(No Model.)

J. NEALE.

REAMER.

No. 330,508. Patented Nov. 17, 1885.

Fig. 2.

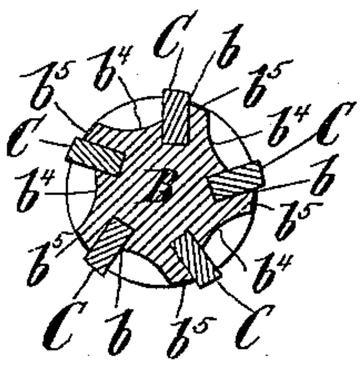

Fig. 1.

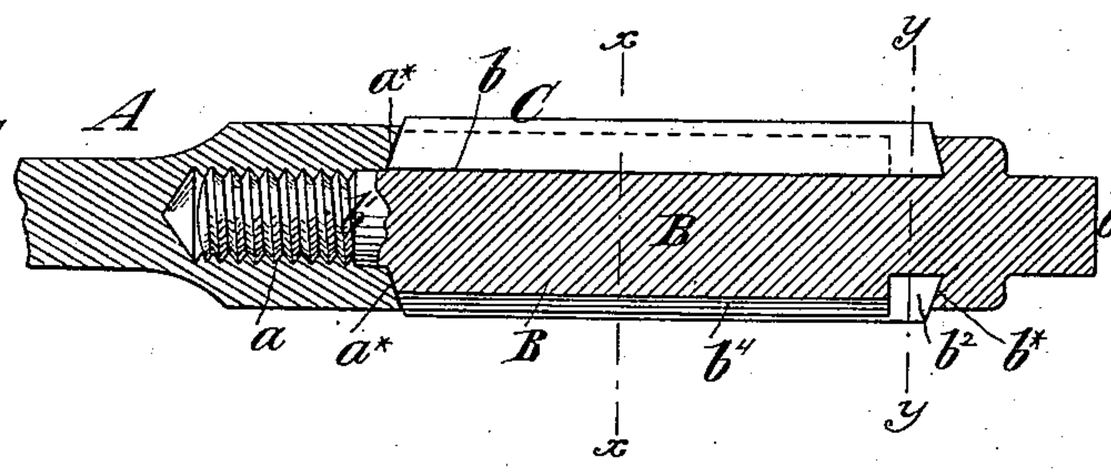

Fig. 3.

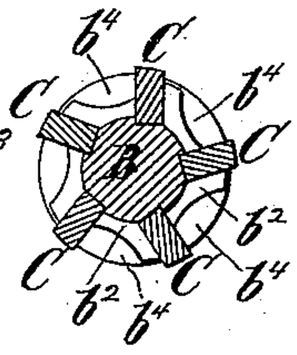

Fig. 5.

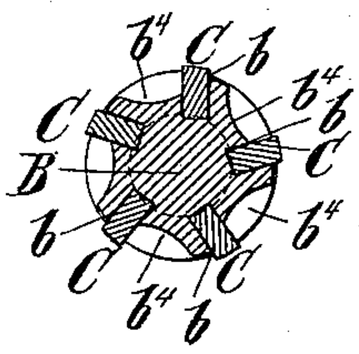

Fig. 4.

