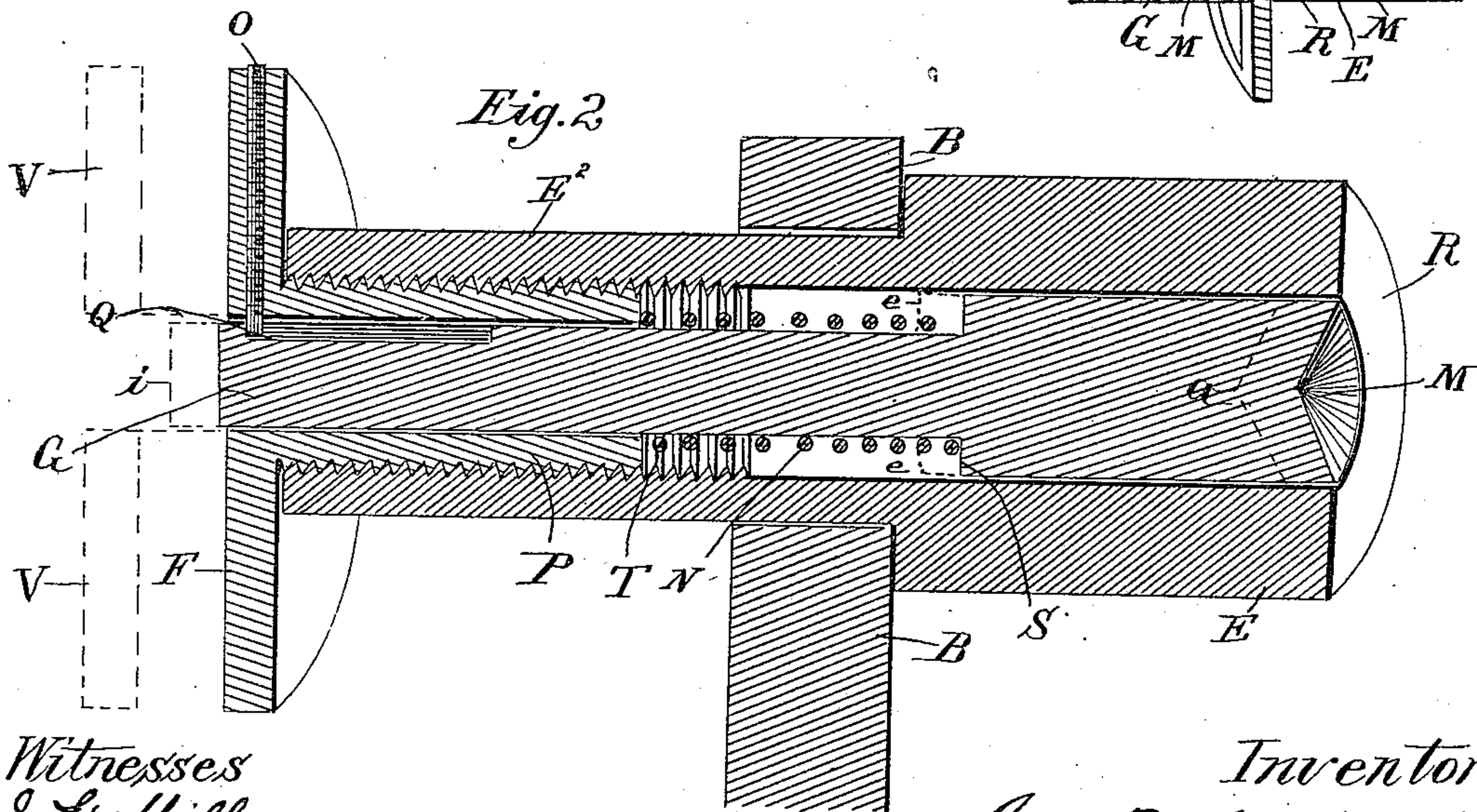
