F. RILEY & C. A. O'CONNOR.

REAMER.

APPLICATION FILED AUG. 20, 1912.

1,166,716. Patented Jan. 4, 1916.

Fig. 1.

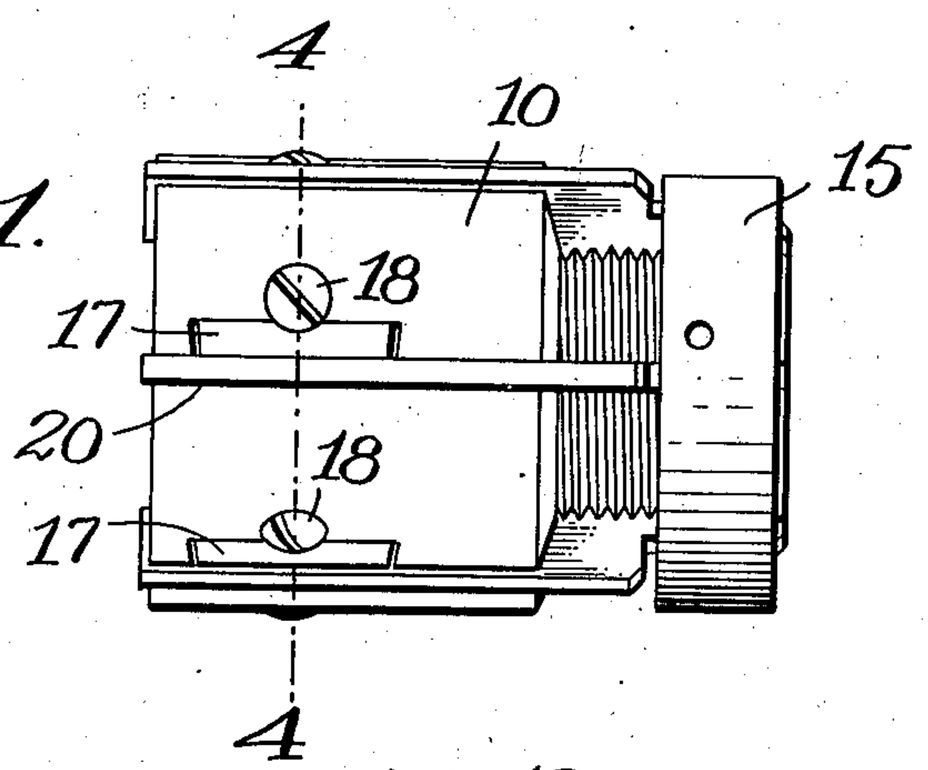


Fig. 2.

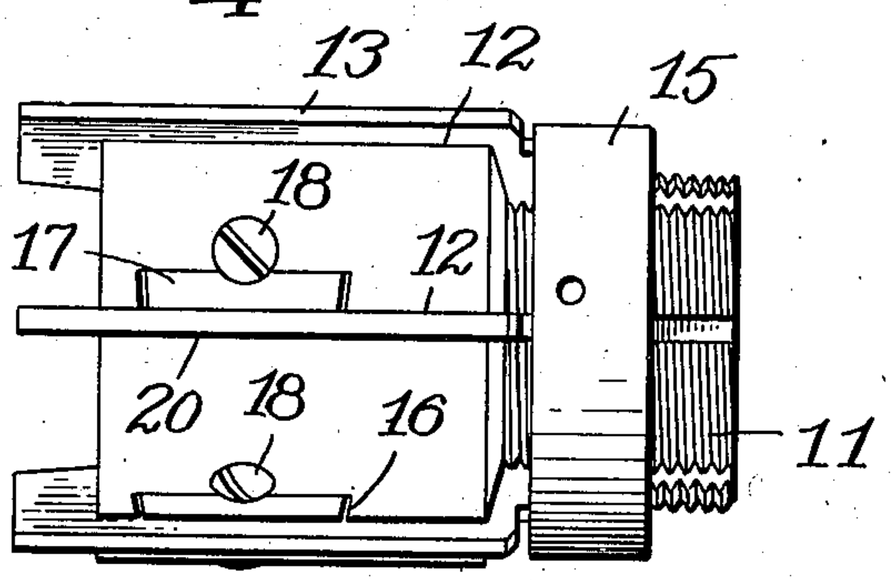


Fig. 3.

