

No. 751,052.

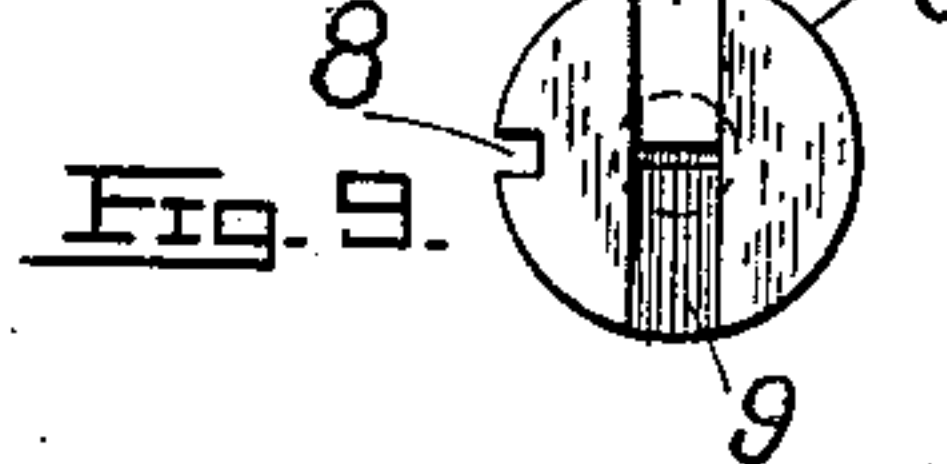
