

No. 747,907.

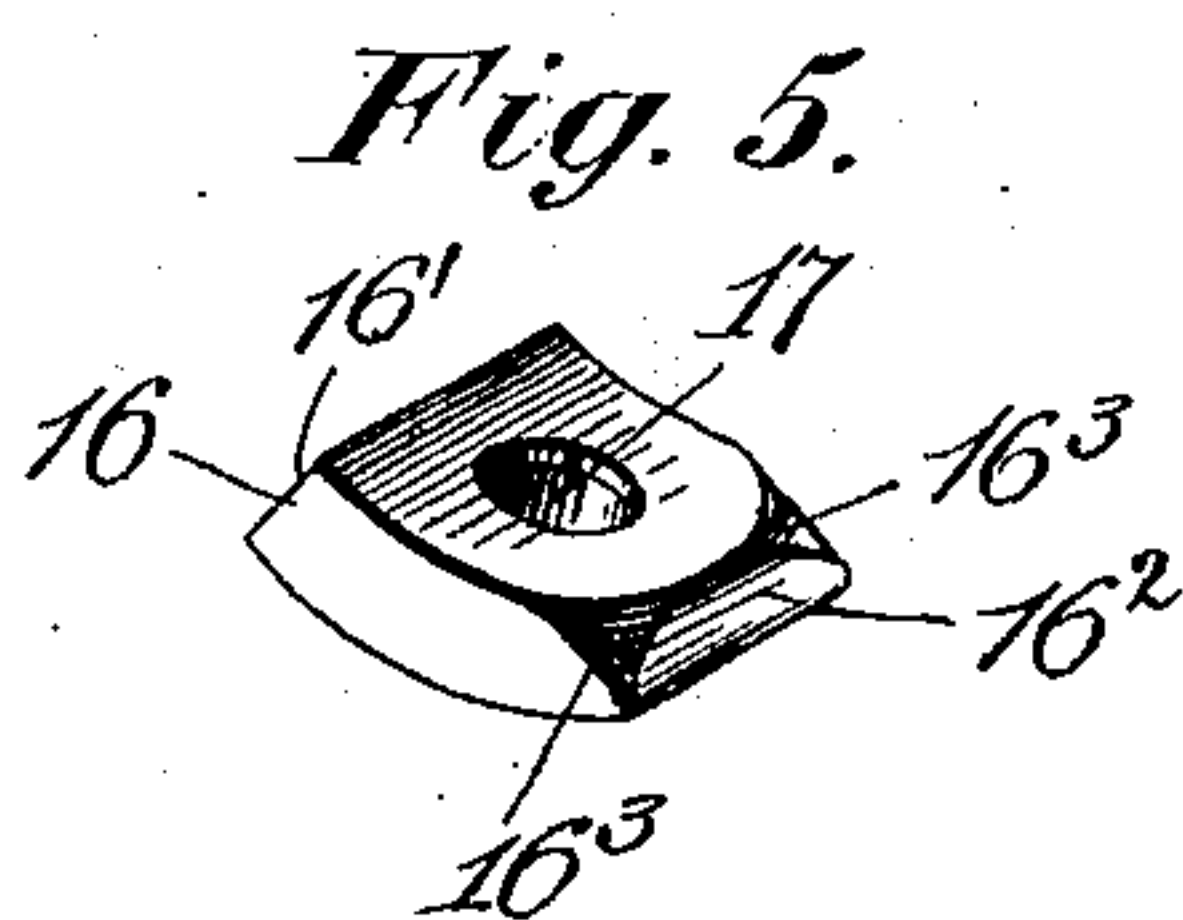