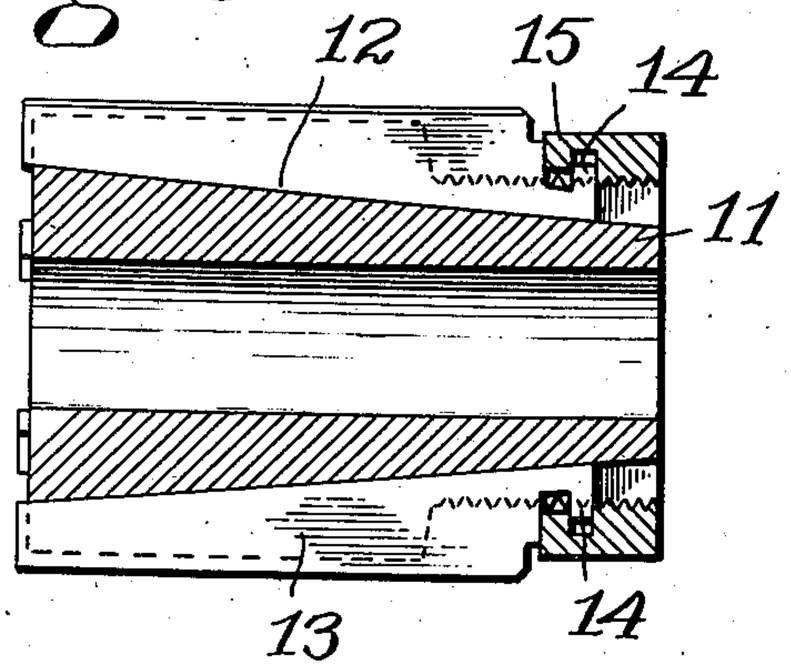


Fig. 4.

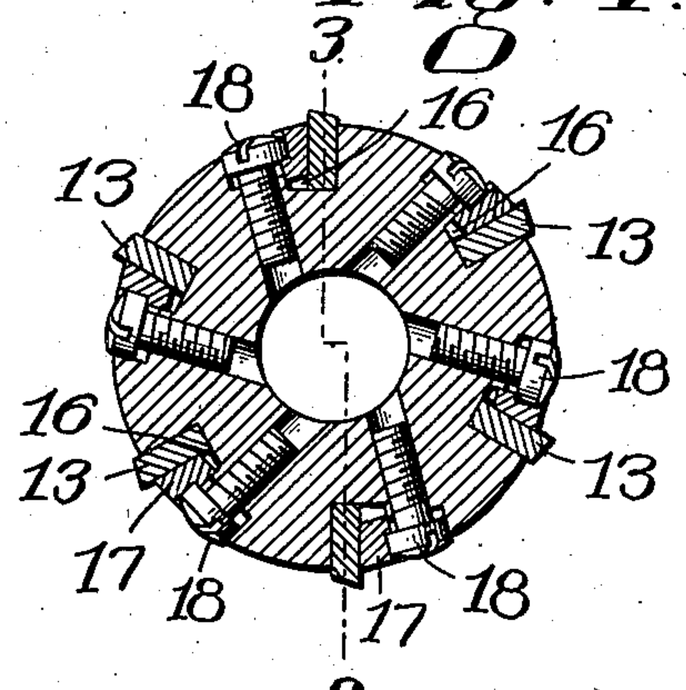
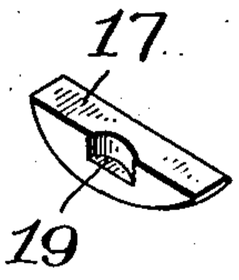


Fig. 5.



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UNITED STATES PATENT OFFICE.

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REAMER.

1,166,716. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed August 20, 1912. Serial No. 716,006.

To all whom it may concern:

Be it known that we, FREDERICK RILEY and CHARLES A. O'CONNOR, citizens of the United States, residing at Worcester, in the county of Worcester, State of Massachusetts, have invented a certain new and useful Improvement in Reamers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to reamers, cutters, taps and the like, but more particularly to such as are expansible, and it has for its object the provision of a simple and efficient construction whereby the cutting members may be more readily adjusted and more firmly clamped in place than has heretofore been possible.

One feature of the present invention is the locking blocks which provide a wedging action to bind the cutting members within the stock or body. Heretofore devices have been constructed with locking blocks acting against the forward portion of the cutting members, but these latter have usually been provided with grooves in the side face of the members to admit portions of the blocks. Such types have been distinctly unsatisfactory in that the amount of possible adjustment has been very limited, and the grooves in the cutting members not only weaken this member but such members are more expensive to construct than the flat-sided cutter which may be used in the applicants' device.

Another feature is the means for adjusting the cutting members whereby these blades may be positively expanded or contracted.

Many other features and advantages of the invention will be described hereinafter and included in the claims.

