

No. 680,166.

Patented Aug. 6, 1901.

J. T. McGRATH.
FLUE CUTTER.

(Application filed Oct. 23, 1900.)

(No Model.)

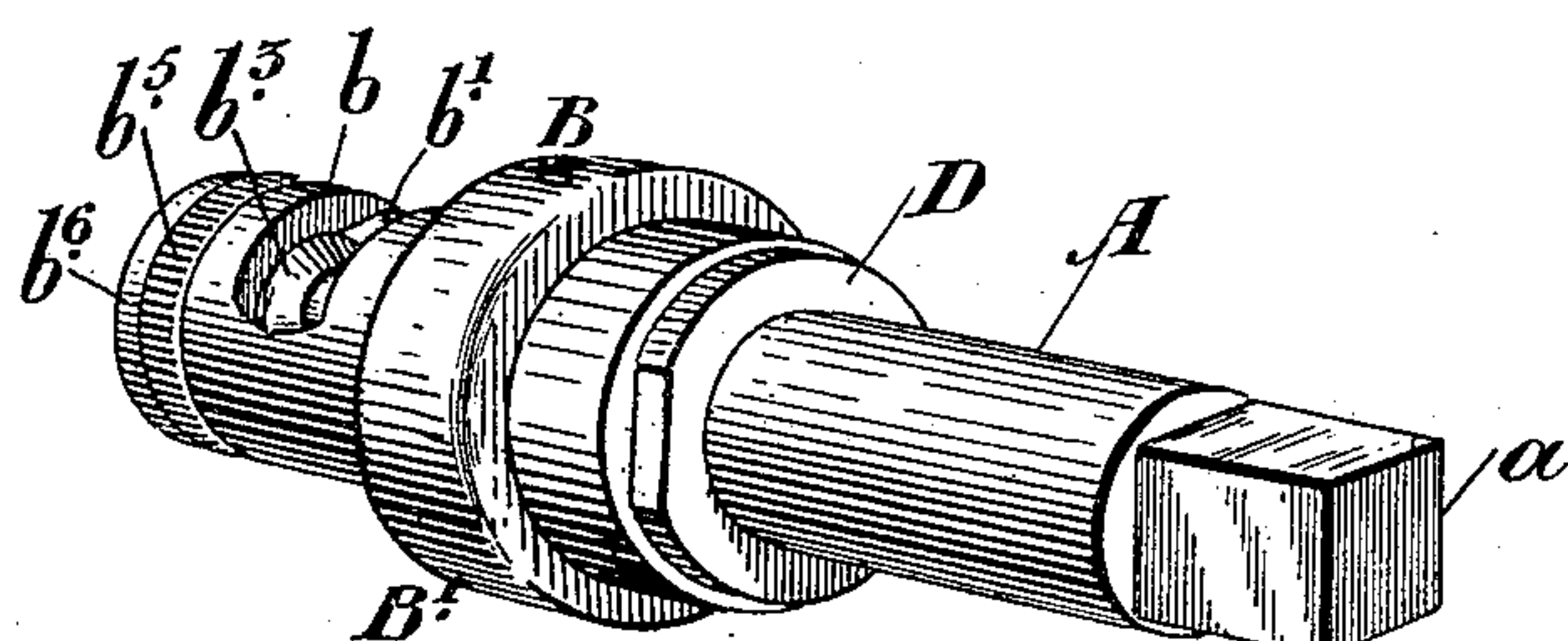


Fig. 1.

