July 17, 1956 S. C. LAY ET AL 2,754,568

BROACHING HORN

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Fig. 1.

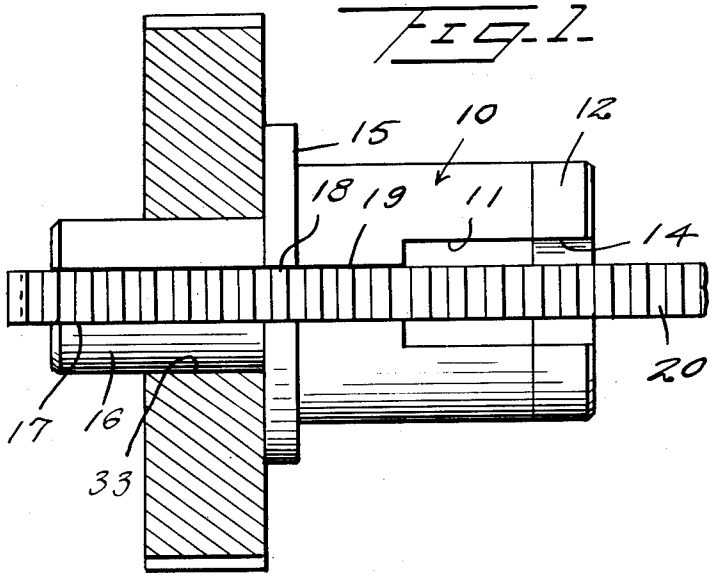


Fig. 4.

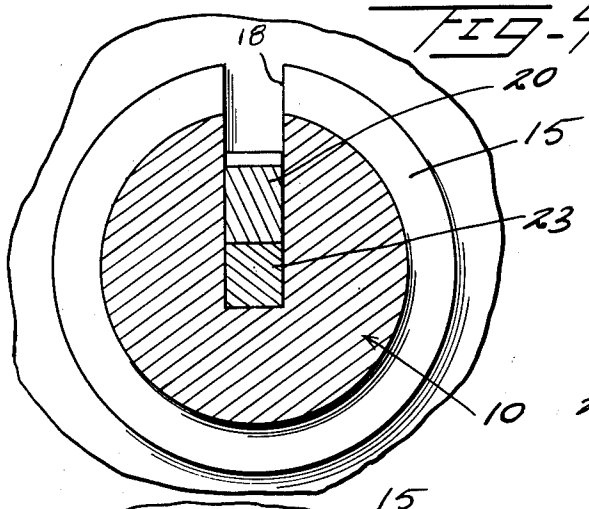
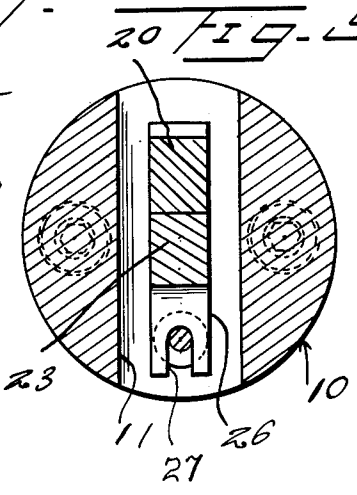


Fig. 5.



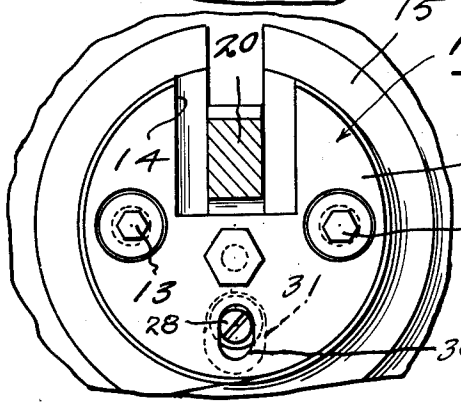


Fig. 6.

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FIG. 2.

