

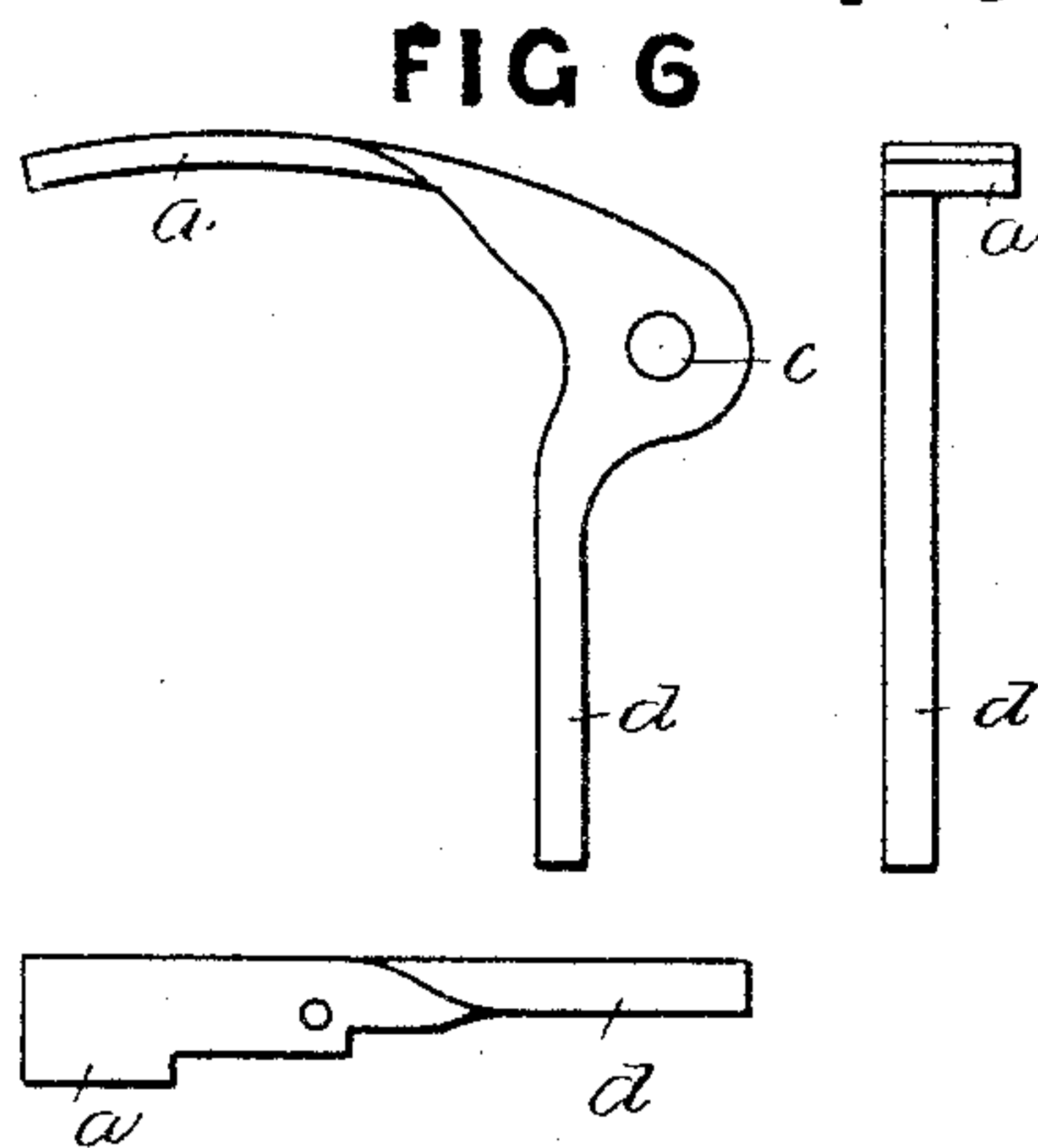
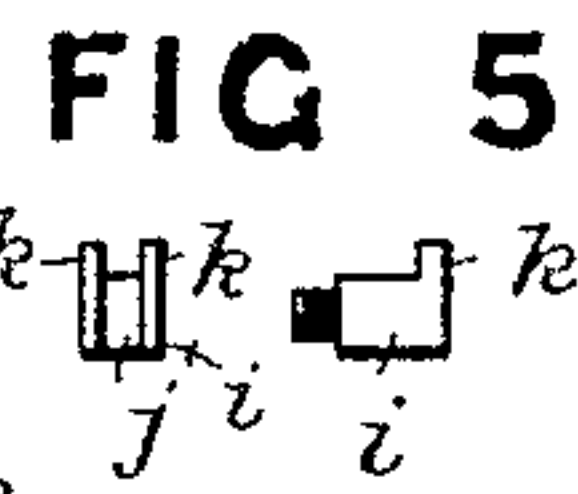
