

R. H. PETERS.
 RATCHET WRENCH.
 APPLICATION FILED DEC. 27, 1909.

978,395.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

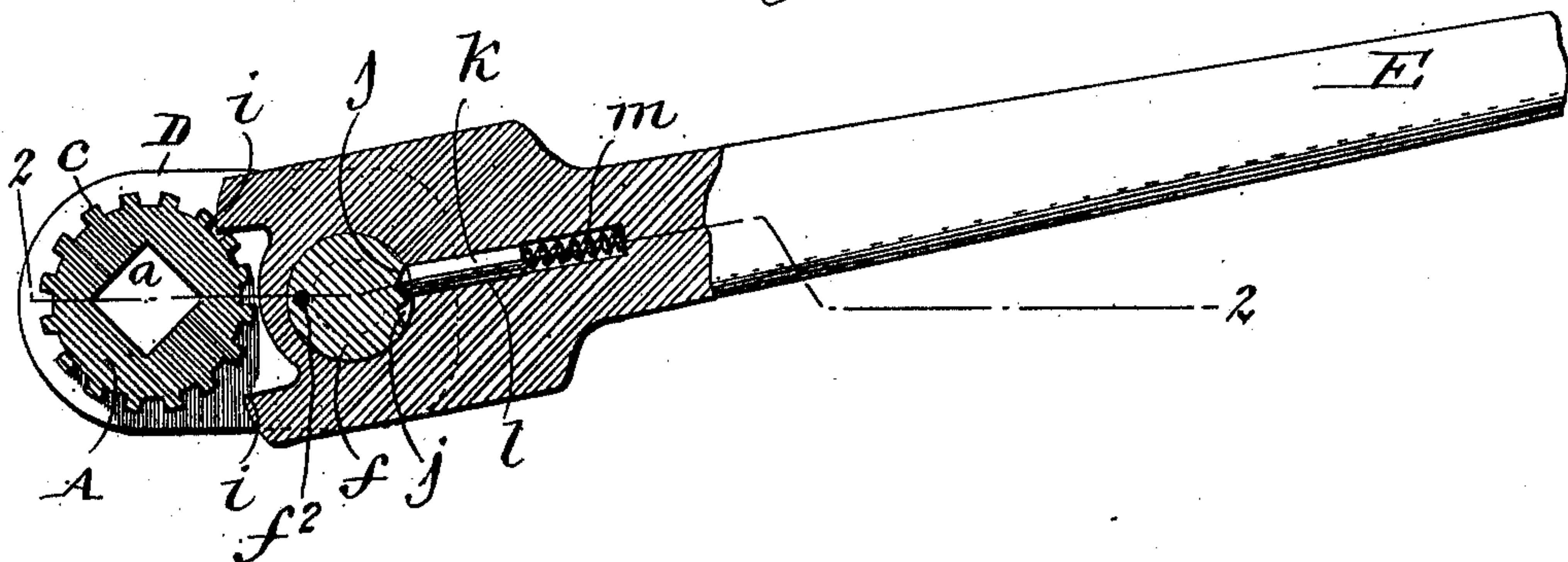
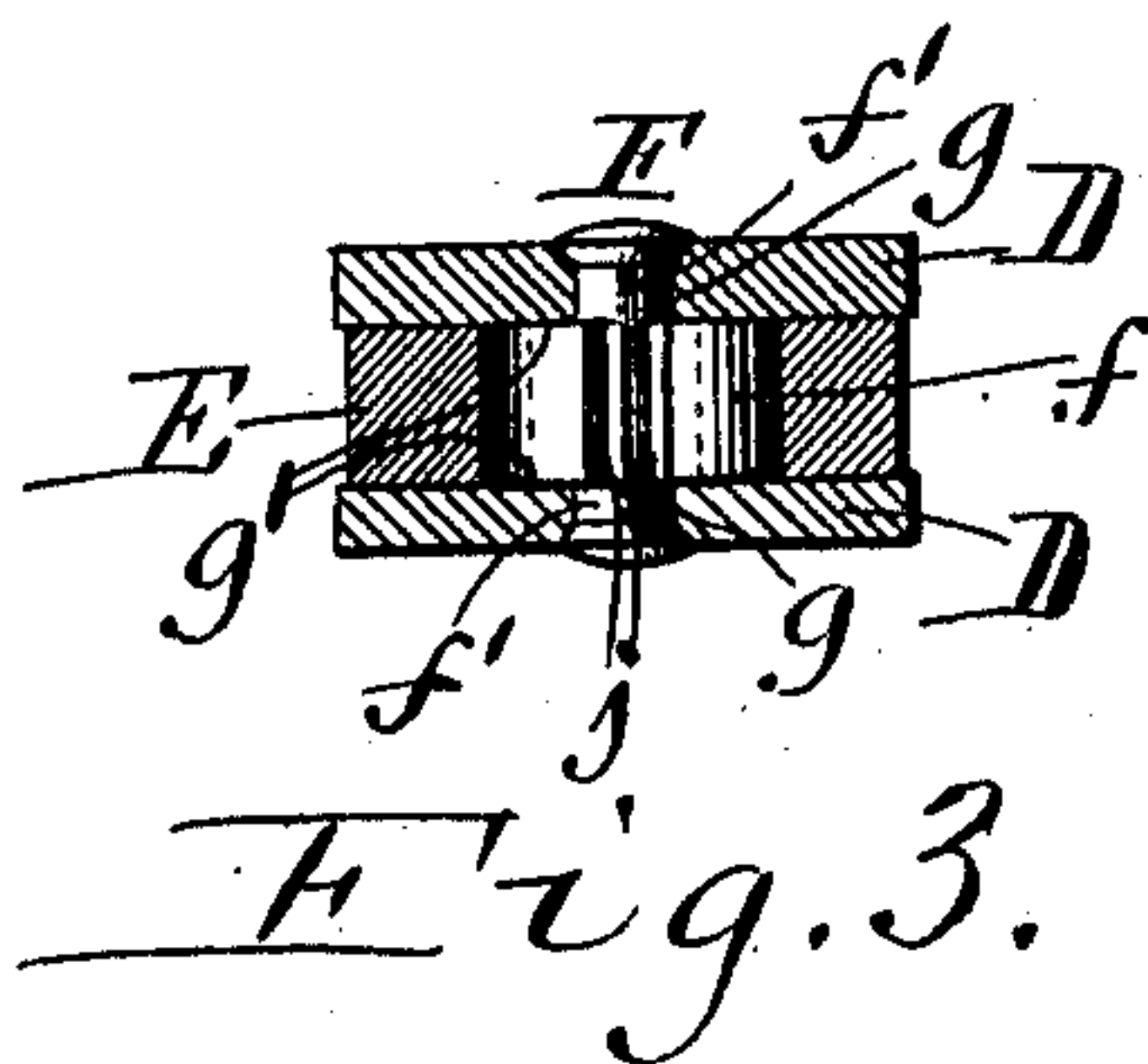
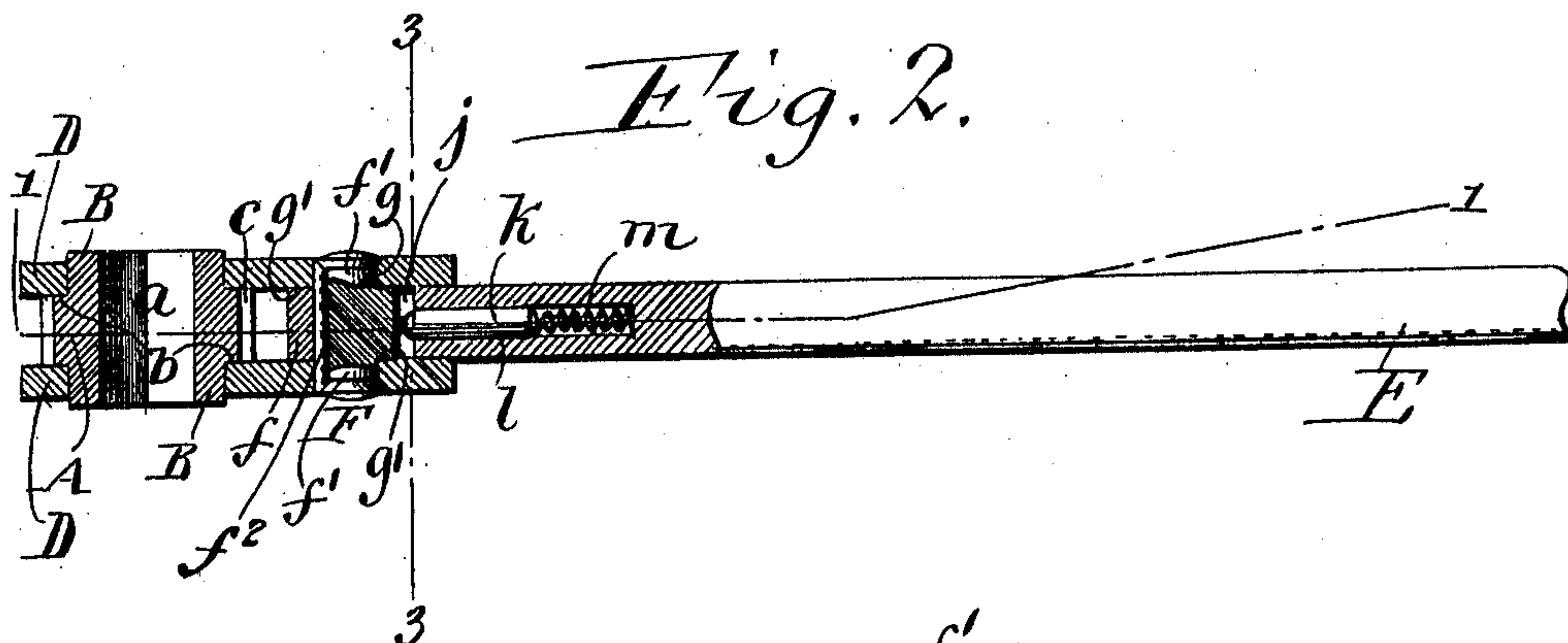


