

No. 666,512.

Patented Jan. 22, 1901.

Z. T. FURBISH.  
RATCHET TOOL.

(Application filed Apr. 12, 1900.)

(No Model.)

Fig. 1.

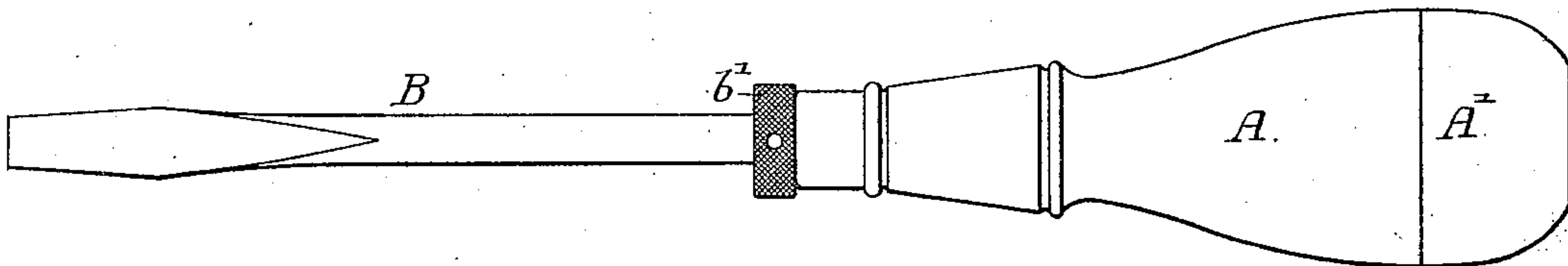


Fig. 8.

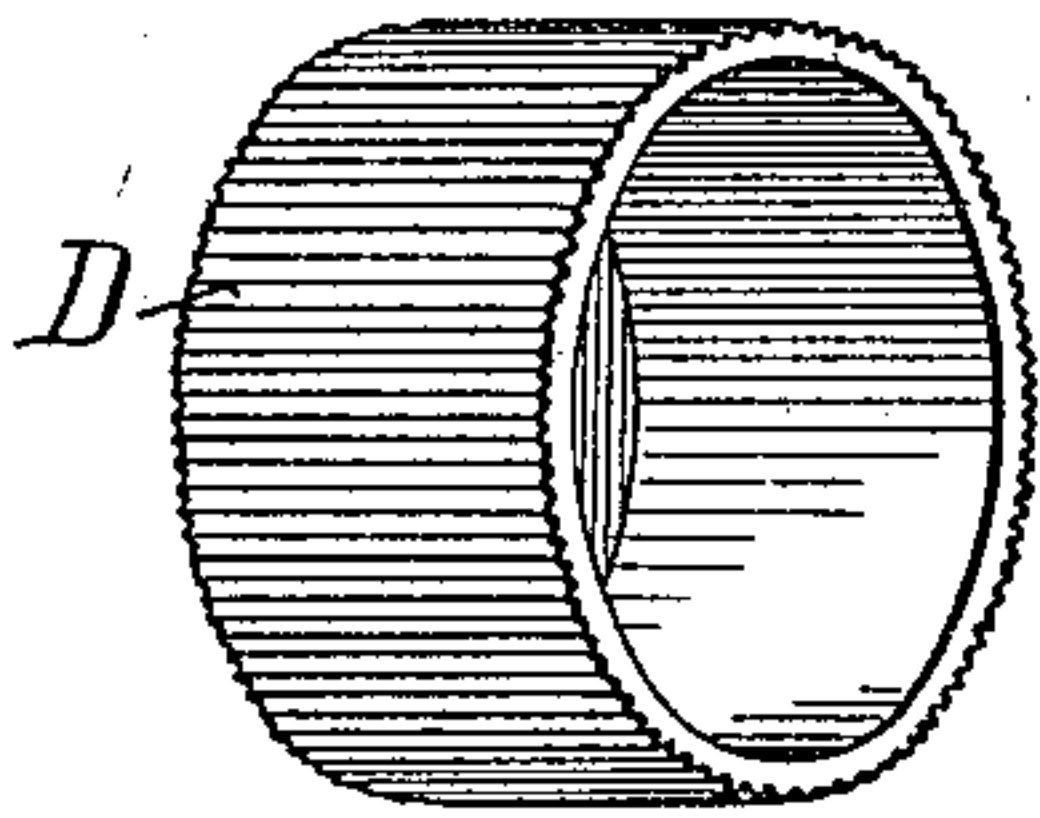


Fig. 2.