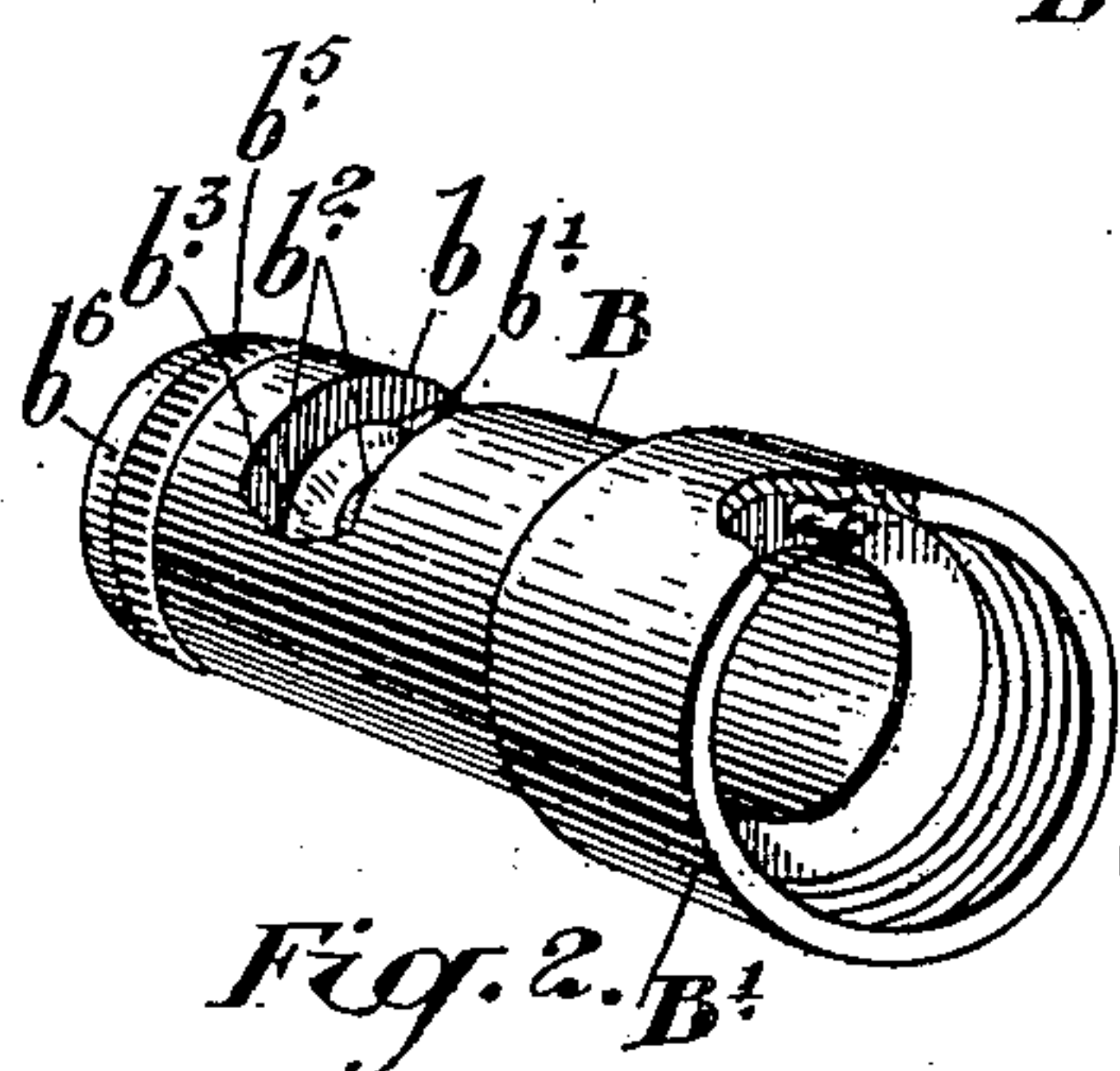


Fig. 2.

