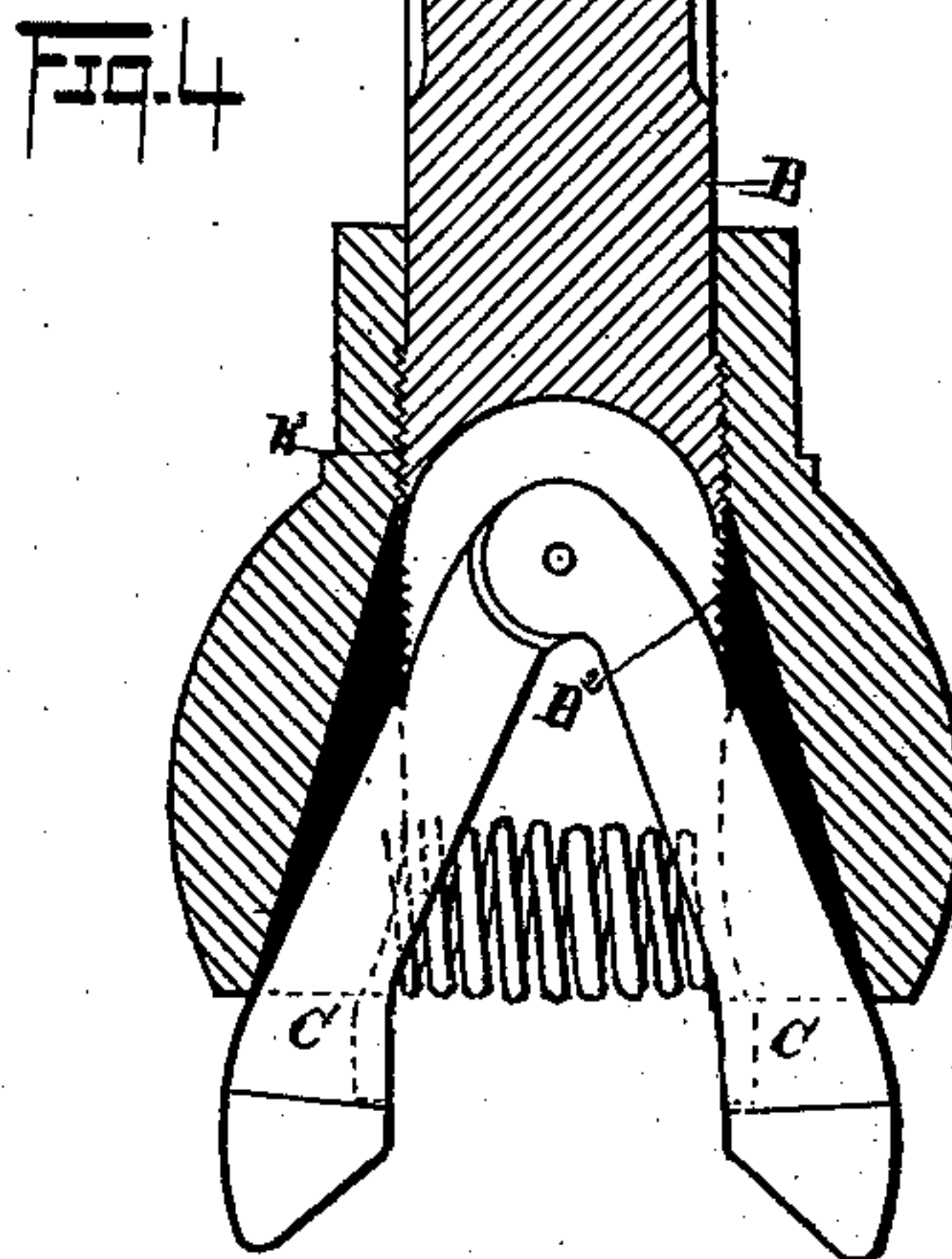