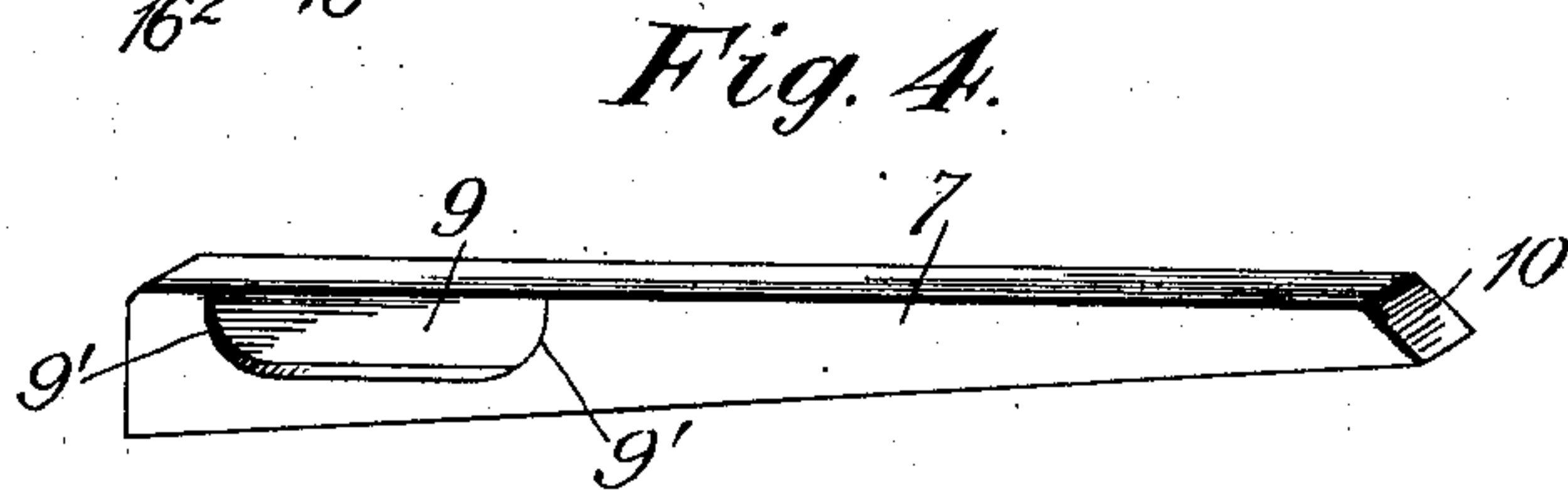
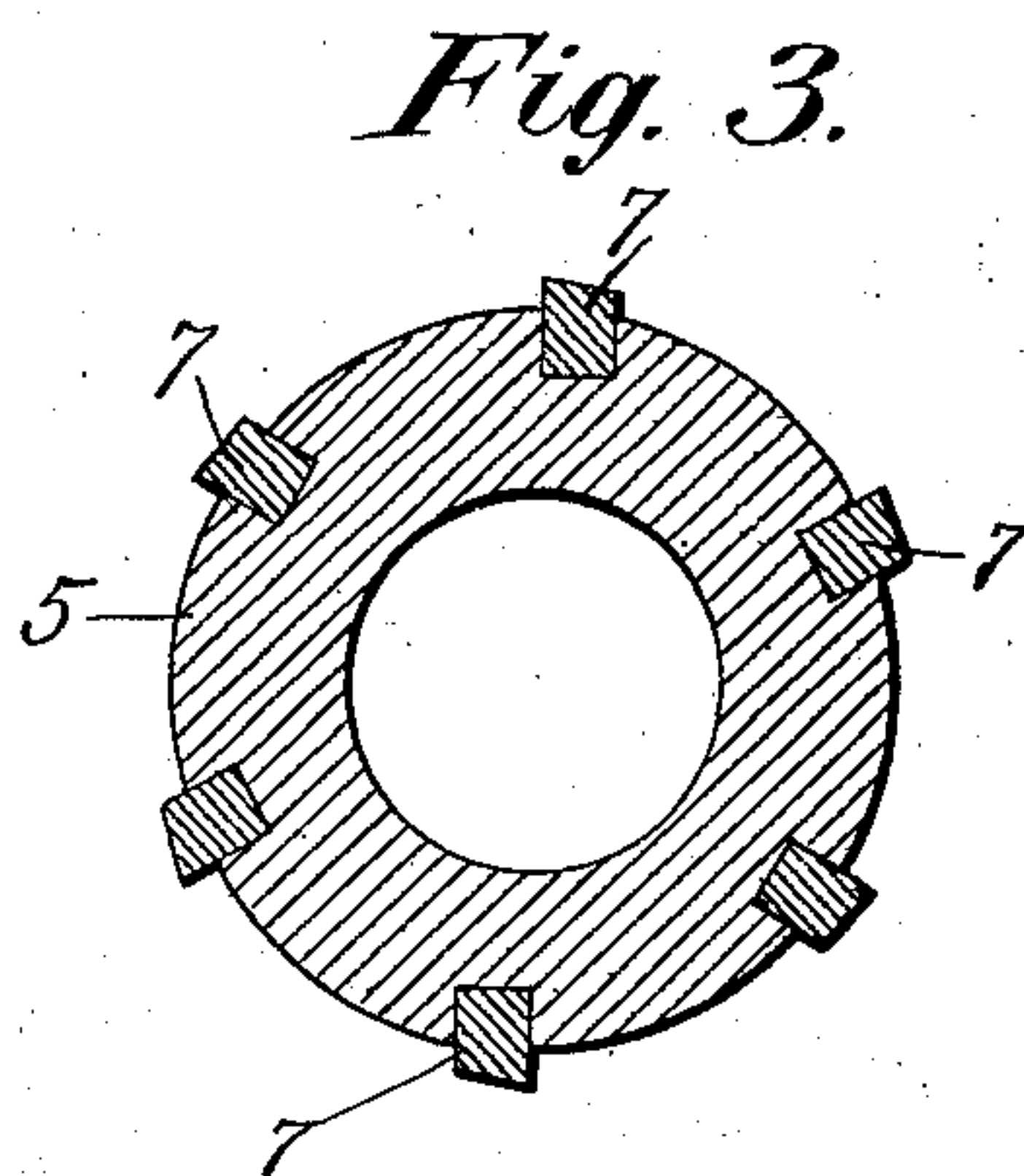
