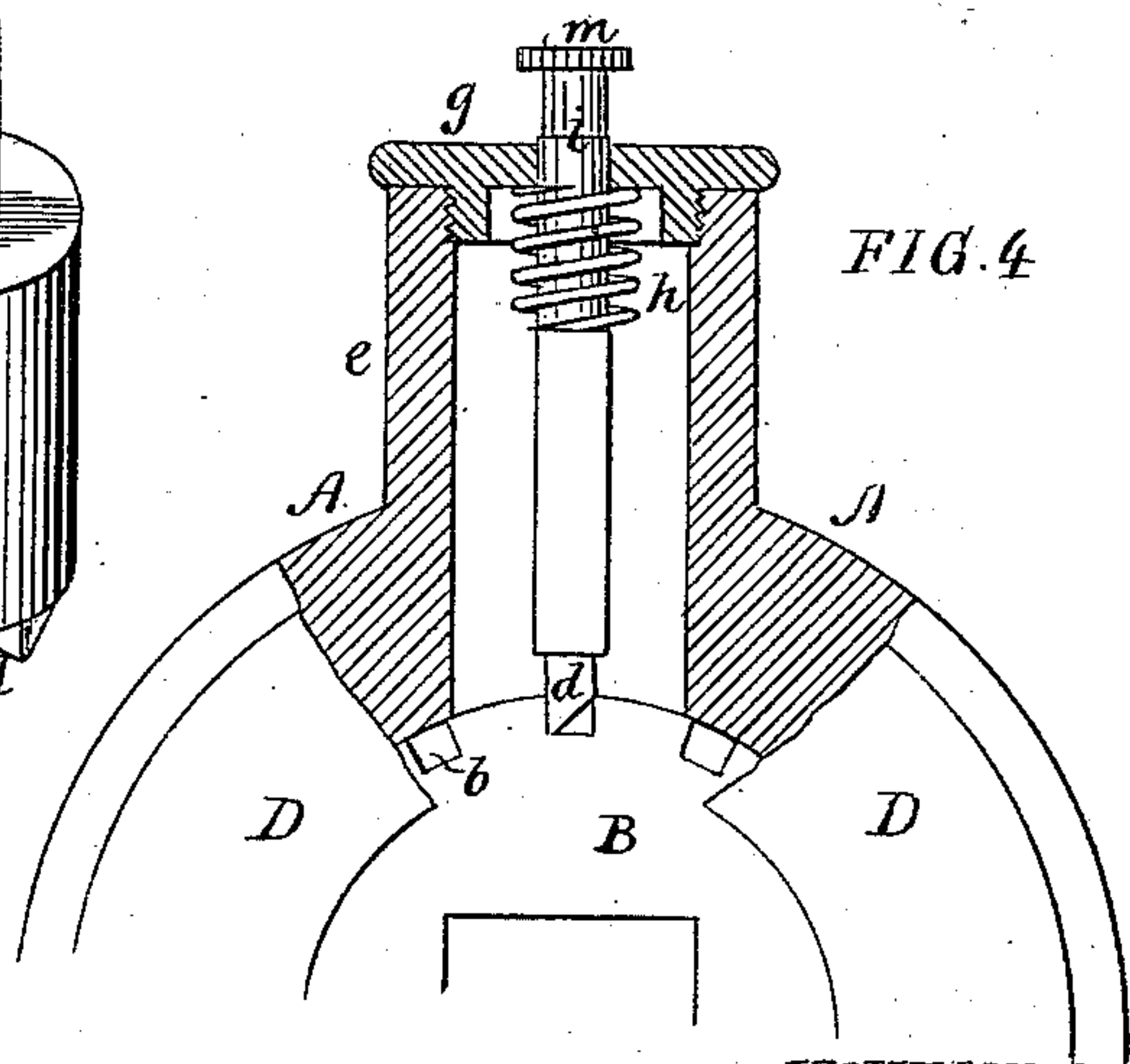
