H. F. WOLNICK.

BROACHING FIXTURE.

APPLICATION FILED OCT. 23, 1920.

1,432,226.

Patented Oct. 17, 1922.

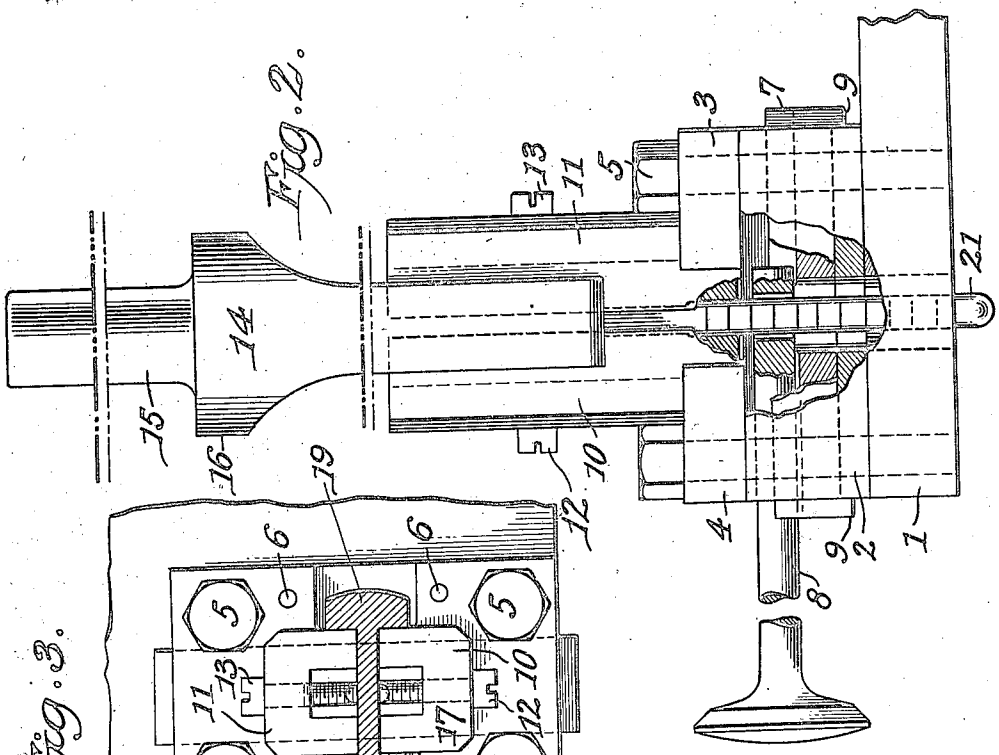


Fig. 2.

Fig. 3.

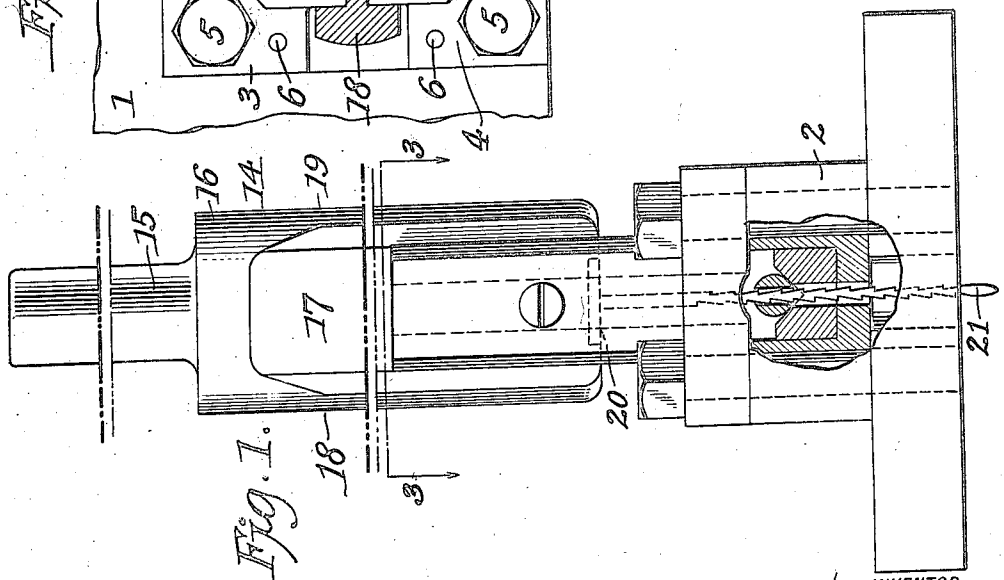


Fig. 1.

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UNITED STATES PATENT OFFICE.

HENRY F. WOLNICK, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN CAR AND FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

BROACHING FIXTURE.

Application filed October 23, 1920. Serial No. 418,892.

To all whom it may concern:

Be it known that I, HENRY F. WOLNICK, residing at Chicago, in the county of Cook, State of Illinois, and being a citizen of the United States, have invented certain new and useful Improvements in a Broaching Fixture, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

In said drawings:

Figure 1 is an end elevation of my improved broaching fixture partly broken away to show the work and work support in section with the broach in position in the work;

Figure 2 is a view in side elevation broken away to show in section the parts shown in section in Fig. 1; and

Figure 3 is a view in section taken on the line 3—3 of Fig. 1.