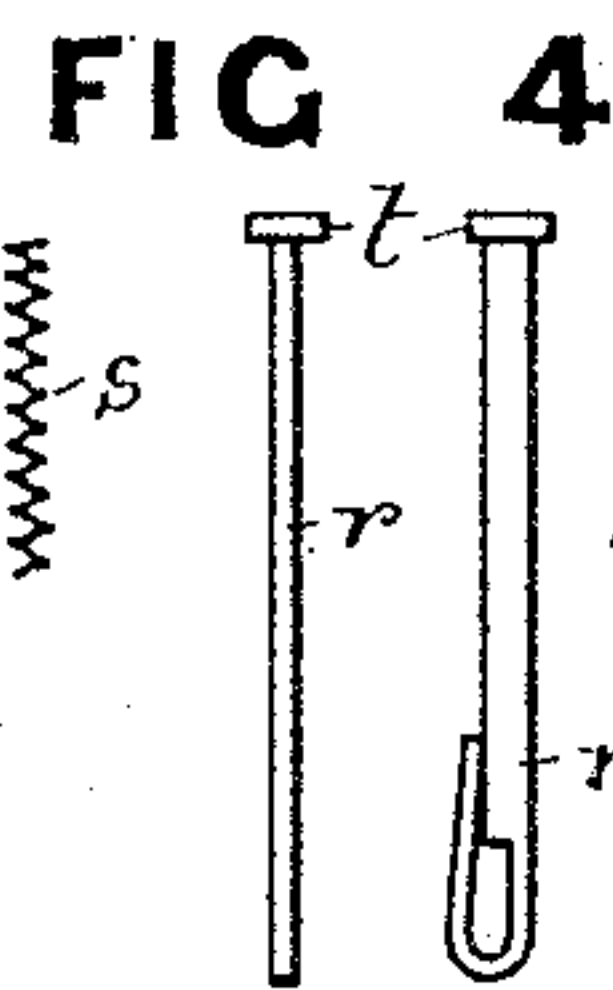
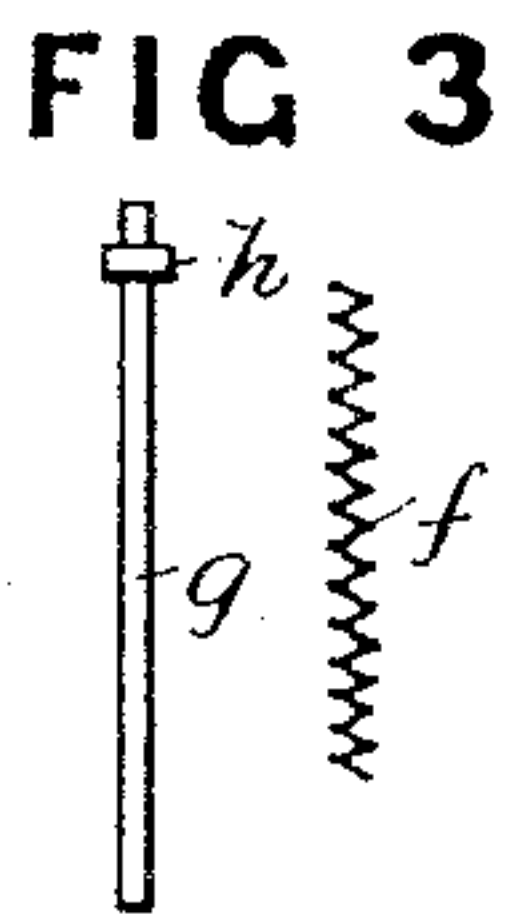
