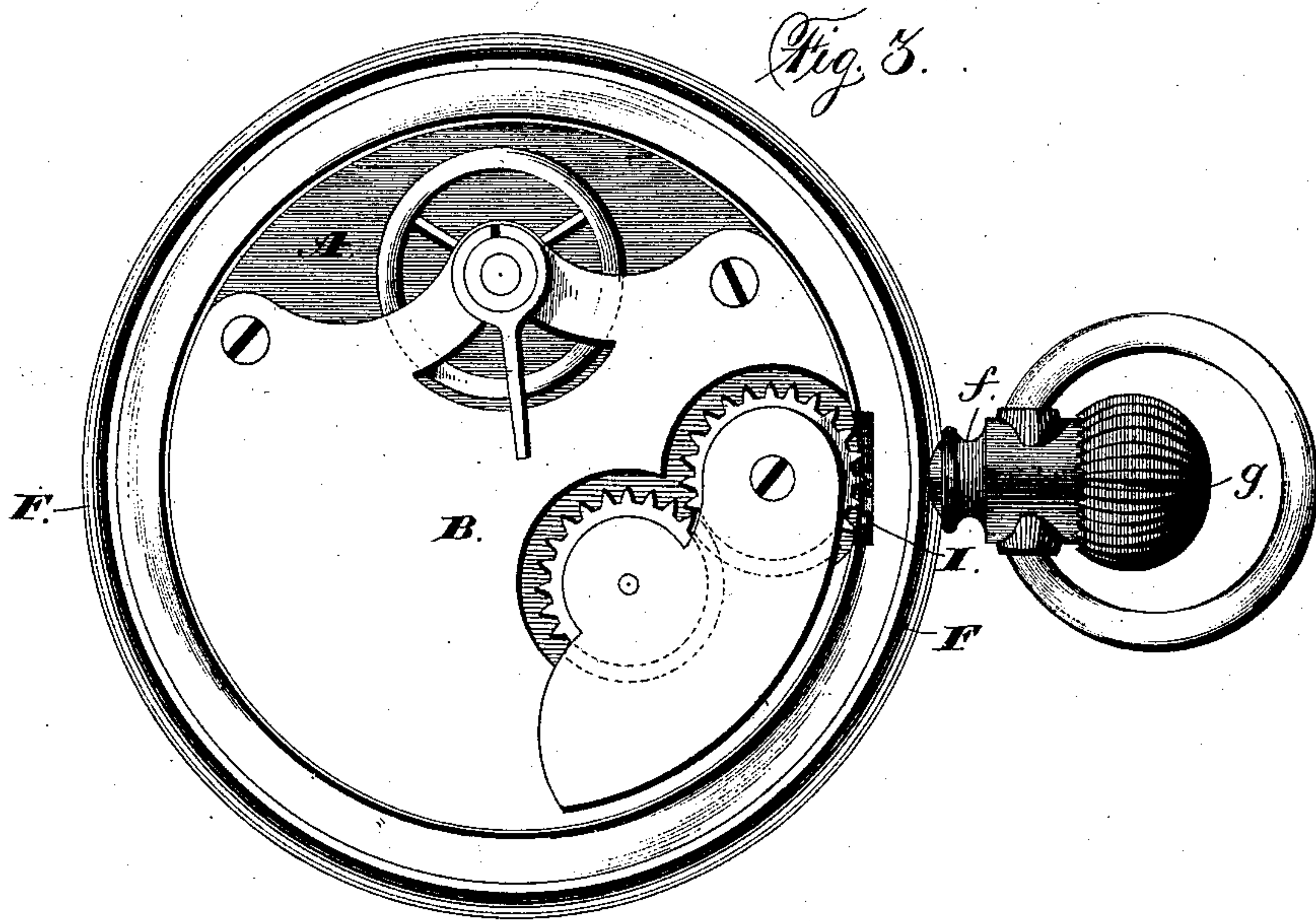
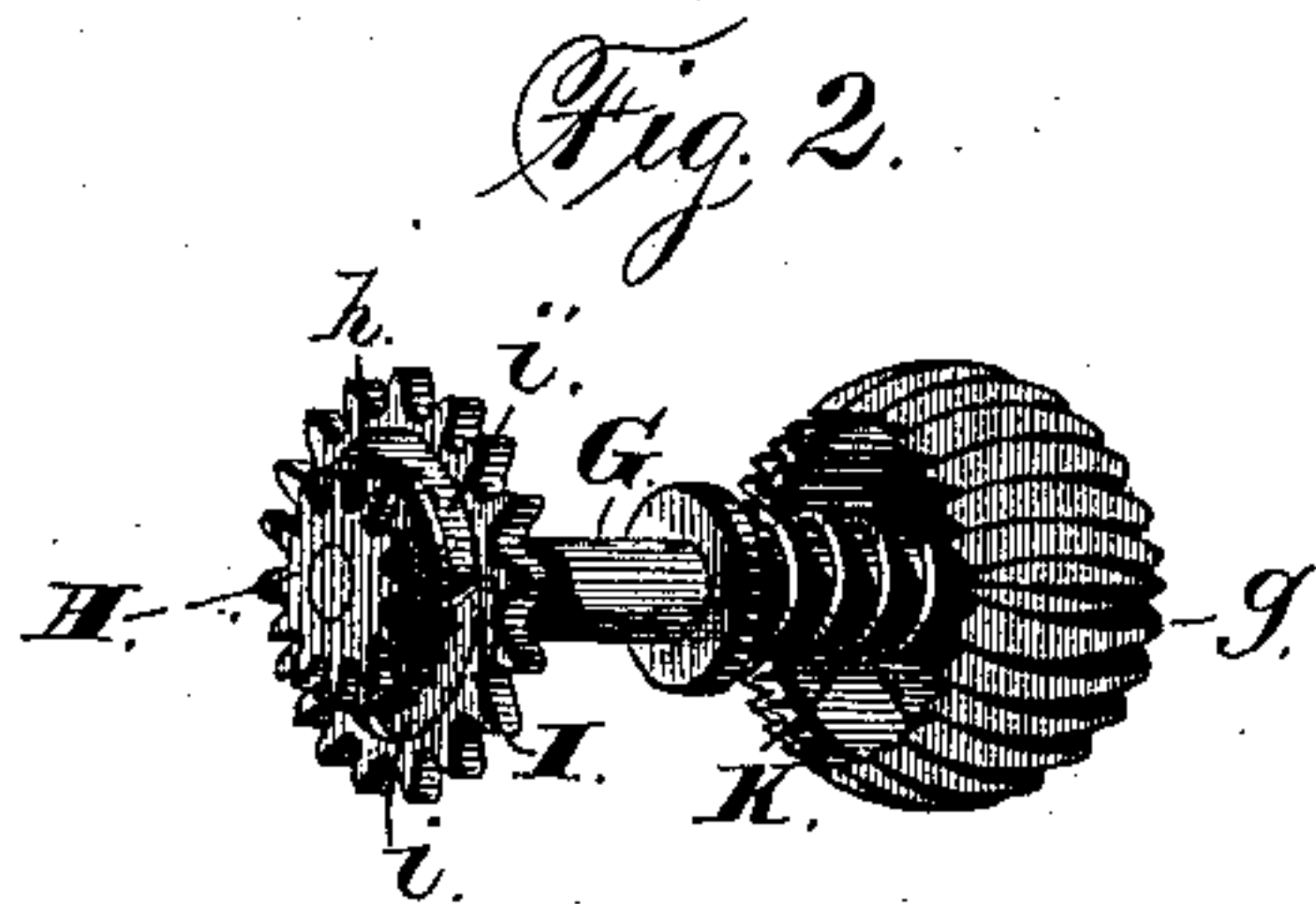