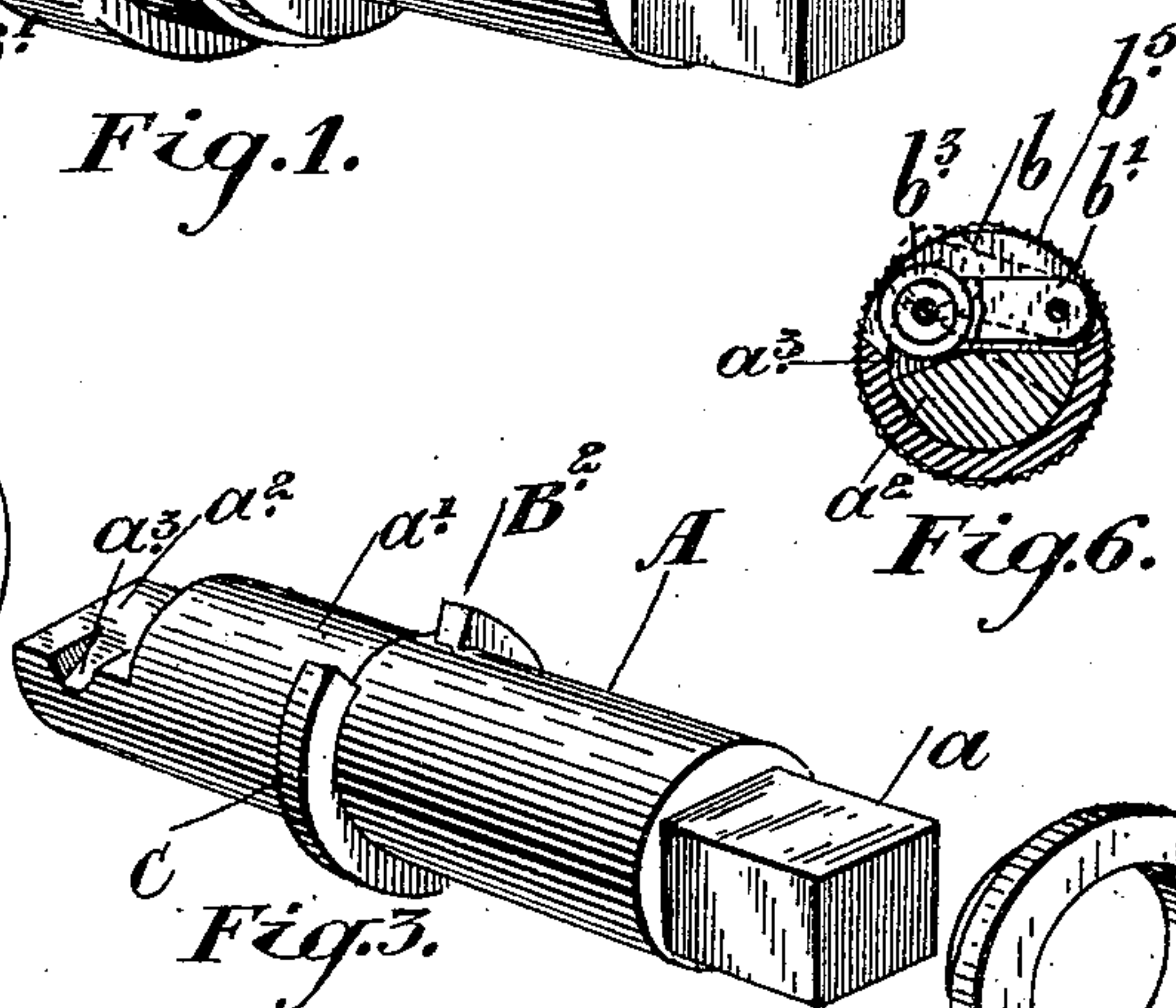


Fig. 3.



Fig. 6.