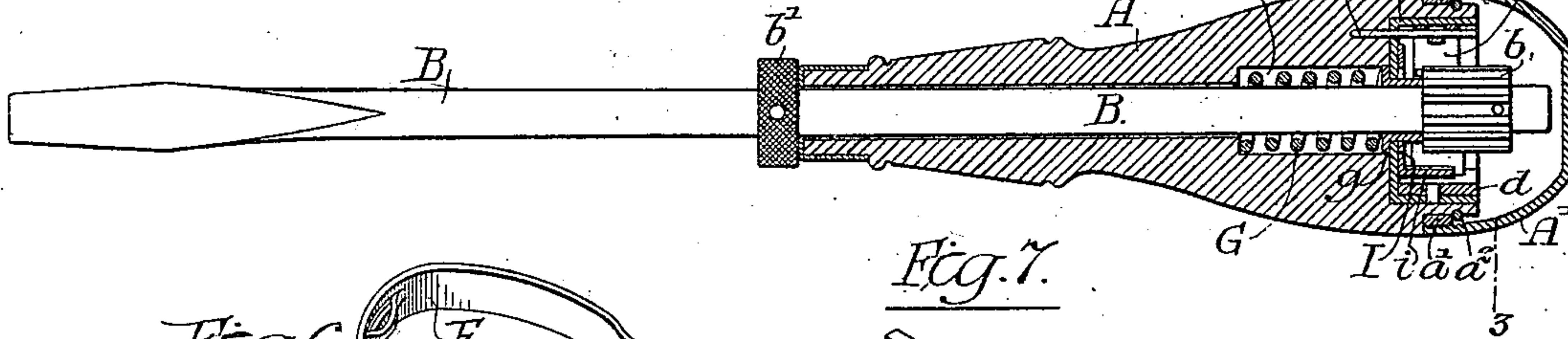


Fig. 7.

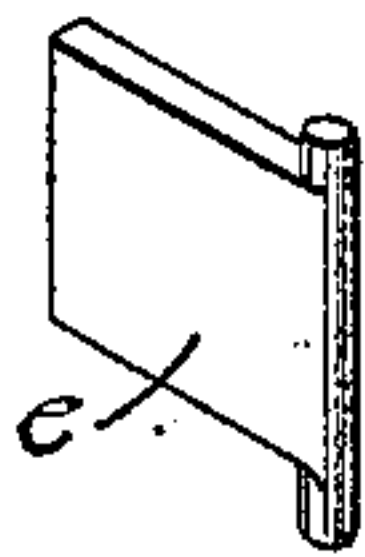


Fig. 6.