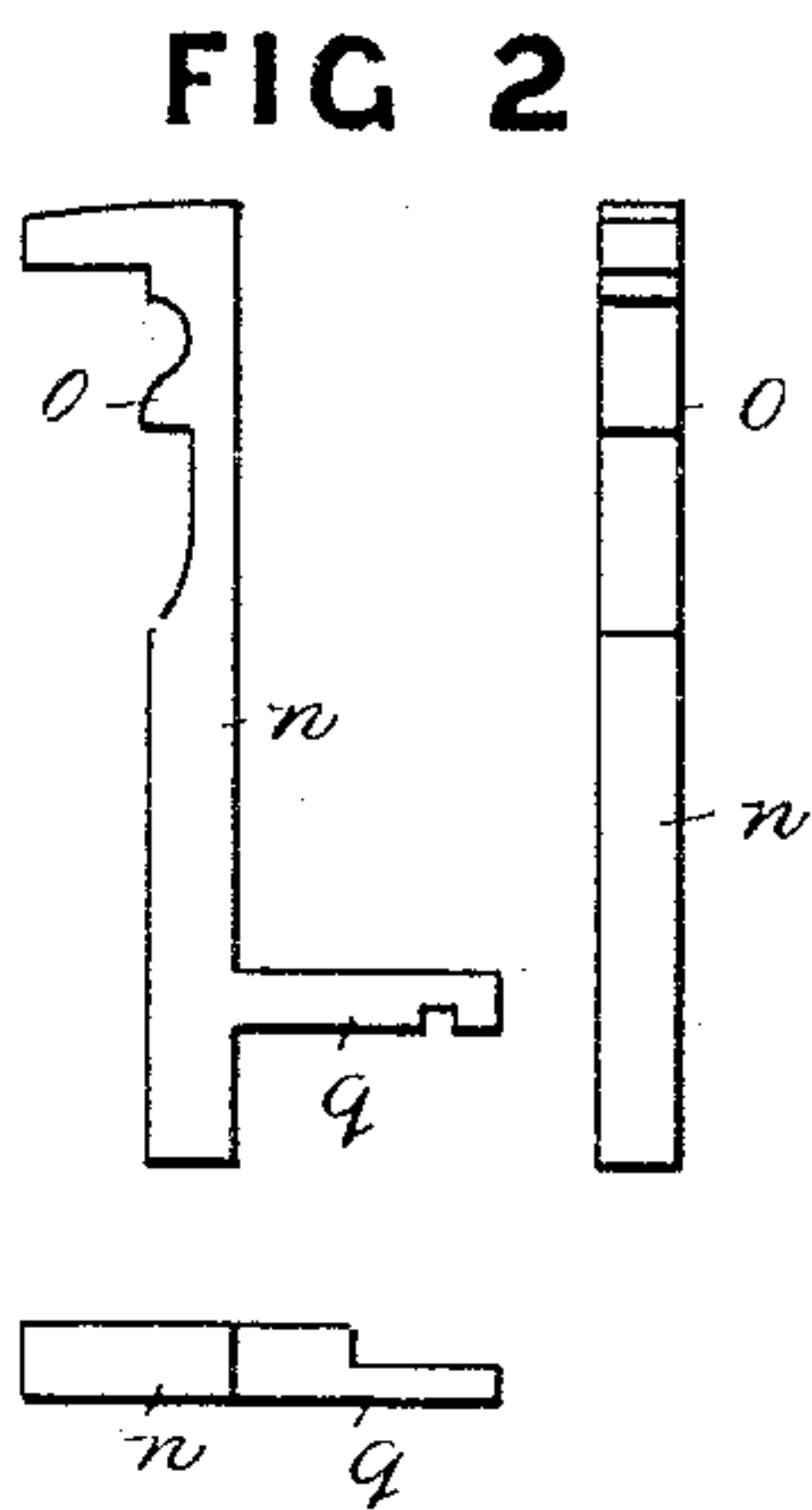
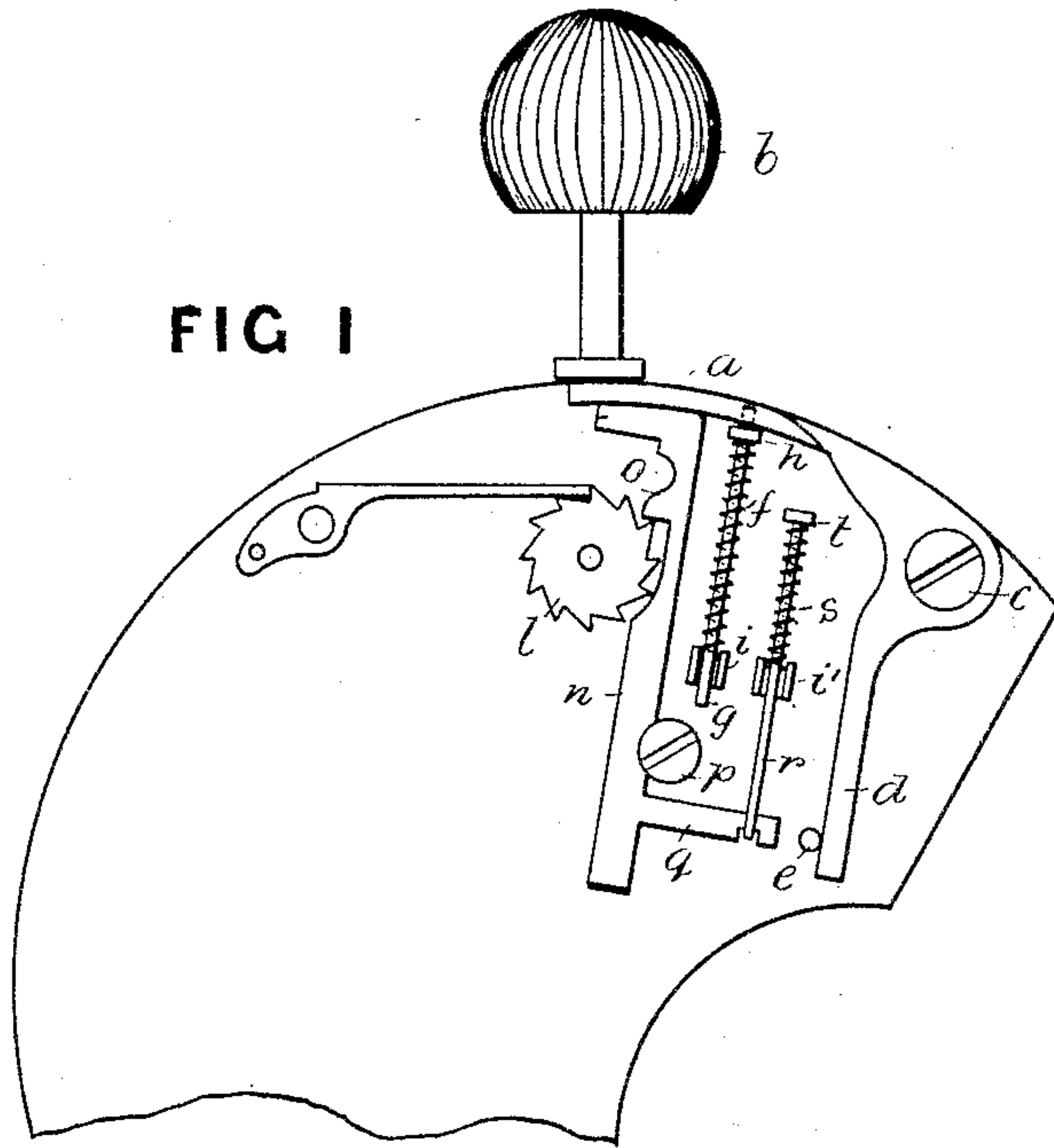
(No Model.)

