Aug. 25, 1936. T. W. QUARLES 2,052,534

COMBINATION GEAR PULLER AND PRESS

Filed Dec. 24, 1934 2 Sheets-Sheet 1

FIG. 1

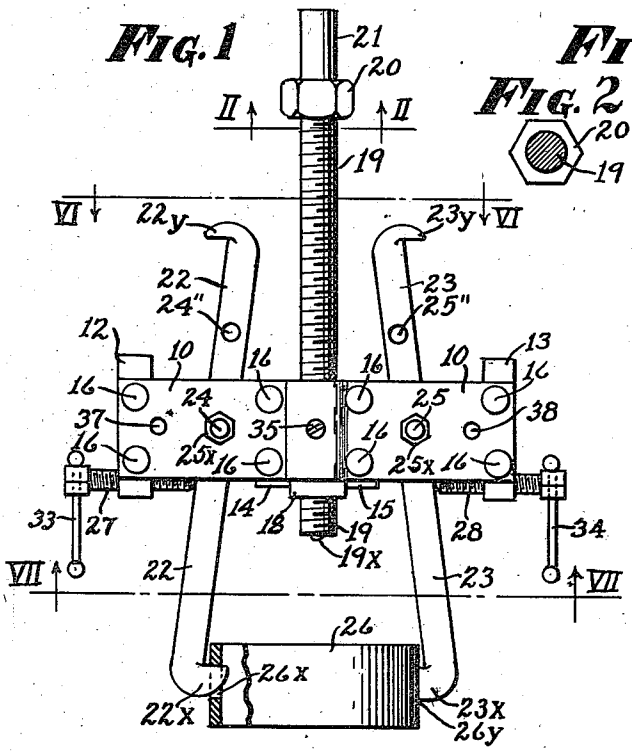


FIG. 2

FIG. 3

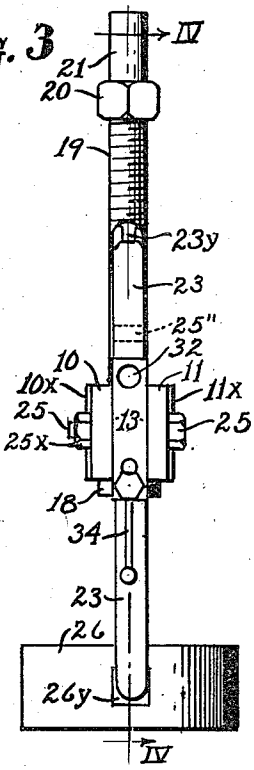


FIG. 4

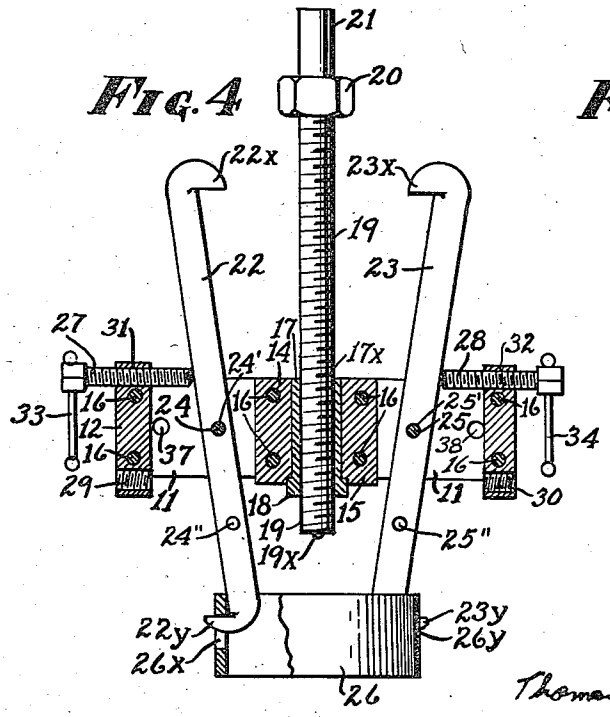
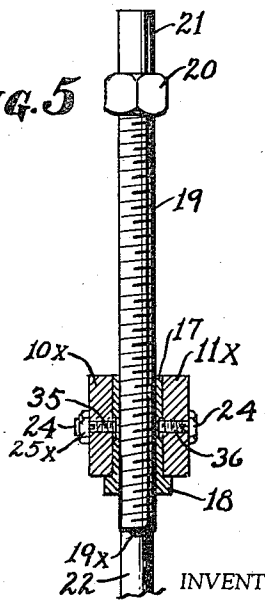


FIG. 5



INVENTOR.

