May 3, 1949. E. B. COLLINS 2,468,867

INTERNAL EXPANDING PIPE WRENCH

Filed Dec. 12, 1944

Fig. 1.

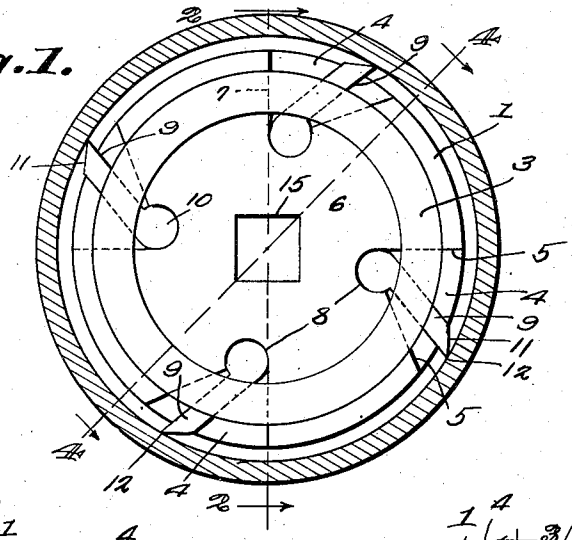
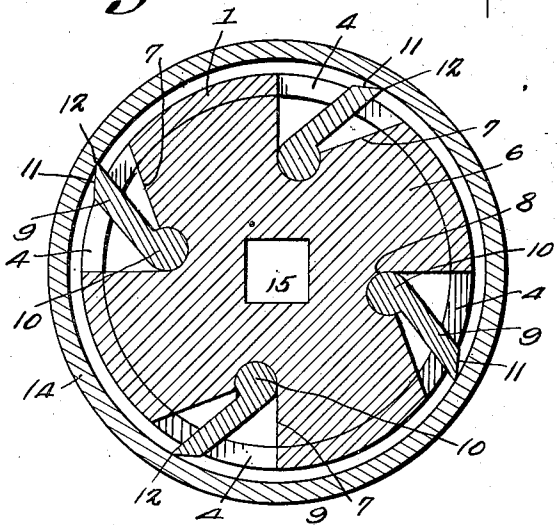


Fig. 3.



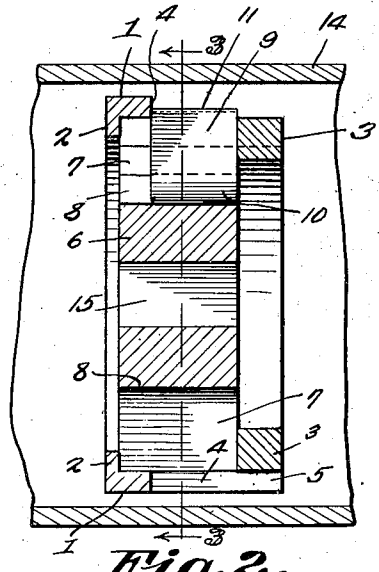


Fig. 2.

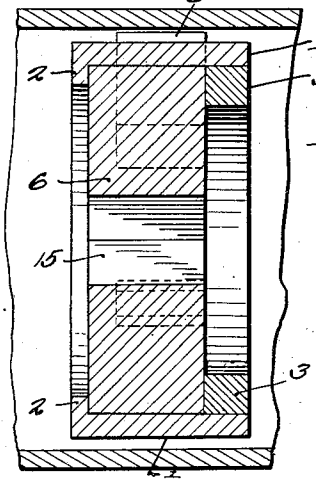


Fig. 4.

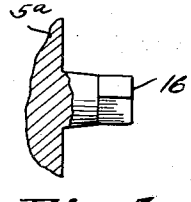


Fig. 5.

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INTERNAL EXPANDING PIPE WRENCH

Elvin B. Collins, Calvert, Tex.

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1 Claim. (Cl. 81—72)

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This invention aims to provide a strong, inexpensive and effective inside wrench tool for gripping an object within the circular bore thereof, to the end that the object may be freed by rotation from a part whereunto it is connected, the tool being capable of use also to rotate an object and assemble it with a part to which it is to be connected, novel structure for accomplishing that result being provided.

In the drawings:

Figure 1 shows, in elevation, an inside wrench constructed in accordance with the invention.

