Nov. 9, 1943. L. E. JONES 2,333,935

INTERNAL GROOVING TOOL

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Fig. 1.

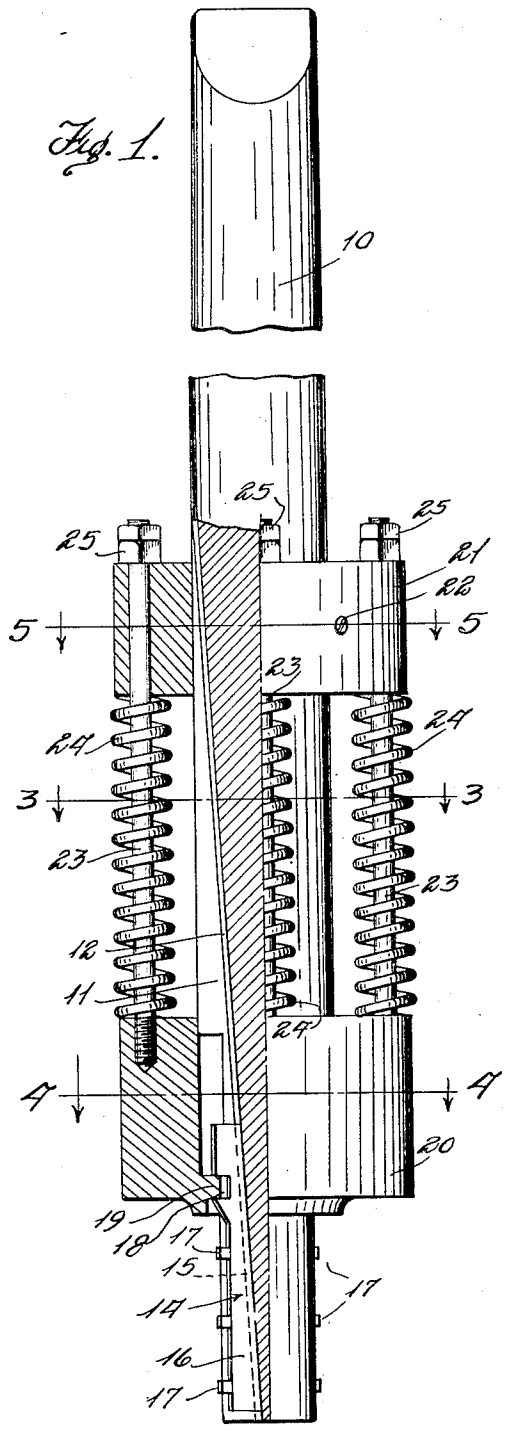

Fig. 2.

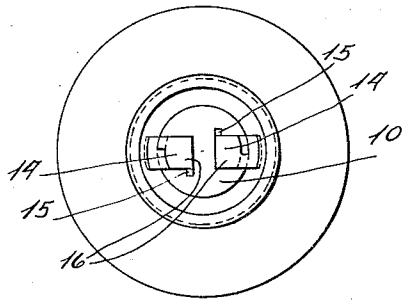

Fig. 3.

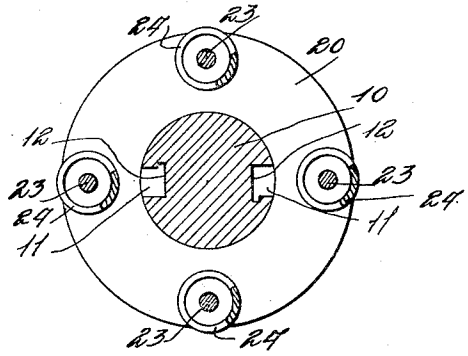

Fig. 4.

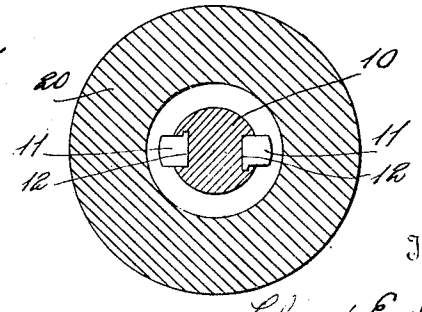

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Fig. 6.