It is the object of my invention to provide an improved broaching fixture in which the work or piece to be broached may be quickly and correctly placed and in which the broaching tool will be readily positioned for operation and will be positively operated by a plunger held in alinement with the opening to be broached. It is also an object of my invention to provide a broaching fixture consisting of a few simple parts that may be readily replaced in case of damage or excessive wear.

In the drawings, 1 indicates the base plate of my improved broaching fixture that may be secured in any desired manner to a suitable support or to the bed of a punch or pressing machine where it is desired to operate the plunger of the broaching fixture by power operated means. Mounted on the base plate 1 is the U-shaped V-block support 2 and carried on the block 2 are the guide holders or supports 3 and 4. Bolts 5 pass through the guide holders and V-block support and secure these members to the base plate 1. Dowel pins, as 6 in Fig. 3, are used to accurately position these members with respect to each other.

In the opening between the sides of the U-shaped support 2 is fitted the block 7 provided with a V-shaped groove in its upper surface in which is placed the work 8, shown in Fig. 2 as the valve of an engine of the internal combustion type. At each end the block 7 is provided with a downwardly projecting shoulder 9 that engages a face of the support 2 and prevents movement of the block 7 in the opening or slot in the block 2. Alined openings are provided in the block 7, support 2 and base plate 1 for the passage of the broaching tool.

Integral with the guide holders or supports 3 and 4 are the U-shaped guide members 10 and 11 which extend to the lower surface of the guide holders 3 and 4 and are constructed so that when the guide supports 3 and 4 are correctly positioned on the support 2 the sides of the U-shaped guide members extend inwardly and have their ends spaced apart, as shown in Fig. 3, sufficiently to provide an opening for the web of the plunger. Screws 12 and 13 are inserted in openings in the guide members 10 and 11.

The plunger 14 comprises a cylindrical stem 15 terminating in an enlarged cylindrical shoulder 16 which separates the stem 15 from the I-shaped portion engaged by the guide members 10 and 11. The I-shaped portion comprises a web 17 fitted between the ends of the sides of the U-shaped guide members 10 and 11 and flanges 18 and 19 which engage outer faces of the guide members 10 and 11. The web 17 is provided at its lower end with a hardened metal insert 20 for engaging the shank of the broaching tool 21. The outer surfaces of the flanges 18 and 19 are portions of a cylinder having the same diameter as the collar 16 and are extended to and merged into the outer surface of the collar 16.

In operation the work is placed in the V-shaped slot in the block 7 with the opening to be broached over the opening in the block, the plunger is withdrawn from the guides and the broaching tool inserted in the opening in the work. The plunger is then inserted in the guides and, after being brought to bear upon the broaching tool, is subjected to pressure from any suitable source to force the broach through the opening in the work.

The block 7 being secured in the slot in the support 2 only by the shoulder 9 may be readily removed and another block substituted whenever the diameter of the work piece necessitates a V-shaped groove of a different size.

What I claim is:

1. A broaching fixture comprising a base, a work holding means, a grooved support securing said work holding means in position, a plunger for operating a broaching tool, guides for said plunger connecting the side members of said support and common securing means securing said guides and support to the base.

2. A broaching fixture comprising a base, a work holding means having a groove adapted to receive the work, a support grooved to receive said work holding means, a flange plunger adapted to operate a broaching tool, U-shaped guides engaged by said plunger flanges and common securing means securing said guides and support to the base.

3. A broaching fixture comprising a base, a detachable work holding means grooved to receive the work, a grooved support grooved to receive said work holding means, a flanged plunger adapted to operate a broaching tool, guides engaged by said plunger web and flanges and connecting the side members of said support and means securing said guides and support to the base.

4. A broaching fixture comprising a base, a grooved support carried by said base, a detachable work holding means fitted to the groove of said support, U-shaped guides projecting vertically from said support and flanged plunger mounted between and embracing said guides.

5. A broaching fixture comprising a base, a grooved support carried by said base, a grooved detachable work holding means fitted to the groove of said support, U-shaped guides secured to said support and base and connecting the sides of said support and a plunger adapted to travel on said guides.

6. A broaching fixture comprising a base, a grooved shaped work supporting block on said base, a work holding member mounted in the groove in said supporting block and having projections engaging the ends of said block, a plunger for operating a broaching tool and guides for said plunger connecting the side members of said block and projecting therefrom.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

HENRY F. WOLNICK.

Witnesses:
S. C. LEONARD,
H. H. VODEN.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,432,226, granted October 17, 1922, upon the request of Henry F. Wolnick, of Chicago, Illinois, for an improvement in "Broaching Fixtures," an error appears in the printed specification requiring correction as follows: Page 2, line 50, claim 6, strike out the word "shaped"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of November, A. D., 1922.

[SEAL.] KARL FENNING,

Acting Commissioner of Patents.