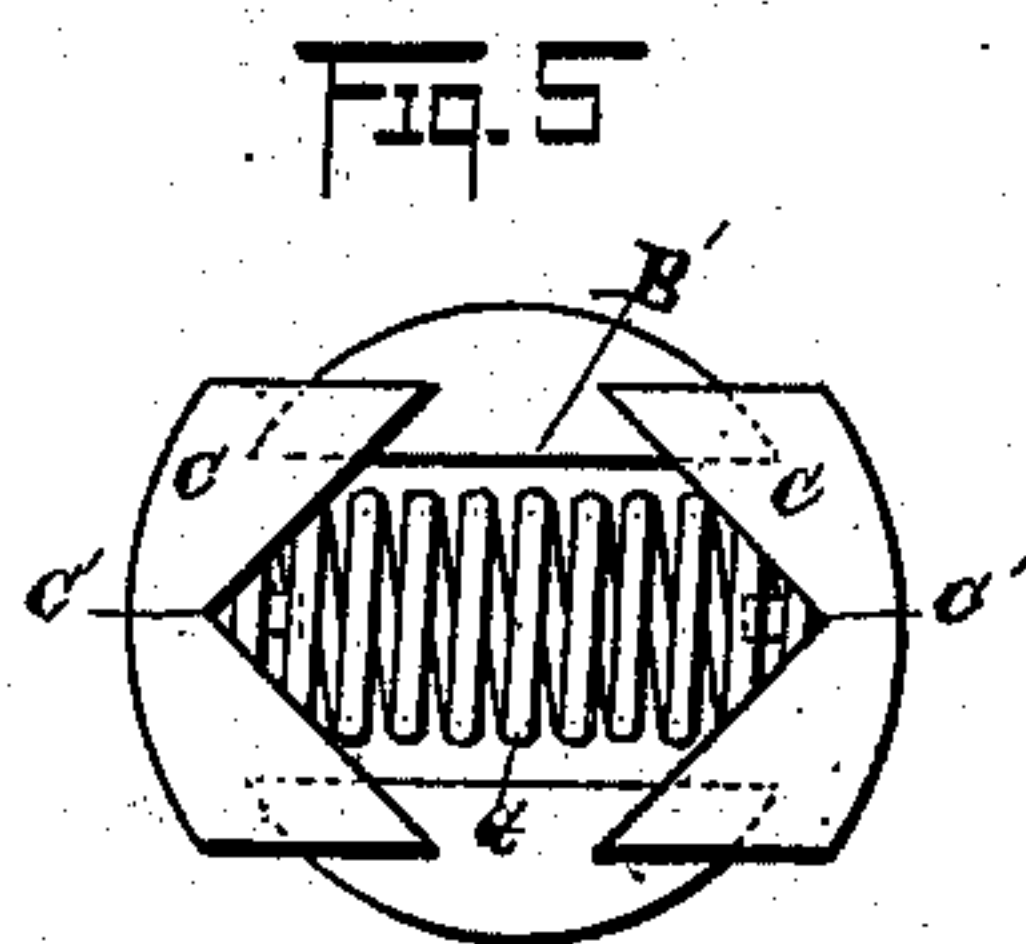
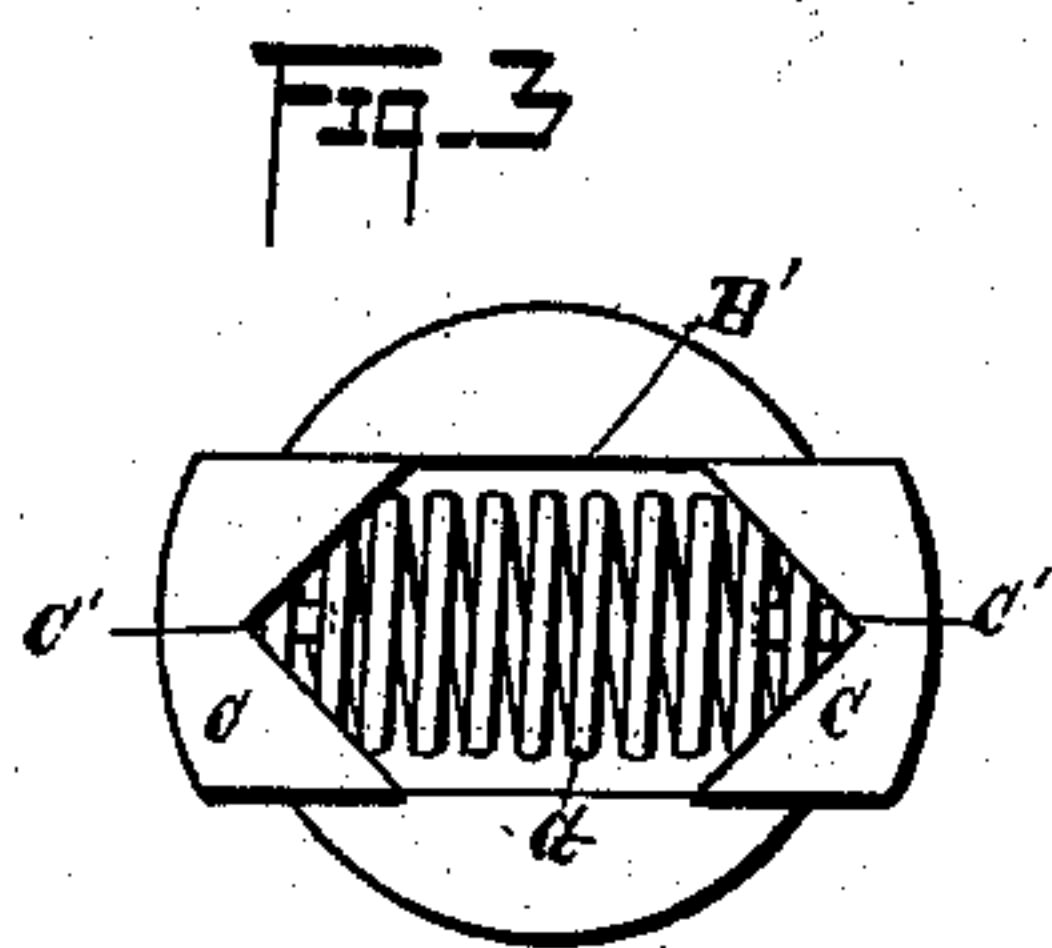
