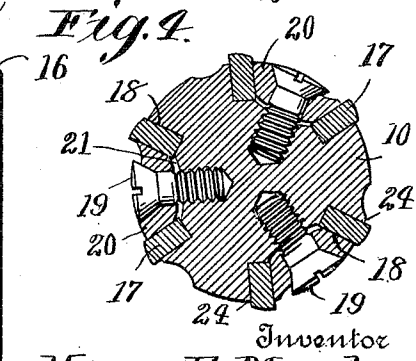
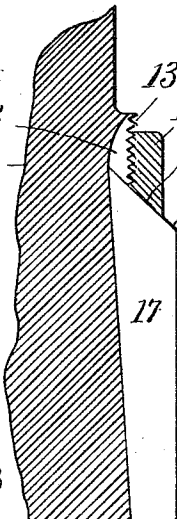
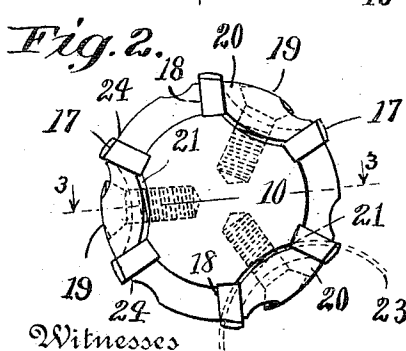
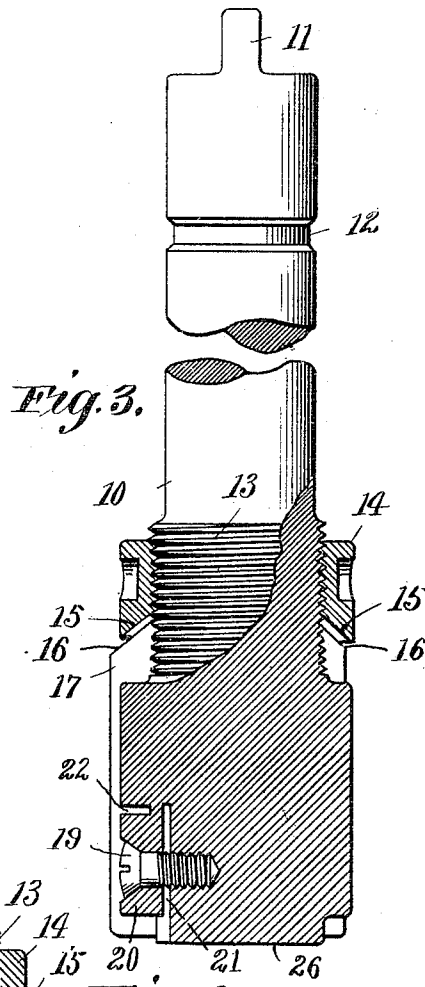
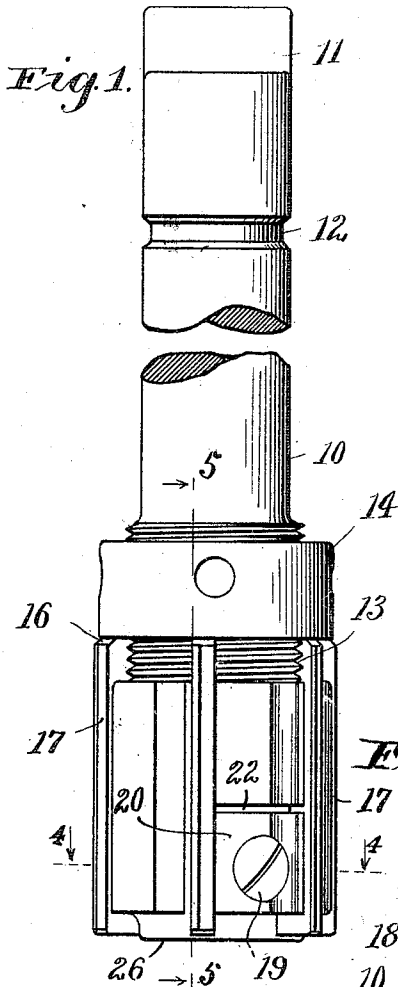


995,413.

Patented June 13, 1911.



Witnesses
 Ernst P. Wold
 Ruth M. Worden

Inventor
 Henry F. Mussler
 By Christian M. Newman
 for Chamberlain & Newman Attorneys

UNITED STATES PATENT OFFICE.

HENRY F. MUSSLER, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE BULLARD MACHINE TOOL CO., OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

REAMER.

995,413.

Specification of Letters Patent. Patented June 13, 1911.

Application filed January 3, 1911. Serial No. 600,635.

To all whom it may concern:

Be it known that I, HENRY F. MUSSLER, citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Reamers, of which the following is a specification.

This invention relates to new and useful improvements in reamers and particularly to the class known as expanding reamers.

The invention has for its object to provide a durable, practical and simple form of reamer which will include but a minimum number of parts consistent with the requirements to be accomplished and which may likewise be manufactured at a lesser cost than other reamers of equal size and capacity.

It is a further object of the invention to provide an improved form of clamp for the blades of the reamer which can be formed integral with the body of the reamer, thereby preventing loose or detachable parts from falling out and becoming lost, and finally to so construct the device that the cutting blades will be normally set back from its forward end, better to protect said blades from injury.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Similar characters of reference denote like or corresponding parts throughout the several figures of the accompanying drawings forming a part of this specification, and upon which—

Figure 1, shows a side elevation of my improved form of reamer, the shank portion being broken away. Fig. 2, is a bottom end view of the reamer shown in Fig. 1. Fig. 3, is a central vertical sectional elevation taken on line 3—3 of Fig. 2. Fig. 4, is a cross sectional view taken on line 4—4 of Fig. 1 and Fig. 5, is an enlarged detailed vertical sectional view through a portion of the reamer body, blade and adjusting nut, taken on line 5 of Fig. 1.