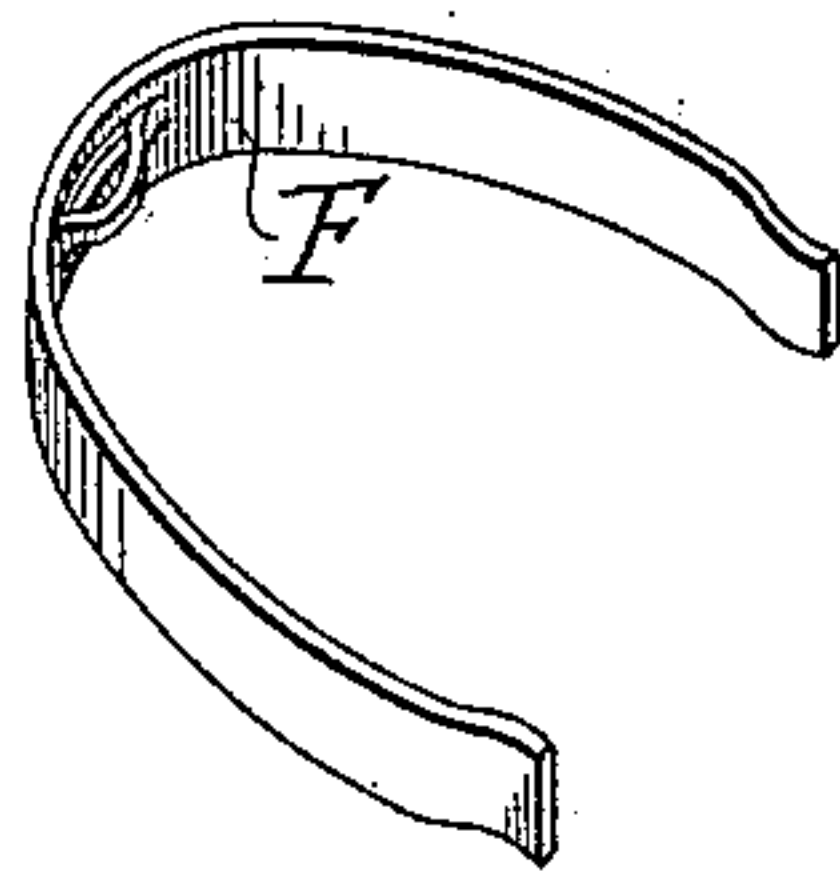


Fig. 4.

