

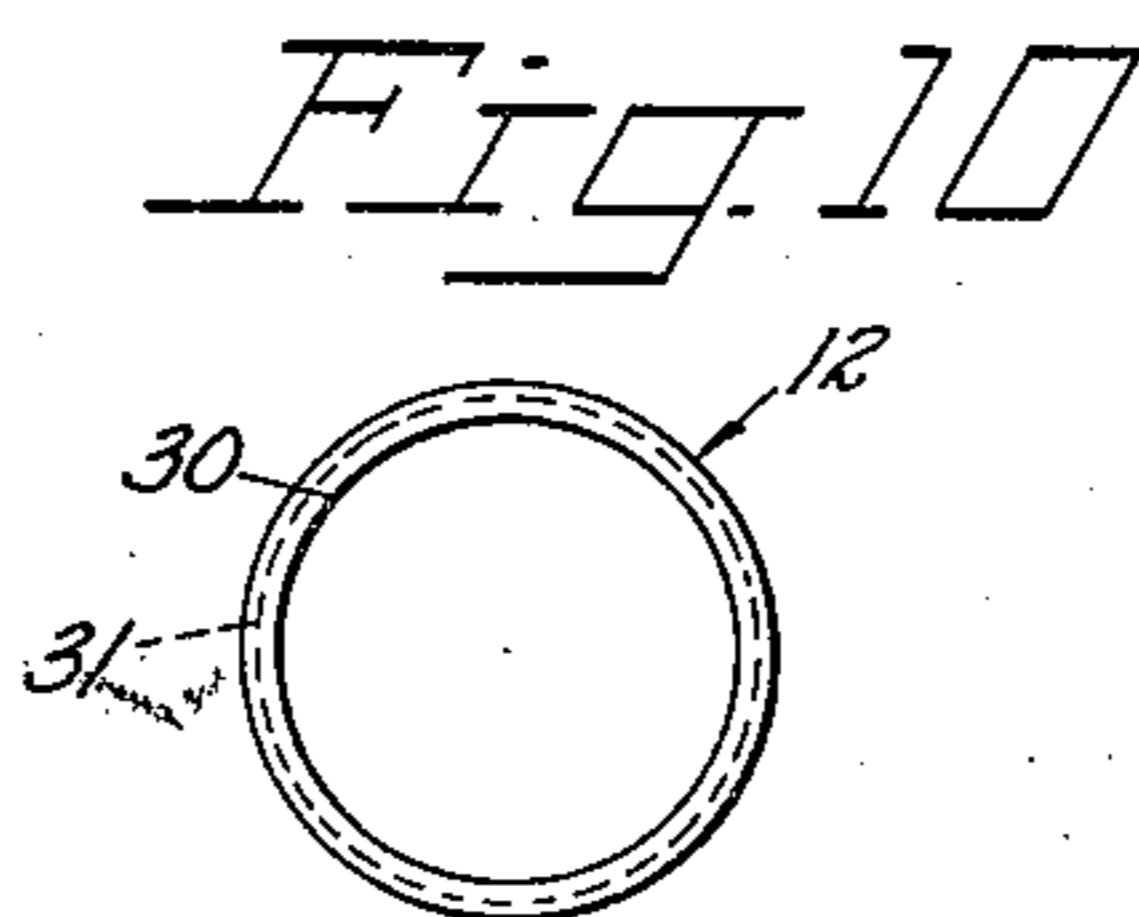
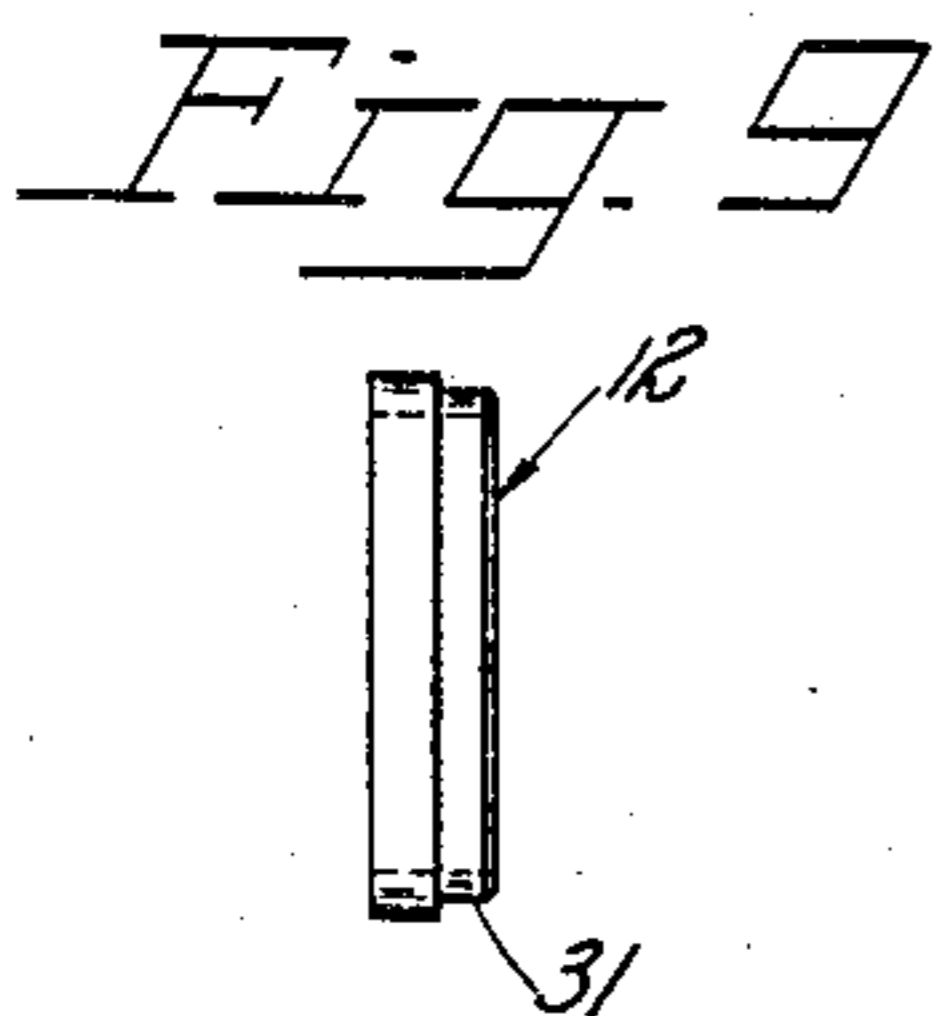