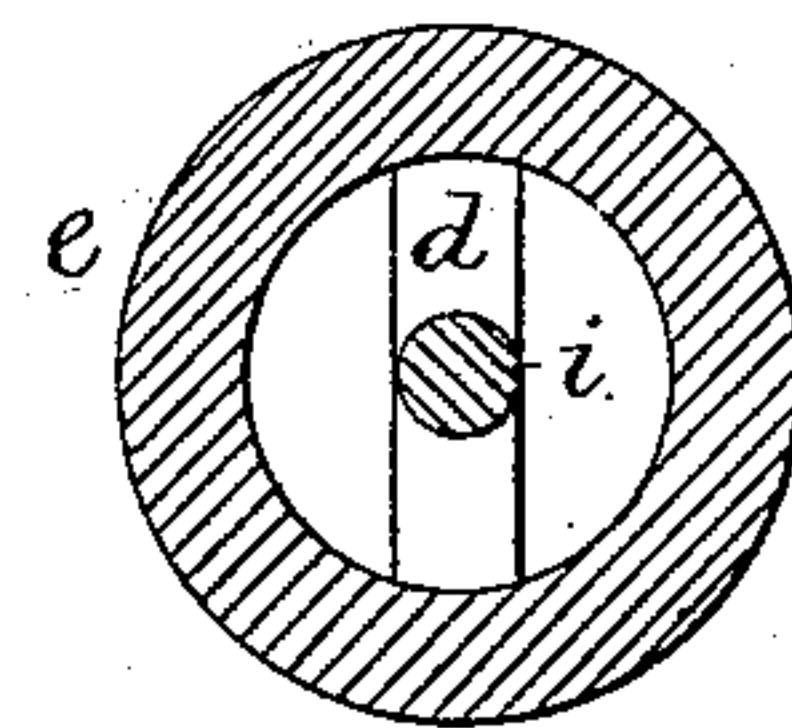
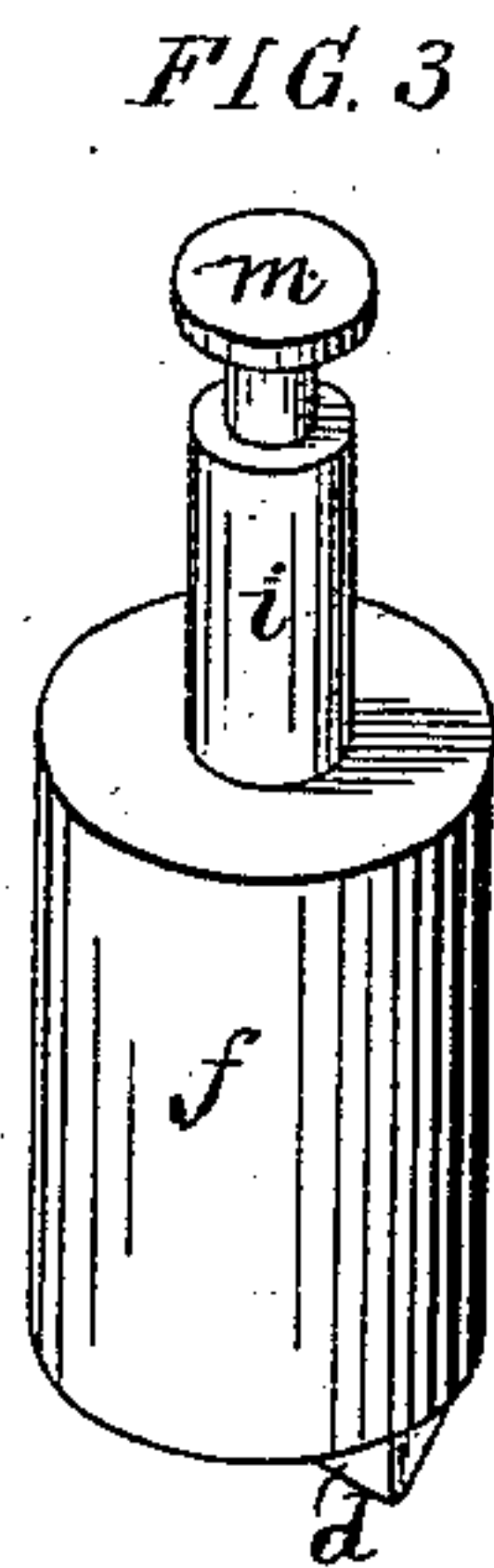