Referring in detail to the drawings, the numeral 10 is applied to represent the body of the reamer as a whole, 11 the tang on the end of the shank for engagement with a chuck in which the reamer may be seated. The shank of the reamer is also provided with an annular groove 12 which further serves to support the reamer in a chuck. The upper end of the enlarged lower end portion of the reamer is threaded as shown at 13 for the engagement of an adjusting nut 14 which is provided with a beveled inner edge 15 that engages the correspondingly beveled end portion 16 of the several cutting blades 17 slidably mounted in longitudinal slots 18 formed in the peripheral surfaces of the enlarged lower end portion of the body 10. These slots are inclined with reference to the longitudinal face of the body thus being deeper at their upper end portion than at their lower end portion. The inner edge of the cutting blade 17 is also inclined with relation to their outer edge and thus corresponds to the inclined surface of the slot referred to. It will thus be noted that any vertical movement of the blades in their slots effected by means of the adjusting nut 14 will move all the blades both longitudinally and radially, so as to diminish or increase the distance between the respective cutting blades and obviously the size of the tool. In the drawing I have shown six slots and six cutting blades, or in other words, three pairs of cutting blades. Either pair of the blades may be readily taken out, ground and replaced, or adjusted up and down as occasion requires by the operation of a single screw 19 of which there are but three one for each pair of blades. The lower end portions 20 of the reamer intermediate of the bottom portion of the slots 18 are provided with a vertically disposed under cut 21 that extends over the outer end portion of the reamer body and up into the same for a distance of approximately one inch, leaving the said intermediate portions 20 disposed to form a yieldable clamp that bears against the adjoining inner side portions of the pair of blades that it serves to clamp by the adjustment of the before mentioned screw 19. This clamping portion 20 may be provided with a cross cut 21 (see Figs. 1 and 2) which will obviously make this member somewhat more flexible and responsive to the adjustment of the screw. It

will be further noted that the vertically disposed slots 21 are concave in form, better to permit of their production by a circular form of cutting tool, whose line of movement in such cutting operation is indicated in Fig. 2 by the dotted circular line 23 which as will be seen clears the outer longitudinal corners 24 of the back of the slot 18 so as to insure it forming a solid and unbroken shoulder against which the blade is forced when clamped in position.

From the foregoing construction it will be noted that I have produced a reamer which has all of the advantages required in a tool of its sort and which is perfectly durable, practical, and will operate in competition with any other reamer known to me of equal size and quality of metal, and which includes a lesser number of parts. In actual count there are but 11 parts to my reamer as against perhaps 18 or 20 found in the better grades of reamer with which I have to compete. It is also true that the blades of this reamer can be removed, adjusted or replaced quicker and more conveniently than any of the competing reamers referred to. The blades of the device are obviously adjusted by first loosening the three screws 20 and then turning the nut 14 (up or down) as occasion requires. If the tool is to be made larger the nut is turned down thus forcing the blades along with it, while if it is to be made smaller the nut is turned up and the blades shoved against it and then secured in place by the said screws. A further advantage which my reamer has above those before mentioned, is that its lower extremity 26 is reduced slightly to form an abutting end, the blades being normally seated above the face of the end, thereby insuring the said end striking the bottom of a hole slightly in advance of that of the blades so as to protect the latter from injury. This extension also serves to an advantage in the setting of the reamer in a chuck, when it is necessary to drive the reamer up in position, and which may be accomplished by simply hitting the end of this reduced end portion with a hammer or other tool to set it in place and which can be done without injury to the ends of the blades.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a reamer of the class described, the

combination with a body having a series of vertical slots therein, blades arranged in the slots, a yieldable clamping portion formed integral with the body and arranged intermediate of the two blades, and means for forcing such yieldable integral clamp portion against said blades to hold them in position.

2. In a reamer of the class described, the combination of a body having a series of longitudinal slots in its periphery, a series of cutting blades arranged in the slots, a yieldable clamping portion formed integral with the body and intermediate of two of the slots and formed by a vertically disposed cut in the lower end portion of the body, and means for clamping the said clamping portion against the blades when arranged in the slots.

3. In a reamer of the class described, the combination of a body having a series of longitudinally disposed blade slots in its periphery, a vertically disposed undercut slot opening out into the adjoining two blade slots to form a longitudinally disposed yieldable clamping portion, and means for forcing the said clamp portion in to close the slots.

4. In a reamer of the class described, the combination of a body having a series of longitudinally disposed blade slots in its periphery, a vertically disposed undercut slot opening out into the adjoining two blade slots to form a longitudinally disposed yieldable clamping portion and an annular disposed cross slot in the upper part of the said clamping portion to make the same more flexible, and means for forcing the said clamping portion into the said blade and slots.

5. In a reamer of the class described, the combination of a body having a series of longitudinally disposed slots in its periphery, a vertically disposed concave undercut slot opening into the two adjoining blade slots, and a screw passing through the said clamping portion into the main body of the reamer to clamp the one to the other.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 28th day of December A. D., 1910.

HENRY F. MUSSLER.

Witnesses:

C. M. NEWMAN,

J. H. VAN YORK, Jr.