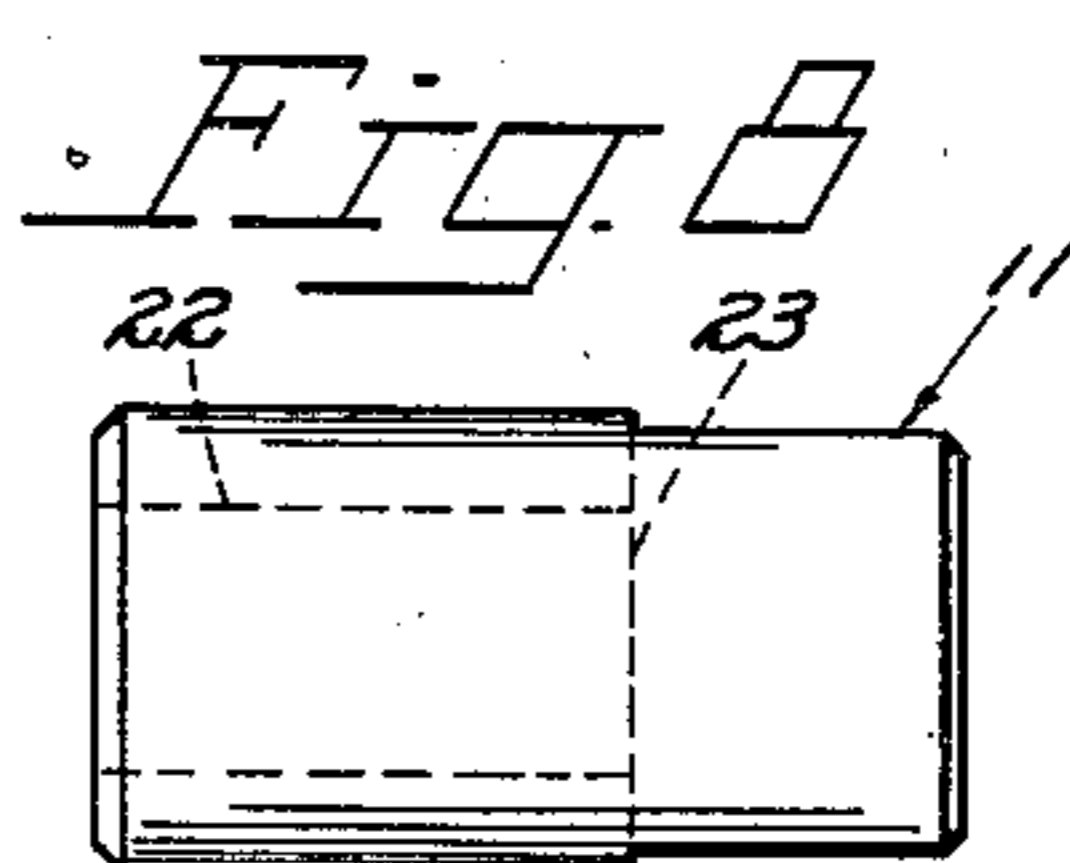
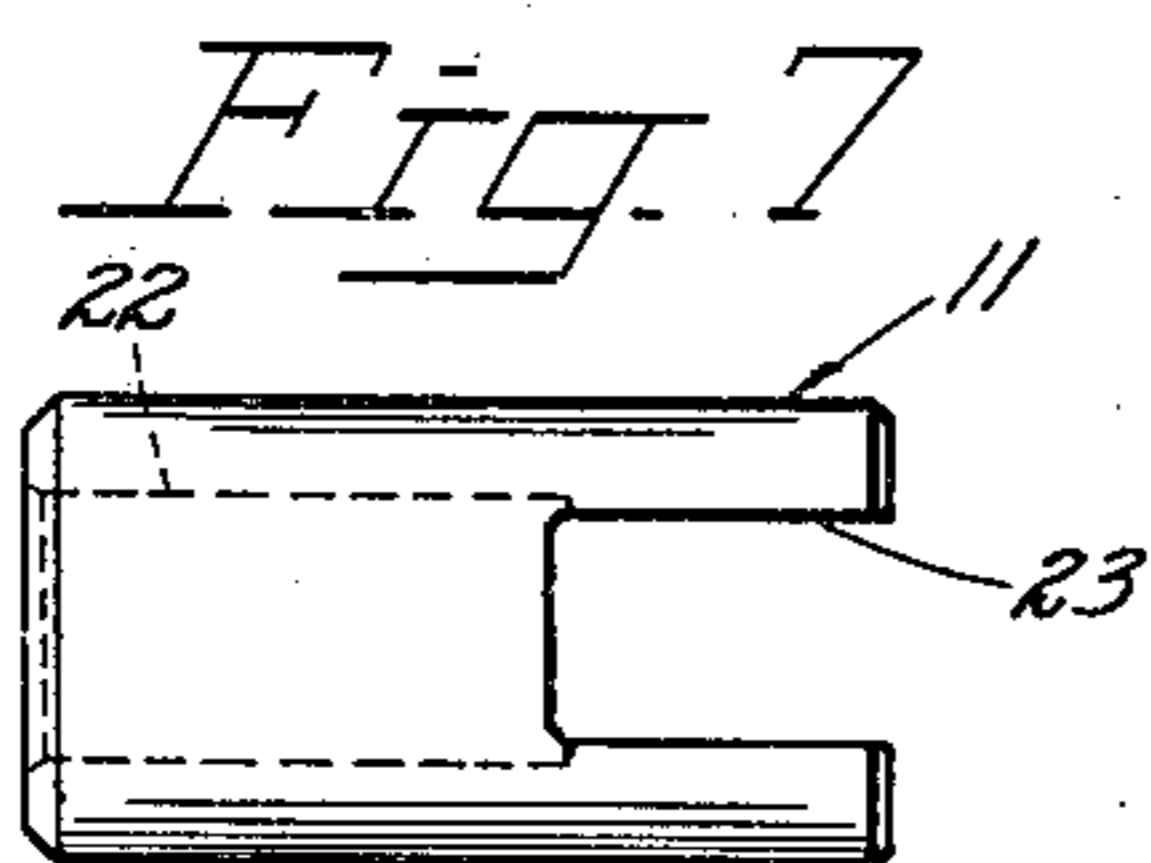