Thomas William Quarles

Aug. 25, 1936. T. W. QUARLES 2,052,534

COMBINATION GEAR PULLER AND PRESS

Filed Dec. 24, 1934 2 Sheets-Sheet 2

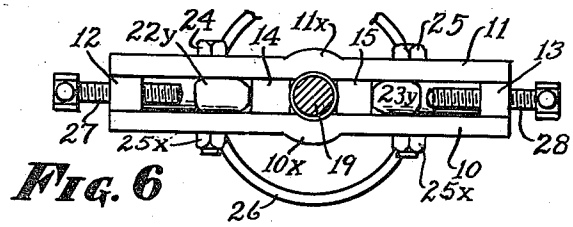


FIG. 6

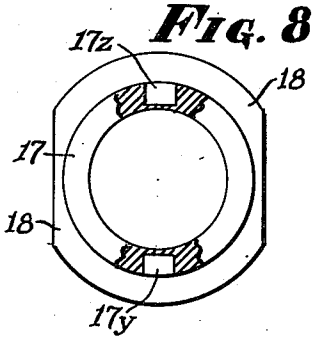


FIG. 8

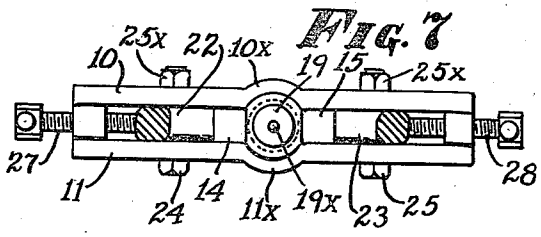


FIG. 7

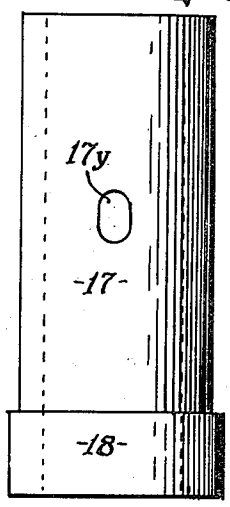


FIG. 9

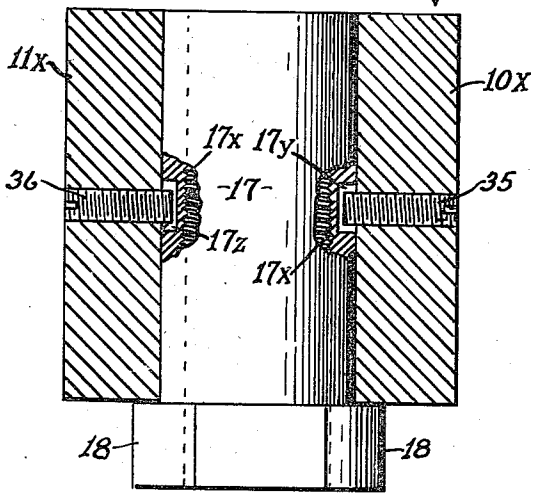


FIG. 10

INVENTOR.

Thomas William Quarles

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UNITED STATES PATENT OFFICE

2,052,534

COMBINATION GEAR PULLER AND PRESS

Thomas William Quarles, Larned, Kans.

Application December 24, 1934, Serial No. 758,906

4 Claims. (Cl. 29—85)

My invention relates to an improvement in a combination gear puller and press useful to machine shops, factories and in the trades for removing gears, sprockets, and the like from shafting, and for the further purpose of pressing bushings and the like from wheel hubs; and for such other uses as gear pullers and the independent presses are usually adapted.

One of the objects of my invention is to maintain a desired application of power requisite for the purposes intended, and also to cause movement of the part in parallelism with its prior position on the shaft or surface from which it is to be removed. A further object is to create a clamp or vise-like grip upon the pulling means and to overcome any tendency of the parts to disengage and fall off the assemblage. A further object is to enable hammer blows to be struck and directed upon the end of the screw shaft without damage to the threads of the screw element of the device. These and other objects will appear during the description of the drawings.