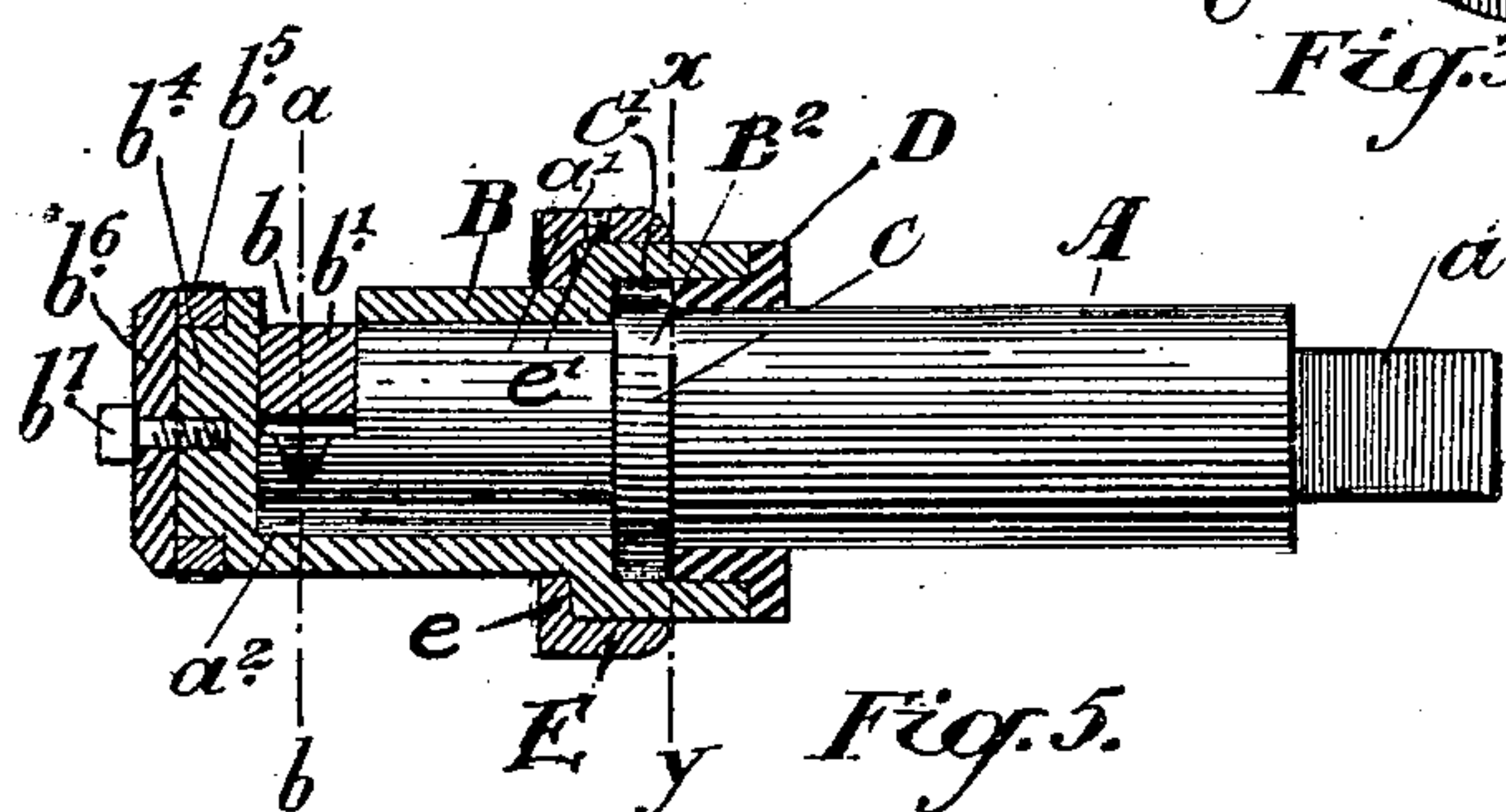


Fig. 5.

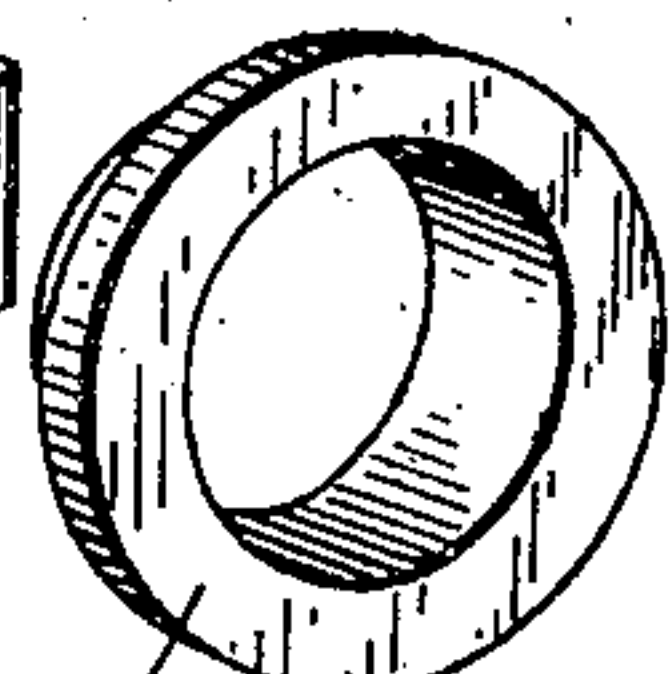


Fig. 4.