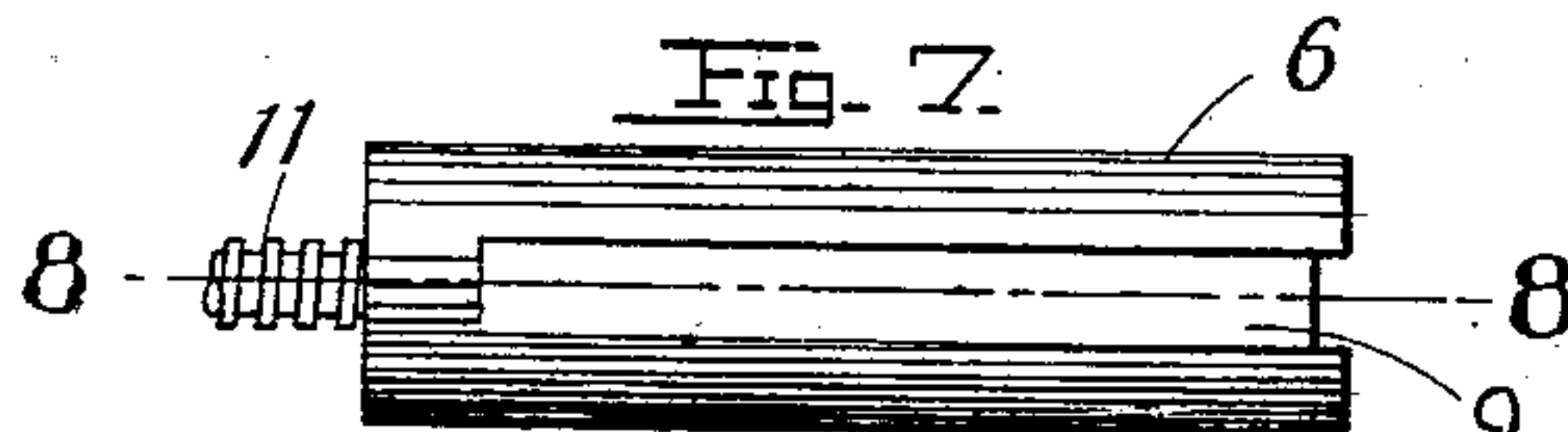
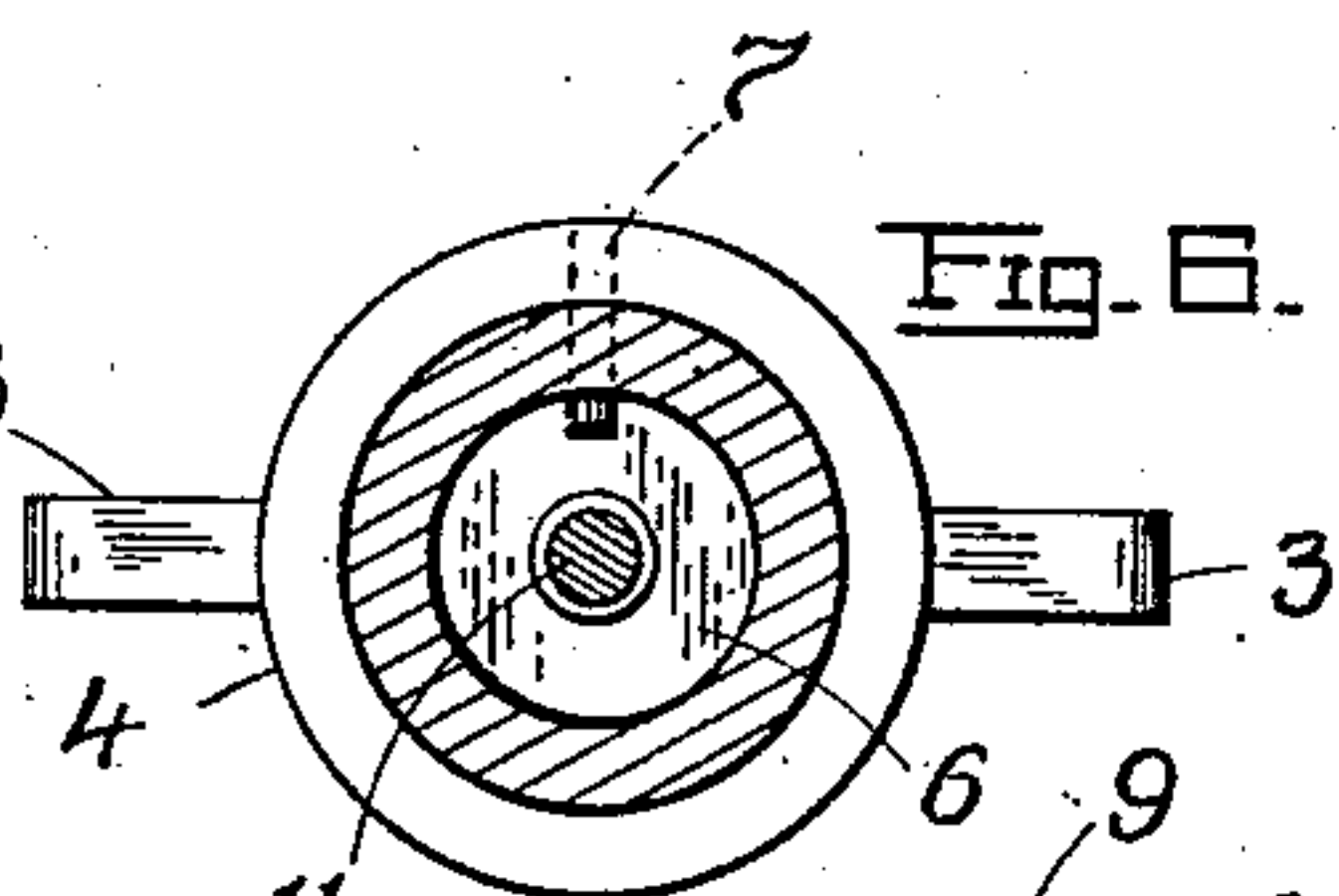
