(No Model.)

H. BERNER.

EXPANDING MANDREL.

No. 525,645. Patented Sept. 4, 1894.

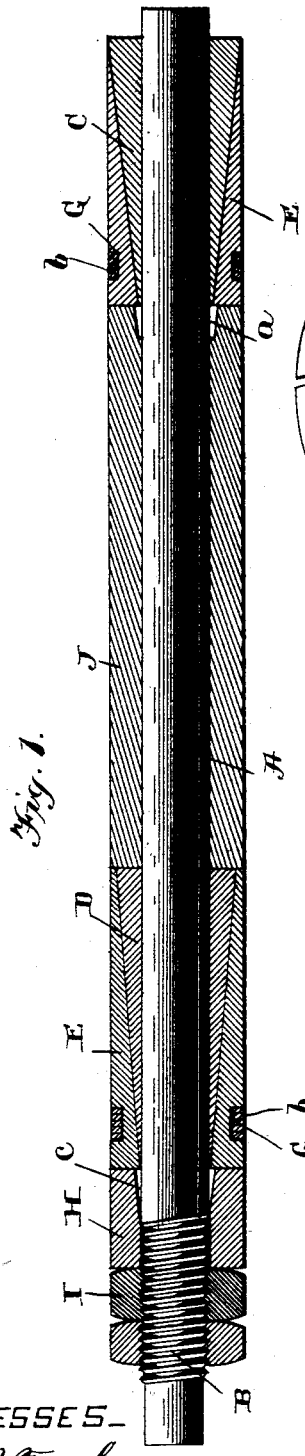

Fig. 1.

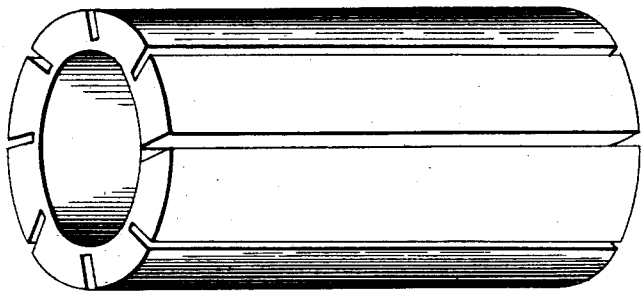

Fig. 3.

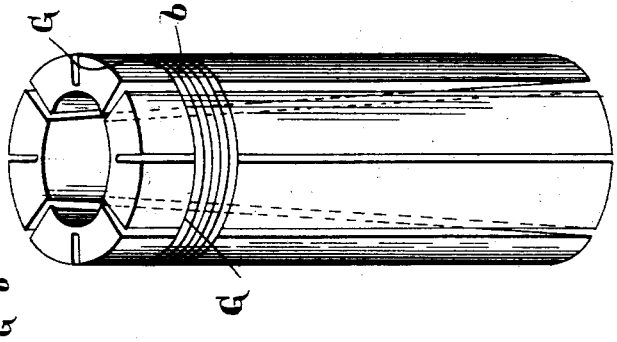

Fig. 2.

WITNESSES—
Geo. E. Frech.
Jas. V. Brune.

INVENTOR—
Herman Berner,
per
Lehmann Pattison & Dabit, Attys

UNITED STATES PATENT OFFICE.

HERMAN BERNER, OF LOUISVILLE, KENTUCKY.

EXPANDING MANDREL.

SPECIFICATION forming part of Letters Patent No. 525,645, dated September 4, 1894.

Application filed April 27, 1894. Serial No. 509,249. (No model.)

To all whom it may concern:

Be it known that I, HERMAN BERNER, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Expanding Mandrels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in expanding mandrels; and it consists in the particular construction and arrangement of parts which will be fully described hereinafter and especially pointed out in the claims.

The object my invention is to provide an expanding mandrel having at each end tapering sleeves which receive the expanding devices adapted to be expanded by endwise motion over the tapering sleeves, the said tapering sleeves and wedges at each end extending in the same direction so that by moving the mandrel endwise in one direction will simultaneously loosen both sets of expanding wedges, and when forced in the opposite direction will simultaneously tighten the same, all of which will be more fully set forth hereinafter.