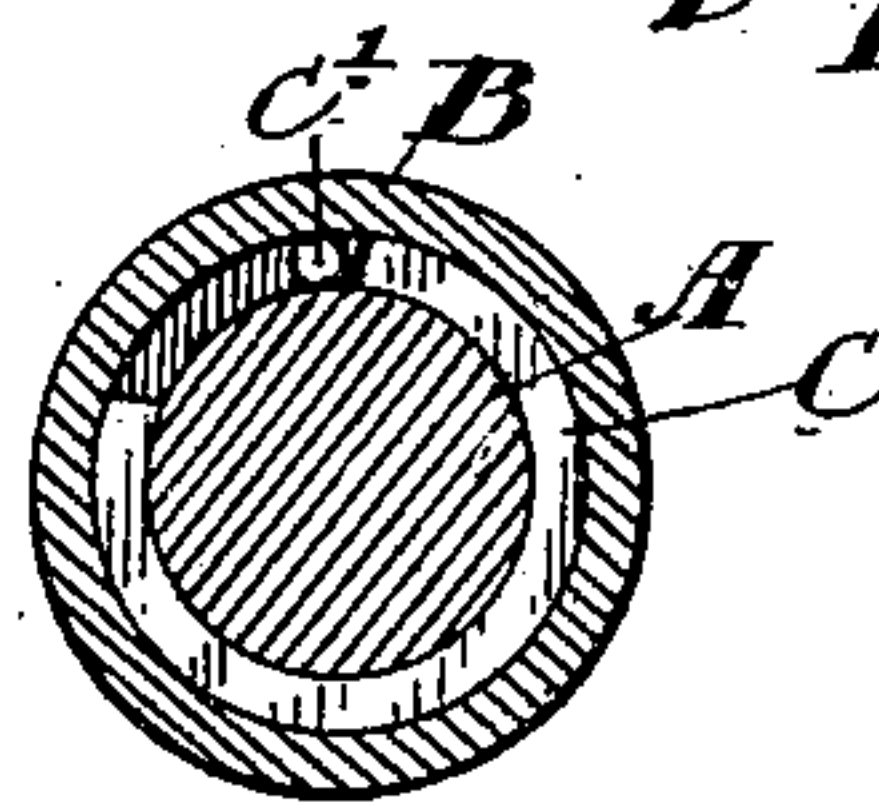


Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN T. McGRATH, OF STRATFORD, CANADA.

FLUE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 680,166, dated August 6, 1901.

Application filed October 23, 1900. Serial No. 34,086. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. McGRATH, of the city of Stratford, in the county of Perth, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Flue-Cutters, of which the following is a specification.

My invention relates to improvements in flue-cutters; and the object of the invention is to provide an automatic adjustment for the cutting-wheel of the tool, whereby it may be fed diametrically outwardly in proportion as the cut increases in depth; and it consists, essentially, of a cylindrical casing having an opening in the periphery thereof, a cutting-wheel adjustably held in said opening, a central rotary spindle with a square shoulder designed to adjust the position of the arms carrying the wheel, and means for limiting said adjustment, as hereinafter more particularly explained.

Figure 1 is a general perspective view of my cutter unattached. Fig. 2 is a detail of the cylindrical casing. Fig. 3 is a detail of the central spindle. Fig. 4 is a detail of the end collar. Fig. 5 is a longitudinal sectional view through the cutter. Fig. 6 is a cross-sectional view of my cutter on the line $a b$, Fig. 5. Fig. 7 is a similar view on the line $x y$, Fig. 5.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is a spindle provided with a square inner end a to fit the sockets of the driving-engine and a reduced outer end a' .

B is a cylindrical casing inclosing the outer end of the spindle A and provided with a closed outer end.

b is an opening formed in the casing in proximity to the outer end. b' is a bar pivotally secured within the wall of the opening b at one end, the opposite end thereof having a cutting-wheel b^3 , formed with a V-shaped crown loosely journaled therein.

a^2 is a segmental extension to the outer end of the spindle A and forming a shoulder extending into the casing beneath the bar b' and serving to support the free end thereof. The extension a^2 is provided with a notch a^3 to contain the crown portion of the cutting-wheel and yet allow the wheel to turn freely in its bearing.

b^4 is a circular projection forming the end of casing B.

b^5 is a knurled ring supported on the annular projection b^4 and secured thereon by the end plate b^6 , which is secured to the projection b^4 by the screw b^7 . The ring b^5 forms a fulcrum or bearing portion for the tool against the wall of the flue and is held by reason of its knurled surface stationary while the body of the tool rotates.