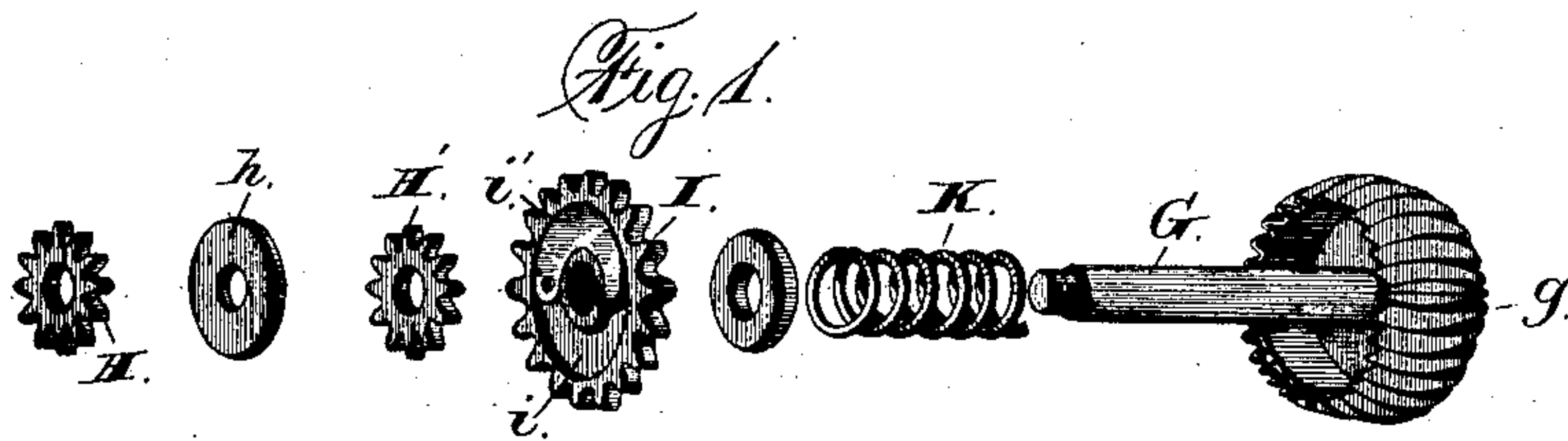
2 Sheets—Sheet 1.