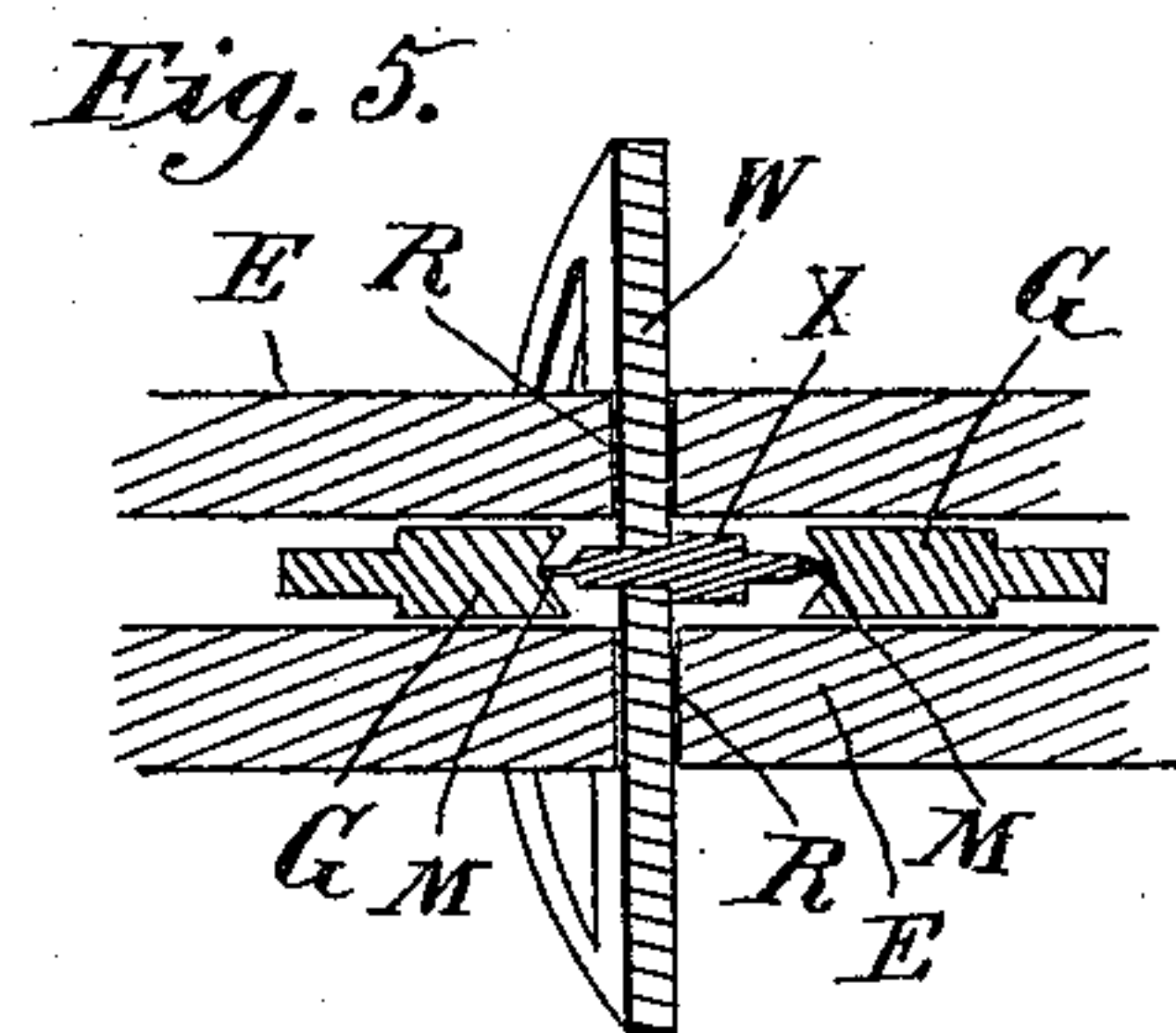
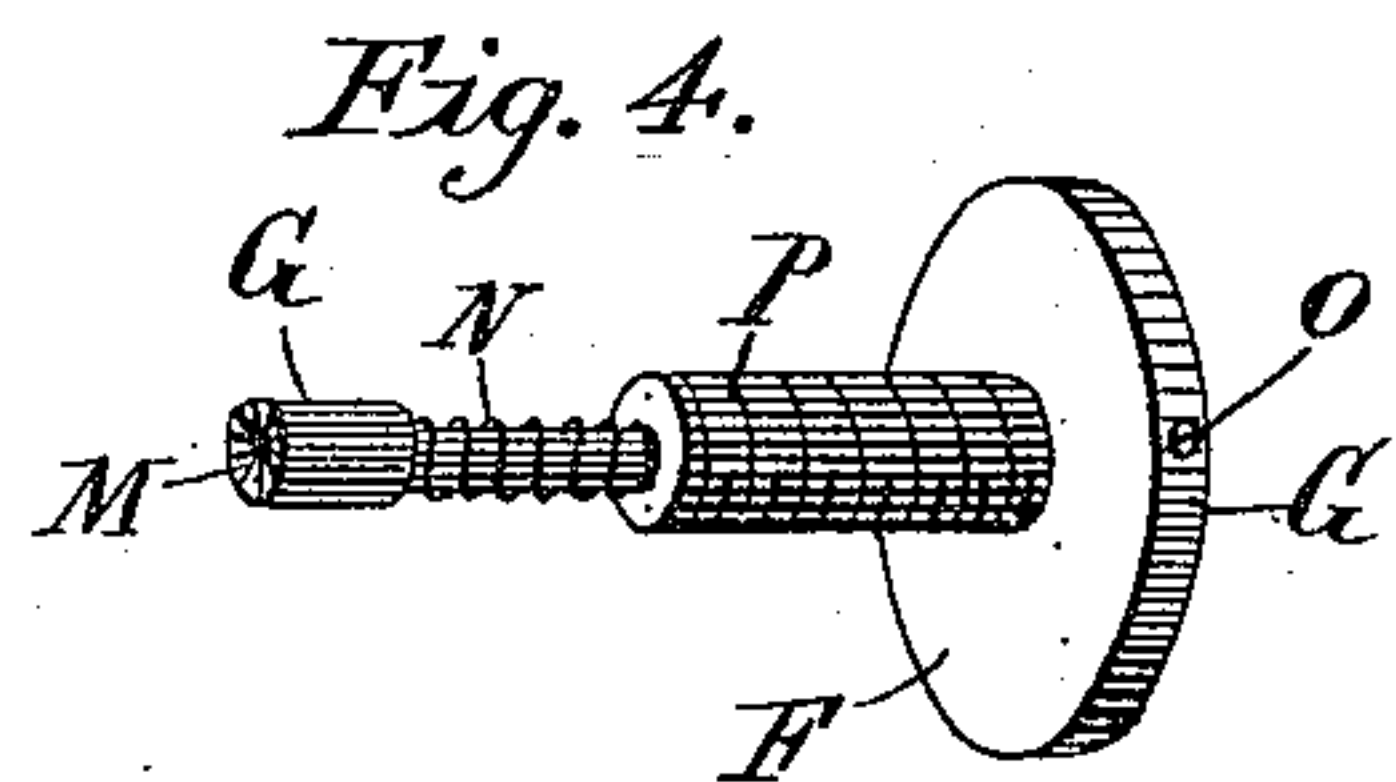