Fig. 2.



Witnesses:

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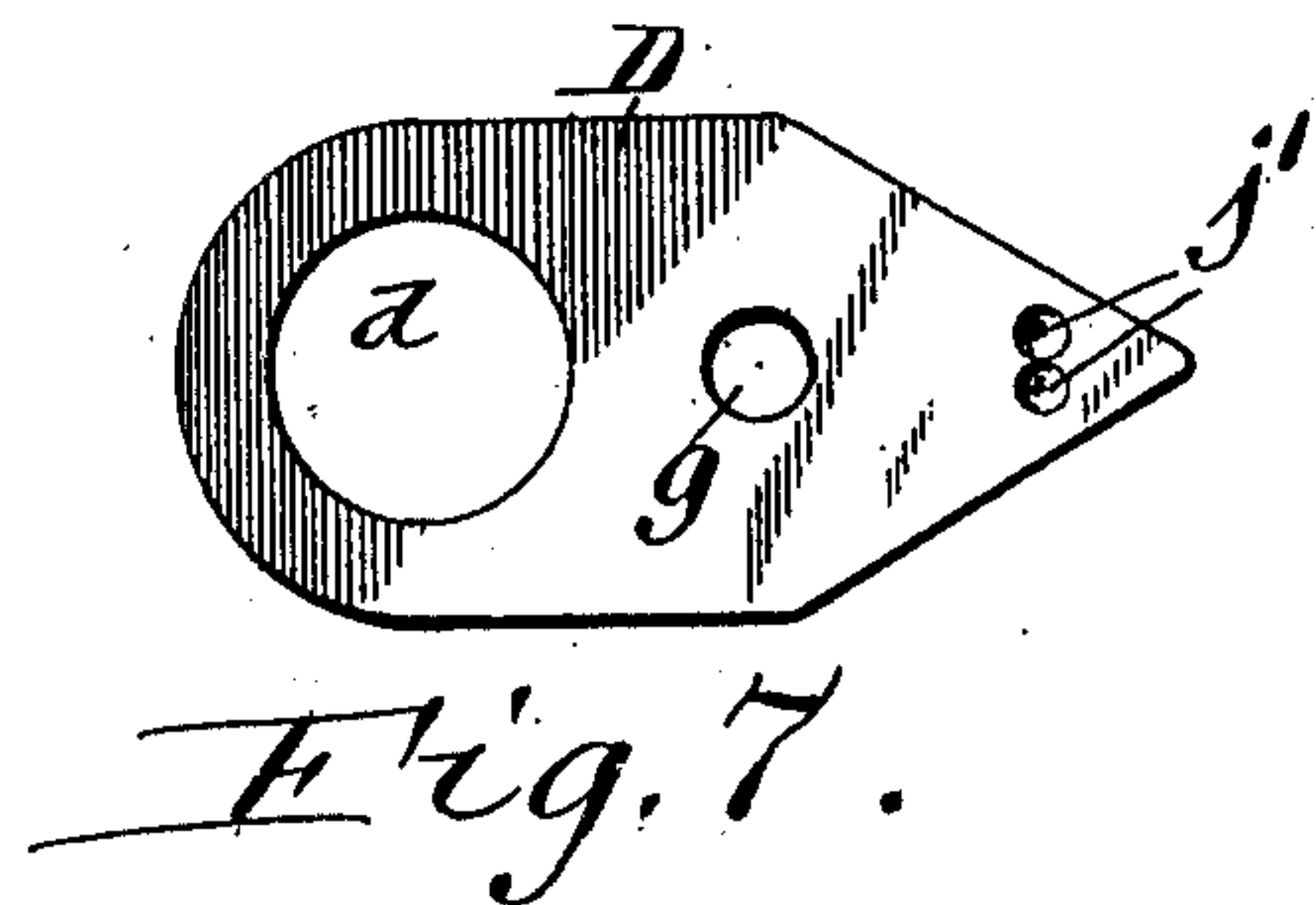