2 Sheets—Sheet 1.

R. BRAGGE.
STOP WATCH.

No. 448,930.

Patented Mar. 24, 1891.



Witnesses

Ernest H. Jones
Charles J. Rowe

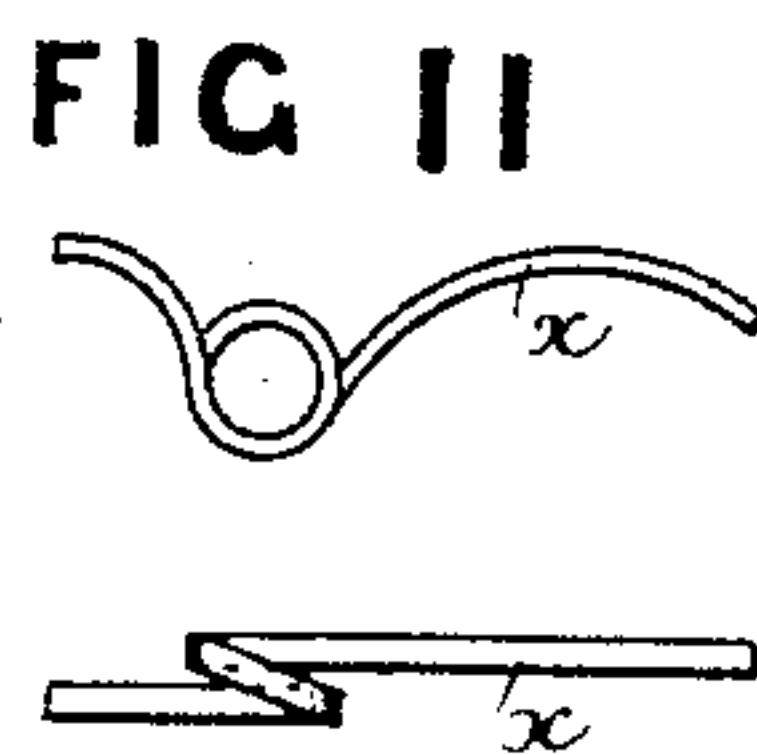
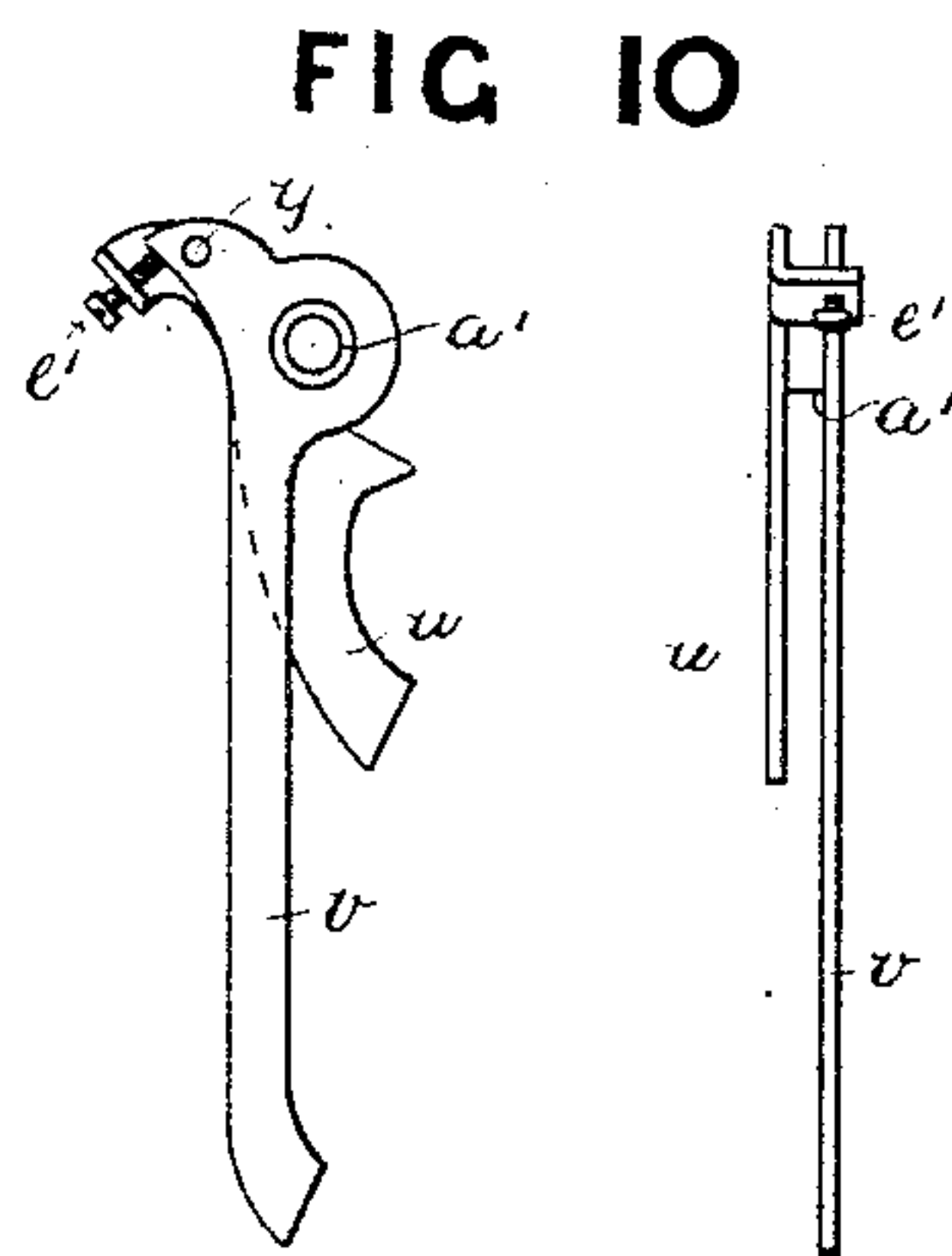