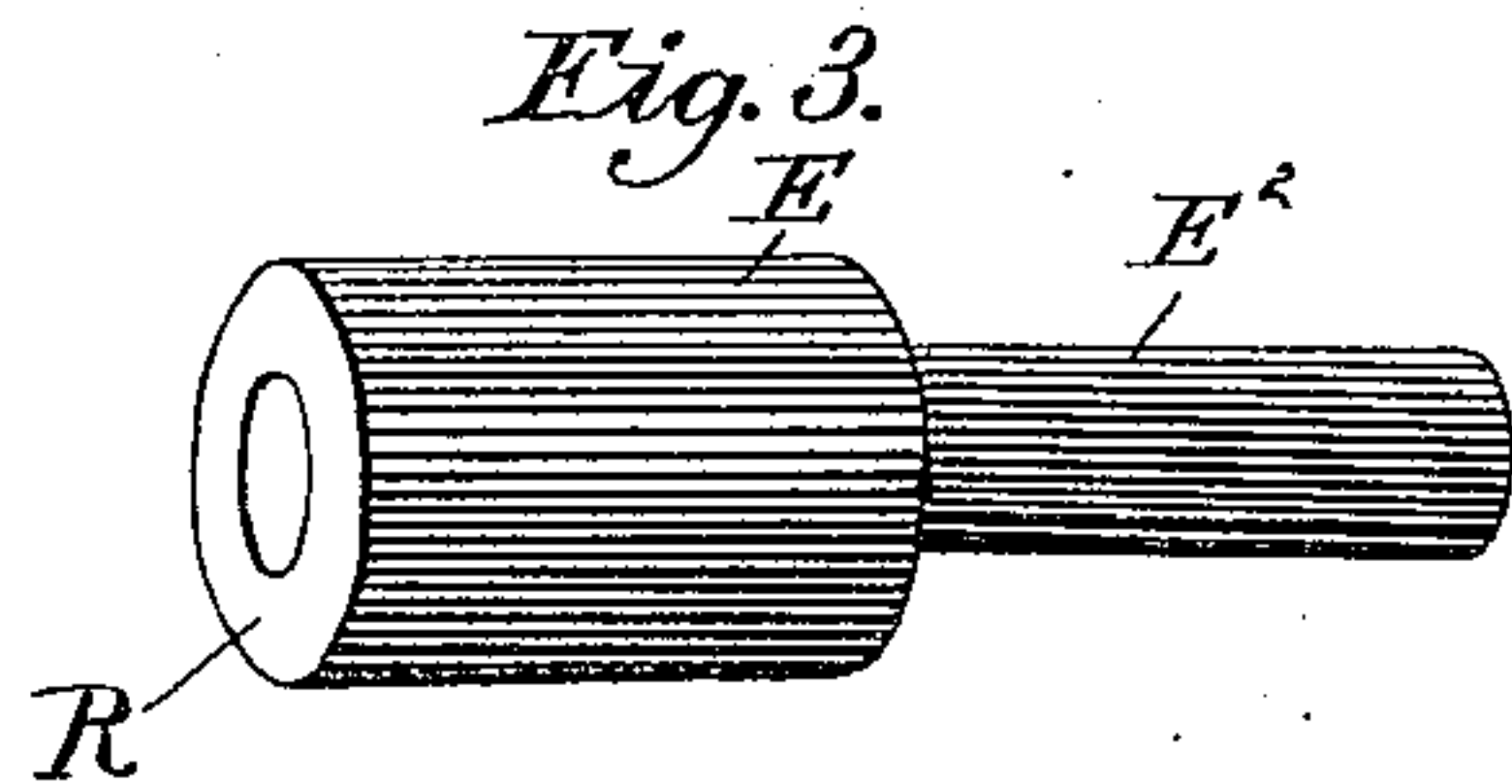