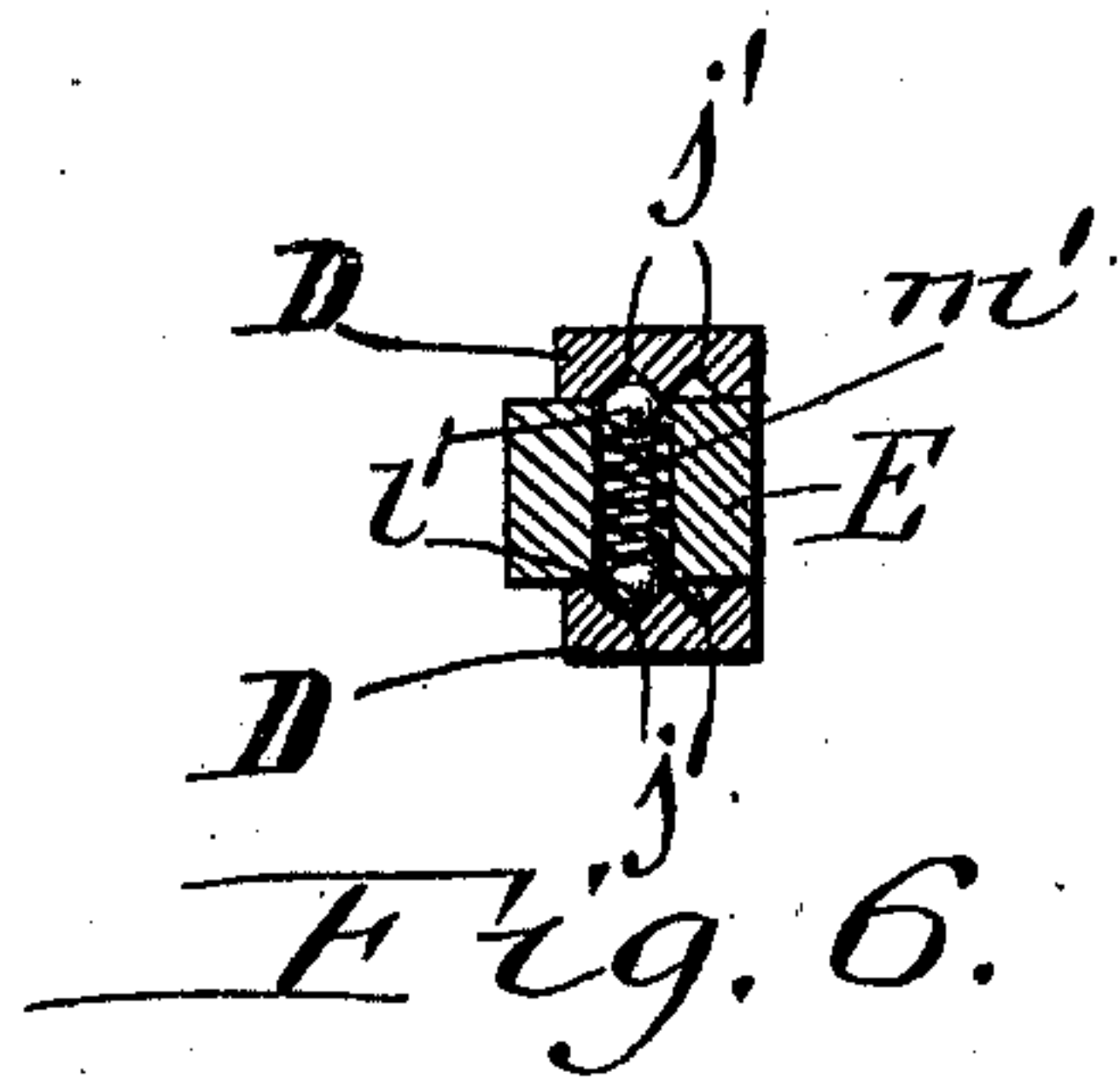
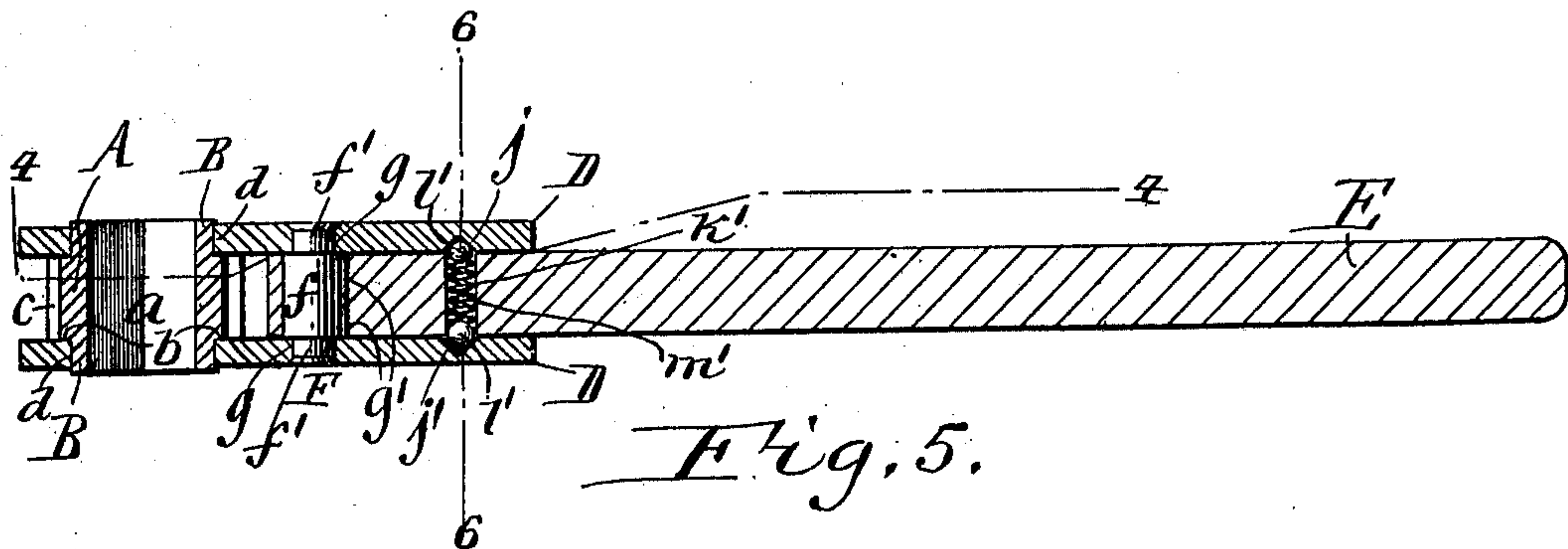
