(No Model.)

W. MILLER.

EXPANDING REAMER.

No. 342,218. Patented May 18, 1886.

Fig 1.

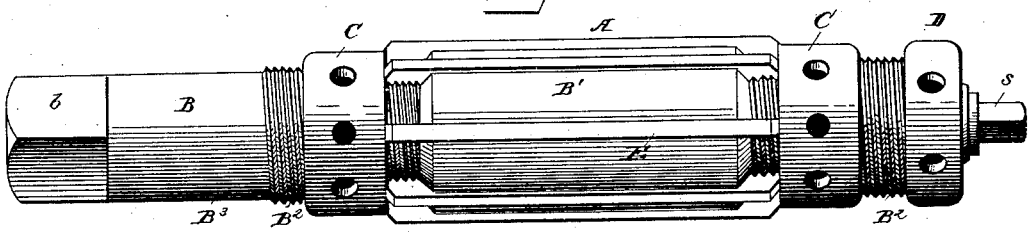


Fig 2.

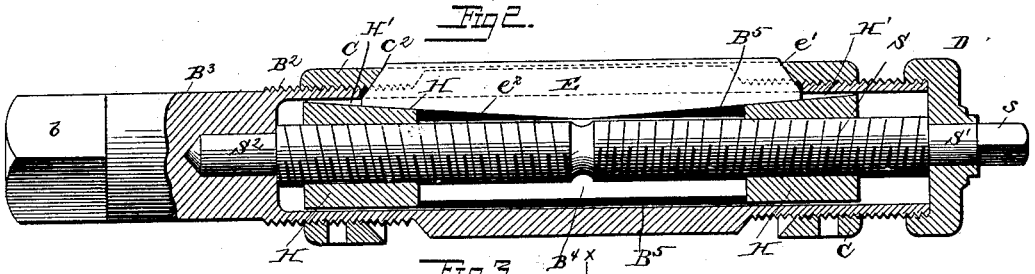


Fig 3.

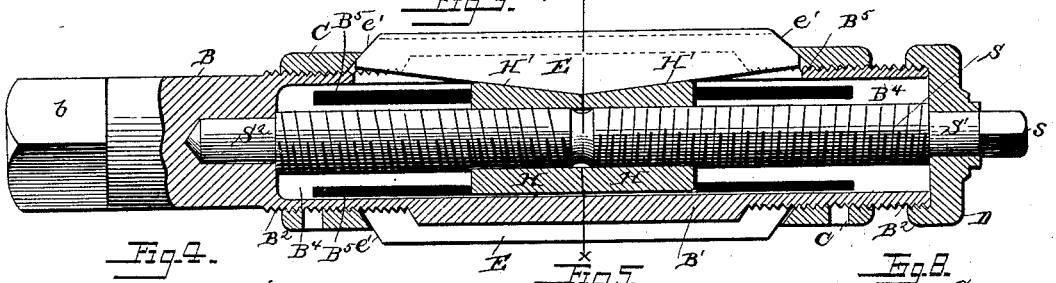


Fig 4.

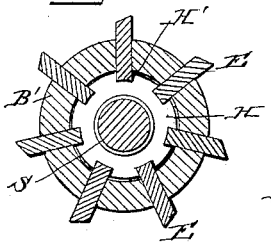


Fig 5.

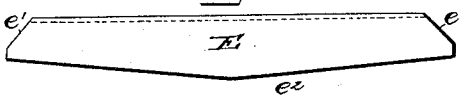


Fig 8.

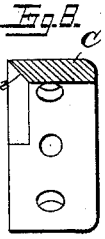


Fig 6.

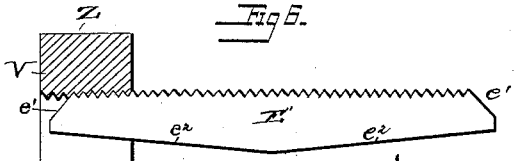
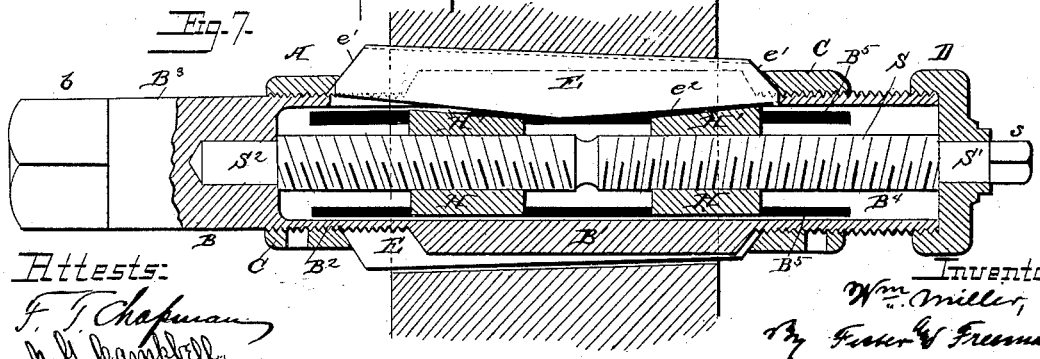


Fig 7.



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UNITED STATES PATENT OFFICE.

WILLIAM MILLER, OF WOONSOCKET, RHODE ISLAND.

EXPANDING-REAMER.

SPECIFICATION forming part of Letters Patent No. 342,218, dated May 18, 1886.

Application filed March 27, 1886. Serial No. 196,834. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MILLER, residing at Woonsocket, county of Providence, State of Rhode Island, have invented certain new and useful Improvements in Expanding-Reamers, of which the following is a specification.