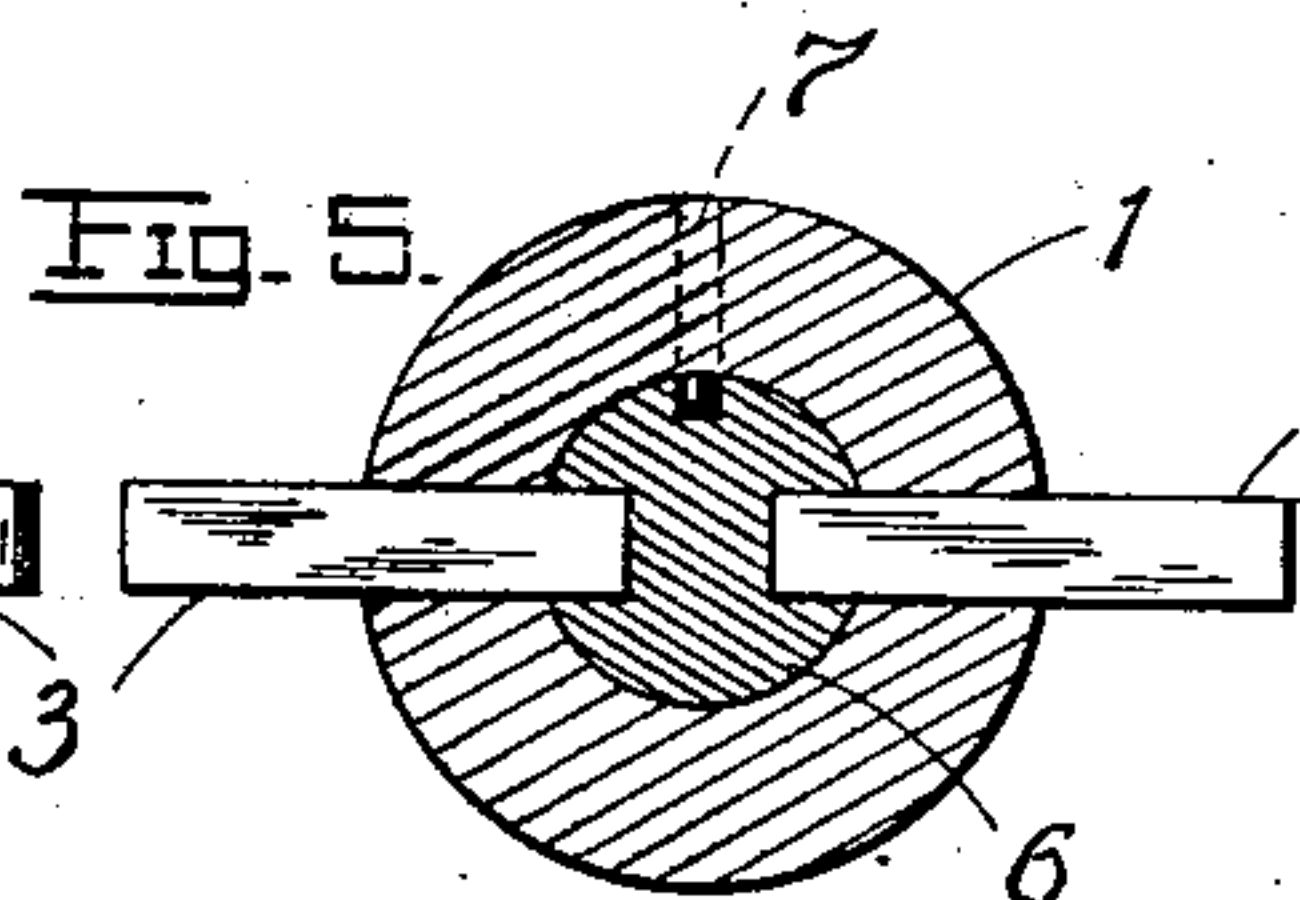