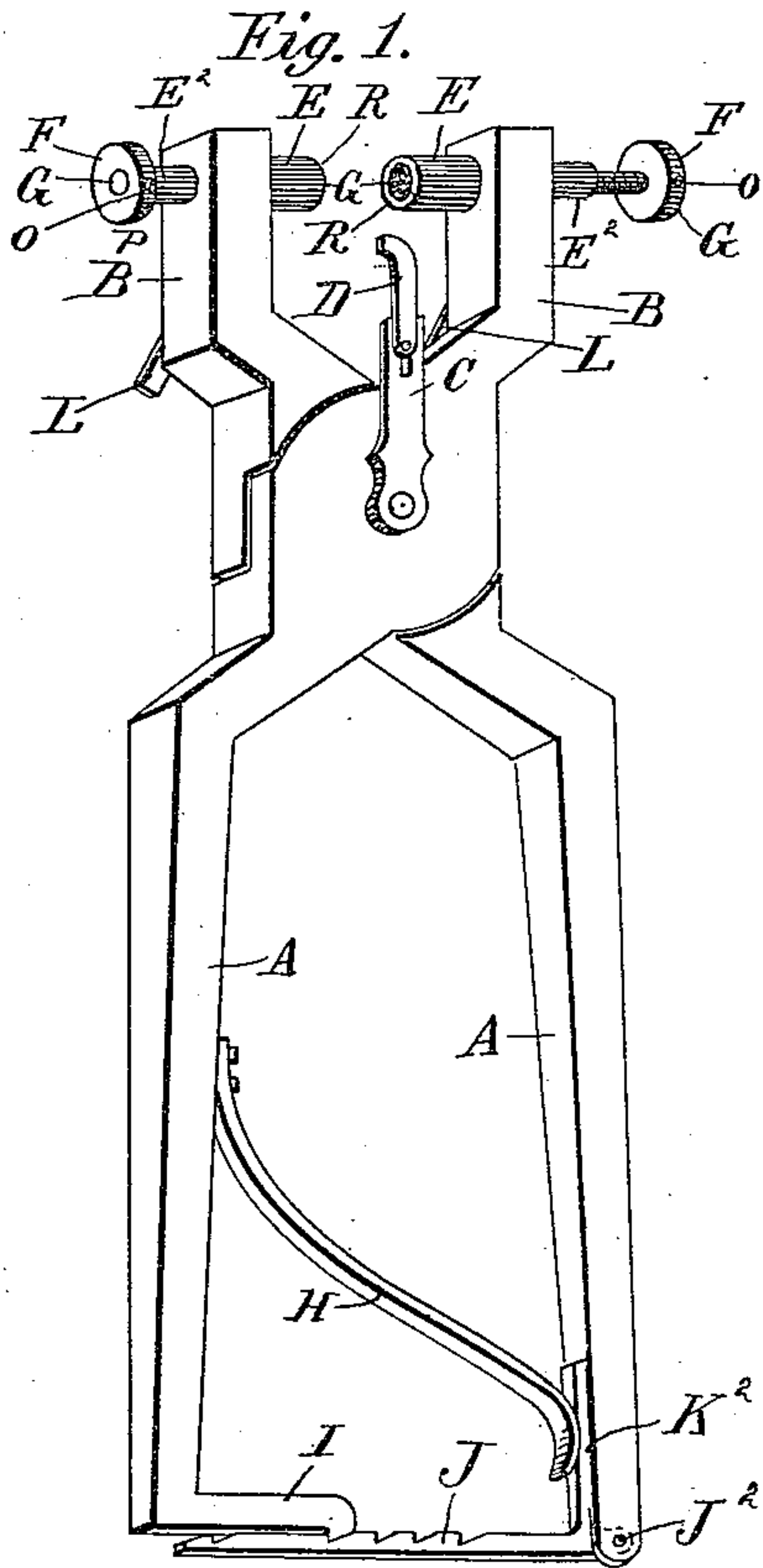