For simplicity of description, the invention will hereinafter be treated only as applied to a reamer.

One embodiment is shown in the drawings in which:—

Figure 1 is a side elevation of the invention complete with the blades not expanded, as will be fully described hereinafter. Fig. 2, same as Fig. 1, with the blades expanded. Fig. 3, section on line 3—3 of Fig. 4. Fig. 4, section on line 4—4 of Fig. 1. Fig. 5, perspective view of one of the locking blocks detached, as will be described hereinafter.

Referring to the drawings: The reamer is shown to consist of a stock or body portion 10 provided at its rearward extremity with a reduced shank 11 and having the body portion provided with longitudinal slots 12 to admit the cutting blades 13 in the manner common to reamers of this type. The under walls of the slots 12 are inclined upwardly toward their outer extremity and the blades 13 are correspondingly inclined on their under faces so that the longitudinally forward movement of the blade causes the cutting edge of these blades to be moved outwardly from the axis of the reamer, and the return movement causes a similar contraction. The rear portion of each of the blades is preferably cut away to form an outwardly extending projection 14 which is adapted to fit within a corresponding groove in the forward extremity of the adjusting ring or collet 15 which has its rear portion interiorly threaded to fit the correspondingly threaded shank 11 of the reamer. This construction permits the blades to be positively advanced and withdrawn in their respective slots, and forms a lock which will not permit the rear end of these blades to become disengaged from the reamer.

In the body of the reamer and opening into the longitudinal slots 12 are recesses 16 into which enter the locking blocks 17 which are adapted to act as a wedge to press against the side face of the opposing blade and lock the blade within the slot. Adjusting screws 18, which are provided with a head which fits within the recess 19 in the blocks 17, force these blocks into the recesses 16. While the particular form of block and screw herein shown and described has been found to be advantageous, it should be clearly understood that any other construction which would produce this wedging effect might be adopted.

To expand the reamer from the position shown in Fig. 1 of the drawings, the screws 18 should be sufficiently loosened to permit the blocks 17 to release the blades, the collet 15 advanced upon the shank of the reamer into the position shown in Fig. 2 or any other position, depending on the desired diameter of bore, and the screws again advanced to force the blocks 17 downwardly into the recesses 16. The wall of the block 17 opposite the face of the blade being at an angle with the opposite wall of the recess

16, the advance of the block into the recess forces the blade against the opposite wall 20 of the longitudinal slots 12 and frictionally binds the blade in this position. The under face of the blade always rests firmly on the bottom of the longitudinal slots and thus cannot be compressed into the reamer. The contraction of the reamer is accomplished by reversing the process of expansion and needs no further description.

The inner extremities of the blades are preferably inserted into the groove in the ring 15 before this ring is screwed upon the shank of the reamer.

The applicants are aware that a large number of changes in the construction and arrangement of parts of the device may be readily made by any one skilled in the art without departing from the scope of their invention, and they do not care to be limited to the particular embodiment herein shown and described but only by the scope of the appended claims.

What we do claim as our invention and desire to secure by Letters Patent is:—

1. In a device of the class described, the combination of a body portion provided with longitudinal slots therein, cutting blades in each of said slots, the portion of one side wall of each of said slots being flat and inclined inwardly toward the blade therein, a wedge member in each of said slots coacting between the inclined wall of the slot and said blade to lock the blade in said slot when said member is forced downwardly therein and screw members operatable from the periphery of said body portion coacting with each of said wedge members to force said wedge members downwardly in said slots.

2. In a device of the class described, the combination of a cylindrical body portion provided with longitudinal slots therein, cutting blades in each of said slots, the portion of one side wall of each of said slots being flat and inclined inwardly toward the blade therein, a wedge member in each of said slots coacting between the inclined wall of the slot and said blade to lock said blade in said slot when said member is forced downwardly therein, and screw members each provided with a head coacting with corresponding shoulders on said blocks to force these blocks downwardly in their respective slots.

3. In a device of the class described, the combination of a body portion provided with longitudinal slots therein, cutting blades in each of said slots, a portion of one side wall of each of said slots being flat and inclined inwardly toward the blade therein, a wedge member in each of said slots coacting between the inclined wall of the slot and said blade to lock said blade in said slot when said member is forced downwardly therein, and screws seated in threaded recesses in said body portion adjacent to each of said slots with the axis of the screw parallel to the inclined face of the slot and the head of each screw projecting into its corresponding slot to engage a shoulder on the block therein to force said block downwardly in said slot.

In testimony whereof we affix our signatures in the presence of two witnesses.

FREDERICK RILEY.
CHARLES A. O'CONNOR.

Witnesses:
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