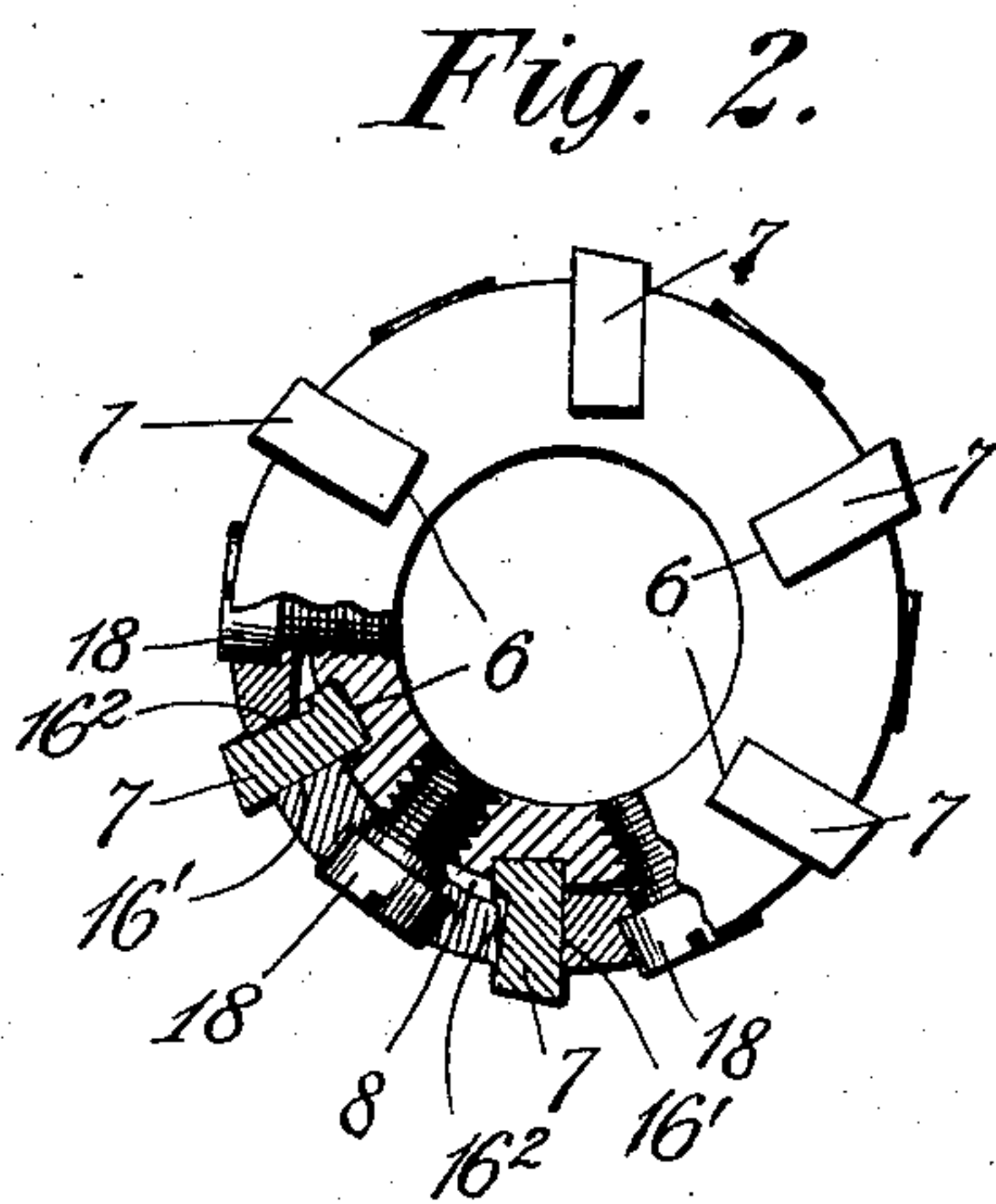
