A. ALEXANDER.

EXPANSION SHELL REAMER AND ARBOR THEREFOR.

APPLICATION FILED FEB. 3, 1917.

1,266,538. Patented May 14, 1918.

FIG. 1.

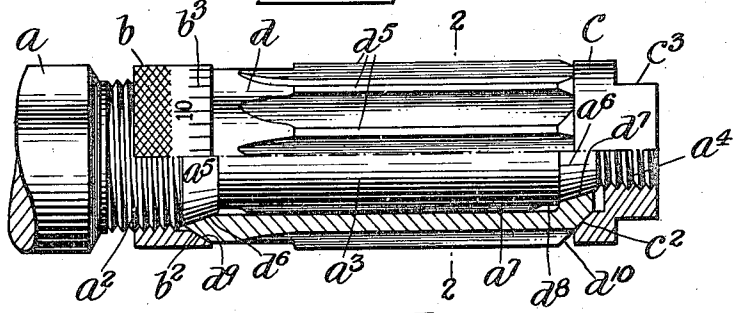


FIG. 2.

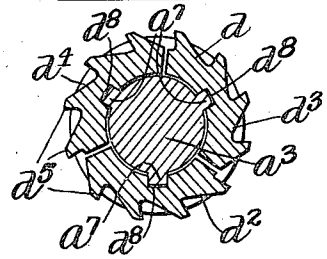


FIG. 3.

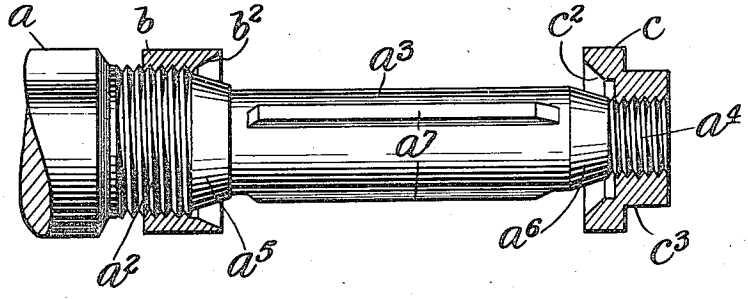
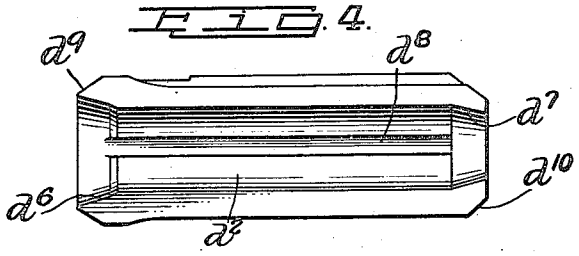


FIG. 4.



Inventor

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UNITED STATES PATENT OFFICE.

ANDREW ALEXANDER, OF NEW YORK, N. Y.

EXPANSION SHELL-REAMER AND ARBOR THEREFOR.

1,266,538. Specification of Letters Patent. Patented May 14, 1918.

Application filed February 3, 1917. Serial No. 146,395.

To all whom it may concern:

Be it known that I, ANDREW ALEXANDER, a citizen of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Expansion Shell-Reamers and Arbors Therefor, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to expansion shell reamers and the arbors therefor, and involves an improved method of expanding said reamer together with improved means by which said expansion is accomplished, or said method carried into effect.

The invention described and claimed herein is an improvement on that described and claimed in U. S. Letters Patent No. 1,210,391 granted to me Jan. 2, 1917, and is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Figure 1 is a side and sectional view of my improvement complete with a part of the construction broken away;

Fig. 2 a transverse section on the line 2—2 of Fig. 1;

Fig. 3 a side view of an improved arbor which I employ with parts connected therewith in section; and,

Fig. 4 an inside view of one of the sections of my improved reamer detached.

In the drawing I have shown at a an arbor such as is usually employed in connection with devices of this class, and one end of which is provided with reduced portions a^2, a^3 and a^4, the reduced portions a^2 and a^4 being threaded as clearly shown and the reduced portions a^2 and a^3, a^3 and a^4 respectively are joined by similar beveled portions a^5 and a^6.

Adjustably mounted on the reduced threaded portion a^2 is a sleeve b which serves to regulate the expansion of the shell reamer as hereinafter set out, and one side of said sleeve is provided with an annular beveled recess b^2. Mounted on the reduced threaded portion a^4 is a lock nut or sleeve c one side of which is provided with an annular beveled recess c^2, and the outer face or periphery of said nut or sleeve is provided with cut out portions c^3 to provide means for turning said sleeve or nut on said reduced threaded portion.