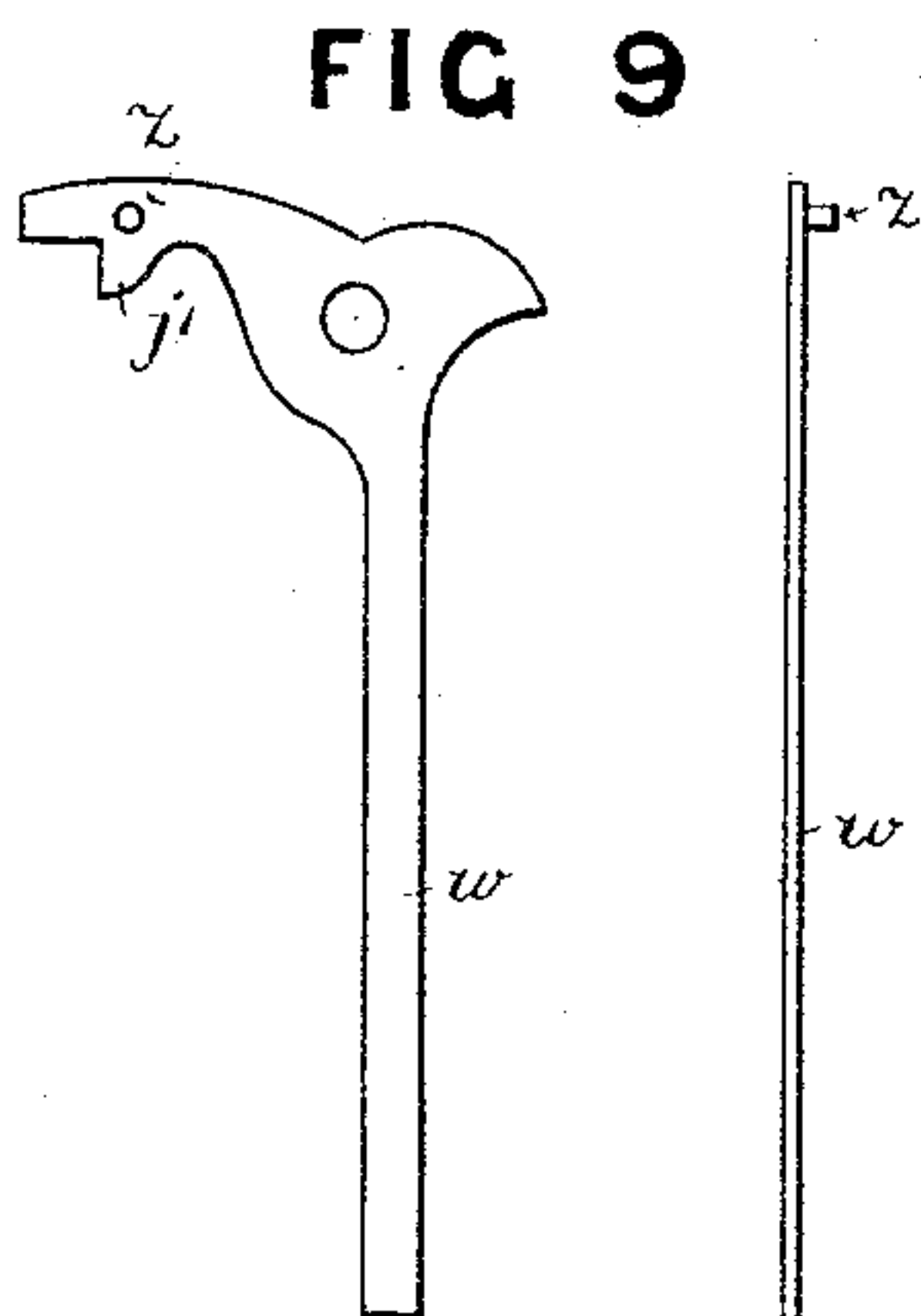
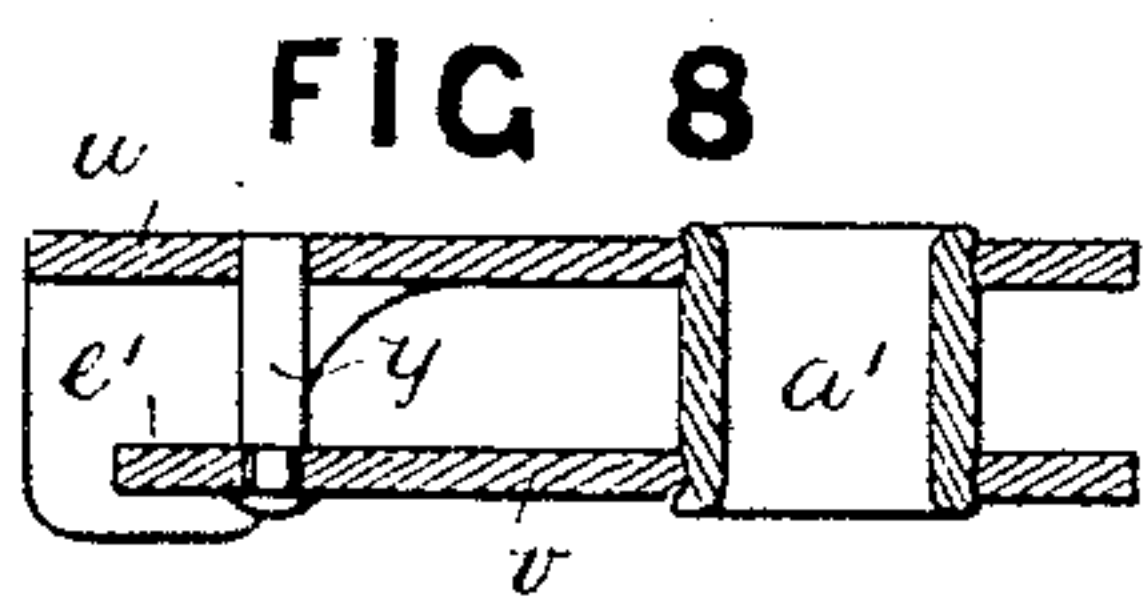
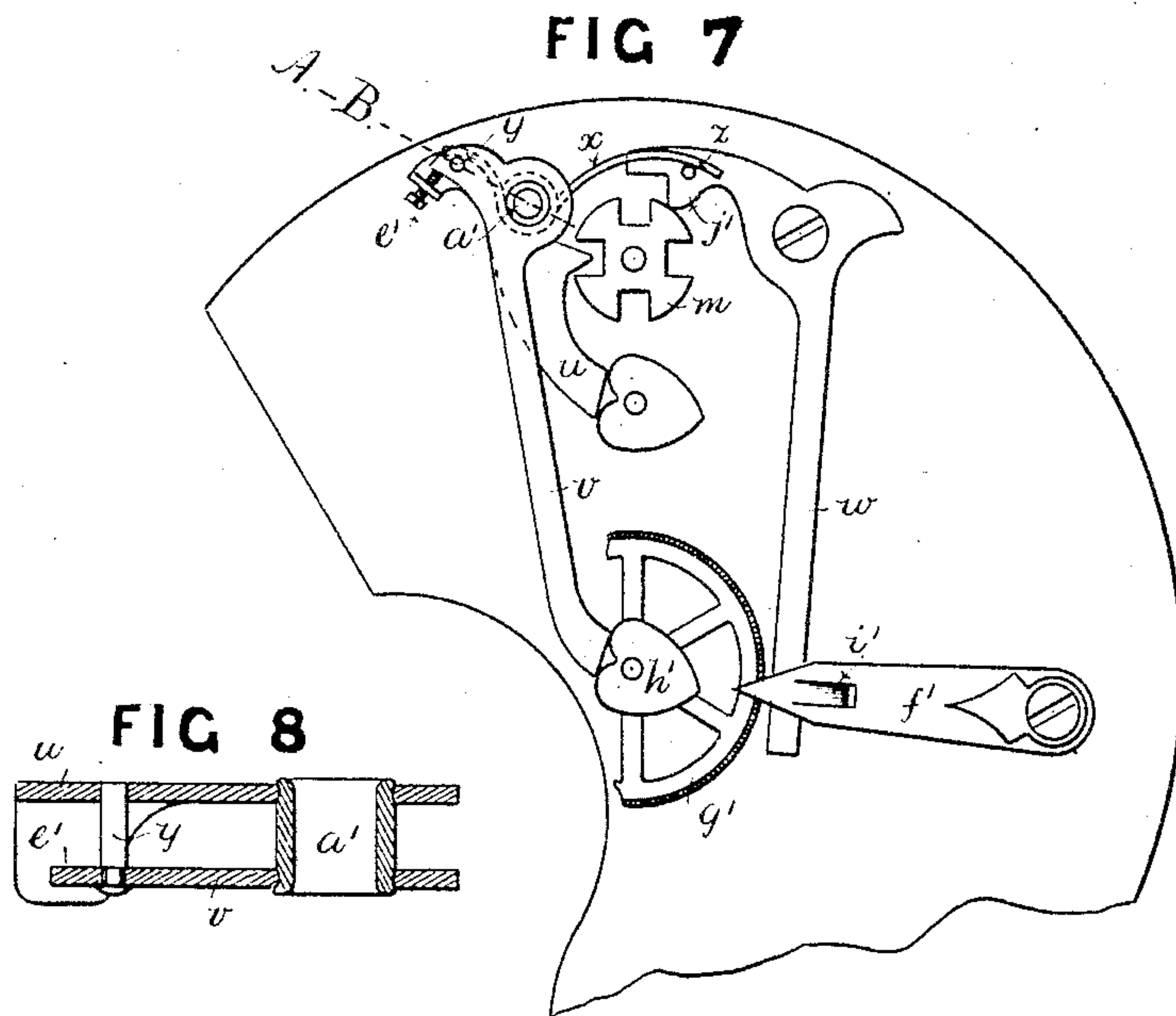
Inventor