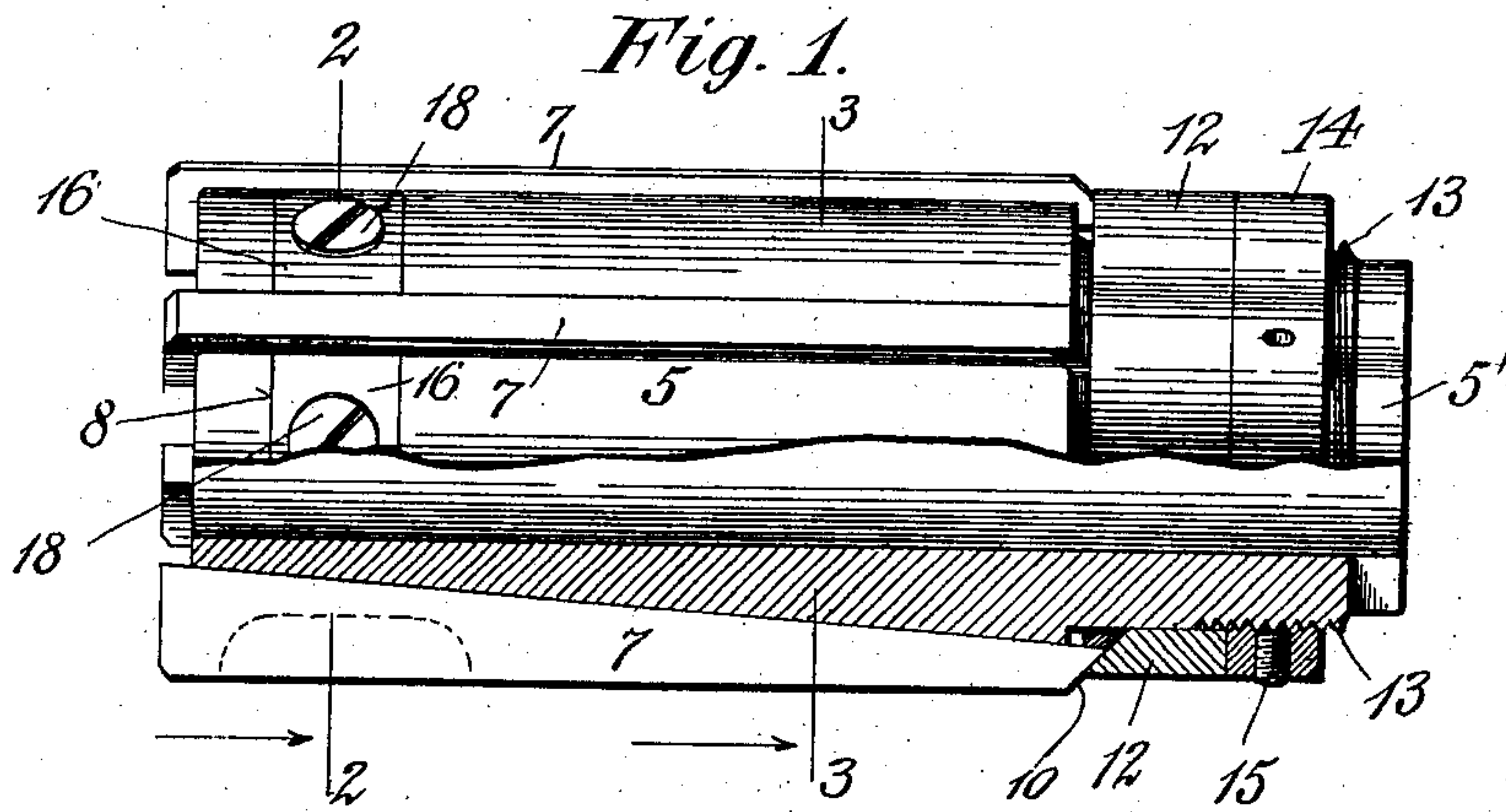
PATENTED DEC. 22, 1903.