G. E. HART.

STEM WINDING WATCH.

No. 364,015.

Patented May 31, 1887.



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

Inventor.  
Geo. E. Hart, by  
Pindle & Russell, his attys

(No Model.)

2 Sheets—Sheet 2.

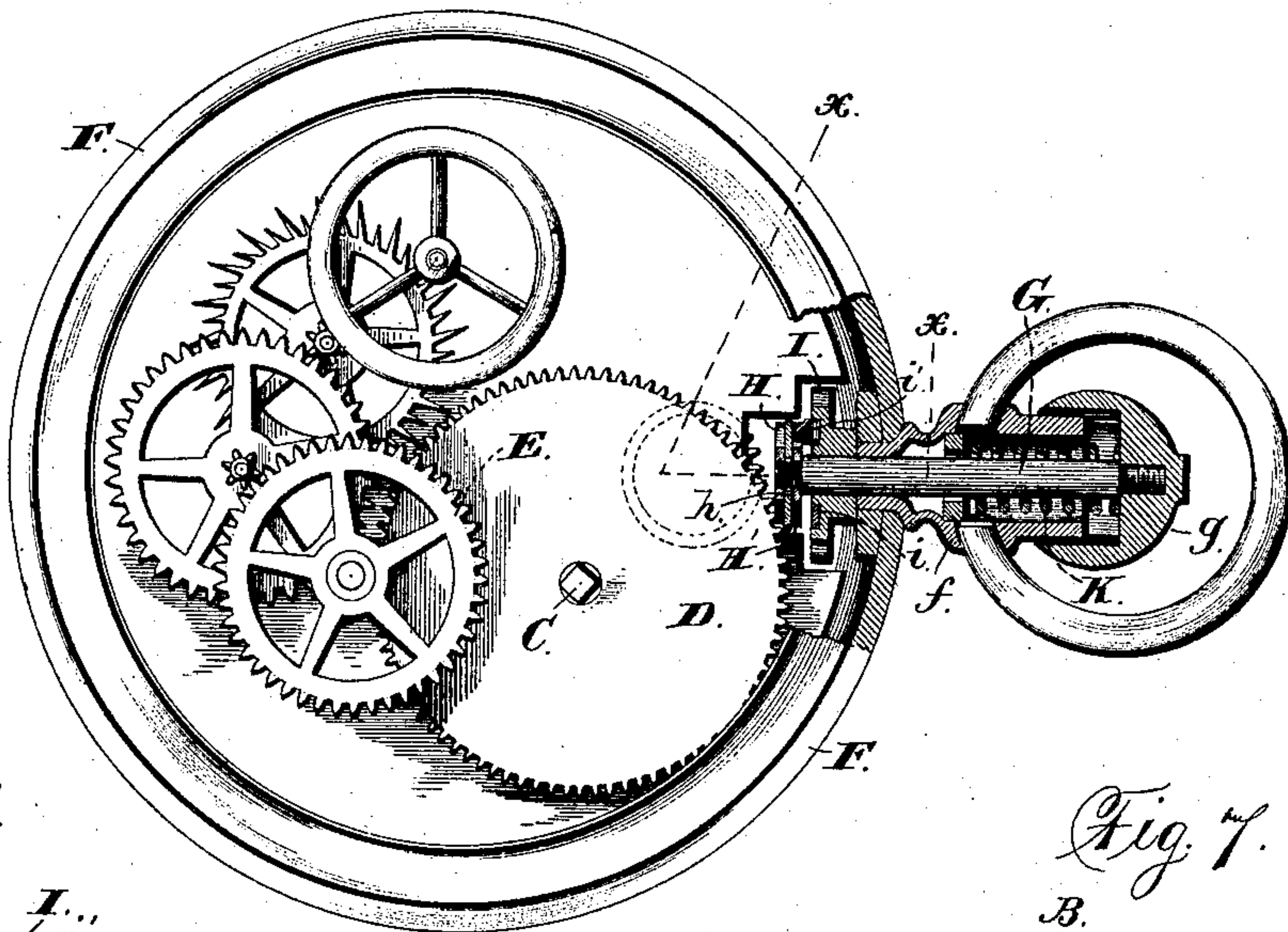
G. E. HART.

