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HORN BUSHING PULLER

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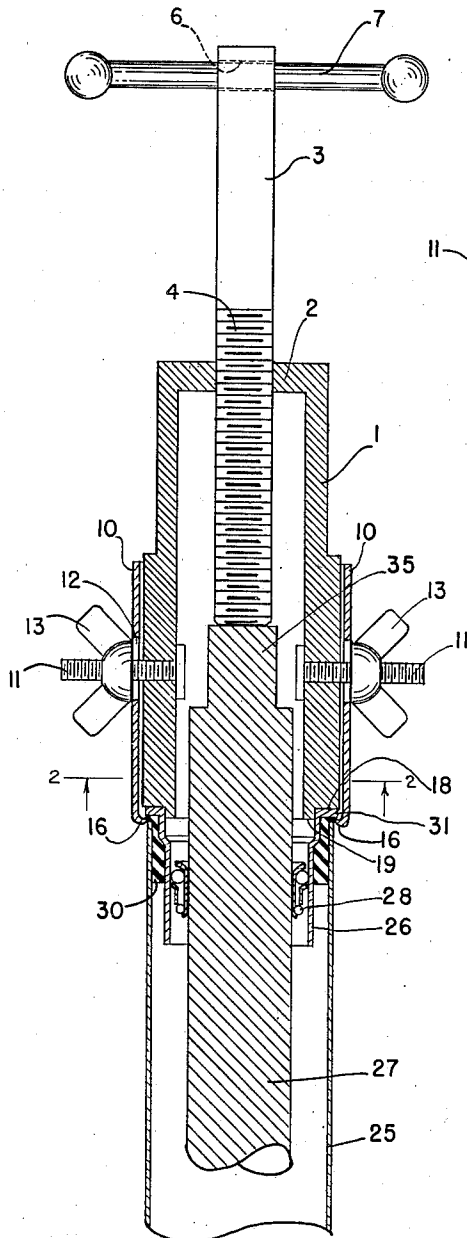


FIG. 1

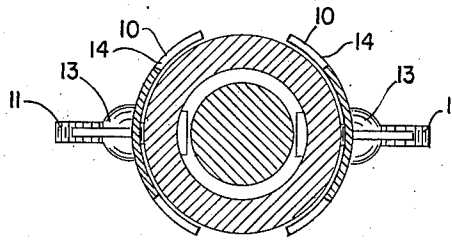


FIG. 2

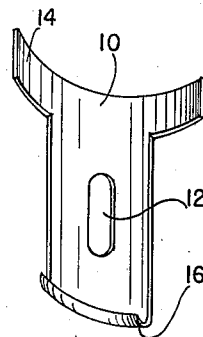


FIG. 3

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HORN BUSHING PULLER

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3 Claims. (Cl. 29—263)

This invention relates to tools in general and more particularly to a pulling tool for facilitating the removal of a horn bushing in an automobile steering column assembly.

In certain types of standard automobile steering column structures there is provided a steering column within which is rotatably mounted a steering post to the upper end of which the steering wheel is connected. The steering wheel carries the electric horn button. A bushing is provided at the top of the steering column for journaling the upper end of the steering post and for providing electrical connection with the horn button wire. It frequently happens that the horn bushing must be removed when repairs are necessary. It is an object of the present invention to provide a horn bushing puller which is simple and economical of construction and which is adapted to grip and positively pull the horn bushing without danger of injury to the bushing. It is a further object of the present invention to provide a horn bushing puller with a centering ring adapted to enter and fit snugly within the horn bushing that is to be pulled, thereby preventing slipping of the horn bushing from the pulled jaws and preventing distortion of the upper end of the horn bushing by the removal action.

It is a further object of the present invention to provide a horn bushing puller which is made of parts such shapes that they can be easily fabricated. The parts of the horn puller of the present invention consist essentially of a tube having a pair of separately movable jaws releasably secured to the outside of the tube, which jaws are adapted to grip the head of the horn bushing for pulling the same while a part of the bushing puller fits into the top of the horn bushing to hold the bushing puller against movement sidewise of the bushing. The opposite end of the horn bushing puller is provided with a screw which is adapted to bear against the top of the steering post that projects through the steering column so that by screwing the screw into the puller the end of the screw bearing against the steering post forces the tubular horn bushing gripping part of the puller upwardly and away from the steering post, thus retracting the horn bushing.

It is a still further object of the present invention to provide a horn bushing puller which is economical of construction and which has few operating parts and which parts operate in a simple manner and are therefore not likely to get out of order.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a longitudinal sectional view through a horn bushing puller embodying the present invention, showing the puller in use;

Figure 2 is a sectional view taken along the line 2—2 of Figure 1; and

Figure 3 is a perspective view of one of the gripping jaws of the puller.

Referring now more particularly to the drawing, the horn bushing puller comprises a tubular casing 1 which is open at the bottom and closed at the top by a closure 2 extending across the tubular casing. A pusher rod 3, circular in cross section and screw threaded as indicated at 4, threads through an opening in the closure 2. The top of the pusher rod 3 has a hole 6 formed therein through which a rod-like handle 7 is extended to facilitate turning of the rod. Two or more identical gripping jaws 10—10, each of which is curved to fit partially around the cylindrical outer surface of the casing 1, are secured to the casing 1. This is accomplished in each instance by a small threaded stud 11 that extends through and is welded to the casing 1 and projects radially outward therefrom. The stud 11 extends through an oval hole 12 in the jaw 10. A wing nut 13 threaded on the stud 11 is provided for rigidly clamping the jaw in adjusted position to the body of the casing. To prevent the jaw from turning on the casing after it has been locked in place the upper end of each jaw 10 is provided with circumferentially extending arms 14—14 that fit around the casing. The lower end of each jaw is provided with a very narrow radially inwardly extending projection 16 which is adapted to fit under and grip a flange on a horn bushing that is to be pulled from a steering column assembly. The projection 16 extends through an arc of almost 80°.