My invention relates to expanding-reamers; and it consists, essentially, of a metallic hollow shell or case adapted to receive a right-and-left-threaded screw, which has mounted thereon two nuts, each having a series of narrow inclined grooves or slots adapted to receive a series of peculiarly-shaped cutters, the said shell being further provided with a series of openings for said cutters and also having an exterior threaded portion adapted to receive adjusting-nuts.

My invention further consists in adapting said reamer to be used as an arbor or mandrel; also for reaming tapering holes; and, finally, as an expanding-tap and squaring-up nut-arbor, all as will be more fully hereinafter set forth.

In the accompanying drawings, Figure 1 represents a side elevation of my improved reamer; Fig. 2, a longitudinal central section through the same, showing the cutters contracted as used for small holes; Fig. 3, a similar view to that shown in Fig. 2, except that the cutters are expanded to their limit, as when used for reaming large holes; Fig. 4, a cross-section through line $x\,x$ of Fig. 3; Fig. 5, a detail view of one of the cutters; Fig. 6, a detail view of the said cutter when adapted to be used in my reamer as a tap or as a squaring-up nut-arbor; Fig. 7, a longitudinal section of the reamer adapted for reaming taper-holes; Fig. 8, a detail, partially sectional, view of one of the exterior adjusting-nuts.

A designates the reamer as a whole, made from suitable metals, and consisting of the round hollow arbor B, having a central enlarged portion, B′, threaded at each end thereof, as shown at B^2, and also provided with the shank B^3, which terminates in a square portion, *b*. The said arbor B is further provided with a series of slots, B^5, extending through the shell thereof and into the chamber B^4.

S designates a right-and-left threaded screw, the end S^2 thereof adapted to be mounted and revolve freely in the arbor B, the opposite end of said screw at S′ being seated in the arbor-cap D. Upon the said screw are fitted the right-and-left nuts H, the peripheries thereof having a series of radial slots or grooves, H′, (see Fig. 4,) formed therein, the bottom of said grooves being cut at a taper or angle to the axis of the nuts.

E, Fig. 5, designates a cutter, which is preferably constructed of steel, and has its under edge, e^2, beveled in opposite directions and adapted to be seated in the grooves H′ of the nuts H. The ends e' of the cutter are also beveled, as shown.

The following is a description of the operation, &c., of my improved reamer, assuming all the parts to have been adjusted and the nuts H separated, as shown in Fig. 2, so as to retract the cutters to correspond to the minimum-size hole: When now, desiring to expand the reamer to ream a larger hole, I first loosen the check-nuts C and screw them outwardly, when, by means of the squared portion *s* of the screw S, I turn said screw in the proper direction, which movement causes the nuts H to move uniformly toward each other, and the latter in turn, by means of the taper-grooves H′ therein, force the cutters E outwardly and radially until the desired size or diameter is reached—as, say, in Fig. 3—when, finally, the nuts C are screwed firmly against the ends C′ of the cutters, thus completing the adjustment. The nuts H are prevented from turning or rotating on the screw by the cutters E connecting said nuts and arbor B together.

The reamer is adapted to be used for reaming tapering holes T, (see Fig. 7,) wherein the left nut C has been screwed outwardly and the other or right nut C is made to follow up against the cutters, the cutter of the latter thereby being forced past the center of the screw S, and the beveled edges e^2 of the cutters resting upon the inner and outer edges, respectively, of the groove of the left and right nuts H, as fully shown.

The reamer is also adapted to serve as an adjustable tap by substituting cutters E′, having cutting-teeth thereon, as indicated in Fig. 6; or it can be used as an adjustable squaring-up arbor by suitably "dogging" and centering the same in a lathe or similar machine.

Z represents a nut mounted on the arbor or tap preparatory to squaring off the face V thereof.

My improvement is also adapted to be used in an expanding reamer or mandrel in connection with ordinary lathes for turning off and squaring up work.

In machine-shops it is customary to possess and use a series of reamers in order to ream holes--say one and fifteen-sixteenths inch to two and one-half inches diameter, thereby greatly adding to the expenses of equipment. With one size of my improved reamer I can practically ream any size hole included between the above-named figures. My reamer, therefore, in connection with its other above-enumerated advantages, will be found to be a valuable and labor-saving tool for the machine-shop, &c.

Without limiting myself to the precise construction shown, I claim—

1. A reamer consisting of a suitable arbor, a screw contained therein, grooved nuts on said screw, and cutters adapted to be seated in the grooves in said nuts and adjustable radially thereby, substantially as described.

2. A reamer consisting of a suitable arbor, a screw contained therein, nuts contained on said screw and having tapering grooves, and cutters having beveled portions resting in said grooves, substantially as described.

3. A reamer consisting of a suitable arbor, a screw contained therein, grooved nuts mounted on said screw, cutters resting in said grooves, and check-nuts engaging the ends of the cutters, substantially as described.

4. In an expanding-reamer having a slotted hollow arbor provided with check-nuts and a cap, the combination therewith of a right-and-left-threaded screw and nuts thereon, the latter adapted to receive suitable cutters, substantially as shown and set forth.

5. In an expanding-reamer, a hollow arbor provided with a slotted elongated portion, a threaded portion, and a shank, in combination with a right-and-left-threaded screw mounted in said arbor, grooved nuts on said screw, a cap closing the end of the arbor, check-nuts on the arbor, and cutters, substantially as shown and described.

6. An expanding-reamer consisting of the hollow arbor provided with exterior threads, slots, and shank, and further consisting of the beveled cutters, check-nuts adapted to engage with said cutters and threads, a right-and-left-threaded screw mounted within the chamber of the arbor and carrying grooved nuts, the whole combined and arranged substantially as shown, and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM MILLER.

Witnesses:
CHAS. E. BALLOU,
E. CHAS. FRANCIS.