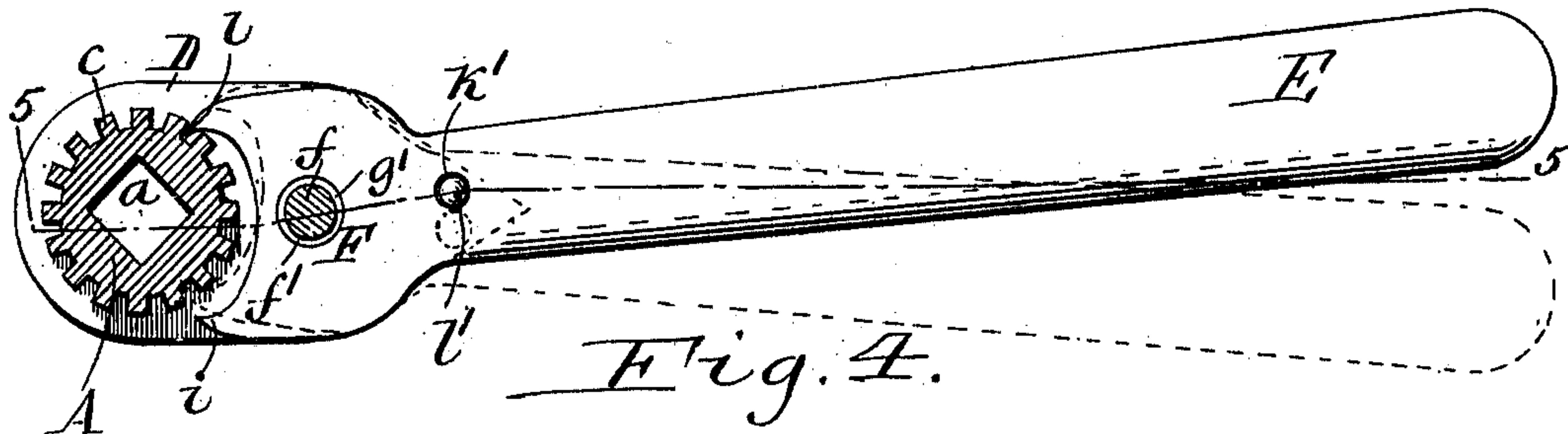
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