(No Model.)

G. B. WIDDIFIELD.
BALANCE WHEEL PLIERS AND CALIPERS.

No. 428,193.

Patented May 20, 1890.



Witnesses
S. L. Miller.
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Inventor:
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per O. H. Woodworth,
Att'y.

UNITED STATES PATENT OFFICE.

GEORGE B. WIDDIFIELD, OF COLUMBIA CITY, INDIANA, ASSIGNOR OF ONE-HALF TO WILLIAM H. SHIFFLER, OF SAME PLACE.

BALANCE-WHEEL PLIERS AND CALIPERS.

SPECIFICATION forming part of Letters Patent No. 428,193, dated May 20, 1890.

Application filed September 12, 1889. Serial No. 323,790. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. WIDDIFIELD, a citizen of the United States, residing at Columbia City, in the county of Whitley and State of Indiana, have invented certain new and useful Improvements in Combined Calipers and Balance-Wheel Truing-Pliers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved tool for the use of watch-makers, being a combined calipers and balance-wheel truing-pliers; and the objects of my invention are to provide a convenient and practical combination implement for holding a balance-wheel loosely or with slight friction on its pivots while truing or training the wheel, said tool being also adapted to be quickly changed, so as to grasp the arms of the wheel firmly in order to bend the arms and true the wheel for use in a watch. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a general view in perspective of the entire implement. Fig. 2 is a longitudinal central sectional view of one jaw or side of the implement, showing in detail the different parts of said jaw or side. Fig. 3 represents the cylindrical hollow jaw-head attached to each side. Fig. 4 represents the adjusting-head and its screw-barrel inclosing the caliper-center and the actuating spiral spring thereof; and Fig. 5 shows a balance-wheel with its arms held firmly between the faces of the two jaw-heads and the pivots of its staff held in the countersinks of the two caliper-centers.

Similar letters of reference indicate corresponding parts of the invention throughout the different views.

A represents the handles of the pliers, and B the jaws, in which are firmly and immovably fixed the jaw-heads E.

C shows a slotted gage or arm pivoted to

the pliers and carrying a pointer D, which is movable in the slot and thereby adjustable in its range of work.

E E show the jaw-heads, E² E² the outer extensions thereof, and R R the clamping or folding faces thereof.

F shows the adjusting-head, P its hollow extension or barrel-screw, and O a set-screw.

G represents the caliper-center cut away or slotted, as at Q, to admit the inner end of set-screw O, to prevent the inner end of center G from projecting beyond face R of jaw-head E. Said inner end of center G is cupped or countersunk, as shown at M, to admit the pivot of a balance or other wheel for training or truing the wheel.

Spring H operates to open the pliers. Bent arm I has a hook so fitted as to catch in the notches of arm J, which is jointed to the handle at J² and held in position by spring H pressing on stud K, as shown, said spring thus performing the double office of opening the pliers and also holding arm J in position.

P represents a hollow extension or barrel screw firmly attached to the adjusting-head F, and fitting a screw-thread formed on the inner surface of the outer extensions E² of jaw-heads E.