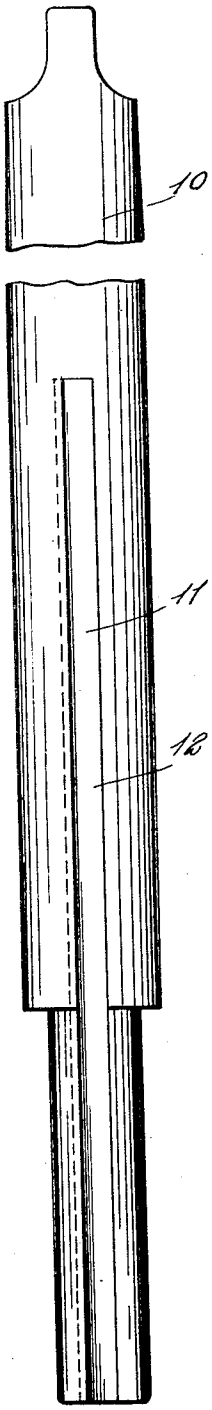


Fig. 5.

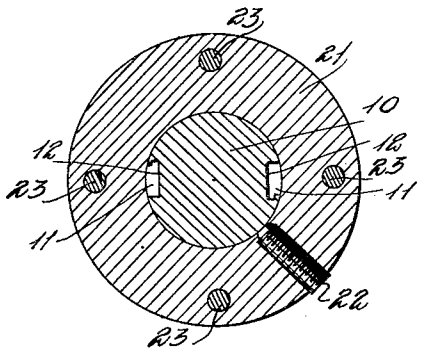


Fig. 7

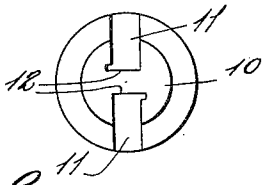


Fig. 8

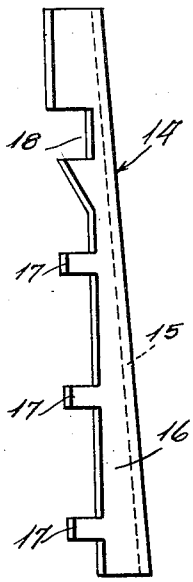
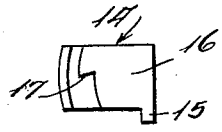


Fig. 9.



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Patented Nov. 9, 1943 2,333,935

UNITED STATES PATENT OFFICE

2,333,935

INTERNAL GROOVING TOOL

Lloyd E. Jones, Beaumont, Tex.

Application May 13, 1942, Serial No. 442,810

3 Claims. (Cl. 77—58)

This invention relates to tools for cutting grooves in the interior of tubes, pipes, headers or the like, and an object of the invention is to provide a tool adapted to be carried by a chuck or other instrumentality of a rotating member.

It is a further object of the invention to provide a cutting tool preferably having a plurality of blades operative to cut circular grooves in tubes as the tool is rotated, means being provided for forcing the blades outwardly at the time the tool is in position within the tube.

It is furthermore an object of the invention to provide novel means for moving the tool as that part thereof carrying the blades is properly positioned within the tube, it being shown that the tool is forced radially of the tube during the operation of the tool in the tube.

It will be obvious to those skilled in the art that the tool may be employed in connection with a boring machine or with lathes or other types of machines where there is relative motion between the tool carrying instrumentality and the carrier of the piece to be worked, the said tool being efficient and satisfactory in use and comparatively inexpensive to produce and maintain.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view in elevation, partly in section, of a tool embodying the invention;

Figure 2 illustrates an end view thereof;

Figure 3 illustrates a sectional view on the line 3—3 of Fig. 1;

Figure 4 illustrates a sectional view on the line 4—4 of Fig. 1;

Figure 5 illustrates a sectional view on the line 5—5 of Fig. 1;

Figure 6 illustrates a view in elevation of the stem and shank;

Figure 7 illustrates an end view of the stem;

Figure 8 illustrates a side view of the cutting tool; and

Figure 9 illustrates an end view of the cutting tool.