In the drawings Fig. 1 represents a side or face view of the composite mechanism. Fig. 2 shows a cross-sectional view as taken along the line II—II in Fig. 1 and looking in the direction of the arrows. Fig. 3 shows a side view of the mechanism seen in Fig. 1. Fig. 4 shows a cross-section view taken along the vertical plane IV—IV in Fig. 3 to show the operative parts of the mechanism. Fig. 5 shows a sectional view taken through the parts 10*x* and 11*x* in Fig. 7. Fig. 6 represents a view taken along the line VI—VI in Fig. 1 and looking in the direction of the arrows. Fig. 7 shows a view taken along the line VII—VII in Fig. 1 and looking in the direction of the arrows. Fig. 8 shows an end view of the sleeved bushing used in the combination, with parts broken away for convenience of illustration. Fig. 9 represents a side view of the sleeved bushing seen in Fig. 8. Fig. 10 shows a side view of the view shown in Fig. 9 as turned at an angle of 90 degrees, with the swedged portions of the side bars of the frame combination in allied association therewith and retaining screws through the side frame members in operative relationship within the slots of the bushings as illustrated in Figs. 8 and 9.

Referring to the drawings; at 10 and 11 are seen the main side frame members of the device, spaced apart by the end members 12 and 13 and the central members 14 and 15 and rigidly connected and held as a unit frame by such rivet means as 16 and in a manner readily understood. As seen in Figs. 1 and 4 the members 14 and 15 extend below the side members 10 and 11. These members are swedged outwardly as at 10*x* and 11*x* between the members 14 and 15 providing a bearing space for a slidable bushing 17. This bushing has a head 18 and as seen in Figs. 7, 8, 9 and 10 the opposite faces of the head 18 are flattened out so that they bear between and contact the extended parts 14 and 15, Fig. 1, and prevent turning of the bushing 17 in its bearing while permitting the head 18 to bear against the under portion of the parts 10*x* and 11*x* as in Fig. 7. The bushing 17 in length is equivalent to the depth of the parts 11*x* and 10*x* and is threaded at 17*x* to receive the screw element 19. A hexagonal nut 20 is integral with the screw element 19, but the portion of the element 19 above the nut 20 is not threaded, instead it extends as a shaft portion 21, for purposes later explained. Intermediate the side members 10 and 11 are shown the pulling members 22 and 23 pivotally hinged upon bolts 24 and 25 which pass through the holes 24′ and 25′ in the side members 10 and 11 and secured in place by means of the nuts 25*x*. Other holes 24″ and 25″ are provided in the members 22 and 23 whereby the pivot points may be changed for accommodating work of different diameter from that disclosed in Fig. 1. It will be noted that the members 22 and 23 have inwardly positioned hooked ends 22*x* and 23*x*, while their opposite ends are also hooked as at 22*y* and 23*y* but arranged in opposite outwardly directions. Thus by interchanging the pulling arms from the position seen in Fig. 1 to that disclosed in Fig. 4, an internal gripping of the parts is accomplished instead of the outward gripping as seen in Fig. 1. Now it will be understood that for gear pulling and the like that the hooks in Fig. 1 would engage directly upon the gear or the sprocket that is to be removed from its shaft.

For certain work, such for instance as the removal of bushings from wheels, it is desirable to maintain a more constant pressure against the hub of the wheel. This is accomplished by inserting the arms 22 and 23 through the spokes of the wheel, or so that the hooked ends engage within recessed portions of a ring-like collar 26 as shown at 26*x* and 26*y*. The collar 26, as will be understood then bears against the full contour of the hub and face, eliminating the hazards of hub breakage common to most tools employed for this purpose.

One of the most valuable features of my invention consists in the vise-like clamp I am able to impart to the hinged pulling members 22 and 23. Screw means such as 27 and 28 are employed

as in Figs. 1 and 4; threaded holes 29 and 31 through the end block 12 and threaded holes 30 and 32 in the end block 13 selectively receive the said screw means 27 and 28, as will be readily understood. I prefer to employ the usual pins 33 and 34, loosely arranged in the heads of the screw means 27 and 28, for easy manipulation and adjustment of these parts. By adjusting these screws 27 and 28 inwardly or outwardly as the case may be, and so as to bear against the hinged members 22 and 23 in proper manner, I am able to center the end 19*x* upon the shaft, either concentric with its axis thereof or off center as the case may be, the part clamped by the gripping means of the member 22 and 23 moving in parallelism with its prior affixed position, as pressure is applied at the screw nut 20, by means of a wrench.