STEM WINDING WATCH.

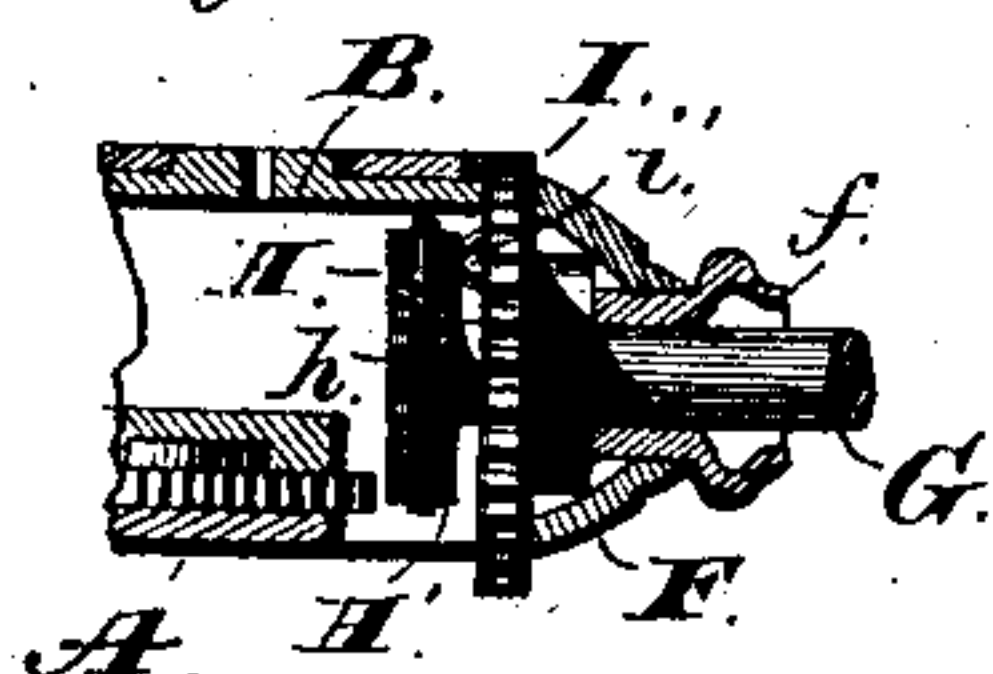
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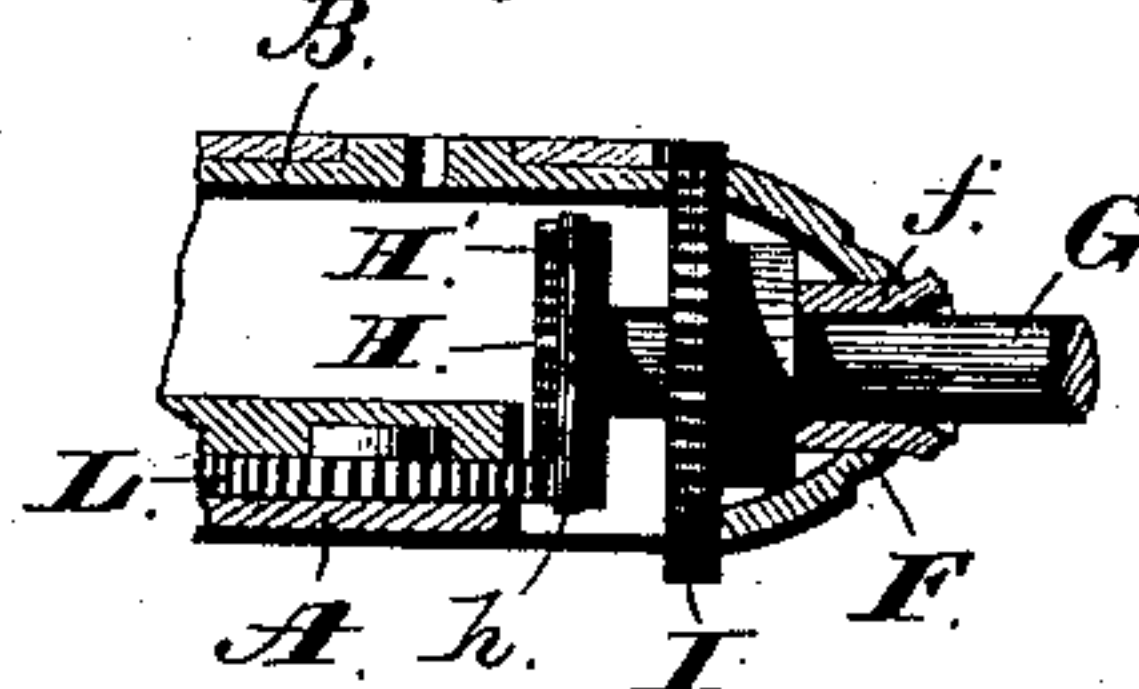
*Fig. 4.*



