July 21, 1931. W. BARK ET AL 1,815,427

PLUG BAR FOR TUBE MAKING MACHINES

Filed Dec. 4, 1929 2 Sheets-Sheet 1

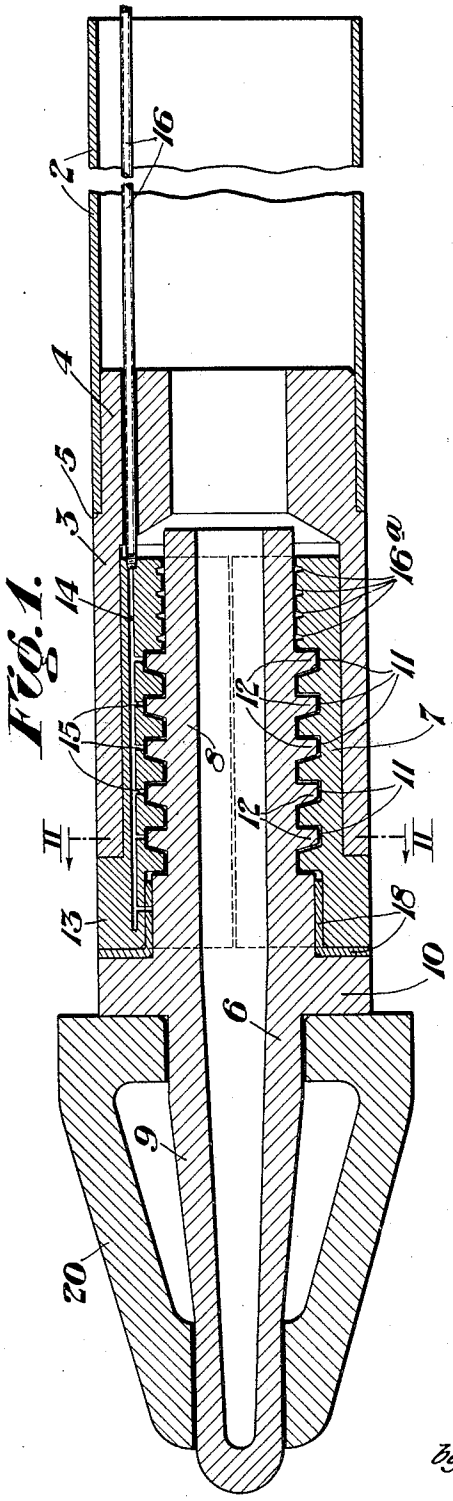


Fig. 1.

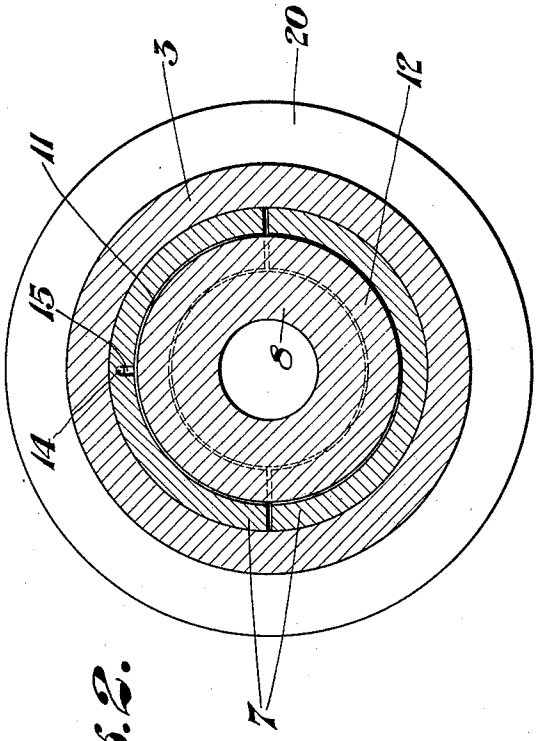


Fig. 2.

