

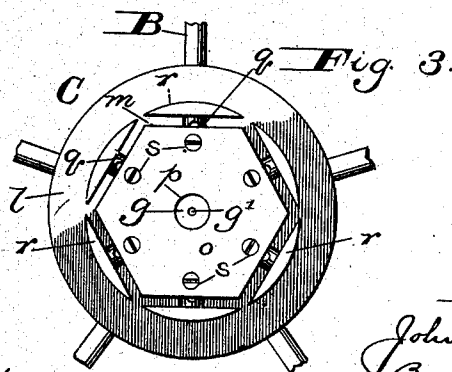
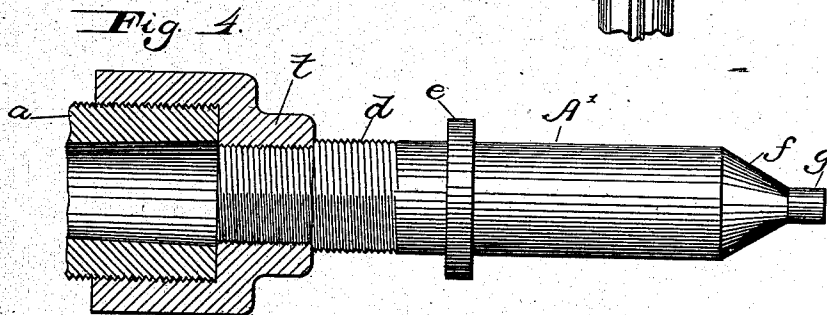
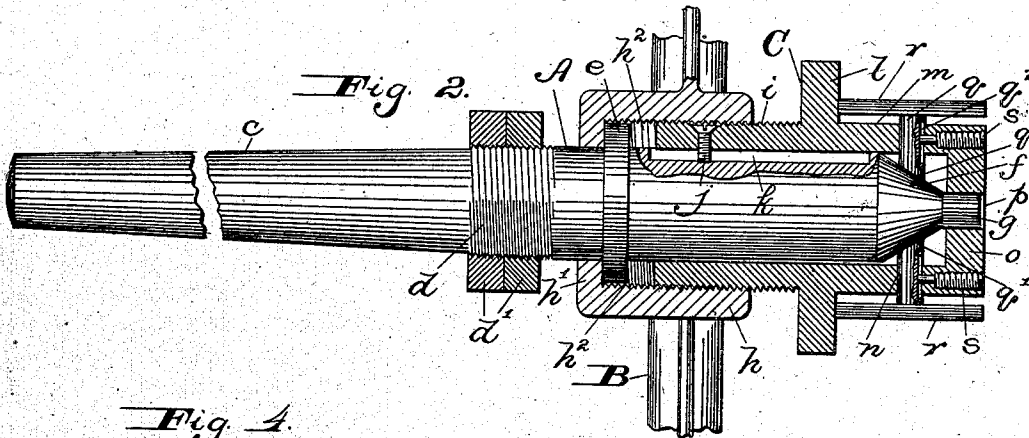
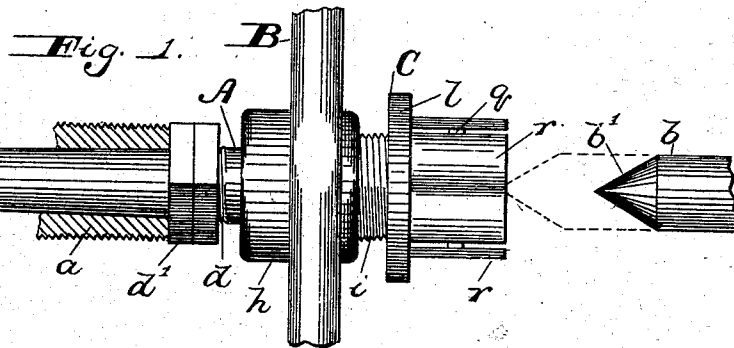
No. 714,448.

Patented Nov. 25, 1902.

J. H. BRYAN.
EXPANSIBLE MANDREL OR CHUCK.

(Application filed July 2, 1902.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN H. BRYAN, OF BALTIMORE, MARYLAND.

EXPANSIBLE MANDREL OR CHUCK.

SPECIFICATION forming part of Letters Patent No. 714,448, dated November 25, 1902.

Application filed July 2, 1902. Serial No. 114,108. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BRYAN, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Expansible Mandrels or Chucks, of which the following is a specification.

This invention relates to improvements in expansible chucks or mandrels designed for attachment to a milling-machine or lathe for the purpose of holding articles that are to be bored, faced, or turned.

One of the objects of the invention is to provide an improved device of this character that may be tightly clamped within the article to be worked upon without danger of scoring, warping, or otherwise injuring the interior of the article; and a further object of the invention is to provide such a device with a shank which while primarily intended to spread apart the clamping-jaws may also be used in place of a live-center in conjunction with the usual dead-center, in which case the dead-center will assist in rigidly supporting the chuck against lateral strain.

With these and other objects in view the invention consists of certain constructions and combinations of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved expansible chuck shown as applied to the spindle of a lathe in juxtaposition to the dead-center of the same. Fig. 2 is a longitudinal sectional view of the chuck on a larger scale and with parts in side elevation. Fig. 3 is an end view. Fig. 4 is a detail view illustrating a modification.

