

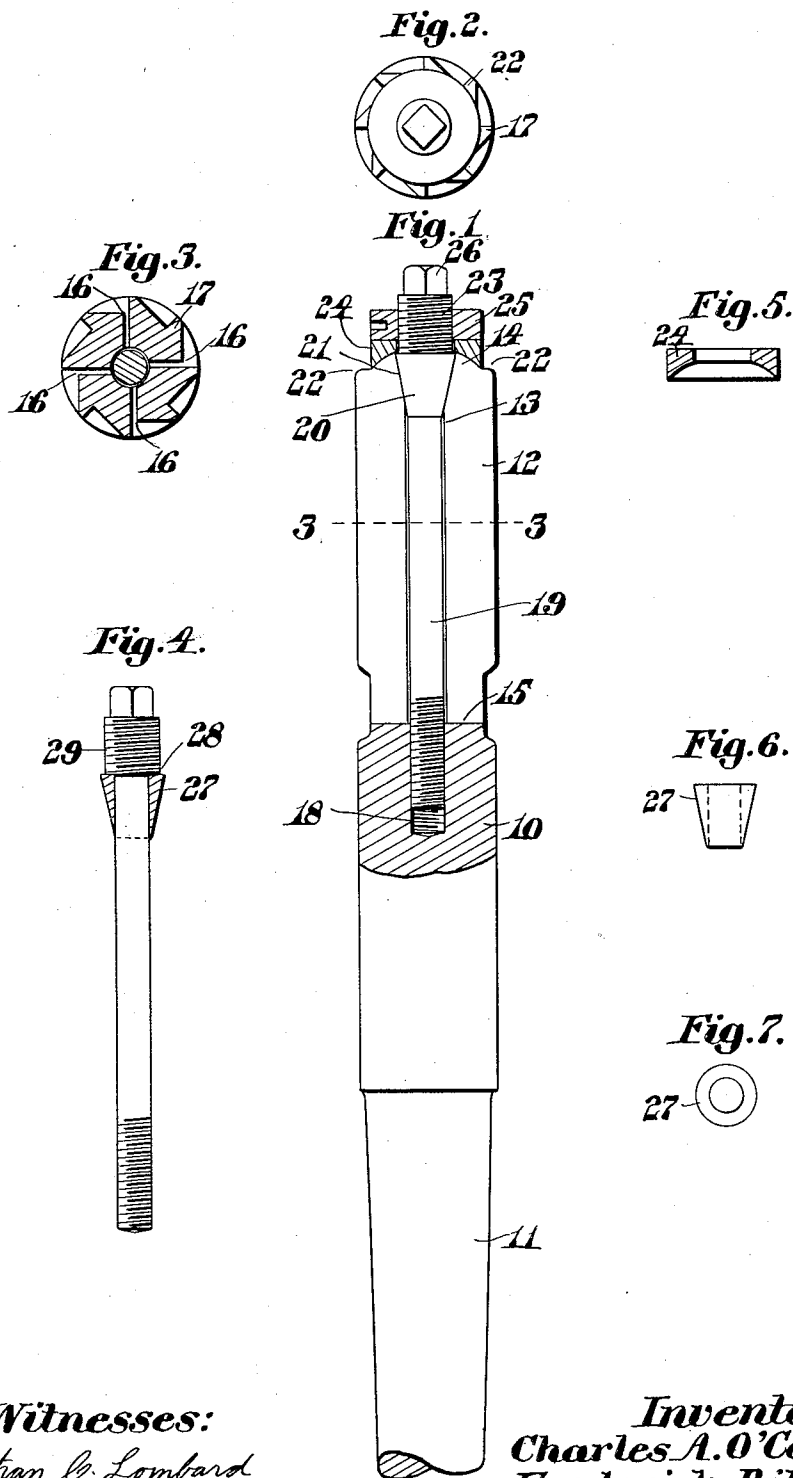
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REAMER.

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1,043,965.

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UNITED STATES PATENT OFFICE.

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REAMER.

1,043,965.

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To all whom it may concern:

Be it known that we, CHARLES A. O'CONNOR and FREDERICK RILEY, 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 metal working tools but more particularly to adjustable or expanding reamers and has for its object the providing of a device which is more efficient, capable of the greater adjustment, and more easily and accurately adjusted than those now in use.

Heretofore numerous forms of central cone adjustable reamers have been devised but these have generally been constructed so that the cutters are expanded throughout their length of a considerable portion thereof by the cone. In this type the side faces of the cutters come in contact with the perforation in which the reamer is operating and cause chattering. Even when the cone exerts an expanding pressure on a considerable length of the cutters, this trouble is encountered.