F. G. ECHOLS.

REAMER.

APPLICATION FILED JUNE 3, 1903.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANCIS G. ECHOLS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

REAMER.

SPECIFICATION forming part of Letters Patent No. 747,907, dated December 22, 1903.

Application filed June 3, 1903. Serial No. 159,860. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS G. ECHOLS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Reamers, of which the following is a specification.

My invention relates to reamers, and particularly to that class of such tools known as "expanding" reamers; and it has for its object the provision of a simple and improved construction whereby the cutting-blades of the reamer may be readily adjusted and then clamped firmly in position.

A further object of the invention is the provision of a reamer the stock of which is provided with a series of grooves having inclined bottoms for the reception of the cutting-blades, said grooves being bisected by a circumferential groove in which blocks or segments are fitted for clamping the cutting-blades firmly in position after they have been adjusted.

A further object of the invention is the provision of a reamer body or stock having a circumferential groove and longitudinal grooves, as above described, segmental blocks of peculiar construction adapted to be secured in said grooves by screws or otherwise, and cutting-blades, also of peculiar construction, clamped in place by said blocks.

In the accompanying drawings, Figure 1 is a side elevation, partially in section, of my improved reamer. Fig. 2 is an end elevation, partially in section, on line 2 2 of Fig. 1. Fig. 3 is a transverse section of my improved reamer on line 3 3 of Fig. 1. Fig. 4 is a side elevation of one of the cutting-blades, and Fig. 5 is a perspective view of one of the clamping blocks or segments.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 5 designates the tubular stock or body of the reamer, and in the periphery of said stock are formed separated longitudinal grooves 6 for the reception of the cutting-blades 7.

Adjacent to the forward end of the stock a circumferential groove 8 is formed therein, said groove being located at right angles to the grooves 6. Each cutting-blade is of tapering form, it being wider at the front end, where it is provided with a longitudinal groove 9, having rounded end walls 9' for a purpose hereinafter stated, and each blade is also provided with a beveled rear end 10, adapted to be engaged by the inwardly-inclined end wall of a ring or collet 12, mounted on the reduced shank 5' of the reamer-stock. This shank is externally threaded at 13 for the reception of a nut 14, said nut having a series of separated holes in its periphery adapted to receive a tool for adjusting the nut and the walls of one of these holes being internally threaded for the reception of a locking-screw 15, by which the nut may be secured in position after adjustment. This nut bears against the collet or ring 12, and by adjusting said nut it will be seen that the ring may be advanced upon the stock, and its beveled end being in contact with the reversely-beveled extremities of the blades 7 will thus force said blades forward in their seats or grooves 6 and will at the same time hold them down therein, this operation being necessary to withdraw the blades within said grooves 6 when it is desired to decrease the diameter of the reamer.

Designated by 16 are concavo-convex blocks or segments having inclined ends 16' for fitting against the faces of the reamer-blades, as illustrated in Fig. 2. At their opposite ends each of these blocks is also inclined at 16² and is provided with rounded corners 16³ for fitting and engaging the rounded end walls 9' of the grooves 9 in blades 7 when said blades are adjusted to the limit of their movement in either direction. Each block or segment 16 is perforated at 17 for the reception of a screw 18, as illustrated more particularly in Fig. 2.