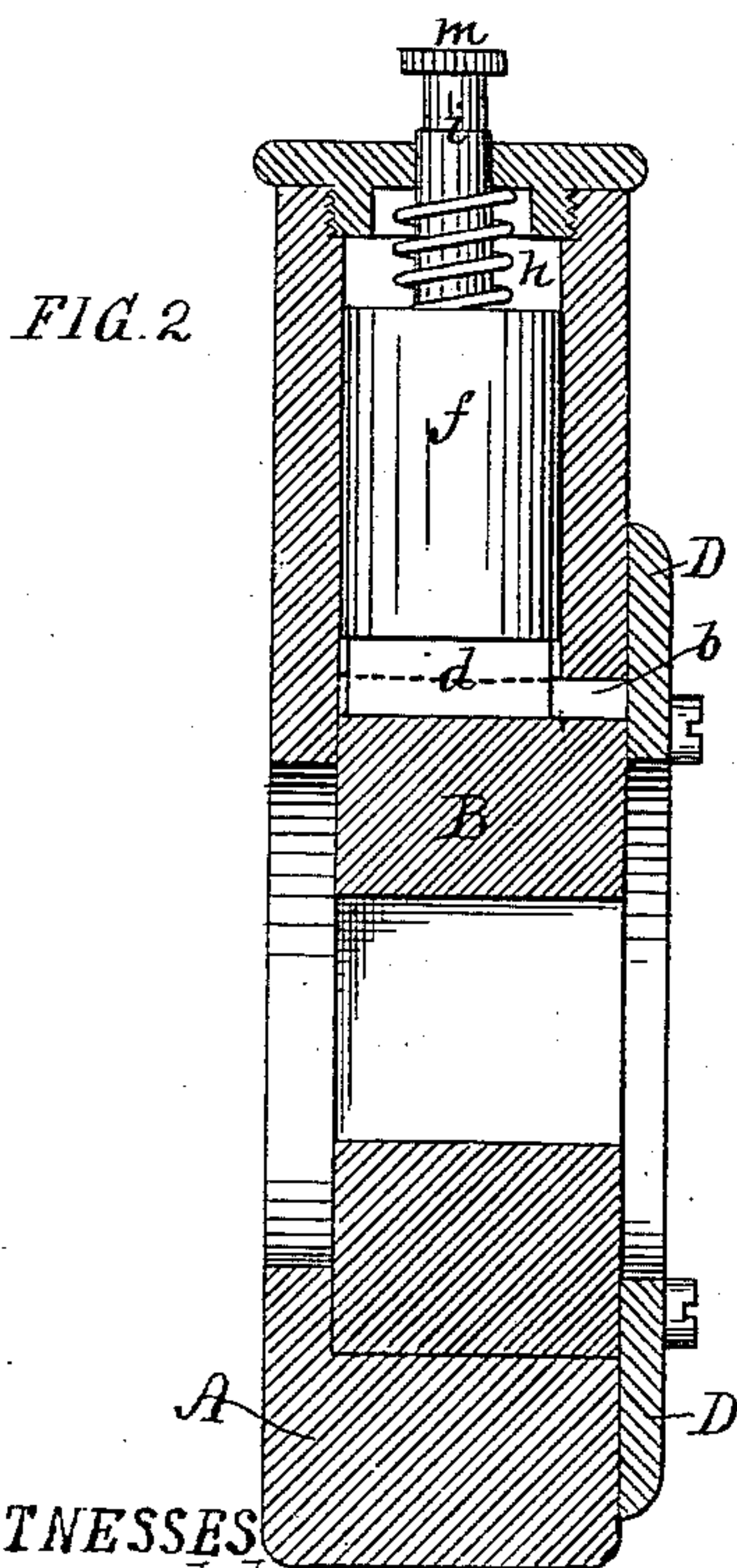