In the accompanying drawings:—Figure 1, is a longitudinal vertical section of an expanding mandrel which illustrates my invention complete. Fig. 2, is a detached perspective view of a series of the expanding wedges. Fig. 3, is a detached perspective view of an expanding sleeve adapted to be placed on the outside of the expanding wedges.

Referring now to the drawings, A indicates the mandrel core which is provided at one end with the screw thread B and at the opposite end with an inwardly tapering sleeve C. At the opposite end of this mandrel inside of the screw threaded portion B is another tapered sleeve D similar to the one C, and which extends in the same direction as is clearly illustrated. Placed upon the mandrel A between the tapering sleeves C and D, is a straight sleeve J slightly larger in diameter than the diameter of the inner thicker end of the sleeve D as shown and which is provided at its opposite end with a recess *a* of a proper length to permit it to pass over the small inner end of the tapering sleeve C at the opposite end of the mandrel.

Placed around each of the tapering sleeves C and D, are a series of tapering wedges E which are provided at their thickest end with grooves G, in which grooves a contracting binding spring *b* is placed for the purpose of holding the wedges normally together as shown in Fig. 2. As will be clearly understood when these tapering wedges are forced endwise upon the tapering sleeves C and D they are expanded for the purpose of engaging the inner periphery of a hub or other object which it is desired to clamp.

Placed outside of the tapering sleeve D, is a sleeve H surrounding the screw threaded portion B, and engaging the said screw threaded portion or the nut I. When the inner nut I is turned inward the sleeve H is forced inward engaging the thickened end of the wedges E, which in turn have their thinnest edges engage the projecting edge of the sleeve J, thus forcing it endwise. The opposite end of this sleeve J engages the thickened end of the tapering wedges at the opposite end of the mandrel and simultaneously force them endwise as will be clearly understood, thus causing the two sets of tapering wedges to simultaneously expand by the endwise movement of the nut on the outer end of the mandrel, and thus clamp the desired object. The outer nut I is then tightened against the inner nut, thus locking it so that the tapering wedges are held permanently in the adjusted position.

I am aware that it is not new to provide a tapering expanding device at each end of a mandrel, but in these incidents the tapers have extended in opposite directions so that each device was separately forced endwise, and this made it very difficult to detach the mandrel from the device clamped for the reason that when the mandrel was moved in one direction it would loosen one set of expanding devices while at the same time it tightened the other.

It will be noticed that by the turning of the nut I, both of these expanding devices were simultaneously expanded and engage the object to be clamped by a single movement which is a great saving of time over the ordinary construction where the tapers extend in

opposite directions requiring a separate movement for each set of expanding devices. Another great advantage in this construction is, that when it is desired to loosen the mandrel from the device clamped it is only necessary to loosen the nut I, and to tap the mandrel endwise when both sets of expanding devices will be simultaneously loosened from the object clamped and it can be removed. This it will be readily understood is a great advantage over devices of this character previously constructed.

The inner end of the opening made in the short sleeve H, is made tapering as shown at *c* for the purpose of passing over the tapered outer end of the sleeve D.

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

1. An expanding mandrel comprising a rod having two separated tapers extending in the same direction, expanding devices surrounding said tapers, an endwise movable operative connection between and abutting against the adjacent ends of said expanding devices, and a means for forcing endwise one of the said expanding devices and through the medium of said connection the other expanding device, substantially as shown and described.

2. An expanding mandrel comprising a shaft or rod having two tapering sleeves with their tapers extending in the same direction, the shaft having a screw threaded portion outside of one of the tapers, expanding devices surrounding the said tapers, a sleeve between the said expanding devices and engaging their adjacent ends, and a nut upon the screw threaded portion adapted to engage one end of the expanding devices for moving it endwise and through the medium of the said sleeve the other expanding device simultaneously for the purpose described.

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

HERMAN BERNER.

Witnesses:
CHAS. FERST,
CHAS. F. RAPP.