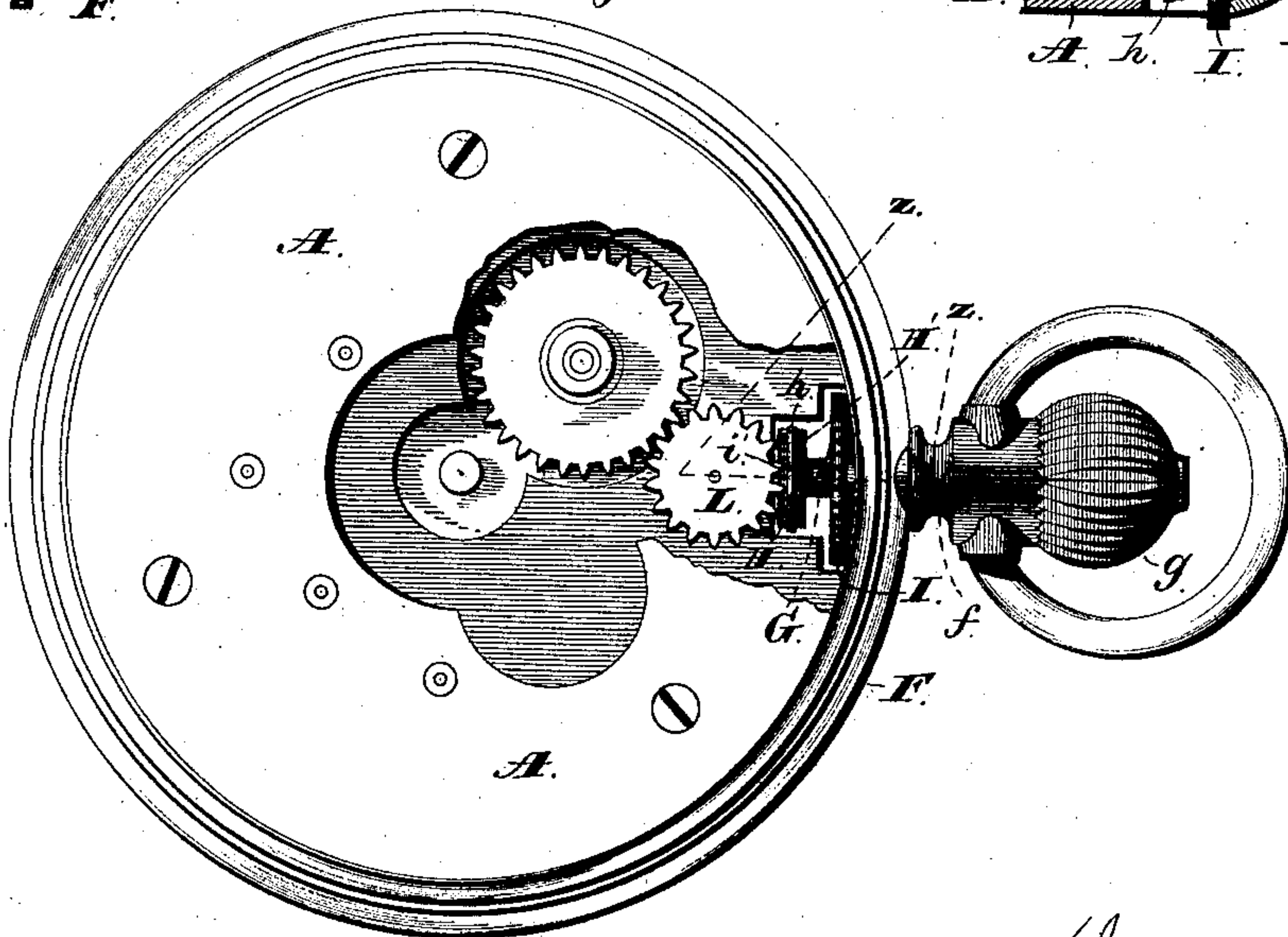
*Fig. 6.*



*Fig. 7.*



*Fig. 5.*



Witnesses:

Jas. C. Hutchinson  
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# UNITED STATES PATENT OFFICE.

GEORGE E. HART, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE  
WATERBURY WATCH COMPANY, OF SAME PLACE.

## STEM-WINDING WATCH.

SPECIFICATION forming part of Letters Patent No. 364,015, dated May 31, 1887.

Application filed October 23, 1886. Serial No. 217,476. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. HART, of Waterbury, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Stem-Winding 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—

10 Figure 1 is a perspective view of the stem-arbor and its connecting parts separated from each other. Fig. 2 is a like view of the same combined, but disconnected from the case. Fig. 3 is a plan view, from the rear, of a watch-  
15 movement containing my improvements. Fig. 4 is a like view of the same from the front, showing the stem-arbor in its normal position. Fig. 5 is a plan view, from the front, of said movement, showing said stem-arbor at the  
20 inner limit of its longitudinal motion; and Figs. 6 and 7 are respectively sections upon lines *xx* and *zz* of Figs. 4 and 5.

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

25 My invention relates to an improvement in stem-winding watches for which application for Letters Patent, Serial No. 186,560, was filed upon the 23d day of December, 1885, and is intended to improve the efficiency and durability of the operative mechanism; to which  
30 end said invention consists in the means employed for regulating the depth of engagement of the teeth of the stem-driven hands setting-wheel with the intermediate wheel, substantially as and for the purpose hereinafter specified.

It consists, further, in the means employed for regulating the depth of engagement of the spring-pawl which operates to connect the  
40 stem-arbor with a winding-pinion that is journaled upon and adapted to be rotated by said arbor, substantially as and for the purpose hereinafter shown.

It consists, finally, in the construction and combination of parts, substantially as and for the purpose hereinafter set forth.

50 In the annexed drawings, A represents the pillar-plate, and B the back plate, of a watch, between which is placed any usual form of time-train that has an ordinary mainspring-arbor, C, which arbor carries upon one end a

winding wheel, D, that meshes with a second or intermediate wheel, E.