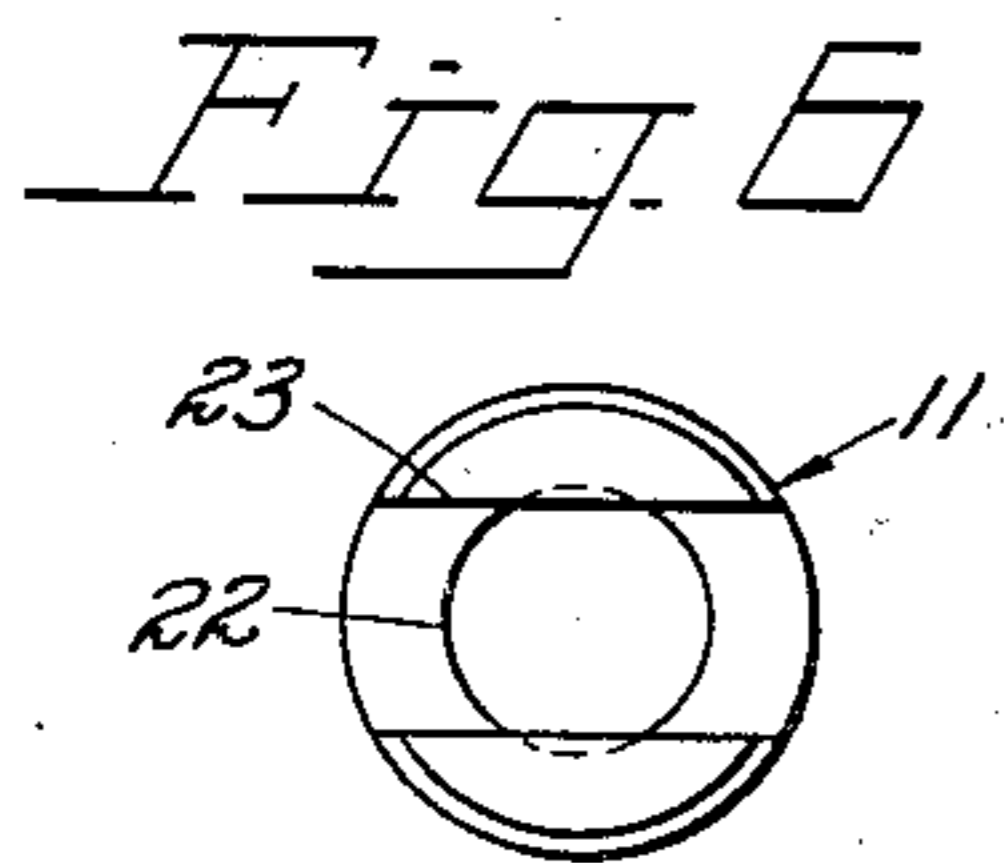
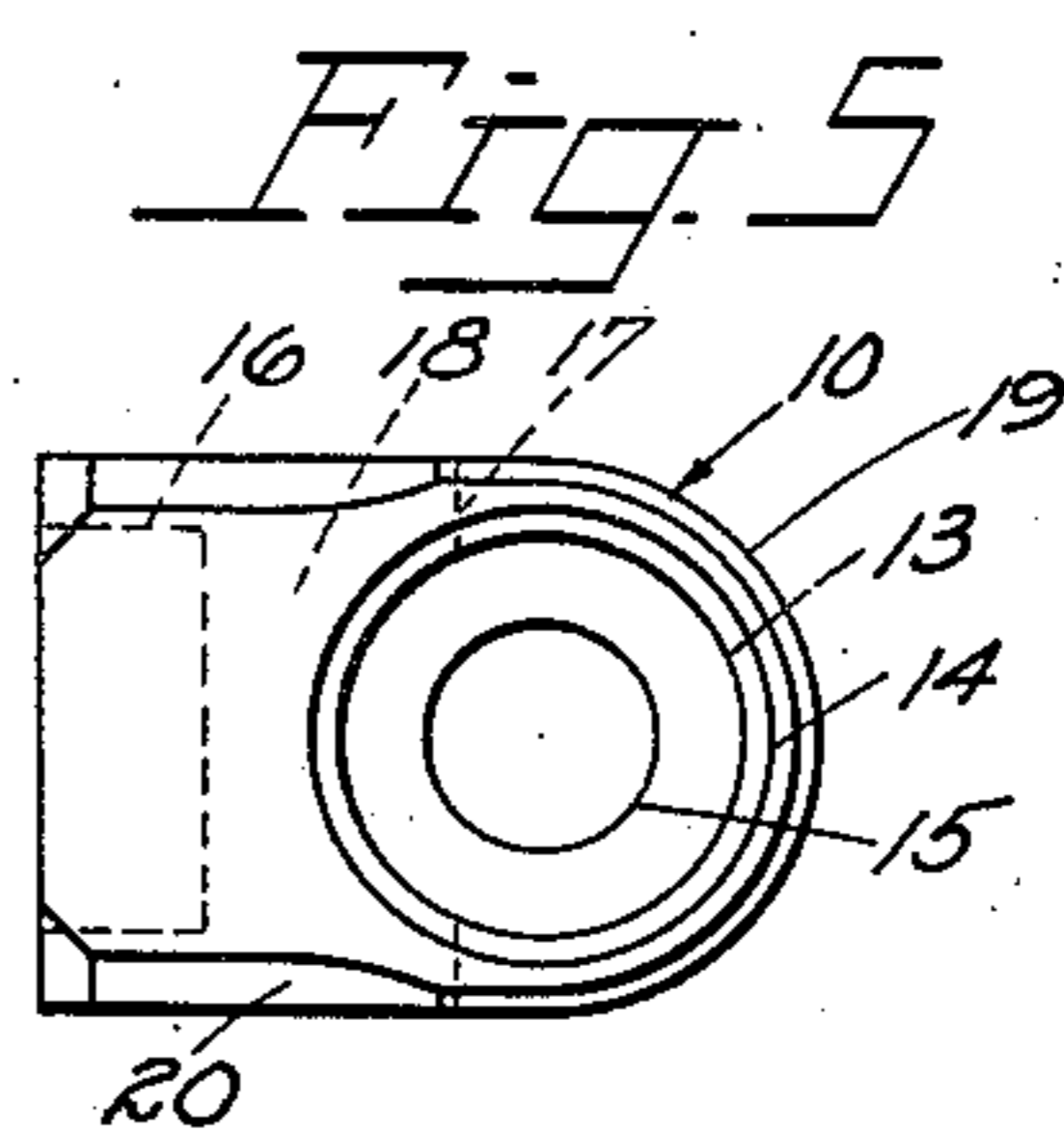