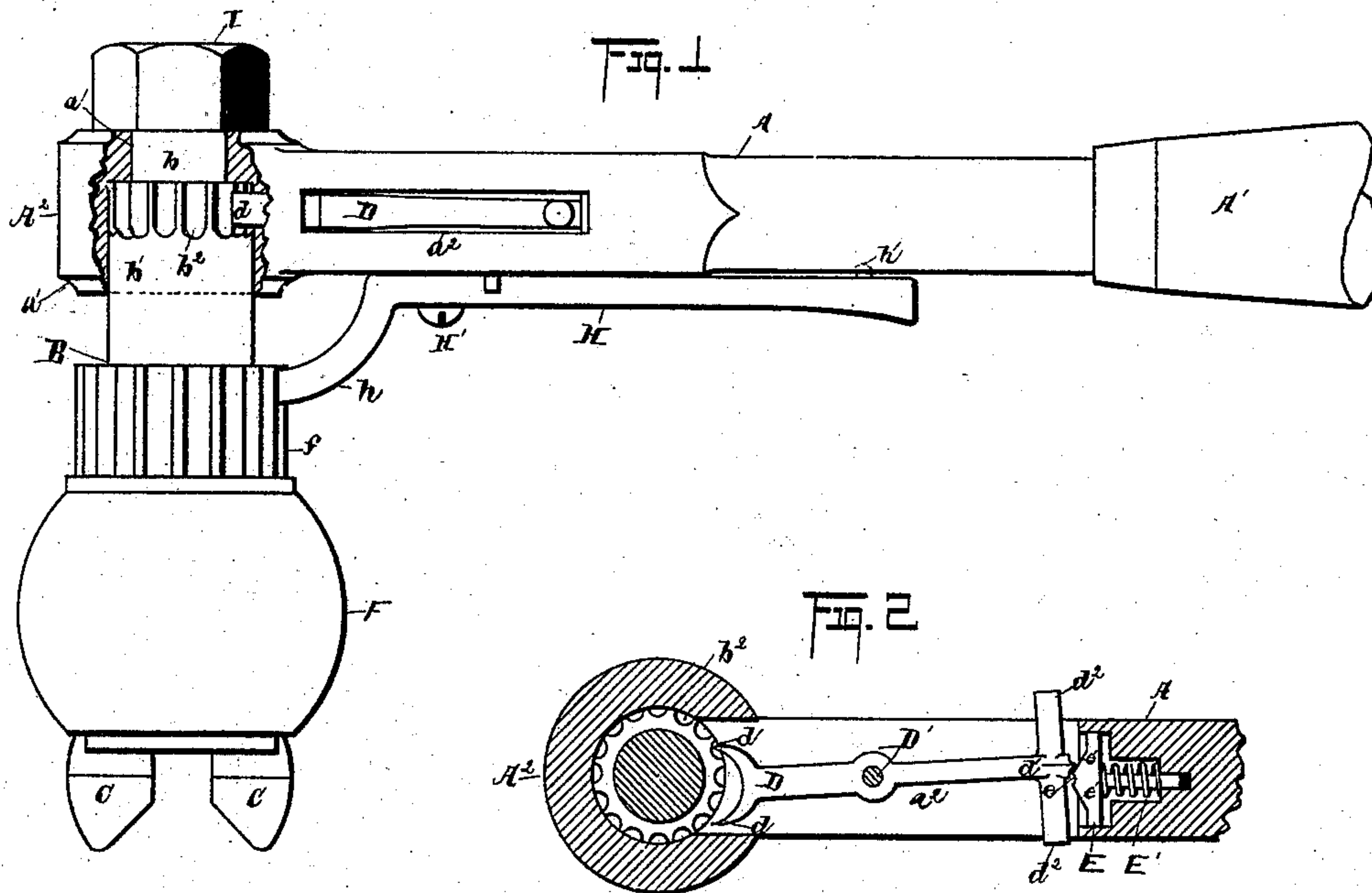