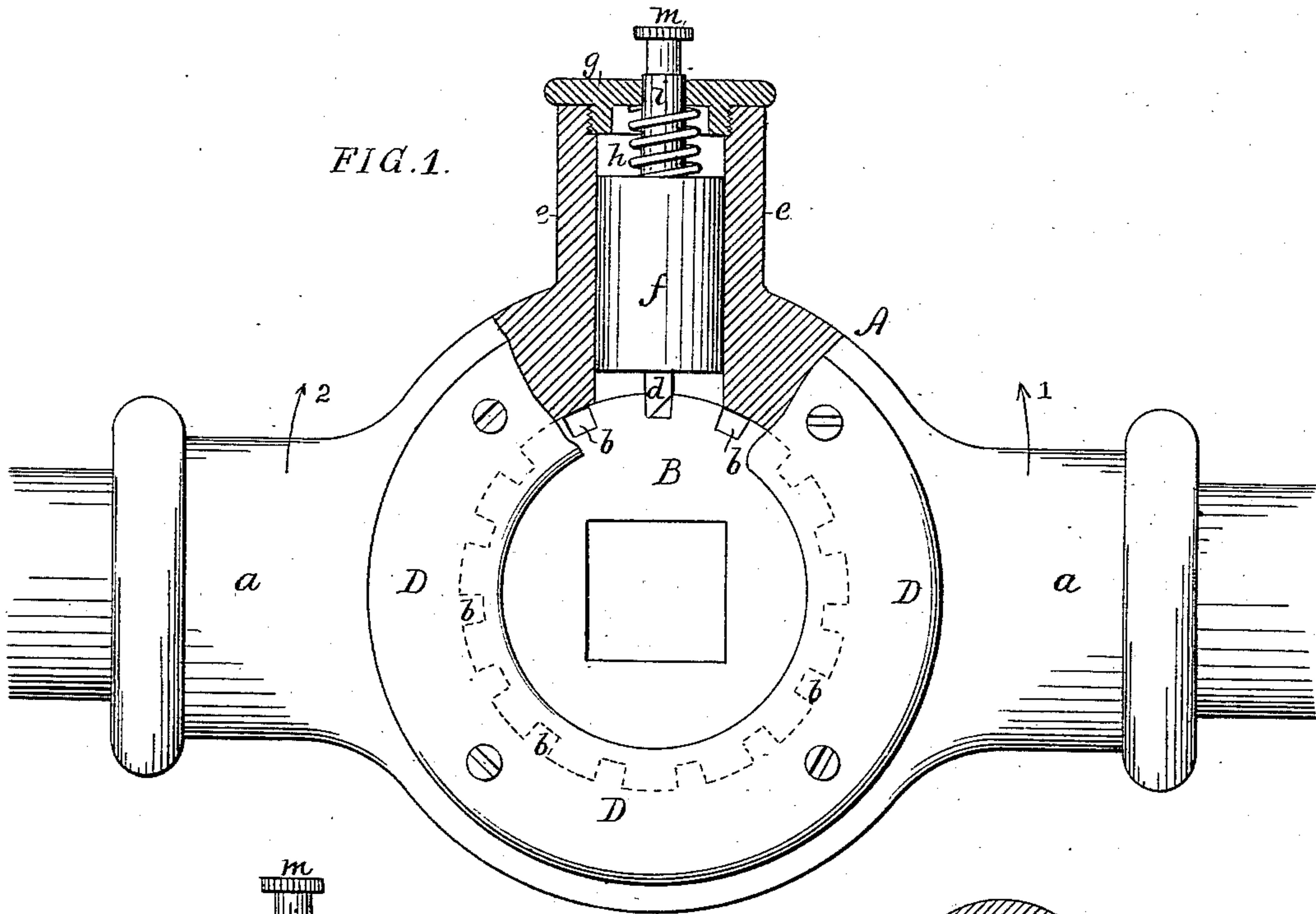