Robert Bragge
Per Charles J. Rowe
Attorney.

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Ernest W Jones
Charles H Powell

Inventor

Robert Bragge
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UNITED STATES PATENT OFFICE.

ROBERT BRAGGE, OF ASTON, ENGLAND.

STOP-WATCH.

SPECIFICATION forming part of Letters Patent No. 448,930, dated March 24, 1891.

Application filed July 26, 1890. Serial No. 360,329. (No model.) Patented in England February 22, 1890, No. 2,856, and in Switzerland April 9, 1890, No. 2,009.

To all whom it may concern:

Be it known that I, ROBERT BRAGGE, a subject of the Queen of Great Britain, and a resident of Villa Street, Aston, in the county of Stafford, England, have invented certain new and useful Improvements in Stop-Watches, (for which I have applied for a patent in Great Britain, No. 2,856, bearing date February 22, 1890, and in Switzerland April 9, 1890, No. 2,009,) of which the following is a specification.

My invention relates to or is connected with the mechanism of stop-watches, and particularly to those parts connected with the starting, stopping, and returning to zero actions in such watches; and its object is, primarily, to provide an improved push-piece; also, an improved return-spring arrangement for the push-piece, an improved sliding pawl or click, an improved return-spring arrangement for the said pawl or click, and an improved method of securing or carrying the said return-springs; also, an improved arrangement of spring mechanism in connection with the starting, stopping, and return or fly-back pallets for the minutes and seconds hands, and, further, an improved method of connecting or adjusting the minutes return or fly-back pallet to the seconds return or fly-back pallets, whereby a compensating or equalizing pressure is applied to both pallets by the spring. I attain these objects by the mechanism illustrated upon the accompanying drawings, upon which are letters of reference, similar letters referring throughout the several views to the same thing or part, and in which—

Figure 1 is a general view of such parts that are relative to this my invention upon the under side of the top plate. Fig. 2 is a plan and side view in detail of this my improved sliding pawl. Fig. 3 is a detailed view of the push-piece, return-spring, and its pin. Fig. 4 is a detailed view of the sliding pawl, return-spring, and its pin. Fig. 5 is a side and top view of the claw-stud. Fig. 6 is detailed views of the push-piece. Fig. 7 is a general view of such parts that are relative to this my invention upon the upper side of the top plate. Fig. 8 is a sectional view of Fig. 7 on line A B. Fig. 9 is a plan and side view of the starting and stopping pallet. Fig. 10 is a detailed plan and side view of the com-

bined minutes and seconds hands fly-back pallets. Fig. 11 is a detailed side and plan view of the coiled spring for the fly-back pallets.

The push-piece *a*, which is operated from the exterior of the watch by the button *b*, is carried upon a fulcrum-joint *c*, the motion of which is limited by reason of an extension or tail part *d*, impinging against a stop *e* when in its normal position. This normal position of the said push-piece *a* is maintained by means of the spiral spring *f*, carried upon a pin *g*, the one end of the latter taking into a hole in the push-piece up to and against the collar *h*, while its other end is carried and securely held by means of the cleft claw-stud *i*, which is screwed into the top plate. Between this stud *i* and the aforesaid collar *h* upon the pin is placed the spiral spring *f*, which is in compression and tends always to press back the said push-piece *a*. This cleft claw-stud *i* is peculiar in its form. Its one end is screw-threaded for attachment to the top plate and its upper part is slotted or gapped at *j*. Into this slot or gap *j* is passed the extending end of the pin *g*, upon which is carried the spiral spring *f*. Upon the front and upper part of the two walls formed by the slot and against which the spring rests are formed two overhanging claws or projections *k k*, under which the end of the spring passes. Thus these claws effectually secure the spring in its working position and prevent its accidental removal. By compressing the spring somewhat, however, the spring *f* and pin *g*, &c., may be readily removed when required.

Engaging with the ratchet-wheel *l*, which operates the star or cam wheel *m*, I employ a sliding pawl or click *n* after the following construction: Upon the one side of a bar *n* I provide the click or pawl-tooth *o*, which engages with the aforesaid ratchet-wheel *l*. The outer end of this bar rests against and is operated upon by the push-piece *a* aforesaid. The inner end of the bar is extended, and at some distance from the pawl-tooth *o* and upon the other side of the bar is provided a fixed peg or pin *p*, having an overhanging head, under which the said bar slides. At the inner end of the bar and upon the opposite side to the pawl-tooth is an arm *q*, to which is con-