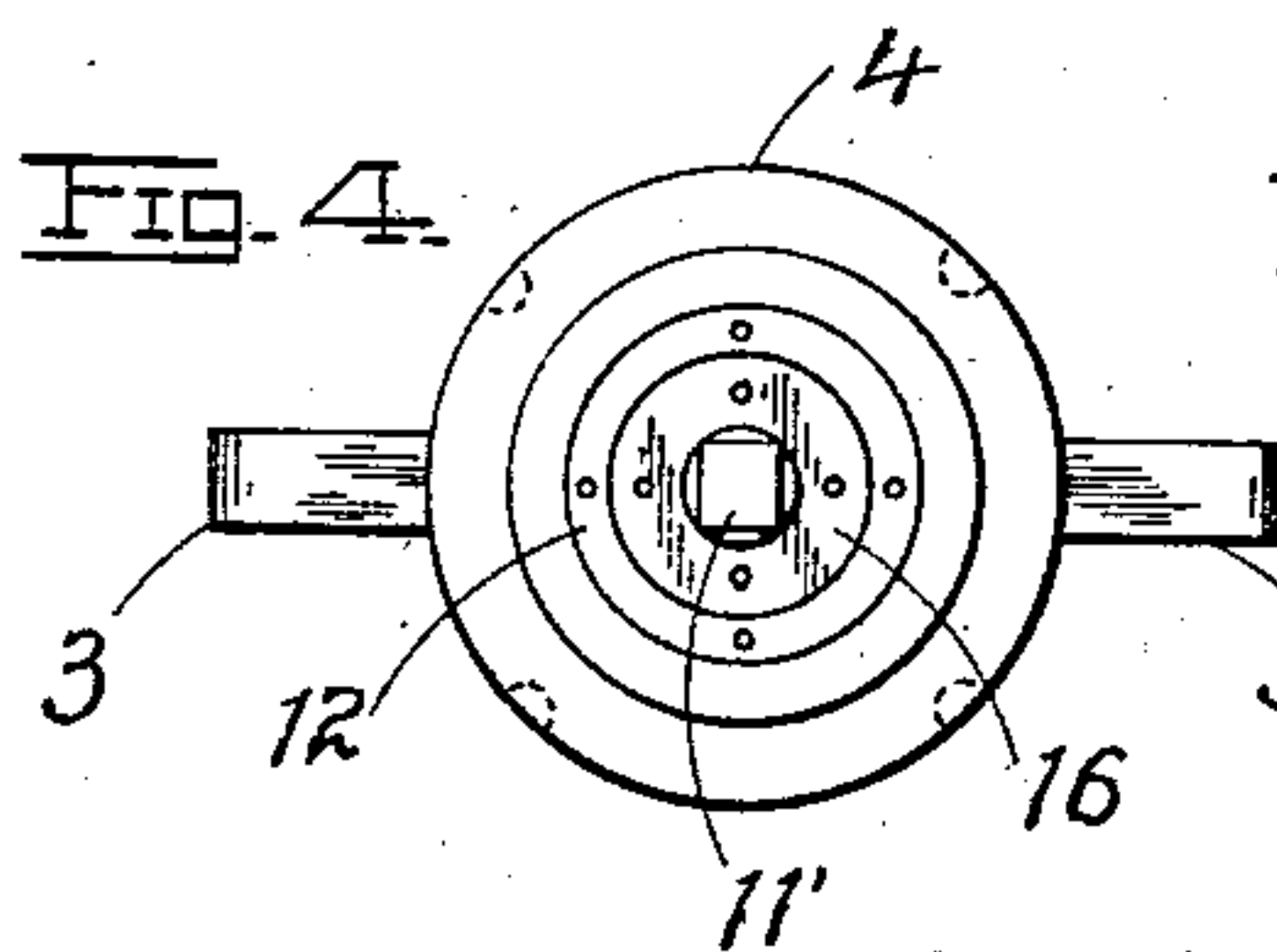
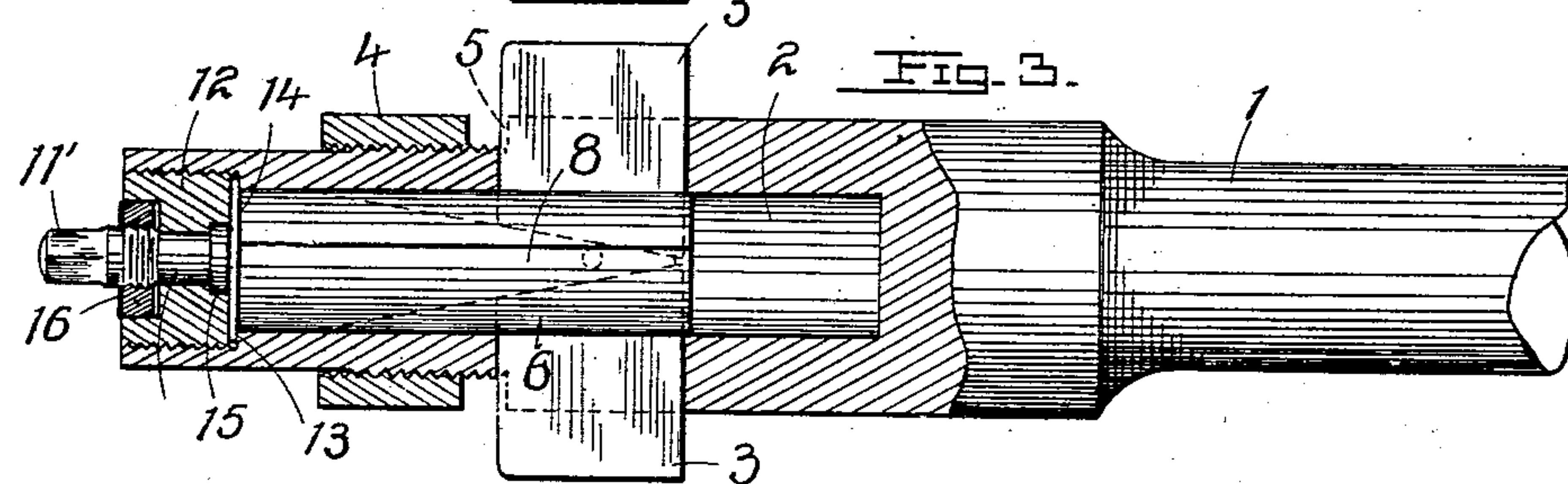