(No Model.)

W. D. FORBES.
RATCHET WRENCH.

No. 277,256.

Patented May 8, 1883.



WITNESSES
James F. John
Harry Drury

INVENTOR
William D. Forbes
by his Attorneys
Howson and Sons

UNITED STATES PATENT OFFICE.

WILLIAM D. FORBES, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF ONE-HALF TO RODERICK P. CURTIS, OF SAME PLACE.

RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 277,256, dated May 8, 1883.

Application filed July 17, 1882. (No model.) Patented in England May 26, 1882, No. 2,508.

To all whom it may concern:

Be it known that I, WILLIAM D. FORBES, a citizen of the United States, and a resident of Bridgeport, Connecticut, have invented certain Improvements in Ratchet-Wrenches, of which the following is a specification.

The object of my invention is to construct a cheap and compact reversible ratchet-wrench, which can be used for operating taps and many other tools, and which can be readily changed from a right to a left handed wrench, and vice versa, and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a face view, partly in section, of my improved ratchet-wrench; Fig. 2, a transverse section; Fig. 3, a perspective view of the reversible pawl detached from the wrench; Fig. 4, a view representing a modification of my invention; and Fig. 5, a transverse section on the line 1 2, Fig. 4.

A is an annular casing having opposite tubular projections, *a a*, adapted for the reception of suitable bars or handles, whereby the wrench can be operated.

To the interior of the casing A is adapted the ratchet-wheel B, which is retained in place partly by the back of the casing and partly by a ring, D, the wheel having a central opening, square in the present instance, for the reception of part of the tool or other object to be turned by the wrench. The teeth of the ratchet-wheel have parallel or nearly parallel sides, and to the notches *b*, between the teeth, is adapted a pawl, *d*, which is arranged to slide radially in a tubular projection, *e*, on and forming part of the casing A, the pawl being abrupt on one side and inclined on the other. The stem *i* of this pawl has a cylindrical block, *f*, which fits snugly in the interior of the projection *e*, and between this block *f* and the screw-cap *g*, which closes the end of the said projection *e*, intervenes a coiled spring, *h*, the tendency of which is to maintain the pawl in engagement with the notches of the ratchet-wheel. The spring *h* surrounds the stem *i* of the pawl, which projects through the cap *g*, and has at the outer end a suitable knob, *m*, whereby the stem may be retracted, so as to free the pawl from the notches *b*, and then turned so as to reverse the pawl. When the

pawl occupies the position shown in Fig. 1 a movement of the casing A in the direction of the arrow 1 will be imparted to the ratchet-wheel, owing to the fact that the straight face of the pawl engages with the teeth of the said wheel. The reverse movement in the direction of the arrow 2, however, does not affect the ratchet-wheel, the pawl trailing over the teeth of the wheel, owing to the presentation of its inclined face thereto. On retracting and reversing the pawl, however, these conditions will be reversed.

The block *f* of the pawl is not essential to my invention, as the pawl may be constructed in different ways without departing from the main feature of my invention. For instance, the pawl may consist of a flat bar of steel, Figs. 4 and 5, having a rounded stem passing through the cap in order to permit the reversal of the pawl.

It will be observed that the pawl *d* is of such a width that it cannot be turned until it has been first withdrawn from between the teeth of the ratchet-wheel. I thus prevent any accidental reversal of the pawl or unintentional movement of the same to an inoperative position, and thereby overcome an objection to that class of reversible ratchet-wrenches in which the pawl can be turned without being retracted.

I claim as my invention—

1. The combination of the casing A and ratchet-wheel B with a guided and reversible spring-pawl, *d*, of such width relatively to the distance between the teeth of the ratchet-wheel that it cannot be turned until it is first withdrawn from between the teeth of the ratchet-wheel, as set forth.

2. The combination of the casing A, having a tubular projection, *e*, with screw-cap *g*, the pawl *d*, guided in the projection, and having a stem passing through the cap, and the spring *h*, interposed between the cap and a bearing on the pawl, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM D. FORBES.

Witnesses:

HARRY DRURY,
HARRY SMITH.