In removing a gear, sprocket or the like, very frequently the full power of gear pullers has been absorbed without starting the frozen part from the shaft; by reason of the vise-like clamp of the screws 27 and 28 upon the pulling members 22 and 23 I am able to strike heavy blows with a hammer upon the projecting end 21 of the screw member 19 without dislodging the gripping means 22*x* and 23*x* and thus start or break the frozen connection of the gear or the like and thus perform an easy removal of such part. This is likewise true for the removal of a frozen bushing and the like, in which case the ring 26 is employed in the combination as a press means. It will be understood, of course, that a piece of shafting slightly smaller in diameter than the bushing would be inserted between the end 19*x* and the end of the bushing or so that the pressure on the bushing would be properly applied around its periphery. Now the reason I am able to strike heavy blows upon the end 21 of the screw 19 without damage to the threads becomes again a major feature of this new invention. In Figs. 8, 9 and 10 is seen the sleeved bushing 17 having a head 18 normally contacting the members 10*x* and 11*x* of the frame. Midway between the ends of this bushing 17 are seen indentations or slots 17*y* and 17*z*. Retaining screw pins 35 and 36 threaded through the portions 10*x* and 11*x* enter the slots 17*y* and 17*z* and maintain the bushing 17 and head 18 in working relation with the frame members, while permitting a slight movement of the bushing under hammer blows such as will not damage the threaded connection of the screw 19 within the threaded part 17*x* of the bushing 17. The advantage of this is obvious to all who are familiar with the damage usually done to the threaded shaft of gear pullers as customarily built and used. At 37 and 38 are holes through the frame members which are used to pass bolts for fastening the device rigidly upon a bench when so desired. Since the bushing 17 is equivalent to the depth of the side members 10*x* and 11*x* and the bushing is to more or less extent flexibly sleeved and slidable within the bearing surface included between the adjacent walls of the parts 14—10*x*—15—11*x* there is no tendency of projecting threaded parts of the screw 19 to come into possible contact with such bearing surface under cross pulls commonly experienced in devices of this character. Jamming therefor of the threads on the screw 19 is obviated. The swedging of parts 10*x*—11*x* materially increases the strength of the device. The reversible feature of the jaws and the possibility of adjustment taken into consideration with the possibility of the varied uses and combinations for which tools of this character are commonly used make the device practical for machine shop usage and fills a wide range of application without disengagement of the parts and without damage to the screw threads.

Such modifications may be employed as lie within the scope of the appended claims. Having fully disclosed my invention, what I now desire to secure by Letters Patent and claim as new is:

1. In a device of the class described, an integral frame comprising a pair of centrally and outwardly swedged side members, spaced apart by a pair of end blocks and a pair of intermediate blocks; said latter blocks being arranged adjacent said swedged portions and extending below the lower edges of said side members; said swedged portions and said intermediate blocks forming on their adjacent surfaces a bearing as a receptacle for a slidable bushing; said bushing being internally threaded and of a length equivalent to the depth of the side frame members and having a head portion normally bearing against the lower edge portion of said side members and against the adjacent faces of the extended lower portions of said intermediate blocks.

2. In a device as described in claim 1, characterized by the further fact that the bushing has indentations for receiving pin elements detachably secured to said side members for flexibly supporting the bushing within the bearing space of the frame.

3. In a device as described in claim 1, characterized by the further fact that a screw member is adjustably threaded through said bushing.

4. In a device of the class described; an integral frame comprising a pair of centrally and outwardly swedged side members, spaced apart by a pair of end blocks and a pair of intermediate blocks; said intermediate blocks being arranged adjacent said swedged portions and extending below the lower edges of said side members; said swedged portions and said intermediate blocks forming a bearing for a slidable bushing; said bushing being internally threaded and of a length equivalent to the depth of the side frame members and having a head portion normally bearing against the lower edges of said side members and against the adjacent faces of the extended lower portions of said intermediate blocks; indentations in said bushing and screw means engaging the side members and arranged within said indentations; a screw element passing said bushing; each end block having threaded holes horizontally disposed for selectively receiving screw elements; a pair of reversible and adjustable pulling members pivotally arranged intermediate said side members and supported thereby; said screw elements adjustably contacting the back edges of the pivotally depending pulling members for positioning said members in a working position towards a screw member; said screw member passing and engaging said threaded bushing.

THOMAS WILLIAM QUARLES.