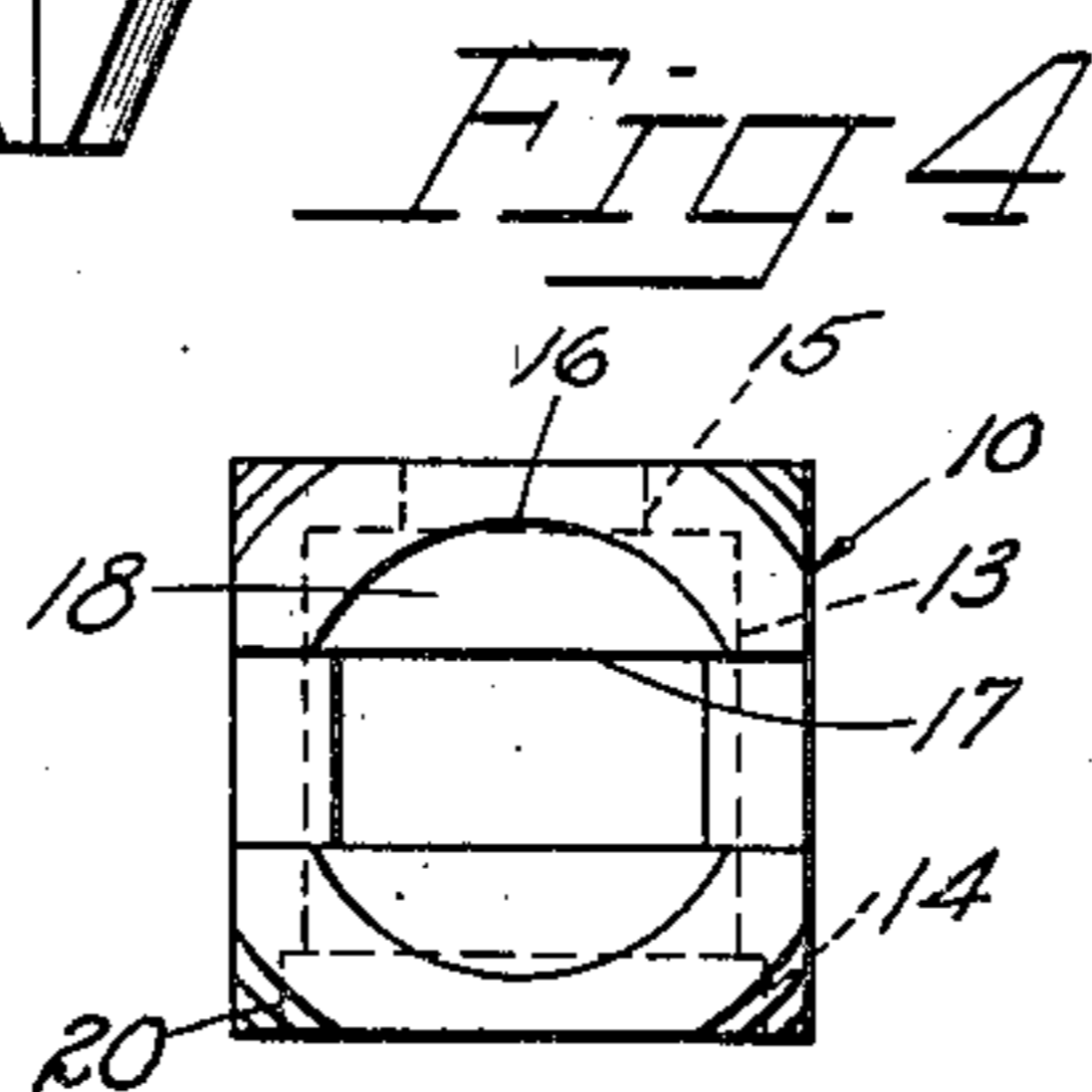
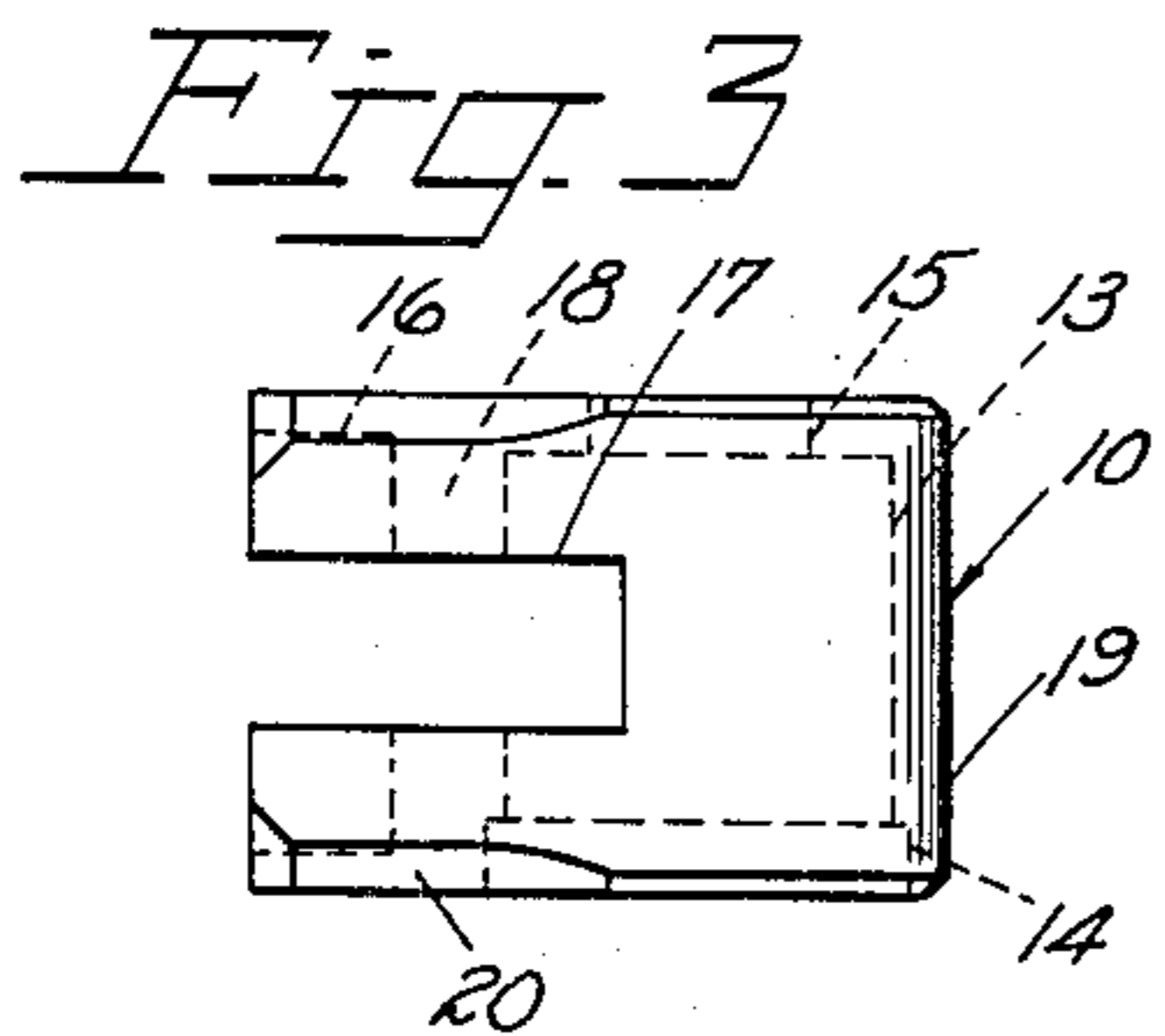