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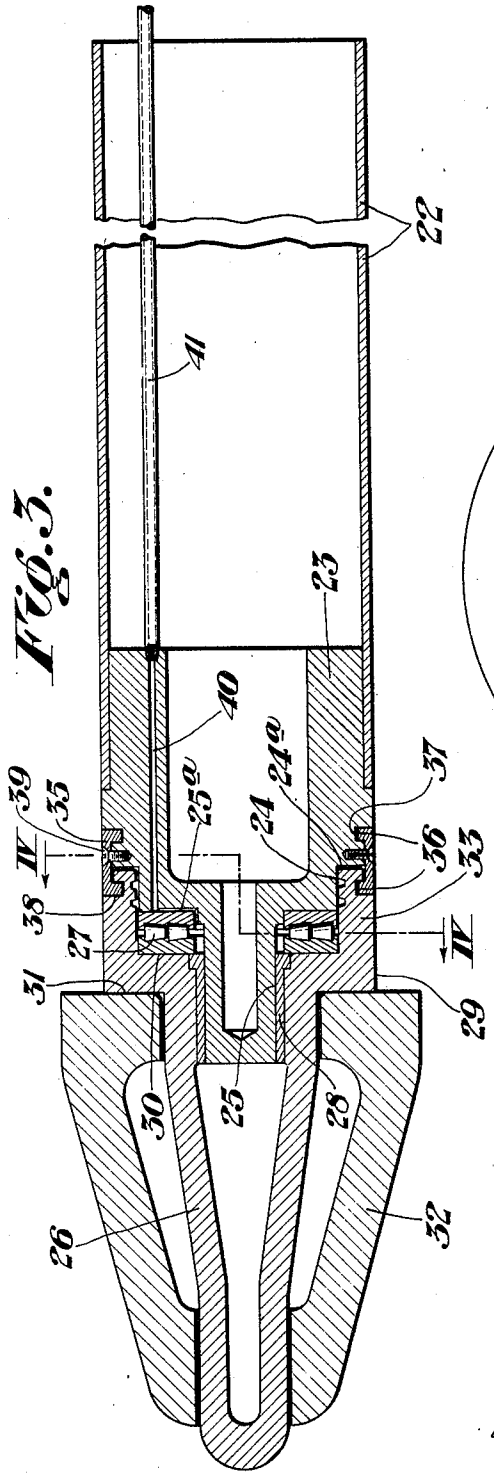


Fig. 3.

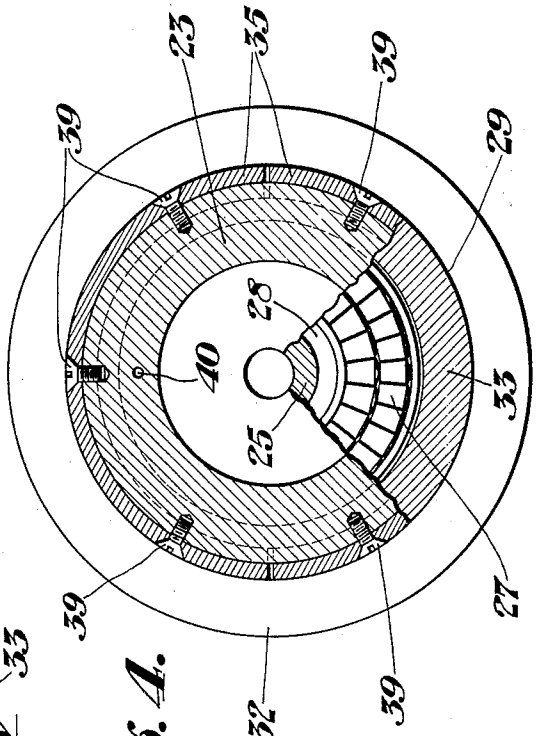


Fig. 4.

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UNITED STATES PATENT OFFICE

WILLIAM BARK AND JAMES V. MAZURIE, OF GARY, INDIANA, ASSIGNORS TO NATIONAL TUBE COMPANY, A CORPORATION OF NEW JERSEY

PLUG BAR FOR TUBE MAKING MACHINES

Application filed December 4, 1929. Serial No. 411,541.

This invention relates to plug bars for use with seamless tube working machines and has for its object the provision of a bar of this class which will have the major portion of its length held stationary while its forward or plug end is free to rotate relative to the remainder of the bar.

By providing a bar of this type with its forward or plug end mounted for rotation relative to the remainder of the bar, the main body portion of the bar may be made from tubular stock weighing only a small fraction of the weight of the bars which are mounted for rotation over their entire length, as is common in the art, and, due to the fact that the major length of the bar remains stationary, whipping of the bar during operation is entirely eliminated.

In the drawings—

Figure 1 is a sectional plan view of an expanding bar and plug constructed in accordance with this invention.

Figure 2 is a transverse sectional view taken on the line II—II of Figure 1.

Figure 3 is a sectional plan view of an expanding bar and plug showing a slightly modified form of the invention.

Figure 4 is a transverse sectional view taken on the line IV—IV of Figure 3.

Referring more particularly to the drawings, the numeral 2 designates the main body portion of the bar which comprises the major portion of its length and is of relatively light weight tubular construction. A relatively heavy walled tubular bearing supporting member 3 has an outside diameter equal to the outside diameter of the body portion 2 and has its rear end 4 reduced in diameter to fit within the body portion 2 and to form a shoulder 5 adapted to abut the forward end of the body 2.