(No Model.)

W. H. WHITMORE.  
RATCHET WRENCH.

No. 400,722.

Patented Apr. 2, 1889.



WITNESSES.

Billie Louie.  
Geo. W. King

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# UNITED STATES PATENT OFFICE.

WILLIAM H. WHITMORE, OF CLEVELAND, OHIO.

## RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 400,722, dated April 2, 1889.

Application filed June 23, 1888. Serial No. 277,939. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. WHITMORE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain  
5 new and useful Improvements in Ratchet-Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable  
10 others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in ratchet-wrenches; and it consists in certain features of construction and in combination  
15 of parts, hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section. Fig. 2 is a plan in section on line  $x x$ , Fig. 1. Figs. 3  
20 and 5 are bottom plans of the jaws and lower end of the spindle. Fig. 4 is a side elevation of the jaws, showing also in section the spindle to which the jaws are attached.

A represents a lever, having usually attached a wooden handle,  $A'$ .

25 B is a spindle or stock having a slotted lower end, in which slot operate the jaws C. The latter are pivoted on pin  $c$ , such pin extending through both jaws and through the embracing-sections of the spindle, these jaws  
30 fitting nicely but easily in this slot  $B'$  of the spindle. The head  $A^2$  of the lever has a bore,  $a$ , that fits the reduced section  $b$  of the spindle, and has a counter-bore,  $a'$ , that fits section  $b'$  of the spindle. The extreme inner or  
35 upper portion of section  $b'$  is grooved at  $b^2$  to form a ratchet-wheel for engaging pawl D. The teeth of the ratchet-wheel are approximately of the form shown in Fig. 2, each face of a tooth being adapted to engage the pawl.  
40 The pawl operates in slot  $a^2$  of lever A, and is pivoted at  $D'$  to the embracing-sections of the lever. The head of the pawl is forked as shown, the prongs thereof,  $d$ , being separated some little distance. The opposite end of the  
45 pawl at  $d'$  is pointed and engages a spring-actuated catch, E, the latter being backed by a spring,  $E'$ , and having on the face thereof a central notch,  $e$ , for engaging point  $d'$  when the pawl is in its central position, in which  
50 neither of prongs  $d$  engage the ratchet-wheel. The face of catch E on either side of notch  $e$  is provided with inclines  $e'$ , that by engaging