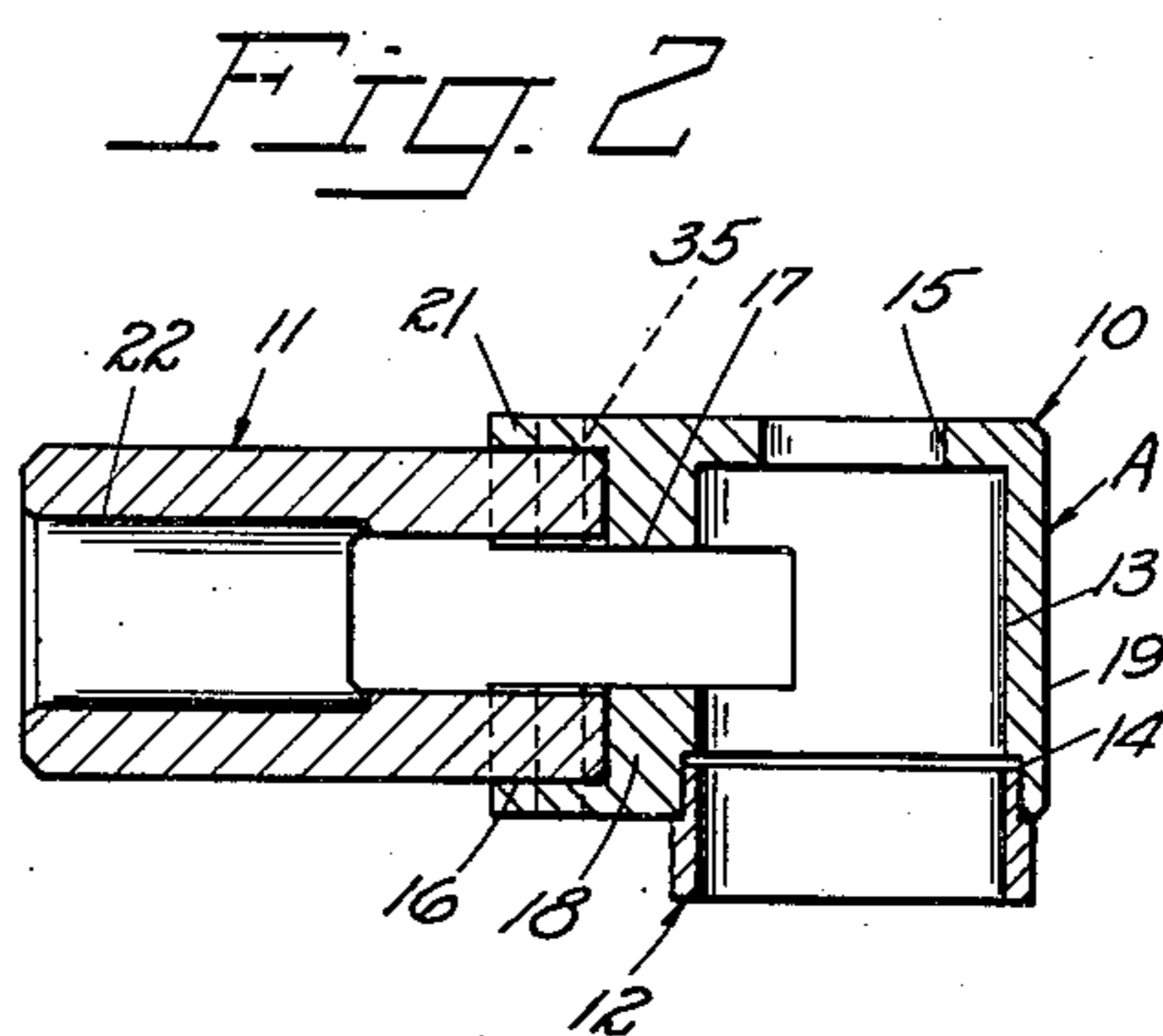
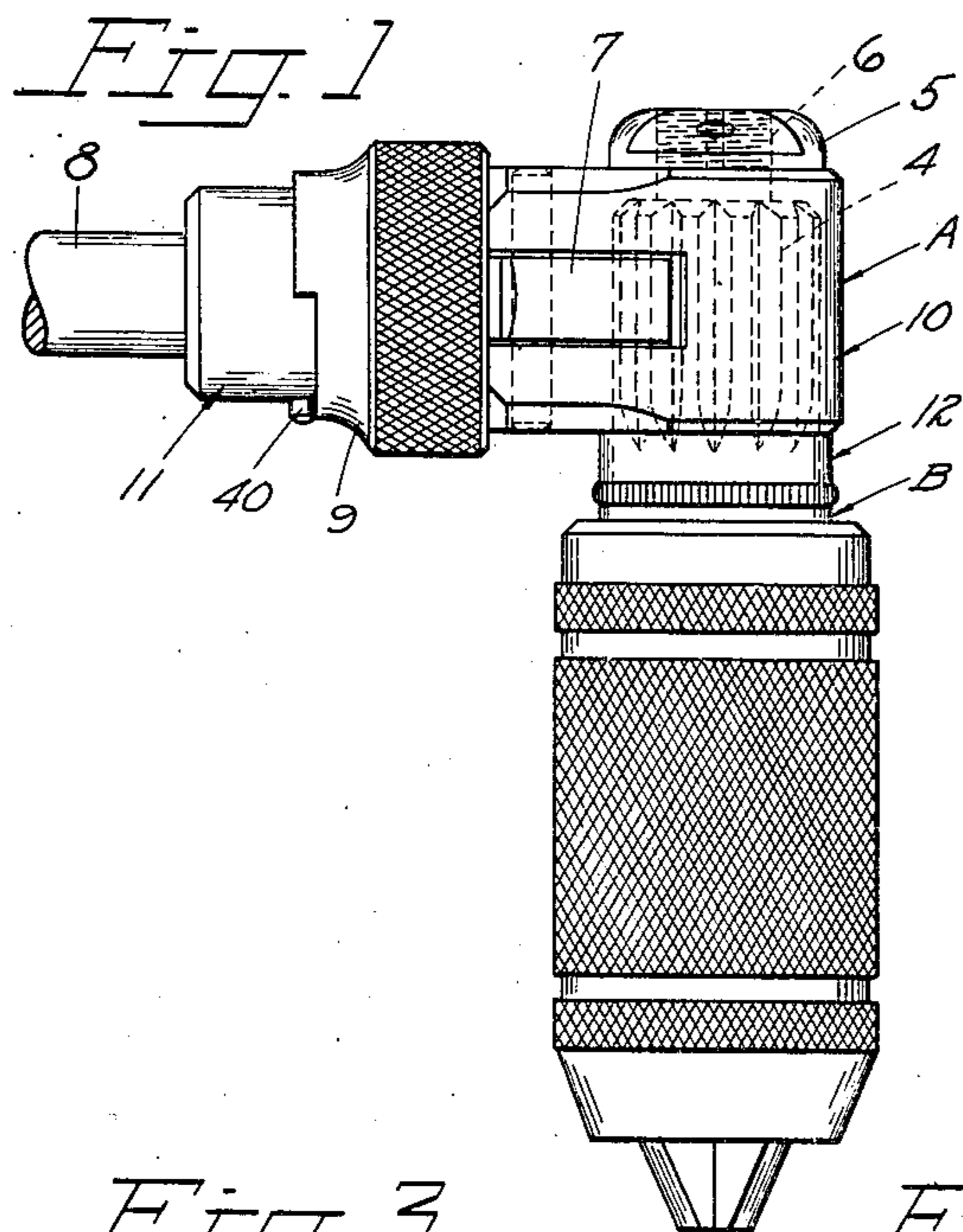
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2,485,991