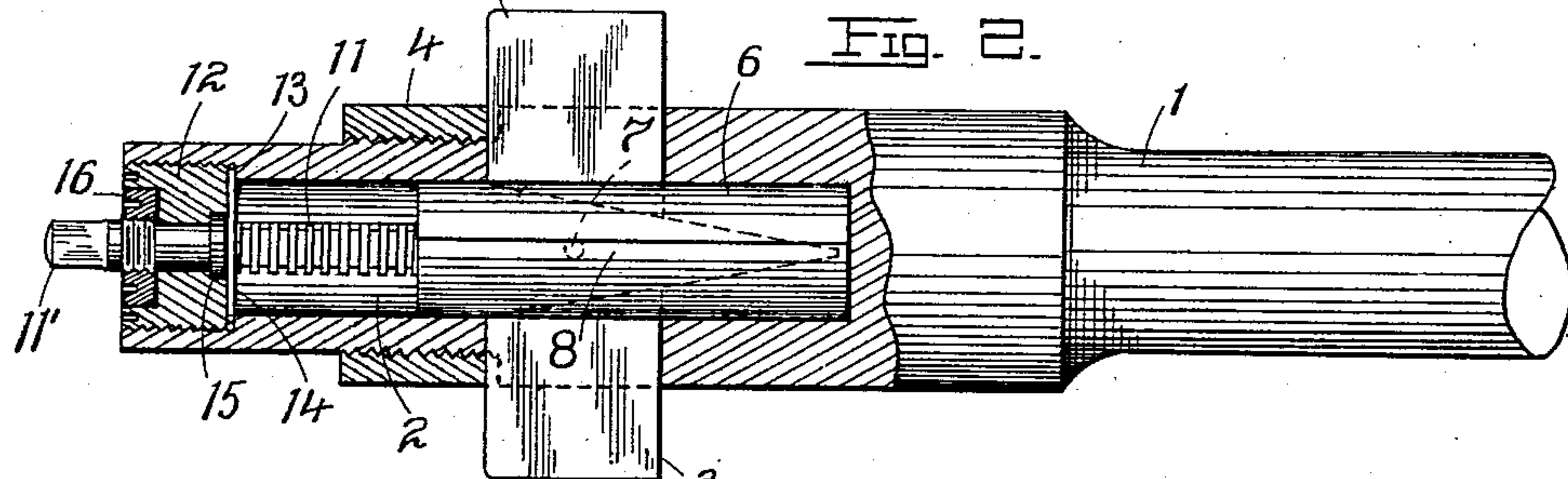