N shows a spiral spring surrounding the smaller portion of center G, with one end pressing outwardly against the inner end of barrel-screw P at T and the other end against the shoulder of center G at S, the tendency of said spring being to drive said center G toward the face R of jaw-head E. Caliper-center G is made to fit loosely and move freely in the cavities of head E and barrel-screw P.

W, Fig. 5, shows the balance-wheel, and X the balance-staff, with its two pivots pressed against by the countersunk portions of the two caliper-centers, and the arms of the wheel clamped and firmly held between the faces of the two jaw-heads E E.

The spiral spring N is so inserted as to have free action; but it is purposely made weak and light enough to prevent any liability to bend or break the pivots of wheels while training or truing them with my combined calipers and balance-wheel truing-pliers herein described.

The work of this implement is not necessarily confined to the balance - wheels of watches, but may be applied to other watch-wheels requiring training or truing.

5 The practical operation of my invention is substantially as follows: Desiring to train or true a balance or other wheel of a watch, I insert the wheel with its pivots each in the countersink of one of the two caliper-centers
10 of the two jaw-heads of the tool, and then if I wish to revolve and test the wheel freely and without friction I close the jaws by means of the handles until the two pivots of the wheel nearly touch the bottoms of the two countersinks, thus enabling it to revolve without friction
15 on its pivots; but if I desire to revolve and test the wheel with sufficient friction on its pivots to prevent all side shake and end shake and without injury to the pivots I further close the jaws or turn head F and drive screw P inward until both pivots touch the bottoms of both countersinks and move the two caliper-centers outward against the pressure of their two spiral springs, thus accomplishing my object. Furthermore, when I desire to grasp and firmly hold the wheel for truing the same, I do not need to remove the wheel from the pliers, but simply proceed to apply pressure to the handles, thus causing
30 the two pivots to press the two centers outward against the pressure of their two spiral springs until said centers are brought to about the positions indicated by the broken lines *a e i*, whereby the two opposite faces R R of the
35 two jaw-heads are brought together, firmly grasping and securely holding the arms of the wheel for truing the same, as illustrated in Fig. 5. The pressure of spiral spring N against shoulder S and the end T of barrel-screw P is increased or diminished at will by
40 the advancing and receding movements of barrel-screw P when turned by means of adjusting-head F.

Fig. 2 shows screw P driven as far as possible into the outer extension E² of head E, thus securing the greatest possible amount of pressure by spring N against shoulder S and the end of screw P, and to reduce that pressure I unscrew and withdraw barrel-screw P from extension E² until head F is brought to the position of the broken lines V, or as far as desired, thus reducing and adjusting the pressure referred to, and adapting
55 it to the strength of the pivots of the wheels to be held between the countersinks of the caliper-centers.

Each jaw and its correspondingly-connected jaw-head may be formed together integrally of one piece instead of being formed separately and attached to each other, as shown herein.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a tool of the character described, a jaw-head attached to a jaw, said jaw-head having an outer hollow extension with its inner surface screw-threaded to receive a barrel-screw attached to an adjusting-head provided with a set-screw, in combination with a caliper-center actuated by a spiral spring, substantially as and for the purposes set forth.

2. The combination of a spiral spring with a caliper-center actuated by said spring and a barrel-screw which is an extension of and attached to an adjusting-head adapted to regulating the pressure of said spiral spring against the shoulder of said caliper-center, substantially as described and illustrated.

3. The combination of jaw B, jaw-head E, extension E², center G, spring N, adjustable head F, barrel-screw P, and set-screw O, substantially as illustrated and described.

4. The combination of set-screw O, adjustable head F, and barrel-screw P, substantially as described and set forth.

5. The combination of the two faces of the jaw-heads clamping the balance-wheel arms with the two countersunk portions of the two caliper-centers pressing against the ends of the pivots of the balance-staff, substantially as and for the purposes set forth.

6. The combination of spring H, stud K², notched arm J, and bent arm I, substantially as described and illustrated.

7. As an improved article of manufacture, the combined calipers and balance-wheel truing-pliers herein described, consisting, essentially, of the handles A, jaws B, arm C and its pointer D, jaw-head E, extension E², adjusting-head F and its barrel-screw P, set-screw O, caliper-center G, spiral spring N, bent arm I, notched arm J, stud K², and spring H, all constructed, combined, and arranged substantially as and for the purposes set forth.

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

GEORGE B. WIDDIFIELD.

Witnesses:

O. H. WOODWORTH,
H. O. CLAPHAM.