C is an annular flange which fits within the enlarged portion B' of the casing B and has a cut-away portion B^2 therein.

C' is a pin secured within the enlarged portion of the casing and extending lengthwise into the opening B^2 .

D is an end screw-cap which is screwed into the enlarged end of the casing and through which the central spindle extends and by means of the flange C holds the spindle A and casing B together.

E is a collar provided with an inwardly-extending annular flange e , having a knurled outer face. This collar is secured by a screw e' to the enlarged portion B' . The knurled face serves to hold the outer casing B stationary by pressing against the outside of the boiler, so as to carry the cutting-wheels into operation.

Having described the principal parts involved in my invention, I will briefly describe the operation of the same.

The tool is inserted into the flue, and on operating the engine the spindle A is caused to rotate and bring the segmental end shoulder a^2 of the spindle A into the position shown in dotted lines in Fig. 6, thereby raising the free end of the bar b' , and consequently bringing the cutting-wheel into contact with the interior surface of the flue. It will be readily seen that as this rotary movement is continued the pressure of the portion a^2 of the spindle against the wheel is continued. Thus as the wheel cuts the interior surface of the flue it is forced into said cut in proportion as the cut grows deeper until the pin C comes into contact with the opposite end of the notch B , thereby limiting the movement of the central spindle in relation to the casing. This operation locks the central spindle and casing together, and thus causes the casing and cutting-wheel to ro-

tate. It will be seen from this description that the cutting-wheel is automatically fed forward against the interior surface of the flue as the said wheel cuts into the wall thereof without any attention on the part of the operator.

What I claim as my invention is—

1. A flue-cutter, comprising a rotatable spindle provided with an integral segmental extension forming a shoulder, a cylindrical casing into which said spindle extends provided with an opening in its periphery, a pivoted arm, a cutting-wheel journaled therein, the segmental end or shoulder of said spindle coacting with said arm to press the wheel outwardly as and for the purpose specified.

2. In a flue-cutter, in combination a rotatable spindle having its end recessed to form a segmental extension, a cylindrical casing having a closed end, the said casing being fitted to said spindle, the head thereof abutting said extension whereby a pocket is formed between the end of the casing and end of the spindle, said casing having an opening through the same in alinement with said pocket, a pivoted arm located in said pocket guided between the head of the casing and the end of the spindle and a cutter carried by said arm, said extension coacting with said arm to force the cutter outwardly, substantially as described.

3. In a flue-cutter, in combination a cylindrical casing having an opening in its periphery, a cutting-wheel journaled in said opening and capable of an outward movement therein, a central rotatable spindle provided with an annular flange provided with a notch, a stop secured to said spindle designed to enter said notch and means for imparting an outward movement to said cutting-wheel as and for the purpose specified.

4. In a flue-cutter, in combination a cylindrical casing having an opening in its periphery in proximity to its outer end and provided with an enlarged portion at its inner end, a pin extending lengthwise from the vertical position of the wall of the cylinder, a central rotatable spindle having a notched annular collar, said notch being designed to receive said pin, a cutting-wheel capable of a movement within the opening of said cylinder, means for adjusting the position of said wheel, and a friction-collar loosely supported at the end of said casing as and for the purpose specified.

5. In a flue-cutter, in combination a cylindrical casing having an opening in its periphery in proximity to its outer end and an enlarged portion at its inner end, a central rotatable spindle, a cutting-wheel capable of an outward movement within the opening, a collar provided with an outer knurled face secured to the casing in proximity to its inner end and means combined with the knurled face for throwing the cutting-wheel outwardly as and for the purpose specified.

6. In a flue-cutter, in combination a cylindrical casing having an opening in its periphery in proximity to its outer end and an enlarged portion at its inner end, a cutting-wheel journaled within said opening, a central rotatable spindle extending beneath said wheel provided with a collar intermediate of its length designed to enter the enlarged portion of the casing and an end nut designed to encircle said spindle and engage with the enlarged portion of the casing as and for the purpose specified.

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