To increase the diameter of the cutting-surface of the reamer, the screws 18 are loosened, thereby releasing the blocks 16 from their clamping action against the cutting-blades, and the nut 14 and collet 12 having been adjusted pressure is applied to the ends of the cutting-blades to move them up the inclined bottom walls of their retaining-grooves until the desired adjustment is effected, when the screws are tightened, and the inclined walls of the concavo-convex blocks or segments 16 are forced against the faces of the blades 7, thus forcing them into their seats or grooves 6 and increasing the diameter of the cutting-surface of the reamer.

It is to be understood that the foregoing description is given by way of illustration only, and that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

ments 16 are caused to bind against the opposite sides of said cutting-blades, thus locking them securely in position, after which the set-screw 15 may be turned to clamp the nut 14 and ring or collet 12 in place. It will thus be seen that a simple and compact construction is provided, one that is composed of few parts, and one in which the cutting-blades may be either withdrawn or extended to change the diameter of the working surfaces of the reamer as may be desired, and one in which said blades after adjustment may be firmly locked against displacement.

Changes may be made in the form and proportions of the parts and in the details thereof without departure from the invention, which is not limited to the exact construction illustrated and described.

Having thus described my invention, what I claim is—

1. In a reamer, the combination, with a stock or body having a series of longitudinal grooves and a transverse, circumferential groove, of cutting-blades seated in the longitudinal grooves; segmental blocks having inclined ends fitted in the circumferential groove between the longitudinal grooves; and means for clamping said blocks against the sides of the cutting-blades.

2. The combination, with a stock or body having separated, longitudinal grooves with inclined bottom walls and a transverse circumferential groove intersecting said longitudinal grooves, of cutting-blades each of a width greater at one end than at the other, and each having a longitudinal groove; segmental blocks fitted in the circumferential groove of the stock and each having an inclined end for fitting against one side of a cutting-blade and an inclined end with rounded corners for engaging the groove on the opposite side of said cutting-blade; means for securing said blocks in position; and an adjustable abutment adapted to engage the inner ends of said cutting-blades.

3. The combination, with a stock or body having longitudinal grooves and a circumferential groove, of reamer-blades fitted in said longitudinal grooves; and devices in the circumferential groove for clamping the blades in position, each of said devices bearing against the opposing sides of a pair of said reamer-blades.

4. The combination, with a longitudinally and circumferentially grooved stock or body, of cutting-blades fitted in the longitudinal grooves; concavo-convex blocks mounted in the circumferential groove, each block having an inclined end; and screws for forcing said blocks against the sides of the cutting-blades.

5. The combination, with a longitudinal and circumferentially grooved stock or body, each longitudinal groove having an inwardly-rising bottom wall, of tapering cutting-blades fitted in the longitudinal grooves, and having adjacent to their forward ends short, longitudinal grooves with rounded corners; segmental blocks fitted in the circumferential groove, one block being located between each pair of longitudinal grooves, and each block having inclined walls for bearing against the face of one cutting-blade and the back of an opposite cutting-blade; and screws engaging threads in the body for clamping the blocks against said blades.

6. The combination, with a stock or body having a series of separated, longitudinal grooves of gradually-decreasing depth from front to rear, and also having a circumferential groove intersecting said longitudinal grooves, and a shank provided with an external screw-thread, of tapering cutting-blades, each having a longitudinal groove with rounded corners adjacent to its one end, and each also having an inclined, inner extremity; a ring or collet mounted on the shank and having a beveled surface for engaging the inclined ends of the cutting-blades; a nut threaded upon the shank and adapted to engage said collet; means for locking said nut in position after adjustment; segmental blocks, each having inclined ends, and the blocks being located in the circumferential groove, one between each pair of the longitudinal grooves, and one end of each block having an inclined surface and the opposite end an inclined surface with rounded corners; and screws passing through the blocks and entering the stock of the reamer.

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

FRANCIS G. ECHOLS.

Witnesses:

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W. N. LARKUM.