RATCHET END FOR BRACE BITS

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## UNITED STATES PATENT OFFICE

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## RATCHET END FOR BRACE BITS

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## 1. Claim. (Cl. 145—72)

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The present invention relates to bit braces of the box ratchet type comprising a ratchet end, a spindle journaled in the ratchet end and carrying a shell and jaws, a crank or bow connected to the ratchet end and extending laterally therefrom, pawls mounted in the ratchet end and cooperating with ratchet teeth on the spindle, and a camming sleeve journaled on the ratchet end for selectively engaging the pawls with the ratchet teeth.

The aim of the invention is to provide a simple, strong and economically manufactured ratchet end, the parts of which may be cheaply made of steel and readily assembled, the resulting structure being extremely durable and of pleasing appearance.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claim.

The accompanying drawings illustrate one embodiment which my invention may take:

Figure 1 is an elevational view of a portion of a bit brace in which my improved ratchet end is incorporated;

Fig. 2 is a vertical longitudinal sectional view of the assembled ratchet end;

Fig. 3 is a side view of the head of the ratchet end;

Fig. 4 is a left-hand view of the head, referring to Fig. 3;

Fig. 5 is a bottom view of the head;

Fig. 6 is a right-hand end view of the shank of the ratchet end, referring to Fig. 7;

Fig. 7 is a side view of the shank;

Fig. 8 is a bottom view of the shank;

Fig. 9 is a side view of the collar or bushing of the ratchet end; and

Fig. 10 is a bottom view thereof.