nected the one end of the pin or rod *r*, upon which is carried the spiral spring *s*, and at its outer end is an enlarged head or collar *t*, against which the one end of the spring abuts.
 5 The other end of this spring rests against and is controlled and secured by a cleft or slotted claw-stud *i'* similar to that already described. Thus when the push-piece *a* is pressed forward the sliding pawl-bar *n* is also pressed
 10 forward, its tooth *o* engaging with the ratchet-wheel *l*, and in so doing the last-mentioned spiral spring *s* is compressed. Upon the return, however, of the push-piece *a*, which is effected by the spring *f*, the said spiral spring *s*
 15 is free to pull back the pawl-bar *n*, and, further, by reason of it (the spring) acting at the outer end of the arm *q* it keeps the lower end of the bar against the fixed peg *p* and its pawl-tooth *o* against the ratchet-wheel *l*, at the
 20 same time yielding in order that the said tooth shall pass or ride over the tooth of the said wheel. Again, *u* is the minutes-hand fly-back pallet. *v* is the seconds-hand fly-back pallet. *w* is the stopping and starting pallet.
 25 I provide upon the arbor of the combined return or fly-back pallets *u* and *v* (which brings the minutes-hand and the extra seconds-hand back to zero) a coiled spring *x*, by which the necessary return (or spring)
 30 motion is imparted to both the starting and stopping and also to the fly-back actions of the pallets. The body of the said spring *x* is coiled around the arbor or center of the pallets *u* *v*, and its one end rests against
 35 a pin *y* or its equivalent upon the said pallet or pallets, while its other end rests and operates against a peg *z* or its equivalent upon the stopping and starting pallet *w*. I secure one only of these two pallets to the
 40 eyelet *a'*, (see Fig. 8,) the other being slightly riveted, but still free upon the arbor or eyelet, and further connect them by means of a loosely-fitting cross-pin *y*, which at its either
 45 end is connected to the said pallets *u* and *v*, and capable of a certain amount of oscillating freedom at each end. Against this connecting-pin *y* the one end of the coiled spring *x* presses, so that should the one pallet fall
 50 upon its heart-shaped cam earlier than the other the pin will accommodate itself to and equalize the pressure applied by the spring and readily press forward both pallets in
 55 order to return both the minutes and seconds hands back to zero. The same result may be obtained if both of the pallets are left lightly riveted or free upon the connecting-arbor, and in certain cases this may be the preferable way. This compensating adjustment of
 60 the two pallets *u* and *v* is limited as to its amount of motion by the adjusting-screw *e'*, which latter always insures the lifting of the pallet *v* clear of its cam. This starting and
 65 stopping operation of the pallet *w* is effected thus: The tail end of the pallet *w* (see Fig. 7) lies beneath the pressure-plate *f'*, the point of which latter rests upon the central seconds-hand wheel *g'*, which carries the heart-

shaped cam *h'*. In this said plate *f'* the middle portion of it is depressed somewhat, forming an underneath incline. As shown, 70 the pressure of the plate *f'* upon the wheel *g'* stops the watch, but upon the action of the spring *x*, pressing the tooth *j'* upon the upper end of the pallet *w* into the notches in the star-wheel *m*, the tail end of the said pal- 75 let *w* is forced back beneath the inclined surface upon the under side of the plate *f'*, by which its point is raised free of the seconds-hand wheel *g'*, and the watch proceeds to work. Upon the star-wheel *m* again being 80 moved into the position illustrated the watch is again stopped. These operations, however, apart from the combination and action of the spring *x*, are not new, and therefore do not form part of my invention. 85

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In stop-watches, the combination of the push-piece *a*, working upon a fulcrum *c*, and having a tail-piece *d* operating against a 90 stop-piece *e*, with the sliding pawl-bar *n* and ratchet-wheel *l*, substantially as described and shown, and for the purpose specified.

2. The combination, in stop-watches, with the push-piece *a*, of a spiral return-spring *f*, 95 stud *i*, and pin *g*, constructed, arranged, and operating substantially as shown and described.

3. In stop-watches, the combination, with the ratchet-wheel *l* and push-piece *a*, of the 100 sliding pawl-bar *n*, having pawl-tooth *o*, arm *q*, and a return-spring, substantially as shown, and for the purposes specified.

4. The combination, with the sliding pawl-bar *n*, tooth *o*, and arm *q*, of the spiral spring 105 *s*, stud *i'*, and pin *r*, substantially as described and shown, and for the purpose specified.

5. The cleft claw-stud *i* or *i'*, having an open slot *j*, and overhanging claws *k* *k*, in 110 combination with their respective springs or carrier-pins, substantially as described and shown, and for the purpose specified.

6. The combination, with the fly-back pallets *u* and *v* and starting and stopping pallet 115 *w*, of the coil-spring *x*, acting upon studs *y* and *z*, substantially as described and shown, and for the purposes specified.

7. The combination, with the fly-back pallets *u* and *v*, eyelet *a'*, and spring *x*, of the 120 loosely-fitting pressure or following-up connecting-pin *y*, substantially as described and shown, and for the purpose specified.

8. The combination, with the fly-back pallets *u* and *v* and the loosely-fitting pressure 125 or following-up connecting-pin *y*, eyelet *a'*, and spring *x*, of the adjusting-screw *e'*, substantially as described and shown, and for the purposes specified.

ROBERT BRAGGE.

Witnesses:

CHARLES T. POWELL,
ERNEST W. JONES.