Figure 2 and Figure 4 are sections taken, respectively, on lines 2—2 and 4—4 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 5 is a fragmental elevation showing a modification.

The inside wrench forming the subject matter of this application comprises a rim 1, which is circular interiorly, and preferably circular exteriorly. At one end the rim 1 has a fixed abutment, in the form of an inwardly projecting integral flange 2. At its opposite end the rim 1 is supplied with a removable, inwardly projecting abutment, which may be a ring 3, held in the rim 1 by a driving fit or otherwise. The rim 1 is supplied with circumferentially elongated and circumferentially spaced openings 4. The openings 4 extend through that end of the rim 1 in which the ring 3 is mounted, this detail being shown at 5 in Figure 1.

A circular body 6, preferably in the form of a disk, is disposed within the rim 1 and is held therein by the abutments 2 and 3. Approximately V-shaped recesses 7 are formed in the periphery of the body 6 and match with the openings 4, the recesses extending entirely across the body. At their inner ends the recesses 7 merge into rounded seats 8. Referring particularly to Figure 3, one side wall of each recess is radially disposed relative to the axis of rotation of the body 6, while the other side wall is tangentially disposed. During operation, the rotation is in a direction wherein the tangential wall of each recess is in advance of the radial wall.

Dogs 9 are mounted for swinging movement in the recesses 7 of the body 6 and in the openings 4 of the rim 1, the swinging movement being circumferential. The dogs 9 have enlarged, cylindrical parts 10 at their inner ends, those parts being mounted to rock in the seats 8 of the body 6. The outer ends of the dogs 9 preferably are beveled at their outer ends, as shown at 11, to afford biting edges 12. The biting edge is at that side of each dog remote from the radial side wall of

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the recess in which the dog is mounted. As to assembly, the body 6 with the dogs 9 placed therein, is slid transversely into the rim 1 until the body abuts against the flange 2, those portions 5 of the openings 4 which extend through the edge of the rim 1, permitting the outer portions of the dogs to enter the openings 4. The ring 3 is inserted into the rim 1, and the device is ready for use.

The numeral 14 designates an object having a circular bore and necessary to be rotated to free it from a part whereunto it is attached. The inside wrench forming the subject matter of this application is introduced into the object 14 and is rotated, the biting edges 12 of the dogs 9 acquiring a hold within the object and effecting its rotation. Should the gripped object be of a greater inner diameter than the illustrated example, the dog would tend to a more rearward position, but would always be stopped by the radial wall before the dog reaches a full radial position, and thus the biting edges, being still off center, will yet be able to grip and turn the object.

The means for rotating the tool may be of any sort. It is shown best in Figure 3 that the aforesaid means may be a polygonal opening 15 extended through the body 6. If desired, however, as shown in Figure 5, the body 5a may be supplied on one or both sides with laterally projecting wrench lugs 16.

The wrench may be inverted and, therefore, it may be employed for starting such a part as the object 14 either on or off.

The device is characterized by a rugged and simple construction, requiring no repairs other than an occasional sharpening or renewal of the dogs 9.

What is claimed:

An inside wrench comprising a rim having an inwardly projecting flange at one side constituting an abutment, a removable ring joined to the opposite side of the rim, there being circumferentially spaced openings in the rim extending through that side of the rim carrying the ring, a body circular in cross section within the rim and held thereto by the flange and ring, angular recesses in the periphery of the said body positioned to register with the openings in the rim, one wall of each recess being radially disposed relative to the axis of the body and the other wall being angularly disposed with respect to said first-mentioned wall, there being rounded seats at the inner ends of the recesses, dogs mounted for swinging movement in the respective recesses and in respective openings, said dogs having substan-

tially cylindrical bearing portions at their inner ends located in the rounded seats, the outer ends of the dogs being provided each with a biting edge along that side of the dog remote from the radial side wall of the recess in which the dog is mounted, said biting edges being positioned for gripping engagement with the inner surface of the work when the wrench is seated therein and rotated relative to the work, there being an opening in the body for the reception of an actuating tool, the radial side walls of the recesses constituting stops engageable with the dogs, whereby, if the dogs are engaged by said side walls, the biting edges will be retained in gripping engagement with the work.

ELVIN B. COLLINS.

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