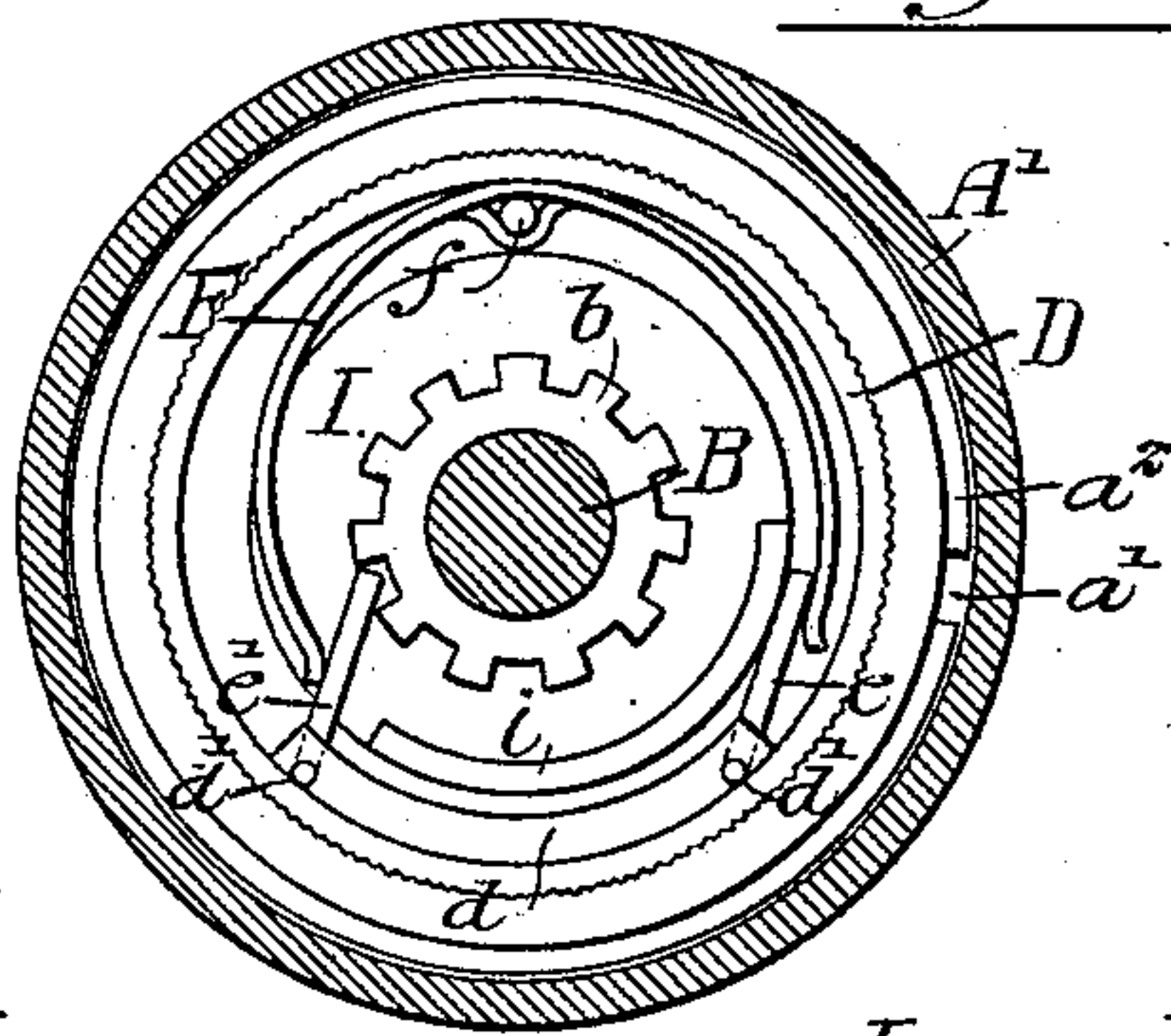


Fig. 3.