55 Journaled within the case-stem *f* is a stem-arbor, G, which has secured to its outer end the usual crown, *g*, and upon its inner end, which extends just through the case-center F, has secured two small spur-pinions, H and H', that are separated by a thin metal disk, *h*. Upon said arbor, immediately in rear of said  
60 pinions, is journaled a second larger pinion, I, which has within the central portion of its inner face a slight recess, *i*, and within the same has a C-shaped spring, *i'*, that is secured at one end to said pinion and at its opposite free end is turned slightly outward into  
65 position to engage with the teeth of said pinion H'.

A spiral spring, K, placed around the stem-arbor G between the crown *g* and the inner end  
70 of the recessed portion of the stem *f*, operates to hold said arbor at the outer limit of its motion with the contiguous faces of the pinions H' and I in contact, and the outer face of the latter in contact with the inner face of the case-center F, such being the normal positions of  
75 said parts, but allows said arbor to be moved longitudinally inward a certain predetermined distance, for reasons hereinafter set forth.

The pinion I is in constant engagement with  
80 the intermediate wheel, E, and is caused to rotate the same, the wheel D, and the mainspring-arbor C whenever the stem-arbor G is rotated in such direction as to cause the spring-pawl  
85 *i'* to be engaged by the teeth of the pinion H', while, when said spring-arbor is rotated in the opposite direction, said pawl will not be engaged, and said pinion I and its connecting parts will remain at rest.

90 Heretofore, when a single pinion was used in place of the pinions H and H' and intermediate disk, *h*, it occasionally occurred that after the mainspring of the watch had been wound a continuation of rotative pressure upon the  
95 stem-arbor would cause the free end of the spring-pawl *i'* to be forced outward between the teeth of said wheel, so as to lock further action and render necessary the removal of said pawl and the insertion of a new pawl before the mechanism could be again used. Such  
100 difficulty is entirely obviated by the present construction, as the free end of the spring-



pawl bottoms upon the disk *h*, and is thus able to resist, without injury, any pressure which would ordinarily be given to it.

The pinion *H* is adapted to engage with an intermediate dial-wheel, *L*, whenever the spring-arbor *G* is moved inward a sufficient distance, as shown by Fig. 5, at which time said stem, by the separation of said pinion from engagement with the spring-pawl *i'*, is disconnected from said winding-pinion and free to rotate in either direction within the latter.

When but a single pinion is employed instead of two pinions, *H* and *H'*, and disk *h*, the depth of engagement of said single pinion and the intermediate dial-wheel, *L*, is determined by the impingement of the crown *g* upon the outer end of the case stem or pendant *f*, and a proper adjustment of such depthing involves a considerable amount of time and work. In the present construction the impingement of the disk *h* upon the ends of the teeth of the wheel *L* fixes the depth of engagement and renders unnecessary any other limitation of the longitudinal movement of the stem arbor. As this construction adds only inexpensive machine-work to the watch, a material saving in cost is effected over what has heretofore been required.

In the organization shown the spiral spring *K* performs no other office than to hold the stem-arbor at the outer limit of its motion, and may have any amount of stiffness necessary for such purpose without interference with the ratchet mechanism, while the spring-pawl *i'* may be made as light as desired within the limits of the required longitudinal rigidity, and adds

but slightly to the resistance offered to the rotation of said arbor.

Having thus described my invention, what I claim is—

1. As a means for limiting the depth of engagement of the teeth of a stem-rotated spur-wheel with the teeth of a dial spur-wheel that rotates in a plane having a right angle to the plane of rotation of the same, a metal disk which is secured upon or against the outer face of said stem-rotated wheel and impinges upon the ends of the teeth of said dial-wheel, substantially as and for the purpose specified.

2. As a means for limiting the depth of lateral engagement of the free end of a spring-pawl with the teeth of a spur-toothed ratchet-wheel, a metal disk which is secured upon the outer side of said wheel and is adapted to be impinged by the end of said spring, substantially as and for the purpose shown.

3. In combination with the dial-wheels of a watch and with a winding-wheel which is journaled upon a rotatable longitudinally-movable stem-arbor and is provided within or upon its face with a spring-pawl, two toothed pinions that are secured rigidly upon the inner end of said arbor and a metal disk which is placed between the contiguous faces of said pinions, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of October, A. D. 1886.

GEORGE E. HART.

Witnesses:

NATHANIEL R. BRONSON,  
CHARLES S. CHAPMAN.