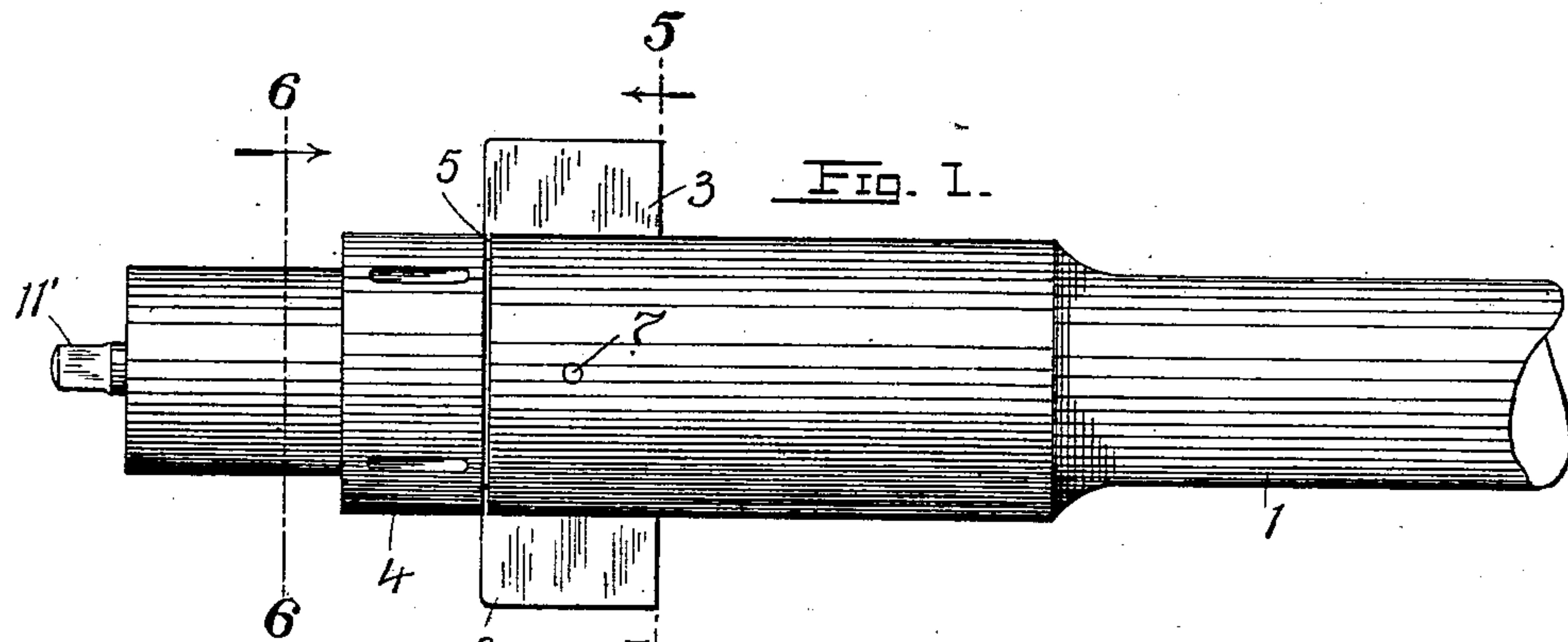
PATENTED FEB. 2, 1904.