The bottom surface of the casing 1 consists of a flat ring 18 that is adapted to seat on a flange of a horn bushing, and a longitudinally extending circular projection 19 which is adapted to enter and fit snugly on the interior of the bushing to be pulled from the steering column assembly.

In Figure 1 there is illustrated the horn bushing puller in use. In this figure there is shown a steering column or housing 25 of an automobile, in the upper end of which is mounted a horn

bushing 26 through which bushing extends the usual steering post 27. The steering post 27 and steering column 25 are part of an automobile structure and are mounted in the usual manner so that neither of the two is movable longitudinally. The steering post is journaled in the horn bushing 26 by a usual bearing 28 which is part of the horn bushing. The horn bushing has a rubber ring 30 separating it from the steering column, and is firmly gripped in place in the steering column. The top of the horn bushing has a peripherally extending flange 31 which projects radially beyond the steering column 25 by a very short amount. When it is desired to remove the bushing from the steering column the casing 1 is positioned as shown in Figure 1, with the flange 19 entering the bushing and thus centering the bottom of the casing 1 with respect to the bushing. The wing nuts 13 are loosened and the jaws 10 are shifted in position until the hook portions 16 of the jaws grip under the flange 31. If the housing 25 and bushing flange 31 are of larger external diameters than illustrated the jaws 10 will fulcrum about their upper ends as the lower ends engage the bushing. Thereafter the two wing nuts are tightened. The pusher rod 3 is then turned by means of the handle 7 until the bottom of the pusher rod comes in contact with the top 35 of the steering post. Upon further turning of the screw 3 the steering post prevents the screw from progressing downwardly and therefore the casing 1 rises upwardly on the threads 4. The jaws 10 are locked to the casing by the wing nuts 13 and the studs 11 and therefore, as the casing rises with respect to the steering post it draws with it the bushing 26, thereby pulling the bushing off and out of the steering column 25.

In view of the fact that the flange 31 of the bushing projects outwardly from the steering column by such a very short amount it is essential that the puller be prevented from sideways shifting with respect to the bushing, because any such sideways shifting would cause one or the other of the two jaws to move out of position under the flange 31. The circular projection 19 which fits snugly within the top of the bushing 26 prevents such shifting of the casing 1 across the flange 31 of the bushing, and thus assures the continued gripping of the bushing by the jaws 10.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction here shown, the same being merely illustrative of the principles of the invention. What is considered new and desired to be secured by Letters Patent is:

1. A tool for facilitating removal of a flanged horn bushing from a steering column assembly the flange of the bushing projecting radially beyond the column, said tool comprising a casing open at one end and having a closure across the other end, a screw threaded through the closure and extending axially into the casing to engage the top of the steering column assembly, means on the screw on the outside of the casing for facilitating manual turning of the screw, and a plural-

ity of gripping jaws having inwardly projecting portions arranged on the outside of the casing adapted to grip under the flange on the horn bushing, screw fastening means extending into the casing and clamping the respective jaws to the casing, said screw means extending through holes in the jaws which holes are elongated to permit lengthwise adjustment of the jaws, said casing having, at the open end thereof, a portion adapted to enter and fit snugly within the bushing when the casing is brought to rest on the bushing flange, whereby said last mentioned portion centers said casing on the bushing.

2. A tool for facilitating removal of a flanged horn bushing from a steering column assembly which includes a steering shaft and a steering column with said bushing therebetween, the flange of said bushing projecting beyond said column, said tool comprising a tubular casing open at one end and having a closure across the other end, a pusher threaded through the closure and extending axially into the casing to engage the end of the shaft as an abutment, a plurality of gripping jaws on the outside of the casing adapted to grip under the projecting flange on the horn bushing, each of said gripping jaws having a single means securing it to the casing and each jaw including portions extending around a substantial arc of the casing periphery to hold the jaws against tilting along the casing surface, said casing having, at the open end thereof, a portion adapted to enter and fit snugly within the bushing when the casing is brought to rest on the bushing flange, whereby said last mentioned portion centers said casing on the bushing, so that upon turning of the screw the end of the screw within the casing is forced into pressure engagement with the steering shaft of the steering column assembly.

3. A tool for facilitating removal of a flanged horn bushing from a steering column assembly which includes a steering shaft and a steering column with said bushing therebetween, the flange of said bushing projecting beyond said column, said tool comprising a tubular casing open at one end and having a closure across the other end, a screw threaded through the closure and extending axially into the casing to engage the end of the shaft as an abutment, a plurality of gripping jaws on the outside of the casing adapted to grip under the projecting flange on the horn bushing when the tubular casing is brought to rest on the flange, each of said gripping jaws being slidably mounted on said casing, and means for locking the gripping jaws immovably to the casing in their gripping position, said casing having, at the open end thereof, a portion adapted to enter and fit snugly within the bushing when the casing is brought to rest on the bushing flange, whereby said last mentioned portion centers said casing on the bushing, so that upon turning of the screw the end of the screw within the casing is forced into pressure engagement with the steering shaft of the steering column assembly and by such pressure action forces the casing and with it the horn bushing from the steering column.

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