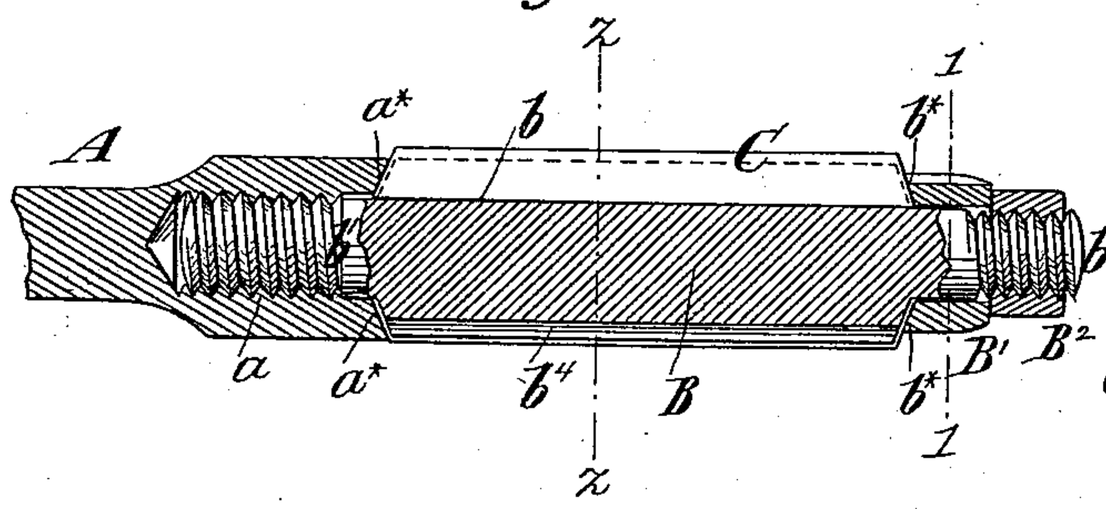

Fig. 6.

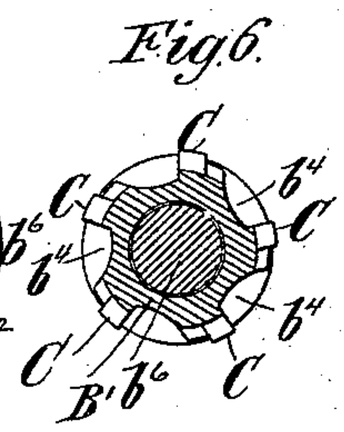

Fig. 8.

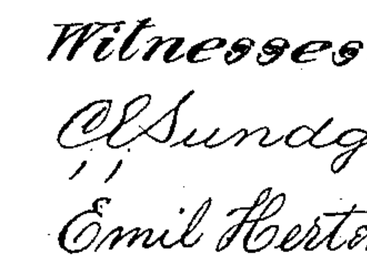

Fig. 7.

Witnesses:
C. L. Sundgren
" "
Emil Herter.

Inventor:
James Neale
by his Attys
Brown & Hall

UNITED STATES PATENT OFFICE.

JAMES NEALE, OF BRIDGEPORT, CONNECTICUT.

REAMER.

SPECIFICATION forming part of Letters Patent No. 330,508, dated November 17, 1885.

Application filed April 18, 1885. Serial No. 162,649. (No model.)

To all whom it may concern:

Be it known that I, JAMES NEALE, of the city of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Reamers, of which the following is a specification.

My invention relates to reamers which consist of a shell or body and cutters detachably secured therein; and the invention consists in a novel construction of the shell or body of the reamer, and in the novel combination therewith of detachable cutters, as hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of a reamer embodying my invention. Fig. 2 is a transverse section thereof on the plane of the dotted line *x x*, Fig. 1. Fig. 3 is a transverse section on the plane of the dotted line *y y*, Fig. 1. Fig. 4 is a central longitudinal section of a reamer embodying my invention in a slightly modified form. Fig. 5 is a transverse section on the plane of the dotted line *z z*, Fig. 4. Fig. 6 is a similar section on the plane of the dotted line 1 1, Fig. 4. Fig. 7 is a central longitudinal section of a reamer of slightly modified form also embodying my invention, and Fig. 8 represents a transverse section on the plane of the dotted line 2 2, Fig. 7.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Figs. 1, 2, and 3, A designates a portion of the shank of a reamer, and B the shell or body, in which are detachably secured cutters C C. The reamer here shown has five cutters arranged at equally-distant points around its circumference, but larger or smaller reamers may have a greater or less number of cutters, as may be desired.

The cutters C consist of straight pieces of steel having parallel sides and dropped into grooves *b* of corresponding form in the shell or body B. These grooves *b* are not dovetailed but have parallel sides, and the cutters C may be introduced into and removed from them in a lateral direction. The shell or body B has at its inner end a screw-threaded projection, *b'*, entering a socket, *a*, in the shank portion A, and the end of the shank portion A around said socket *a* is undercut or beveled inward so as to form a dovetailed shoulder, *a**. The shell or body B has near its outer end a circumferential groove, b^2, as best shown in Figs. 1 and 3, thereby forming beyond the groove a fixed collar, the inner face or side of which is inclined or beveled inward, as shown at *b**. The grooves *b* in the shell or body B extend from the inner end thereof outward to the circumferential groove b^2, and the cutters C, which are fitted in the grooves *b*, extend from the shoulder *a** to the shoulder *b**, and have their ends beveled or inclined corresponding to these shoulders. The shell or body B has at the outer end a square or polygonal head, b^3, to which a wrench may be applied for screwing the shell or body into the shank portion, and the cutters C, having been previously placed in their grooves or seats *b*, will then be confined and held against outward movement by their inclined or beveled ends fitting against and under the inclined or beveled shoulders *a* b**.