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RATCHET-WRENCH.

978,395.

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To all whom it may concern:

Be it known that I, ROBERT H. PETERS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Ratchet-Wrenches, of which the following is a specification.

This invention relates to a ratchet wrench of the double acting type whereby the article which is operated on can be turned in either direction without removing the wrench therefrom.

This invention has for its object the production of an improved reversible ratchet wrench which is capable of being operated by one hand for turning the article to which it is applied and also for reversing the action of the ratchet mechanism without requiring a change in position of the hand from that in which it holds the wrench while turning the article operated on.

In the accompanying drawings consisting of two sheets: Figure 1 is a horizontal longitudinal section of one form of my improved wrench taken in line 1—1, Fig. 2. Fig. 2 is a vertical longitudinal section in line 2—2, Fig. 1. Fig. 3 is a cross section in line 3—3, Fig. 2. Fig. 4 is a horizontal longitudinal section showing another form of my improved wrench in line 4—4, Fig. 5. Fig. 5 is a vertical longitudinal section in line 5—5, Fig. 4. Fig. 6 is a vertical cross section in line 6—6, Fig. 5. Fig. 7 is a detached plan view of one of the supporting bars of the wrench, shown in Figs. 4, 5 and 6.

Similar letters of reference indicate corresponding parts throughout the several views.