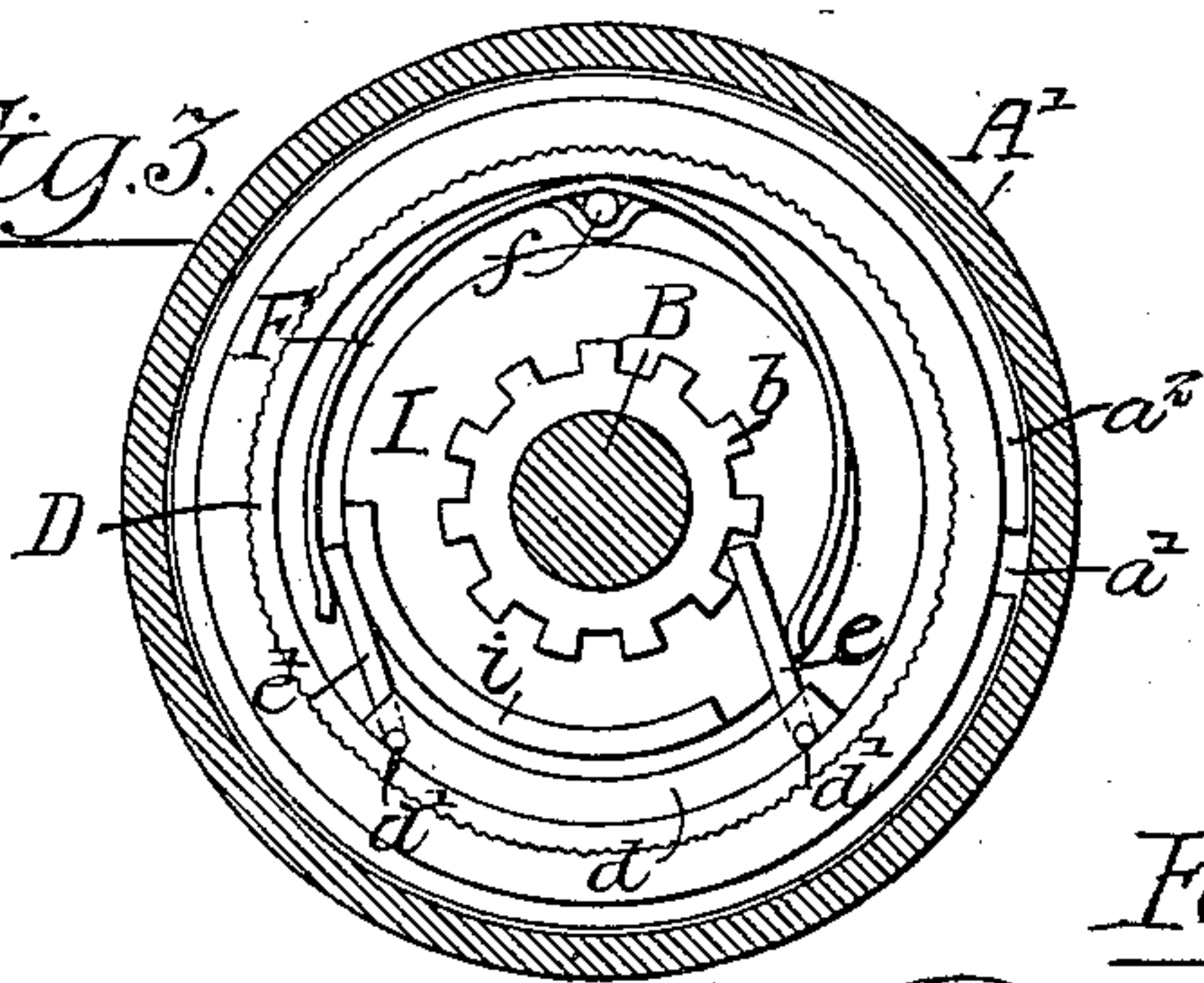
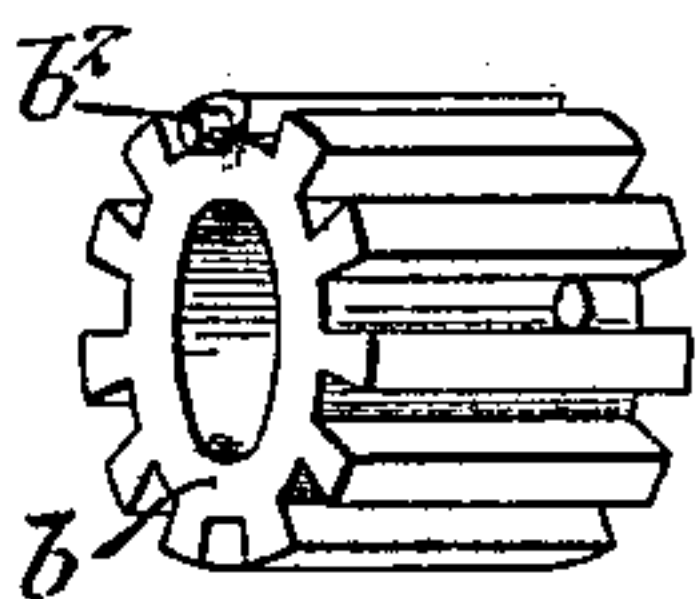
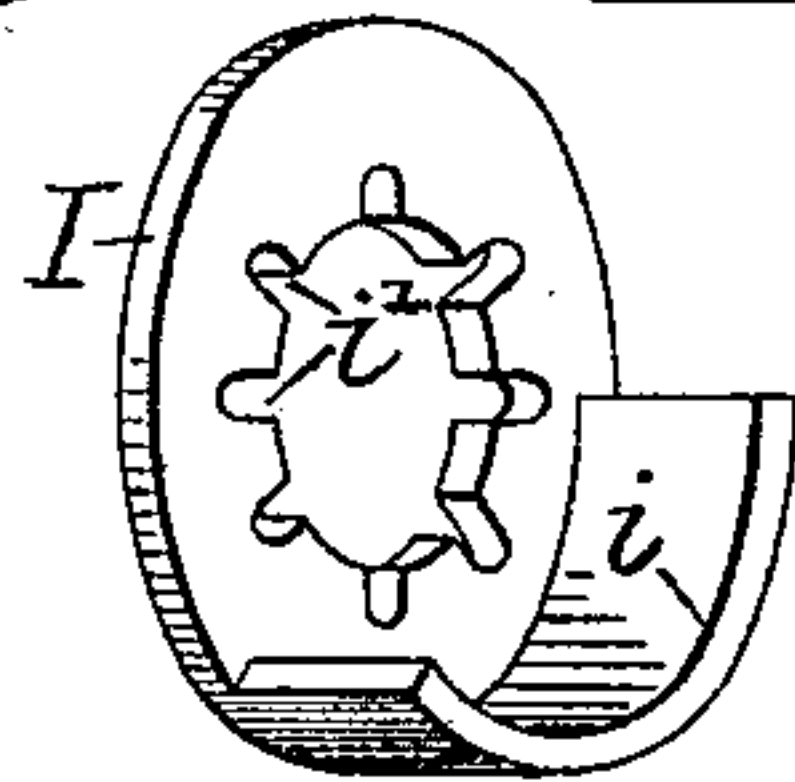