In order to give proper clearance for chips, the portions of the shell or body which are between the grooves *b* are grooved or cut away, as represented at b^4 in Fig. 2, and it will be observed that these grooves or channels b^4 extend inward at one edge nearly to the bottom of the grooves *b*, but at the other edge do not extend to the grooves *b*. By this construction an ample shoulder or body of metal, b^5, is afforded at the back of each cutter to support it and still ample clearance for chips is afforded. If by reason of wear on the cutters the reamer does cut up to the standard size, then paper may be introduced into the grooves *b* under the cutters C, or the cutters may be thrown away and new ones supplied, which may be done very cheaply. Very little steel is used in the cutters, and hence this construction enables the very finest steel to be used for the cutters without adding greatly to the expense of the reamer.

I will now turn to Figs. 4, 5, and 6, which show a reamer, but slightly different from that previously described. The shank A has a socket, *a*, into which is screwed a stud, *b'*, projecting from the shell or body B, and the shell or body B has at its outer end a screw-threaded stud or projection, b^6, on which is placed a collar, B', and a nut, B^2.

The cutters C fit in grooves *b*, as before described, and are inclined or beveled at their ends and fit against corresponding inclined or

beveled shoulders, a^* b^*, upon the shank portion A and collar B′. The shell or body B between the grooves *b* which form the cutter-seats is grooved or channeled, as shown at b^4, in order to afford proper clearance for chips, and such grooves or channels extend on their sides which are rearmost nearly to the bottom of the groove *b*, while on the opposite sides they do not extend quite to the grooves *b*, thereby forming an ample body of metal to support the back of the cutter.

In Figs. 7 and 8 I have represented a reamer which embodies my invention in a slightly modified form. In this example of the invention the shank portion A and the shell or body B are made in one piece, which is formed with a circumferential groove or recess, b^2, the rear or inner side of which is beveled or inclined inward so as to form the shoulder a^* on the shank at its junction with the shell or body. At the outer end of the shell or body is a screw-threaded stud, b^6, on which are a washer or loose collar, B′, and a nut, B^2. The cutters C are fitted to grooves or seats *b*, which extend from the circumferential channel or recess b^2 to the forward end of the body or shell, and the cutters C are held at opposite ends between the inclined or beveled shoulders a^* b^*, the former on the shank A and the latter on the collar B′.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a reamer shell or body provided with longitudinal grooves or cutter-seats having parallel sides, a shank portion having at its junction with one end of the shell or body an inclined or beveled shoulder, a^*, a collar at the other end of the shell or body forming an inclined or beveled shoulder, b^*, and cutters C, fitted to the said grooves or cutter-seats and having their ends inclined or beveled to fit the inclined or beveled shoulders a^* b^*, substantially as herein described.

2. The combination of a reamer shell or body provided with longitudinal grooves or cutter-seats having parallel sides and grooved at b^4 between the cutter-seats to afford clearance for chips, a shank portion having at its junction with one end of the shell or body an inclined or beveled shoulder, a^*, a collar at the other end of the shell or body forming an inclined or beveled shoulder, b^*, and cutter C, fitted to the said grooves or cutter-seats and having their ends inclined or beveled to fit the inclined or beveled shoulders a^* b^*, substantially as herein described.

3. The combination, with the shank portion A, having an inclined or beveled shoulder, a^*, of the shell or body B, screwed into said shank portion A, having near its outer end a circumferential recess or groove, b^2, forming beyond the recess or groove a fixed collar, the inner side, b^*, of which is beveled or inclined, and having the grooves or cutter-seats *b* with parallel sides, and the cutters C, fitting the seats *b* and having their ends inclined or beveled to fit under and against the shoulders a^* b^*, substantially as and for the purpose herein described.

JAMES NEALE.

Witnesses:
J. O. HORTON, Jr.,
L. DAVIS.