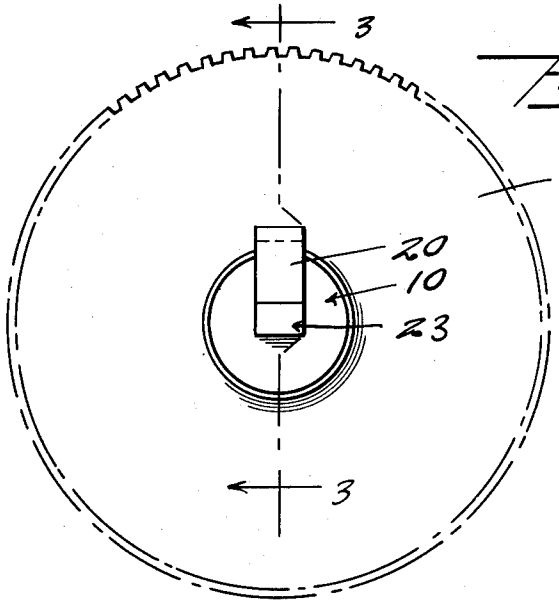


FIG. 3.

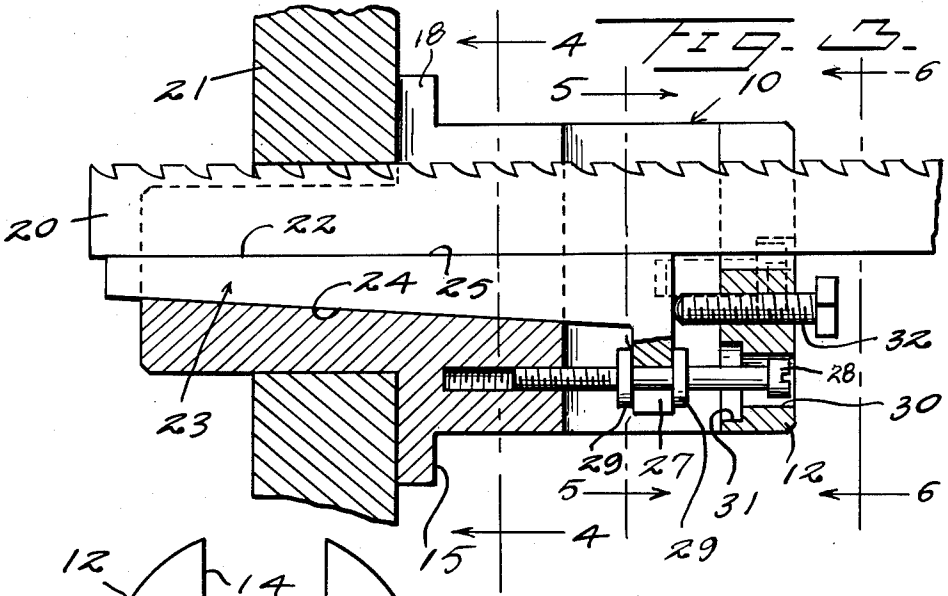
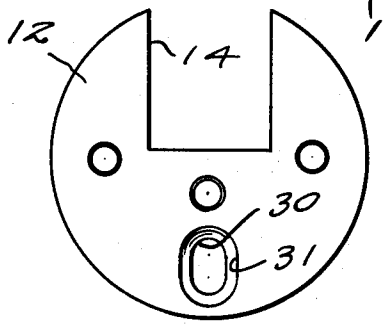


FIG. 7.



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BROACHING HORN

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Application August 21, 1953, Serial No. 375,700

1 Claim. (Cl. 29—95.1)

This invention relates to broaching horns.

In the use of a broach for cutting keyways in gears, wheels or the like, it is the practice to use a broach guide in the bore of the article, the guide being known as a broaching horn. Heretofore, the horn or guide has been of the non-adjustable type, and after a short period of use the bottom of the broach guiding channel has become worn due to the friction and wear by the hardened broach. When the guiding channel has become worn, the horn was useless and was thrown away. It is an object of this invention to provide an improved broaching horn which includes an adjustable or wear take up member which can be finely adjusted to take up any wear.

Another object of this invention is to provide an adjustable channel bottom for a broaching horn, which can be made out of highly tempered steel so as to thereby reduce wear.

A further object of this invention is to provide a broaching horn which can not only be adjusted to take up wear, but can also be adjusted to provide for cutting keyways of different depths.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawing and specification and then more particularly pointed out in the appended claim.

In the drawings:

Figure 1 is a plan view of a broaching horn constructed according to an embodiment of this invention showing the horn in operative position with respect to a gear and with the gear in section.

Figure 2 is an outer end elevation of the horn and gear.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1.