Fig. 5.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

ZACHRY T. FURBISH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
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## RATCHET-TOOL.

SPECIFICATION forming part of Letters Patent No. 666,512, dated January 22, 1901.

Application filed April 12, 1900. Serial No. 12,601. (No model.)

*To all whom it may concern:*

Be it known that I, ZACHRY T. FURBISH, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain  
5 Improvements in Ratchet-Tools, of which the following is a specification.

One object of my invention is to construct a ratchet-tool in which the ratchet mechanism is in the head of the handle of the tool and  
10 in which the pawls can be shifted by moving the stem of the tool in the handle.

A further object of my invention is to firmly secure the cap to the body of the handle, as fully described hereinafter.

15 In the accompanying drawings I have illustrated and will describe my invention as applied to a screw-driver; but it will be understood that a drill, countersink-bit, or other tool can be substituted for a screw-driver  
20 without departing from my invention.

In the accompanying drawings, Figure 1 is a side view of a screw-driver, illustrating my invention. Fig. 2 is a longitudinal sectional view. Fig. 3 is a transverse sectional view,  
25 drawn to an enlarged scale, on the line 3 3, Fig. 2, showing one pawl in engagement and the other pawl thrown out. Fig. 4 is a view similar to Fig. 3 with the pawls reversed. Fig. 5 is a perspective view showing details  
30 of the shifting mechanism. Fig. 6 is a perspective view of the pawl-spring. Fig. 7 is a perspective view of one of the pawls, and Fig. 8 is a detached perspective view of the shell and bearing-plate.

35 A is the handle.

B is the spindle of the tool, which in the present instance is a screw-driver. This spindle is mounted in a central opening in the handle, as shown in Fig. 2, and secured to the  
40 upper end of this spindle is a ratchet-wheel *b*. (Shown in Fig. 5.) This ratchet-wheel in the present instance is pinned to the spindle. Secured to the spindle directly beyond the handle is a collar *b'*. This collar is preferably  
45 roughened on its outer surface and is for the purpose of starting the screw by moving the spindle direct with the thumb and first finger and is also used for longitudinally moving the spindle for shifting the pawls, as  
50 described hereinafter.

Driven into a cavity in the end of the han-

dle A is a shell D. This shell has a roughened outer surface, preferably formed by small longitudinal ribs. These ribs cut their way through the wood when the shell is  
55 driven into the handle, and thus secure the shell firmly to the handle, preventing it from turning therein. Secured to the shell is a segmental plate *d*, having bearings *d'* for the pawls *e* and *e'*. These pawls are shaped as  
60 shown in Fig. 7 and are so proportioned that they engage the ratchet-wheel *b*, as indicated in Figs. 3 and 4.

Secured to a pin *f*, driven through the base of the shell D and into the handle, is a spring  
65 F, Fig. 6, which presses upon both pawls, as shown, so as to keep either one or the other in yielding engagement with the ratchet-wheel. The spring is secured to the pin *f* by  
70 making two incisions in the spring and forcing out the central portion to form a socket, through which the pin passes, as shown in Fig. 6.

Mounted within a cavity *a* in the handle is a spiral spring G, which presses against a  
75 flanged sleeve *g*. This sleeve passes through the shell D and rests against the ratchet-wheel *b*.