J. BUMILLER.

BORING TOOL.

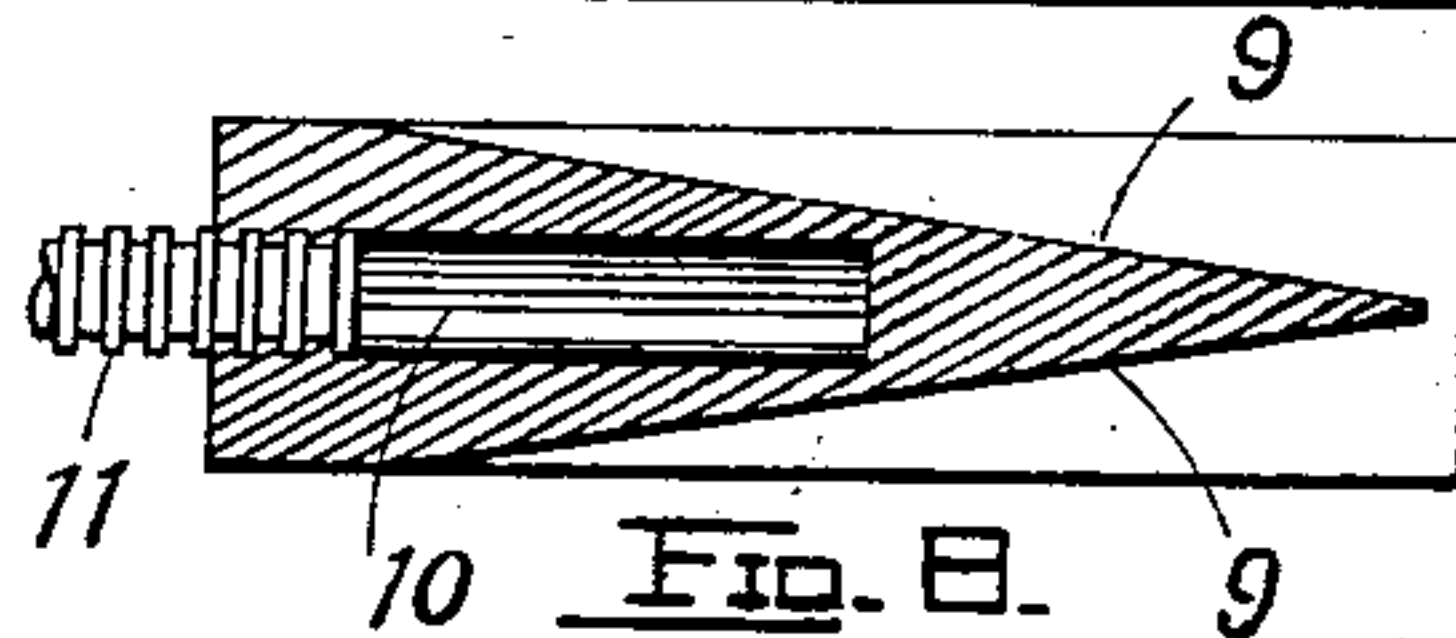
APPLICATION FILED MAR. 9, 1903.

NO MODEL.



WITNESSES:

*Thos. J. Gawn*  
*G. L. Buefy*



INVENTOR  
*Julius Bumiller*  
BY  
*Emil Storer*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

JULIUS BUMILLER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF THREE-  
FOURTHS TO ERNST BLOSS, OF ST. LOUIS, MISSOURI.

## BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 751,052, dated February 2, 1904.

Application filed March 9, 1903. Serial No. 146,907. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS BUMILLER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Boring-Tools, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in expansion boring-tools; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is an elevation of the tool. Fig. 2 is a combined longitudinal section and elevation showing the interior construction, the cutters being in their expanded position. Fig. 3 is a similar view showing the cutters occupying the limit of their inner position. Fig. 4 is an end view of Fig. 1. Fig. 5 is a cross-section on line 5 5 of Fig. 1. Fig. 6 is a cross-section on line 6 6 of Fig. 1. Fig. 7 is a detached view of the traveling cutter-adjusting head. Fig. 8 is a longitudinal section on line 8 8 of Fig. 7, and Fig. 9 is an end view of Fig. 7.

The object of my invention is to construct a boring-tool in which the radius of operation of the cutters may be adjusted at will, a single tool serving to bore holes of different diameters according to the adjustment effected for the cutters mounted in the tool-stock.

In detail the invention may be described as follows:

Referring to the drawings, 1 represents the tool-shank, and 2 a chamber or socket formed at the operating end thereof. Formed in the peripheral walls of the chamber at approximately the medial portion are openings for the reception of the cutters 3, the inner ends of the cutters being inclined to the adjacent edges, as shown in the drawings. When the proper radial adjustment of the cutters has been once effected, the cutters are clamped rigidly in position by the clamping nut or ring 4, which is passed over the adjacent and somewhat-reduced screw-threaded portion of the peripheral wall of the chamber, the openings receiving the cutters being ex-

tended slightly beyond the shoulder 5, (formed between the screw-threaded portion receiving the nut and the portion receiving the cutters,) so that the nut can be firmly forced against the adjacent edges of the cutters and hold them rigidly in their adjusted position. The chamber 2 is adapted to receive a cutter supporting and adjusting head 6, preferably cylindrical in form, (though not necessarily so,) which is constrained to move longitudinally by a pin 7, operating in a longitudinal peripheral groove 8, formed in the head, the peripheral walls of said head being furthermore recessed, so as to form guideways 9 for the reception of the cutters, the bottoms of such guideways being inclined and converging rearwardly, so as to virtually form the sides of a wedge whose base conforms to the diameter of the cross-section of the head. The inclined inner ends of the cutters are free to travel along the inclined bases of the guideways 9, the radial extension of the cutters depending on the relative position the same occupy along the length of the inclines.