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

Figure 5 is a sectional view taken on the line 5—5 of Figure 3.

Figure 6 is a sectional view taken on the line 6—6 of Figure 3.

Figure 7 is an inner elevational view of the cap or end plate on the horn.

Referring to the drawings, the numeral 10 designates generally a round body which is formed with a transversely extending opening 11 formed therethrough and opening through the end of body 10. A cap or plate 12 is fixed as by fastening devices 13 to the rear end of the body 10 and cap or plate 12 is formed with a slot 14 registering with opening 11. Body 10 is formed at its forward end with an annular flange 15 and a reduced diameter stud 16 extends axially from the forward end of body 10.

Stud 16 is formed with a longitudinal slot 17 which extends through flange 15 as indicated at 18 and also extends through body 10 as indicated at 19.

A broaching member 20 is adapted to slidably engage in the slot or passage formed by the aligned slots 17, 18 and 19 and is adapted to form a keyway in a gear or work piece 21.

In order to provide a means whereby the wear of the inner face 22 of the broaching tool 20 may be taken up and materially reduced, we have provided a wear member 22 which is loosely mounted in the aligned slots 17, 18 and 19.

The bottom surface of the slot is inclined longitudinally as indicated at 24 and the wear member 23 is formed with an inclined lower side engageable with the inclined surface 24. The upper surface 25 of wear member 23 is parallel with the lengthwise axis of body 10 and stud 16. The rear end of wear member 23 is formed with a right angularly disposed lug 26 having a slot 27 through which the shank of an adjusting screw 28 loosely engages. Screw 28 is threaded into body 10 and has fixed thereon a pair of collars 29 between which lug 26 engages.

Screw member 27 loosely engages in a radially elongated opening 30 which is formed in the inner side of plate 12 and plate 12 is also formed with a second radially elongated opening 31 within which the outer one of collars 29 is adapted to engage.

A locking or clamping screw 32 is threaded through plate 12 and bears against the rear end of wear member 23 as shown in Figure 3 so as to tightly clamp wear member 23 against the inclined bottom 24 of the longitudinal slot.

Preferably, the wear member 23 is formed of relatively highly tempered material which will resist wear when broaching member 20 is moved lengthwise of the slot.

In the use and operation of this device, the stud 16 is inserted in the bore 33 of the gear or work piece 21. Wear member 23 is initially adjusted lengthwise of the horn by adjusting screw 27 and locked in adjusted position by means of the clamping screw or bolt 32.

The broaching element 20 is then moved lengthwise through the slot in the horn and thereby forms a keyway in the bore 33 of the work piece 21.

Due to the fact that the wear member 23 can be formed of a highly tempered metal, this wear member will resist wear to a greater degree than was possible in prior broaching horns. When wear occurs in the outer side 25 of wear member 23, this wear can be taken up by adjustment of screw 27. The wear member 23 can also be used for varying the depth of the keyway which is formed by the broaching tool.

This latter procedure is possible by lengthwise adjustment of wear member 23 so that a predetermined portion of the broaching tool 20 will project from the slot 17 of stud 16.

What is claimed is:

A broaching horn comprising a cylindrical body, an annular flange at one end of said body and integrally extending radially, outwardly therefrom, a stud extending axially from said flange oppositely of said body, said stud, said flange and said body having a longitudinal channel extending therethrough, said channel having the bottom surface thereof longitudinally inclined upwardly from said body through said stud, an elongated wear member in said channel, said wear member having a longitudinally inclined lower face in engagement with the inclined bottom of said channel, the upper face of said wear member being parallel with the longitudinal axis of said body and said stud, a right angularly disposed lug integrally carried by the end of said wear member adjacent said body, said lug having a slot opening from the lower edge thereof with the axis of said slot parallel to the axis of said wear member, an adjusting screw extending through said slot in said lug and into a threaded bore in said body, a pair of collars formed on said screw and engaging opposite faces on said lug, whereby movement of said screw will move said wear member, a lock screw

mounted in said body and adapted to engage the end of said wear member carrying said lug to lock said wear member against movement in said body, and a cutting broach mounted for reciprocation in said slot with its lower face in engagement with the upper face of said wear member and with the cutting portion of said broach projecting out of said slot in said stud for cutting work mounted on said stud.

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