A plug supporting spindle 6 is journaled in a combined journal and thrust bearing sleeve 7 carried in the member 3.

The plug supporting spindle 6 comprises a bearing portion 8 and tapered plug supporting portion 9 and a collar portion 10 between the portions 8 and 9.

The bearing sleeve 7 is divided longitudinally to form two halves and is provided with a series of annular grooves 11 having vertical rear walls and downwardly and rearwardly inclined forward walls. The bearing portion 8 of the spindle is provided with ribs 12 adapted to fit within the grooves 11. The forward end of the bearing sleeve 7 is provided with a collar 13 adapted to engage the forward end of the bearing supporting member 3 and limit the rearward movement of said sleeve.

An oil supply duct 14 extends longitudinally through the bearing sleeve 7 and is provided with branches 15 entering each of the grooves 11. An oil supply pipe 16 is threaded into the rear end of the duct 14.

The rear portion of the bearing sleeve 7 is provided with a plurality of annular oil grooves 16^a adapted to collect and retain any oil which may flow rearwardly along the spindle 6.

A wear ring 18 is positioned on the forward end of the bearing sleeve 7 and has one flange extending within the bearing sleeve and its other flange extending between the end face of the bearing sleeve and the collar 10.

A plug 20, of any desired construction, is removably mounted on the plug supporting portion 9 of the spindle 6.

In operation, when the plug is entered into a tube for the purpose of piercing, expanding, reeling or any other operation, the tube, which is rotated during its passage over the plug, will cause the plug 20 and plug spindle to rotate in the bearing sleeve 7 while the remainder of the bar remains stationary.

In Figures 3 and 4 we have shown a modified form of bar comprising a tubular body portion 22 having a relatively heavy walled supporting member 23 mounted therein.

The forward end of the supporting member 23 is reduced in diameter, as at 24, forming a shoulder 24^a, and again as at 25, to receive a plug supporting spindle 26 and forming a shoulder 25^a. An anti-friction thrust bearing 27 is mounted on the portion 25 and bears against the shoulder 25^a while a journal bearing sleeve 28 is mounted on the portion 25 in advance of the thrust bearing 27.

The spindle 26 is enlarged, as at 29, to provide a shoulder 30 adapted to bear against the bearing 27 and a shoulder 31 adapted to form a stop for the rear end of a plug 32 mounted on the spindle 26.

A flange 33 extends rearwardly from the portion 29 over the bearing 27 and over the reduced portion 24.

The spindle 26 is secured against displacement relative to the member 23 by a split locking-ring 35 which has internal flanges 36 along each edge which enter annular grooves 37 and 38 in the member 23 and spindle 26, respectively. The ring 35 is adapted to be held in operative position by set-screws 39.

An oil duct 40 is formed in the member 23 and is connected to an oil supply pipe 41 to supply oil to the bearing 27.

The operation of this modified construction is the same as the preferred form described above; that is, as the revolving tube is passed over the plug 32 the plug and spindle 26 will rotate relative to the remainder of the structure.

While we have shown and described certain specific embodiments of our invention it will be understood that we do not wish to be limited thereto since various modifications may be made without departing from the scope of our invention, as defined in the appended claims.

We claim—

1. A plug bar for seamless tube machines comprising a relatively thin walled tubular body portion extending for the major portion of the length of said bar, a relatively heavy walled tubular bearing supporting member carried by the forward end of said body portion, a combined journal and thrust bearing sleeve mounted within said bearing supporting member, a plug supporting spindle journaled in said bearing, and a plug on said spindle.

2. A plug bar for seamless tube machines comprising a relatively thin walled tubular body portion extending for the major portion of the length of said bar, a relatively heavy walled tubular bearing supporting member carried by the forward end of said body portion, a combined journal and thrust bearing sleeve mounted within said bearing supporting member, a plug supporting spindle journaled in said bearing, and means for supplying lubricating oil to said bearing and a plug mounted on said spindle.

3. A plug bar for seamless tube machines comprising a relatively thin walled tubular body portion extending for the major portion of the length of said bar, a relatively heavy walled tubular bearing supporting member carried by the forward end of said body portion, a combined journal and thrust bearing sleeve mounted within said bearing supporting member, a plurality of annular grooves in said sleeve, a plug supporting spindle journaled in said bearing sleeve, annular ribs on said spindle and entered into said grooves in said sleeve to take up the thrust of said spindle, and a plug mounted on said spindle.

4. A plug bar for seamless tube machines comprising a main body portion, a tubular bearing supporting member carried by the forward end of said body portion, a combined journal and thrust bearing sleeve mounted within said bearing supporting member, and a plug supporting spindle journaled in said bearing whereby the main body portion of said bar may be held stationary during the tube working operations.

In testimony whereof, we have hereunto set our hands.

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