In these drawings 10 denotes the stem and integral shank, which stem preferably has two grooves 11. The bottom 12 of each groove is tapered or bevelled from the lower end, as will be seen from an inspection of Figure 1, and the side wall of each groove has a channel 13 along the base line of the groove, the said groove and channel being formed to receive the cutting tool, generally identified by the numeral 14, which has a flange or rib 15 that moves in the channel when the tool moves longitudinally of the groove. The tool has a body portion 16 with spaced blades 17 which are intended to cut grooves in the tubes, cylinders or the like. The tool 14 also has a recess 18 into which a flange 19 of a collar 20 is seated so that as the collar moves, the blade is caused to travel in the groove of the stem.

A collar 21 is fixed or attached to the stem by a set screw 22, whereas the collar 20 is free to slide on the stem toward and away from the collar 21. Bolts 23 are anchored to the collar 20 and are free to slide in the collar 21. A spring, such as 24, is mounted on each bolt and its ends abut the collars 20 and 21 and the springs are operative to force the collars apart within the bounds allowed by the nuts 25 that are threaded on the upper ends of the bolts. Thus the collar 20 is normally held in the position in which it is shown in Fig. 1, but when the tool is applied to a tube with the blades inside of the tube in position to operate in cutting the circular grooves in the tube, the collar 20 is forced toward the collar 21 and the cutting tool riding on the tapered surface of the groove will be forced radially so that the blades are in contact with the inner wall of the tube to be cut. The blades are spaced a desired distance apart to cut grooves in such spaced relation to one another as is desired in practice. It is seen that the collar 20 and the blade or tool are moved in unison with the tube as the collar carries the tool up the inclined surface of the groove so that thereby the blades are moved outwardly as the cutting action progresses.

I claim:

1. In an internal grooving tool, an elongated body member having longitudinally disposed grooves the bottoms of which taper from the outer end of the body to form cams, a wall of each groove at the base of the groove having a lateral channel, a tool fitted to each groove and having a lateral rib movable in said channel, the said tool having blades projecting from its edge and movable laterally as the tool rides on the inclined surface of the groove, a collar fixed on the body, bolts slidable therein, a coacting collar slidable on the body and in which the bolts are anchored, springs interposed between the collars on the said bolts and operative to hold the collars in spaced relation to each other but yield-

able to permit the second mentioned mentioned collar to move toward the first mentioned collar, and a flange on the second mentioned collar engaging the tool to move it as the second mentioned collar moves on the body.

2. In an internal grooving tool, an elongated body member having longitudinally disposed grooves the bottoms of which taper from the outer end of the body to form cams, a tool slidable in each groove, the said tool having blades projecting from its edge and movable laterally as the tool rides on the inclined surface of the groove, a collar fixed on the body, bolts slidable therein, a coacting collar slidable on the body and in which the bolts are anchored, springs interposed between the collars on the said bolts and operative to hold the collars in spaced relation to each other but yieldable to permit the second mentioned collar to move toward the first mentioned collar, and a flange on the second mentioned collar engaging the tool to move it as the second mentioned collar moves on the body.

3. In an internal grooving tool, an elongated body member having longitudinally disposed grooves the bottoms of which taper from the outer end of the body to form cams, a tool slidable in each groove, the said tool having blades projecting from its edge and movable laterally as the tool rides on the inclined surface of the groove, said tool having a recess in its edge, a collar fixed on the body, bolts slidable therein, a coacting collar slidable on the body and in which the bolts are anchored, springs interposed between the collars on the said bolts and operative to hold the collars in spaced relation to each other but yieldable to permit the coacting collar to move toward the first mentioned collar, and a flange on the coacting collar and projecting into the recess of the tool, whereby the tool and coacting collar move on the body.

LLOYD E. JONES.