Referring to the drawings, Fig. 1, the letter *a* designates the tubular rotary spindle of a lathe, which spindle is ordinarily adapted to receive a rod with a hardened point, called the "live-center," and intended to coact with a similar hardened point *b'* on a rod *b*, called the "dead-center." As is well known, the said spindle forms part of the head-stock of the lathe, and the dead-center *b* is secured in the tail-stock, which is adjustable longitudinally toward and from the head-stock in the usual manner.

My invention is intended to be used for holding hollow work, such as piston-rings and

similar articles, in place of the live-center just mentioned, and it comprises a shank *A*, provided with a tapering end *c*, adapted to fit within the spindle *a*, as illustrated in Fig. 1, said shank being threaded, as at *d*, and provided with jam-nuts *d'*, whereby to prevent the insertion of the shank within the spindle farther than the desired position. At a point between its ends the said shank *A* is provided with a circumferential flange *e*, and at its end opposite the tapered end *c* the said shank is sharply beveled, as at *f*, said bevel merging into a cylindrical nose *g*, which is provided on its outer face with a small socket *g'*, as illustrated in Fig. 3.

A hand-wheel *B* is provided with a cylindrical hub *h*, surrounding said shank *A* and having an inwardly-extending flange *h'*, taking over the circumferential flange *e* and bearing on the shank, and said hub is internally screw-threaded, as shown at *h²*, and receives within it the externally-threaded end *i* of a cylindrical jaw-casing *C*. A feather-screw *j* extends through said casing end into a longitudinal groove *k* in the shank, whereby the revolution of the hand-wheel *B* will effect a longitudinal movement of the jaw-casing with respect to the shank without any rotary movement of said casing. The said jaw-casing *C* is provided with a butt-flange *l* and a polygonal head *m*, in each of whose sides is formed a radially-extending aperture *n* and in whose outer face *o* is formed a central aperture *p*, as illustrated in Figs. 2 and 3, the last-named aperture receiving the nose *g* of the shank *A* for a purpose presently described.

In each of the radial apertures *n* is mounted the stem *q* of a clamping-jaw, whose head *r* is sector shape in section, with its convex side outermost, and the said convex sides together form an approximately circular expansible part of the chuck to bear outwardly against an article inserted thereon. Each of the stems *q* is beveled at its inner end *q'* to ride on the beveled end *f* of the shank *A* and is provided with a longitudinal groove *q²*, in which fits a feather-screw *s*. The inner ends of the jaw-heads *r* are in sliding contact with one wall of the butt-flange *l*, as illustrated in Figs. 1 and 2.

In order to clamp a piston-ring or similar article inserted over the circle of clamping-

jaws, the hand-wheel B is turned so as to draw the jaw-casing C inwardly on the shank A, which action causes the beveled stems *g* to ride up on the beveled end *f* of the shank, thereby moving the jaws outwardly into clamping engagement with the article. The butt-flange *l* serves as an end stop for the article.

If desired, the dead-center *b* may be moved up, as indicated in dotted lines, Fig. 1, and the nose *g* projected out through the aperture *p* in the outer face of the jaw-casing, so that the point *b'* of the dead-center may enter the socket *g'* in the said nose to assist in supporting the chuck for very heavy work.

The shank of the chuck may be constructed as illustrated in Fig. 4, in which the said shank designated A' is similar to the before-described shank A, with the exception that it is provided on one end with a coupling-sleeve *t*, adapted to screw over the lathe-spindle *a*.

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

1. An expansible mandrel or chuck, comprising a shank adapted for attachment to the spindle of a lathe or the like and provided with a beveled end and with a circumferential flange between its ends; a jaw-casing movable longitudinally on said shank; clamping-jaws carried by said casing and adapted to ride on the beveled end of said shank; and a wheel mounted on said shank and provided with an inwardly-extending flange taking over the circumferential flange of the shank and also provided with a screw-threaded engagement with said jaw-casing, as set forth.

2. An expansible mandrel or chuck, comprising a shank provided with a beveled end and a circumferential flange intermediate its ends; a hand-wheel provided with an in-

wardly-extending flange taking over said circumferential flange and also provided with an interiorly-threaded hub; a jaw-casing movable longitudinally on said shank and provided with an exteriorly-threaded end entering and engaging with said hub and said casing also provided with a butt-flange, *l*, and a head having radially-extending apertures; and clamping-jaws having stems mounted in said apertures and adapted to ride on the beveled end of said shank, as set forth.

3. An expansible mandrel or chuck, comprising a shank provided with a beveled end and a cylindrical nose, *g*, projecting beyond said end; a jaw-casing movable only in a longitudinal direction on said shank and provided with radially-extending apertures, *n*, and an outer face, *o*, in which is formed a central aperture, *p*, through which latter the said cylindrical nose may project; and clamping-jaws provided with stems mounted in said radially-extending apertures and adapted to ride on the beveled end of said shank, as set forth.

4. An expansible mandrel or chuck, comprising a shank provided with a beveled end and a nose projecting beyond said end; a jaw-casing movable longitudinally on said shank and provided with a polygonal head having an aperture in each of its sides and a central aperture in its outer face which latter aperture is adapted to receive the said nose; and a clamping-jaw mounted in each of said side apertures, and adapted to ride on the beveled end of said shank, as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN H. BRYAN.

Witnesses:

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