Formed at one end of the head 6 within the planes of the inclined bottoms of the guideways 9 is a socket 10, having an outer screw-threaded section for the reception of the inner screw-threaded end of a rotatable stem 11, the outer smooth end of the stem passing loosely through a plug 12, screwed into and closing the outer end of the chamber 2, the stem having a polygonal or square projection 11', whereby the same may be turned by a tool-wrench. (Not shown.) Interposed between the plug 12 and a shoulder 13 is a washer 14, the plug 12 being provided on the end adjacent to the washer with a depression for the reception of a collar 15, formed integrally with the stem 11. The outer face of the plug 12 is provided with a socket for the reception of a lock-nut 16, passed over the outer screw-threaded end of the stem 11, both the lock-nut and the plug being provided with depressions for the reception of the teeth of suitable keys or wrenches (not shown) by which the same may be operated.

The operation of the tool is as follows: By first loosening the lock-nut 16 it leaves the



stem 11 free to be rotated. By rotating the stem in one direction it forces the head 6 in one direction, (it being remembered that the head has only a reciprocating or longitudinal movement within the chamber 2,) and by rotating the stem in the opposite direction it of course draws the head in the opposite direction. If therefore the head 6 moves inwardly, the cutters will ride up the inclines or wedges of the head, and their radius of action will be increased, Fig. 2. If the head moves outwardly, the cutters are forced by hand until they bear against the now receding inclines, when their radius of action becomes reduced, Fig. 3. It may be stated in passing that before operating the stem the nut 4 is first unscrewed sufficiently to allow the cutters a free radial movement, and when the cutters are once adjusted the nut is subsequently forced firmly against them. After any adjustment of the cutters is once effected the lock-nut 16 is firmly screwed down, this action drawing the collar 15 firmly to the plug 12, when the several parts will be restored to their original rigid positions. Of course the purpose of the collar 15 on the stem 11 is apparent, since by its presence a longitudinal movement of the stem during its rotation is impossible, the collar being confined between the plug 12 and washer 14.

From the foregoing it is apparent that the cutters may be adjusted to bore any size opening, depending on the position the cutters occupy along the inclines of the traveling head 6. I do not of course wish to be limited to the precise details herein set forth, as they may in a measure be departed from without affecting the nature or spirit of my invention. For example, I may vary the number of cutters, varying of course the number of inclined guideways 9 to receive them. Neither is the invention to be limited in its application to boring-tools specifically, as the same principle may be applied to other classes of tools.

Having described my invention, what I claim is—

1. A boring-tool comprising a suitable shank, a chamber formed at one end of the

same, a cylindrical head having a longitudinal movement mounted in said chamber, inclined guideways formed on said head within the compass of the peripheral walls thereof, cutters extending radially outward through peripheral openings in the walls of the chamber and having their inner ends engaging and permanently confined within the limits of the guideways, a plug at the outer end of the chamber, a stem having an inner screw-threaded portion carried by said plug, a cavity having a closed bottom formed in the head for the reception of the screw-threaded end of the stem, means for rotating the stem from the outside of the tool, means for clamping the stem to the plug, and a nut passed about the shank and adapted to firmly hold the cutters in position when once adjusted, the parts operating substantially as, and for the purpose set forth.

2. A boring-tool comprising a suitable shank, a chamber formed at one end of the same, a plug provided with a recess at the outer end of the chamber, a washer supported on the shank and bearing against the inner face of the plug, a rotatable stem having a smooth and screw-threaded portion, the smooth portion being supported within the plug, a collar on said stem interposed between the washer and the plug, a lock-nut passed over the outer end of the stem and resting in the recess, a polygonal head formed on the stem and projecting beyond the lock-nut, a head confined in the chamber and reciprocated therein by the rotation of the stem, inclined rearwardly-converging ways formed on the head, cutters disposed radially through peripheral openings in the chamber and with their inner ends engaging the said ways, and a nut for clamping the cutters in position when once adjusted, the parts operating substantially as, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JULIUS BUMILLER.

Witnesses:

EMIL STAREK,  
G. L. BELFRY.