A represents the barrel of the wrench which is of circular form and provided axially with a socket *a* of flat sided form in cross section so as to compel the head or nut of a bolt or other article of corresponding shape placed in the same to turn with the barrel. At its opposite ends the barrel is provided with circular trunnions B which are reduced or of smaller diameter than the central part of the barrel, thereby forming outwardly facing shoulders *b* at the base of said trunnions. On its periphery and between said trunnions the barrel is provided with an annular row of ratchet teeth *c* each of which preferably has abrupt or substantially radial faces on its opposite sides. The barrel is rotatably mounted in a support or frame which preferably consists of two par-

allel bars or plates D, D which are provided at their corresponding outer ends with bearing openings *d* which are axially in line. The barrel is arranged between the outer ends of the supporting bars and its trunnions are journaled in the bearing openings thereof and their shoulders *b* engage with the inner opposing sides of the bars so as to hold the barrel against axial movement but permitting the same to turn relatively to said bars.

Between the inner ends of the supporting bars is arranged the front end of a handle E which may be pivotally connected therewith in any suitable manner but preferably by means of a pivot pin or rivet F which is arranged parallel with the axis of the barrel and has a large cylindrical central part *f* on which the handle turns, and reduced opposite ends *f*¹ which are secured in openings *g* in the adjacent parts of the supporting bars by upsetting the extremities of the pivot pin on the outer sides of the supporting bars. The pivot pin F is preferably further secured to the supporting bars D, D by means of a key *f*² passing lengthwise through the pin F and through the bars D, D, as shown in Figs. 1 and 2. The outwardly facing shoulders *g*¹ formed on the pivot pin F between the large central and the reduced end parts thereof bear against the opposing inner sides of the supporting bars, whereby the latter are maintained at the proper distance apart and binding of the handle between the same is avoided. At the front end of the handle and on opposite sides of its pivotal connection with the supporting bars the handle is provided with ratchet jaws, dogs or pawls *i*, *i* which are so spaced relatively to the ratchet teeth of the barrel that in the central position of the handle both of its jaws are disengaged from the teeth of the barrel but upon turning the handle in either direction from its central position one or the other of its jaws will engage with the adjacent teeth of the barrel and cause the latter together with the article to which it is applied to turn with the handle. Upon rocking the handle while thus turned at one angle relatively to its support the operative jaw will be engaged with the ratchet teeth during the forward movement of the handle and disengaged therefrom during the backward movement of the handle but the other jaw remains at this time wholly out of

engagement from the ratchet teeth, thereby causing the barrel and the article to which it is applied to be turned intermittently in one direction. If, after turning the wrench in one direction while in engagement with an article, it is desired to reverse the action of the ratchet device, it is only necessary to turn the handle on its support, so that it is arranged at an angle thereto on the opposite side of its pivot, whereby the previous idle jaw is moved into engagement with the ratchet teeth of the barrel while the previous active jaw is moved out of engagement from said teeth. Upon oscillating the handle and supporting bars in this reversed position of the handle, the active jaw will engage the ratchet teeth during the forward stroke of the handle and turn the barrel in the opposite direction and during its backward movement this jaw will trip idly past the teeth while the other jaw will at this time remain out of engagement from the teeth during both the forward and backward movement of the handle. This reversal of the action of the ratchet wrench is effected while the operator grasps with but one hand the handle of the wrench and in a position in which the turning of the barrel is effected, thereby avoiding the necessity of changing his hold on the wrench for reversing the ratchet device and also leaving the other hand of the operator entirely free for other work. It is evident therefore that this wrench is capable of turning an article forward or backward at will by the use of but one hand and without releasing the hold of the hand on the wrench which it has during the turning operation. This wrench is therefore particularly suited for use where a change of hold of one hand on the article being turned is not permissible for reversing the ratchet device and the use of the other hand is not possible.

Although this wrench is desirable for general use under the special conditions above mentioned, it is particularly useful for a person having but one hand inasmuch as it permits such a person to do work as effectively with this wrench as a person having two hands.