Mounted on the sleeve *g* between the shell and the ratchet-wheel *b* is a disk I, having a  
80 segmental flange *i*, extending in line with the pawls *e e'*. This disk I has a series of slots or holes *i'*, Fig. 5, and on the ratchet-wheel *b* is a pin *b<sup>2</sup>* in line with the slots. The pin *b<sup>2</sup>* is normally out of engagement with the slotted  
85 disk. When the spindle is drawn out to compress the spring G, the pin *b<sup>2</sup>* will pass into one of the slots *i'*, and by turning the spindle when it is in this position the disk I and its flange can be turned so as to throw either  
90 one or the other of the pawls out of engagement with the ratchet-wheel or throw both of the pawls out of engagement, so as to allow the ratchet-wheel to be freed, as described.

95 Fig. 3 shows the disk moved to the left and the left pawl thrown out and the right pawl thrown in, while Fig. 4 shows the disk moved to the right and the right pawl thrown out and the left pawl thrown in. As soon as the  
100 spindle is released the spring forces the pin *b<sup>2</sup>* out of engagement with the disk. Thus



the flange remains in the set position, while the spindle will be under the control of one of the pawls and will only turn in the one direction. It is a difficult matter in pawls of this character, where the handle is to be turned by pressure from the top, to provide means for securely holding the cap to the top of the handle. This cap must be removable, so that access may be had to the mechanism.

10 I reduce the end of the handle, as shown in Fig. 2, and on the reduced portion I place a sleeve  $a'$ , of metal, having a screw-threaded periphery, and in order to hold this sleeve in place I make an annular groove in the re-  
15 duced portion directly in front of the sleeve and spring into the groove a spring-ring  $a^2$ , thus preventing the sleeve  $a'$  from moving longitudinally. The cap  $A'$  may be of metal and has an internal screw-thread, which is  
20 adapted to the screw-threads of the sleeve  $a'$ , so that when the cap is in place it is firmly held to the body of the handle and can be readily removed when it is wished to gain access to the operating mechanism.

25 I claim as my invention—

1. The combination of a handle, a spindle, an externally-toothed ratchet-wheel keyed on the spindle, a spring tending to hold the spindle in its normal position, two pawls constructed to engage the ratchet-wheel, a shifting-disk having a flange engaging the pawls, with a pin on the ratchet-wheel engaging said disk when the spindle is moved longitudinally against the pressure of the spring, substantially as described.

35 2. The combination of a handle, a spindle, an externally-toothed ratchet-wheel keyed to the end of the spindle, a shell forced into the cavity in the end of the handle, said shell having a ribbed outer surface, so as to prevent it  
40 turning in the handle, a segmental plate se-

cured to the shell, bearings therein, pawls adapted to the bearings and engaging the ratchet-wheel, and shifting mechanism for shifting the pawls, substantially as described. 45

3. The combination of a handle, a shell forced in the end of the handle, pawls pivoted to the shell a spindle within the handle, a ratchet-wheel on the spindle and within the shell, a shifter-plate between the ratchet-wheel and the shell, a flange on the plate arranged to engage the pawls and shift them, a flanged sleeve on the spindle in front of the ratchet-wheel, the flange of said sleeve resting in front of the shell, a spring between the  
50 handle and the sleeve tending to keep the spindle in its normal position, a pin on the ratchet-wheel, the shifter-disk having a series of openings for the reception of the pin, a spring mounted on the pin within the shell  
55 and bearing upon the pawls, the whole being so constructed that when the spindle is drawn out it will engage the shifter, and by turning the spindle the shifter will be turned throwing one or both of the pawls out of engage-  
60 ment with the ratchet-wheel, substantially as described. 65

4. The combination of a handle, a spindle adapted to the handle, a sleeve on the end of the handle, said sleeve being threaded on its  
70 periphery, the handle having an annular recess in front of the sleeve, a spring-ring adapted to the recesses, a cap having an internal thread adapted to the thread on the sleeve, substantially as described. 75

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

ZACHRY T. FURBISH.

Witnesses:

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JOS. H. KLEIN.