Referring to the drawings, and particularly to Fig. 1, A denotes my improved ratchet end. B is a spindle carrying the usual shell and jaws at one end, the spindle at its upper end being provided with ratchet teeth 4 and journaled in ratchet end A and maintained in place by a nut 5 on a threaded stem 6 projecting from the upper end of the head of the ratchet end. Pivoted in the ratchet end and cooperating with ratchet teeth 4 on the spindle are two oppositely positioned pawls 7, only one pawl being illustrated. The ratchet end is provided with a lateral ex-

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tension or shank for receiving the crank or bow 8 of the bit brace and about this extension is a camming sleeve 9 cooperating in the usual manner with the tails (not shown) of the pawls.

Referring more particularly to my improved ratchet end, the same comprises three pieces, a head 10, a shank 11, and a collar or bushing 12. The head 10, which may be formed from steel stock, is provided with a vertical cylindrical bore or chamber 13 for accommodating the toothed portion 4 of the spindle. Chamber 13 is counter-bored at its lower end, as at 14, and is provided at its upper end with an opening 15 axially aligned with the other bores for receiving stem 6 of the spindle. One end of the head is provided with a circular recess or bore 16 disposed at right angles to the chamber 13 and adapted to accommodate one end of the shank. The head 10 is transversely milled on a horizontal plane, as at 17, providing a slot through the chamber 13, the recess 16, and the wall 18 between the chamber and the recess. The end of the head containing the chamber is rounded, as at 19, to provide a pleasing appearance and to reduce the weight thereof.

The shank 11 is formed from round steel stock and is provided, at one end, with an axial bore 22 for receiving the end of the crank or bow 8. The shank is transversely and horizontally slotted at the other end, as at 23, and the diameter of the shank is such as to fit in the recess 16 of the head. The slot 23 is so positioned that when the shank is fitted into the head, an elongated horizontal slot is formed for accommodating the pawls 7. The collar or bushing 12 is a circular piece having a through opening 30 of equal diameter to the diameter of chamber 13. At the upper end of the collar is a cylindrical flange 31 of such dimension as to closely fit in the counter-bore 14 of the body member.

The head is formed from steel stock which, if desired, may be square in cross section. The recess 16 may be bored in a screw machine and at the same time the corners of the stock chamfered, as at 20, to give the head an ornamental appearance. The piece may then be cut from the stock and be bored and drilled in a chucking machine to form the chamber 13, the counterbore 14, and the opening 15. A milling machine may then be employed to round the piece about the radius of the bore and to mill the slot 17. The shank may be very easily and cheaply manufactured by boring a piece of stock and cutting it to length in a screw machine and then, in a second operation, milling the slot. The collar or bushing may

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be a circular piece of steel and may be economically manufactured in a screw machine by a boring operation, an operation for reducing the upper end to form flange 31, and then cutting off to size.

After forming the pieces, they can be easily and quickly assembled into a rigid unit to produce the ratchet end. The flange 31 of the collar 12 is positioned in the counterbore 14 of the head 10 and the slotted end of the shank 11 is fitted into the recess 16 of the head. A brazing material is applied to the joints as, for example, by inserting rings of copper into the bores before inserting the shank and collar therein. The assembled parts are then brazed together by applying heat, preferably in a medium from which oxygen is excluded, or by immersing in a liquid heat bath. This procedure has the advantage of keeping the surface of all parts clean and free from scale or other oxidation. After assembling the parts of the ratchet end, vertical holes 35 are bored through the outer wall 21 of the recess 16 of the head and through the end of the shank projecting into the recess. Into these holes are inserted pivot pins on which are mounted the pawls. The camming sleeve is then inserted over the shank and maintained in position by a pin 40 (Fig. 1) driven into the shank. The crank or bow is then driven or force-fitted into the axial bore 22 of the shank.

It will be seen from the foregoing description that my improved ratchet end is easily and economically manufactured with a minimum of operations, and that the parts thereof can be quickly assembled into a complete rigid unit which, in turn, is easily assembled with the other parts of the brace bit into the finished product.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language

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used in the following claim is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

A ratchet end for bit braces comprising a head, a shank and a collar, said head being formed of steel bar stock and having adjacent one end a transverse chamber with a counterbore at one end of the chamber and an axial opening at the other end of the chamber so as to accommodate a chuck spindle, said head having in its other end a circular recess disposed at right angles to said chamber there being a wall between said chamber and recess and having a diametrical slot at right angles to the axis of the chamber extending through said recess, said wall, and a portion of the wall of said chamber, the first-mentioned end of said head being curved substantially about the axis of said chamber; said shank comprising a cylindrical piece of steel having one end fitted into said recess and provided with a diametrical slot registering with said first-mentioned slot and forming a continuation thereof so as to provide an elongated opening closed at each end adapted to receive ratchet pawls, the other end of said shank having an axial bore to receive the end of a crank; said collar comprising a steel bushing having a through opening corresponding in diameter to and registering with said chamber and having a cylindrical flange at one end fitted in said counterbore with the remainder of the collar projecting outwardly from the head, said shank and collar being permanently joined to the head by brazing.

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The following references are of record in the file of this patent:

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