For the purpose of holding the handle and supporting bars yieldingly at one angle or another relatively to each other for causing the ratchet mechanism to operate one way or the other a detent device is provided which may be variously constructed. The detent device for this purpose shown in Figs. 1, 2 and 3 comprises two V-shaped recesses or grooves j, j formed in the periphery of the central part of the pivot pin F , a detent pawl or member k sliding in a guideway l formed in the handle and communicating with the bore of its pivot opening and having a pointed or conical front end which is adapted to engage with one or the other of said recesses

j , and a spring m arranged in said guideway and bearing at one end against the rear end of the detent pawl and at its opposite end against the rear wall of the guideway. The spring m is of such tension that it holds the detent member k in one recess j with sufficient friction that the handle remains yieldingly in a position at one angle to the supporting bars. When it is desired to shift the handle relatively to the bars it is only necessary while holding the handle to apply sufficient extra pressure to the same in a direction reverse to the previous forward movement of the handle to overcome the frictional engagement of the detent member with one of the recesses and cause the detent member to leave the respective recess and enter the other recesses j after which the detent member holds the handle and supporting bars frictionally in a relatively reversed position.

The construction of detent device shown in Figs. 4-7 consists of a pair of conical recesses j^1, j^1 formed on the inner flat side of each supporting bar at the inner end thereof the recesses of one bar being in line and corresponding with the recesses of the other bar, an opening k^1 formed in the handle parallel with the axis of its pivot f , detent members l^1 preferably in the form of balls, arranged in said opening at opposite ends thereof and each adapted to engage with one or the other of a pair of recesses j^1 , and a spring m^1 arranged in the opening k^1 and bearing at its opposite ends against the detent members l^1 and operating to press the same against the supporting bars. This detent device is preferably so located that the pivot F of the handle is between the detent device and the barrel, as shown in the drawings. The spring m^1 is of such tension that it holds the detent members l^1 in corresponding recesses j^1 of the bars with sufficient friction to hold the handle at one angle relatively to the bars. When it is desired to shift the angle of the handle relatively to the bars, it is only necessary while holding the handle to apply sufficient extra pressure to the same in a direction reverse to the previous forward movement of the handle to overcome the frictional engagement of the detent members with one set of recesses j^1 and cause the same to leave the latter and enter the other set of recesses j^1 after which the detent members l^1 hold the handle and supporting bars frictionally in a reversed position of these parts relatively to each other.

The operation of the detent devices is effected while holding the handle of the wrench by one hand in the position for turning the wrench and does not require any change of hold for this purpose nor the use of the other hand, thereby leaving the latter free for other work.

I claim as my invention:

1. A ratchet wrench comprising a rotata- 130

ble barrel having an axial socket and provided on its periphery with an annular row of teeth, a support on which said barrel is pivoted, a handle pivoted on said support
 5 on one side of said barrel and provided on opposite sides of its pivot with jaws which are adapted to engage with the teeth on the adjacent part of said barrel, and a yielding detent device for holding said handle
 10 yieldingly in a position in which either one or the other of its jaws engages with the teeth of the barrel.

2. A ratchet wrench comprising a rotatable barrel having an axial socket, circular
 15 trunnions at its opposite ends and an annular row of ratchet teeth on its periphery, a support comprising two bars provided at their outer ends with circular bearing openings in which said trunnions are journaled,
 20 a handle pivoted on the inner ends of said bars and provided on opposite sides of its pivot with ratchet jaws which are adapted to engage with the adjacent teeth of said barrel, and a yielding detent device for holding
 25 said handle yieldingly in a position in which either one or the other of its jaws engages with the teeth of the barrel.

3. A ratchet wrench comprising a rotatable barrel having an axial socket, circular
 30 trunnions at its opposite ends and an annular row of ratchet teeth on its periphery, a support comprising two bars provided at their outer ends with circular bearing openings in which said trunnions are journaled,
 35 a pivot pin connected with said bars on one side of said barrel and provided on its periphery with two recesses which are arranged side by side, a handle pivoted on said pin between said barrel and provided with
 40 a guideway opening into the pivot opening, a detent pawl or member arranged in said guideway and adapted to engage with one or the other of said recesses, and a spring
 45 arranged in said guideway and bearing at its opposite ends against said detent member and the rear wall of said guideway for holding the latter yieldingly in engagement with one or the other of said recesses.

Witness my hand this 22nd day of December, 1909.

ROBERT H. PETERS.

Witnesses:

THEO. L. POPP,
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