H. S. NICHOLSON.

EXPANDING MANDREL.

APPLICATION FILED MAR. 7, 1916.

1,186,429. Patented June 6, 1916.

Fig. 2.

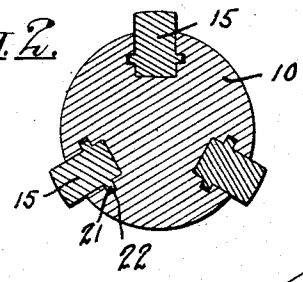


Fig. 1.

Fig. 3.

Fig. 4.

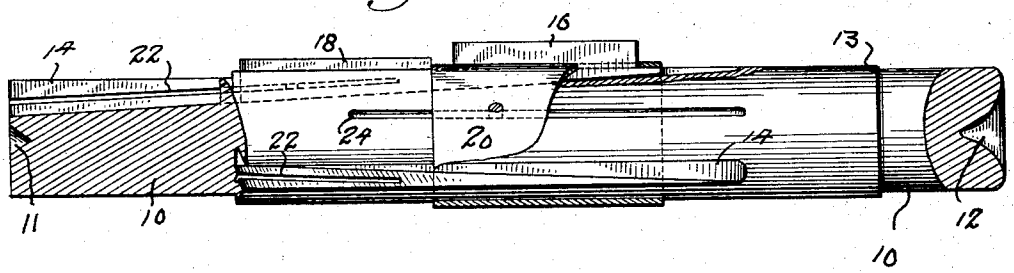
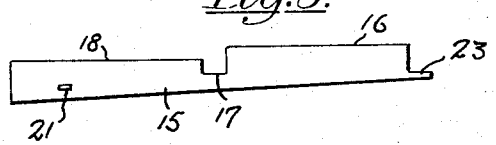


Fig. 5.



Inventor

HARRY S. NICHOLSON

By His Attorneys

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Witness:-

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UNITED STATES PATENT OFFICE.

HARRY S. NICHOLSON, OF WILKES-BARRE, PENNSYLVANIA, ASSIGNOR TO W. H. NICHOLSON AND COMPANY, OF WILKES-BARRE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

EXPANDING MANDREL.

1,186,429. Specification of Letters Patent. **Patented June 6, 1916.**

Application filed March 7, 1916. Serial No. 82,711.

To all whom it may concern:

Be it known that I, HARRY S. NICHOLSON, a citizen of the United States of America, and residing at Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented a certain new and useful Improvement in Expanding Mandrels, of which the following is a specification.

My invention relates to expanding mandrels and particularly to a mandrel of the arbor type adapted to be used on lathes, and the object of my invention is to provide an improved mounting for the mandrel dogs, actuating sleeve and other details as more fully described hereinafter or shown in the accompanying drawings in which—

Figure 1 is a perspective of an expanding mandrel in which my invention is embodied in one form; Fig. 2 is a cross section therethrough; Fig. 3 is a perspective of the sleeve for actuating the mandrel dogs; Fig. 4 is a side elevation of the mandrel partially broken away to illustrate certain features; and Fig. 5 is a side elevation of one of the mandrel dogs.

Referring to the accompanying drawings, the present device comprises an arbor 10 of generally cylindrical shape and provided with centers 11 and 12 at its opposite ends to receive the lathe centers, not shown, in well understood manner. For the sake of added strength and greater range I have made the arbor of slightly greater diameter in its mid-section 13 than at the opposite ends.

A series of longitudinal channels 14, here three in number, are cut into the arbor from one end. The bottoms of these channels are inclined to any desired pitch. Working in these channels are the mandrel dogs 15 here in the form of stepped bars the bottoms of which are inclined to the pitch of the channels 14, while their outer faces are parallel to the axis of the arbor. The upper dog 16 is spaced at 17 from the lower dog 18 to permit the former to be passed through longitudinal cuts 19 in the actuating sleeve 20 which slides freely upon the arbor to force the dog bars longitudinally in their channels. In order to prevent the lower dog 18 from radial movement in the channel 14, I provide the bars with side lugs 21 which work in lateral slots 22 cut in the sides of the channels 14 in the arbor. The outward escape of the upper dog 16 is prevented by its engagement with the sleeve 20 at the point 17 and at the extension 23 which underlies the end of the sleeve beyond the longitudinal cut 19 therein.

In order to prevent the possible escape of the sleeve and dog bars from the arbor when the latter is not in position in the lathe, I provide a longitudinal groove 24 in the arbor which receives a limiting pin 25 screwed through the tap 26 in the sleeve and entering the groove 24. The displacement of the sleeve 20 longitudinally of the spindle is thus limited by the length of the groove 24.

To assemble the parts on the arbor the three dog bars are adjusted within the sleeve 20 with the outer dogs 16 projecting through the apertures 19 therein and the parts then slipped upon the arbor with the several bars entering the several channels 14. As the sleeve is drawn on the arbor the side lugs 21 on the dog bars enter the slots 22 in the channels 14. When the sleeve 20 has been drawn on sufficiently far the limiting pin 25 is screwed into the tap 26 and enters the groove 24.

The parts are simple, rugged and strong, the device is readily manufactured and quickly adjustable to blanks of different internal diameter.

I do not limit my invention to the precise construction shown which may be variously modified without departing from what I claim as my invention.

I claim as my invention:—

1. An expanding mandrel comprising an arbor having a series of longitudinal channels with inclined bottoms opening to one end of the arbor, slots in the sides of said channels, dog bars working in said channels and provided with means on their sides entering the slots in the channel, together with a sleeve sliding freely on said arbor and engaging said dog bars together with a limiting pin on said sleeve and a groove in said arbor in which said pin works to prevent the accidental escape of the sleeve and dogs from the arbor when the latter is disengaged from the blank.

2. In an expanding mandrel, an arbor having a series of longitudinal channels with inclined bottoms formed therein, dogs working in said channels and bearing against said bottoms, a sleeve sliding freely

on said arbor and engaging said dogs to displace the same in their respective channels, each of said dog bars comprising dogs spaced apart and lying at different radial distances from the axis of the arbor, only one of said dogs on each bar passing through the actuating sleeve and the latter being confined at one end in the space between adjacent dogs, substantially as described.

3. In an expanding mandrel, an arbor, a stepped dog bar working thereon, the dogging areas being spaced apart, a sleeve for moving the dog bar longitudinally on the arbor, said sleeve being apertured to permit the outer dogging area to pass therethrough and abutting at one end against the inner dogging area.

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

HARRY S. NICHOLSON.

Witnesses:

WILBERT O. BENNING,

WILLIAM R. NICHOLSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."