point  $d'$ , when the pawl is turned in the one direction or the other from its central position, presses the pawl still farther laterally 55 until one prong  $d$  engages the ratchet, the catch being snubbed back by the action of the pawl, as it in turn is snubbed back by the ratchet-wheel with reverse movement of lever A. The pawl has only to move a trifle by the 60 action of an incline,  $e'$ , to cause the one prong  $d$  to engage the teeth of the ratchet-wheel, and after such engagement prong  $d$  will draw in the groove of the ratchet-wheel. Pawl D has thumb-pieces,  $d^2$ , extending laterally on 65 either side thereof, these thumb-pieces protruding beyond the sides of lever A, by means of which the pawl may be turned to a central position, so as not to engage the ratchet-wheel, or may be turned to the one side, so as to en- 70 gage either prong  $d$  with the ratchet-wheel, according to the direction in which the ratchet-wheel and spindle are to be turned.

Spindle B is provided with screw-threads at 75  $b^3$ , that engage corresponding internal threads on sleeve F. The spherical section of the sleeve is a mere matter of fancy, and might just as well be made cylindrical or of other form. The bore of the sleeve where it en- 80 gages jaws C had better be made a trifle conical; but this is not a matter of importance. Rounding off the internal edge at this part will answer every purpose. By turning the sleeve in the direction to extend it further 85 down over the jaws the latter are made to approach each other to cause the jaws to grasp, for instance, a nut or bolt-head. The inner or opposing faces of jaws C are preferably made angular, as shown at  $C'$ , to fit the corners of four-sided nuts or bolt-heads, in which 90 case they will also engage the opposite corners of hexagon or octagon nuts or heads, and will also grasp a round rod.

For small work the jaws may be somewhat narrow, not broader, for instance, than the 95 slot  $B'$ , as shown in Fig. 3, so that when the jaws are brought together they will grasp a very small nut. For larger work the jaws had better be broader, as shown in Fig. 5, the ends of the jaws being considerably broader than 100 slot  $B'$ . The jaws are distended by means of a spring. Spiral spring G, as shown, is well adapted for this purpose; but other springs, for instance, of the flat variety, will answer



the purpose. The inner end of sleeve F is fluted at *f* for turning by hand. In operating the wrench in close quarters section *b* of the sleeve is not always accessible to the hand of the operator, and for turning the sleeve F under such circumstances, and for tightening the sleeve upon the jaws harder than it could be done with the fingers, dog H is provided for the purpose, this dog being operated by hand. The dog is pivoted at H' to the under side of lever A. The dog is provided with prongs *h*, the plan of which is substantially the same as pawl D, and is therefore not shown in detail. The head or prongs of the dog are offset downward, as shown in Fig. 1, to bring these prongs within reach of section *f*, when sleeve F is turned down to the limit of its movement in this direction, and section *f* is long enough to engage prong *h* when the sleeve is turned up against the under side of the lever. The free end of dog H is provided with a conical-ended teat, *h'*, that engages a slight corresponding depression on the under side of lever A when the dog is in its central position, with neither prong engaging section *f*.

The dog may be turned in either direction and operated by the finger, so that the one prong *h* or the other will be made operative, according as the sleeve is to be turned down

in tightening the jaws or to be turned up in releasing the jaws. Of course, by using the dog the sleeve can be made to press much harder on the jaws, and consequently make the jaws grasp more firmly the nut or bolt-head than could be done by screwing down the sleeve by means of the fingers of the operator. The protruding end of spindle B above lever A is provided with nut I, to hold the spindle to its seat in the lever.

This wrench will be found useful in many places where it is difficult to operate an ordinary wrench.

What I claim is—

In a ratchet-wrench, the combination, with a lever, a spindle journaled therein, and pawl mounted on the lever and engaging the spindle for operating the latter, of a sleeve mounted on the spindle for compressing the jaws of the latter, and a dog mounted on the lever and adapted to engage the sleeve for moving the latter up or down, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 1st day of February, 1888.

WILLIAM H. WHITMORE.

Witnesses:

CHAS. H. DORER,

ALBERT E. LYNCH.