In the present invention the expanding pressure on the cutters is exerted only at the forward extremities thereof so that only these extremities contact with the perforation.

One feature of the present invention is the use of a free cone upon the operating bolt. Such a construction permits the reamer to be more easily adjusted than is the case in a reamer where the conical portion is integral with the operating bolt. Also it permits the use of different sizes and styles of cones upon the same bolt.

Numerous other features of the invention will be hereinafter described in the specification and included in the claims.

Referring to the drawings:—Figure 1 is a side elevation of the invention complete, portions having been removed to show the interior construction. Fig. 2, is an end view of Fig. 1. Fig. 3, section on line 3—3 of Fig. 1. Fig. 4, modified form of expanding bolt, as will be described hereinafter. Figs. 5, 6 and 7, detail views.

In the drawings the body portion 10 of the reamer is provided with a shank 11 constructed to enter a tool holder in the usual

manner, and at the opposite end of the body portion is a shell 12 having an axial-opening or bore 13. This shell 12 is split longitudinally from the outer end 13 to the point 15. In the embodiment shown, there are four of these splits as is shown best in Fig. 3, the slits being designated 16. This shell is provided with a plurality of cutters 17.

The inner end 18 of the axial opening 13 is threaded to receive the threaded extremity of the bolt 19 and this bolt is provided with a conical portion 20 adapted to act in a tapering portion 21 of the bore 13. This tapering portion 21 is at the outer end of the bore and only extends a very short distance therein and the conical portion 20 which acts therein is also very short so that this cone expands the reamer at the outer end thereof.

This reamer is of the end operating type in that only the outer corners 22 of the cutters perform the cutting. For this reason, it is desirable to expand only the extremity thereof. If the cone extends any considerable distance into the bore, a considerable length of the cutters must necessarily be expanded thereby and such construction prevents the proper operation of the cutters. Also the longer cone, when the same is integral with the bolt, makes it much more difficult to turn the bolt on account of the greater friction surfaces involved.

Near the outer end of the bolt 19 is an enlarged threaded portion 23 over which is adapted to slip a cup shaped washer 24, best shown in Figs. 1 and 5, which engages the end 14 of the reamer having a convex face. Upon this threaded portion 23 operates the lock-nut 25 adapted to bind the washer 24 against the end portion 14. The extremity 26 of the bolt 19 is adapted to be grasped by a wrench to permit this bolt to be advanced or withdrawn as is usual in this type of reamer.

In Fig. 4 of the drawing is illustrated a very desirable modification of the invention in which a loose cone 27 is provided in place of the usual conical portion integral with the bolt. This feature is a very important one as it allows the bolt to revolve within the conical portion and thus this conical portion does not have to rotate within the tapering portion of the bore, permitting the reamer to be adjusted much more easily than with the fixed cone. Also this construction per-

mits cones of different sizes or styles to be placed upon the bolt when greater or less degree of expansion are required. This cone acts against the shoulder 28 on the threaded portion 29 of the bolt.

Figs. 6 and 7 show detailed views of the cone removed from the bolt, Fig. 6 being a side elevation and Fig. 7, a view of the end contacting with the shoulder 28.

10 The applicants are aware that numerous other modifications could be made by anyone skilled in the art without departing from the scope of the appended claims and therefore they do not care to be limited to the particular embodiments herein shown and described.

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

20 1. In a device of the class described, the combination of a body portion provided at one end with an expansible shell having cutting members on the outer face thereof and an axial opening therein; a bolt within said opening having its inner end threaded to act in a corresponding threaded portion within the axial opening; a conical member slidable upon said bolt and adapted to act within a corresponding tapering portion of

said axial opening to exert a pressure on the walls thereof to cause said shell to expand, 30 and a shoulder on said bolt against which said conical member acts.

2. In a device of the class described, the combination of a body portion provided at one end with an expansible shell having cutting members on the outer face thereof and an axial opening therein; a bolt within said opening having its inner end threaded to act in a corresponding threaded portion within said axial opening; a sleeve mounted upon 35 said bolt having its inner face smooth to contact with a corresponding smooth portion of said bolt and its outer face conical to exert an expanding pressure on a corresponding tapering portion of the walls of 45 said opening; a shoulder on said bolt against which said sleeve acts; and means for locking said shell upon said sleeve.

In witness whereof we have hereunto set our hands this 9th day of March 1911.

CHARLES A. O'CONNOR.
FREDERICK RILEY.

Witnesses:

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EMMA E. GALE.