An expansion shell reamer d is mounted on the reduced central portion a^3 of the arbor and in the construction shown said reamer is composed of three substantially similar arc-shaped sections d^2, d^3 and d^4, each of which is provided with a plurality of teeth or blades d^5, and the bore of said reamer formed by the separate sections is provided in the end portions thereof with beveled faces d^6 and d^7, the beveled face d^6 being adapted to operate in connection with, or on the beveled portion a^5 of the arbor, while the beveled face d^7 is adapted to operate on the beveled portion a^6 of said arbor. Each of the sections d^2, d^3 and d^4 is provided on the inner face thereof with a longitudinal groove d^8 forming a key way, as clearly shown in Figs. 2 and 4 of the drawing, in connection with which ribs a^7 on the central reduced portion a^3 of the arbor are adapted to operate, and this construction forms a key-lock for the sections of the reamer whereby the same are held against rotation on the arbor.

The end portions of the sections of the reamer d are provided with external beveled faces d^9 and d^{10} which are adapted to operate respectively in connection with the beveled recesses b^2 and c^2 in the sleeve b and nut c.

With this construction, the sections of the reamer d may be placed on the reduced portion a^3, the ribs a^7 fitting in the grooves d^8, as above described, and the sleeve b is adjusted to the desired position to govern the extent of the expansion, which position may be determined by a suitable scale b^3 on the periphery thereof, as indicated in Fig. 1, after which the lock nut c is operated to force the reamer d, or the sections thereof, against, or in the direction of the sleeve b in which operation the beveled faces d^6 and d^7 on said reamer operate in connection with the beveled portions a^5 and a^6 on the arbor to expand the sections of the reamer, or the periphery thereof to the extent controlled by the sleeve b.

With my improvement the cost of manufacturing devices of this class is materially decreased and yet the desired result is accomplished in a very efficient manner, the reamer d being given a uniform expansion throughout the full length thereof due to

the arrangement of beveled portions on the arbor and within the reamer, as herein set out, and by keying the sections of the reamer individually to the arbor the strain on said sections is equalized which prevents the bending or breaking of said sections and insures the true expansion thereof, and use thereof, in the usual manner.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with an arbor having a reduced end portion consisting of a central cylindrical portion, and larger and smaller portions connected with the central portion by similarly beveled portions, of a sectional reamer mounted on said arbor and each section of which is provided at its ends with internal beveled portions which adjustably engage the beveled portions of the arbor, means for preventing rotation of the reamer sections relative to the arbor, each section of the reamer being also provided at its ends with exterior beveled portions, and securing members mounted on the larger and smaller portions of the arbor and provided with internal beveled faces which adjustably engage the external beveled portions of the reamer sections for regulating the expansion of the separate sections of said reamer.

2. The combination with an arbor having a reduced end portion consisting of a central cylindrical portion, and larger and smaller threaded portions connected with the central portion by similarly beveled portions, of a sectional reamer mounted on said arbor and each section of which is provided at its ends with internal beveled portions which adjustably engage the beveled portions of the arbor, longitudinal ribs provided on the central portion of the arbor coöperating with recesses in the reamer sections for preventing rotation of the sections relative to the arbor, each section of the reamer being also provided at its ends with external beveled portions, and nuts mounted on the threaded portions of the arbor and provided with internal beveled faces which adjustably engage the external beveled portions of the reamer sections.

3. A device of the class described, comprising an arbor one end of which is provided with reduced portions consisting of a central cylindrical portion of the same diameter throughout its length, and larger and smaller threaded portions connected with the central portion by similarly beveled portions in combination with a sectional expansion reamer adapted to be mounted on the reduced central portion of the arbor and the ends of the bore of which are provided with beveled portions which correspond with and operate in connection with the beveled portions of the arbor, said reamer being composed of a plurality of independent similar sections, the central reduced portion of the arbor being provided with a plurality of longitudinal ribs which are adapted to operate in connection with correspondingly formed recesses in the separate sections of said reamer to prevent rotation of the sections relative to the arbor, a threaded sleeve mounted on the larger threaded portion of the arbor and adapted to govern the expansion of the reamer, and a lock nut mounted on the smaller threaded portion of the arbor, said nut being adapted to force the reamer in the direction of said sleeve to expand the separate sections thereof to the extent limited by said sleeve.

4. The combination with an arbor having a reduced end portion consisting of a central cylindrical portion and larger and smaller threaded portions connected with the central portion by similarly beveled portions, of a sectional reamer mounted on said arbor and each section of which is arc-shaped in cross section and provided with a longitudinal groove, internal beveled portions provided at the ends of said sections for adjustably engaging the beveled portions of the arbor, longitudinal ribs provided on the central portion of the arbor coöperating with the grooves in the reamer sections for preventing rotation of the reamer sections relative to the arbor, each section of the reamer being also provided at its ends with external beveled portions, and nuts mounted on the threaded portions of the arbor and provided with internal beveled faces which adjustably engage the external beveled portions of the reamer sections.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 1st day of February, 1917.

ANDREW ALEXANDER.

Witnesses:

C. E. MULREANY,

H. E. THOMPSON.