Sept. 11, 1928. 1,683,757

W. BRAUER

VALVE SEAT PULLER

Filed Nov. 1, 1927

Fig. 1

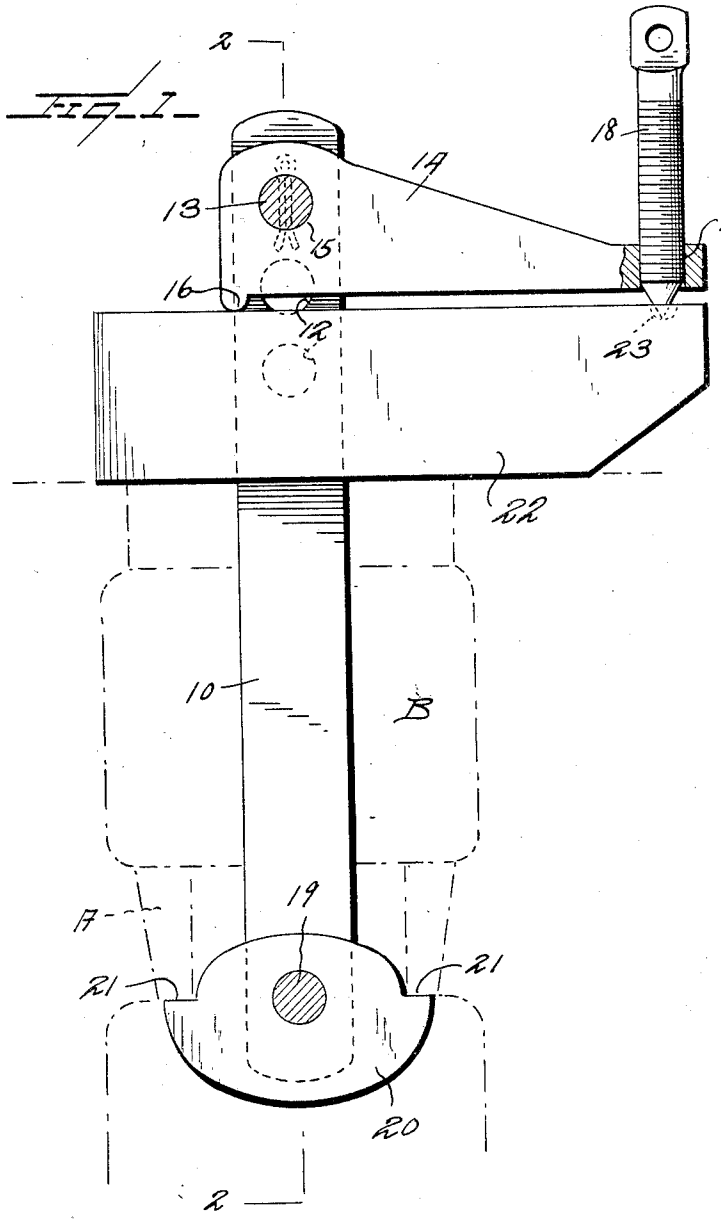
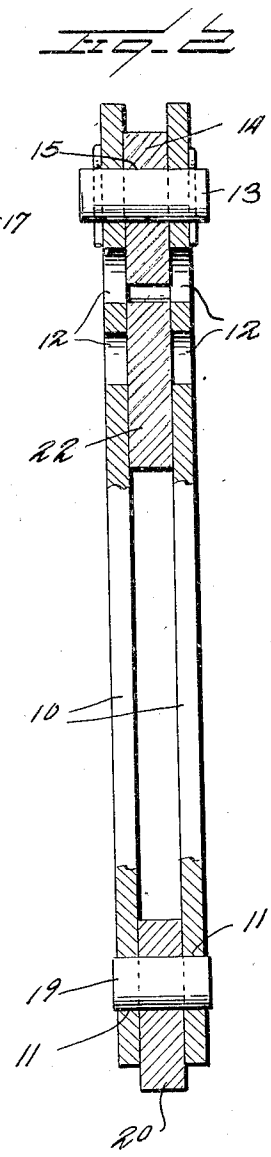


Fig. 2



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VALVE-SEAT PULLER.

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This invention relates to valve seat pullers or implements for a like purpose, and the general object of the invention is to provide a device for pulling valve seats which is so constructed that a very powerful lifting or pulling effect may be secured, the device being particularly adapted for pulling the valve seats of pumps where it is necessary that considerable power be developed for this purpose.

Another object is to provide a device of this character which is very simple, strong, which may be easily applied, and which is thoroughly effective in action.

My invention is illustrated in the accompanying drawing, wherein:—

Figure 1 is a side elevation of a valve seat puller constructed in accordance with my invention, one of the links being removed and the pivot pin for the lever being shown in section;

Figure 2 is a section on the line 2—2 of Figure 1.

Referring to this drawing, 10 designates a pair of links. Each of these links at its lower end is provided with an opening 11 constituting the bearing for the trunnion of a lifting block, as will be later stated. Adjacent the upper end of the links there are provided a plurality of openings 12 for the reception of a transverse pin 13, this pin having cotter pins at its extremities whereby it may be held in place.

Mounted upon this pin 13 and oscillating upon the pin is a lever 14 which is provided with an opening 15 through which the pin 13 passes, the lever having a flat lower face and its upper face extending downward and toward the rear end of the lever. The thickened or free end of the lever is formed with a nose 16 and the opposite end of the lever is formed with a screw-threaded bore 17 and through this bore passes an adjusting screw 18 having means at its upper end whereby it may be turned, the lower end of this adjusting screw being rounded.

Mounted upon a trunnion or pin 19 is the lifting block 20 which is approximately elliptical in form and provided with the two outwardly projecting teeth or shoulders 21 which are adapted to engage beneath a valve seat A, as shown in Figure 1. This lifting block may be turned into a position nearly parallel to the links 10 for insertion through the valve opening and then turned to a transverse position beneath the valve seat, as shown in Figure 1.

The links 10 are designed to be disposed on each side of a cross bar 22 designed to extend over the mouth of the valve chamber B and rest upon the margins of said mouth, as shown in Figure 1. This cross bar is preferably about fourteen inches long, one inch thick and four inches wide, and the links 10 are about twenty-two inches long. The rotation of the screw 18 forces the point of this screw downward in a seat 23 formed in one end of the cross bar and this forces the nose 16 down against the cross bar and exerts, of course, a very great lifting force upon the links 10, thus pulling the valve seat from its normal position. The valve seats in a pump only have to be pulled about $\frac{1}{16}''$ and they come loose, as they have considerable taper. It is, therefore, not necessary, where this device is designed for the pulling of pump valve seats, that the links 10 shall have a great amount of movement but it is necessary that the device should have very great power, and that is precisely what is secured in this device.

Obviously this valve seat puller might be constructed of different dimensions and proportions for use under different circumstances, and it is likewise obvious that a number of the lifting blocks 20 might be provided of different sizes so as to fit valve seats of different diameters and engage simply beneath the valve seat itself and not with the wall surrounding the valve seat.

I claim:—

1. A valve seat puller comprising a cross bar adapted to be disposed across the mouth of a valve chamber, links disposed on each side of the cross bar, a lever to which the upper ends of the links are attached, a valve seat engaging member pivotally mounted upon the lower ends of the links and carried thereby, and means disposed at the end of the lever remote from the links engageable with one end of the cross bar to force the opposite end of the lever downward in fulcruming engagement with the cross bar to thereby lift upward on the links.

2. A valve seat puller comprising a cross bar adapted to be disposed across the mouth of a valve chamber, a lever, links depending from the lever adjacent one end thereof and disposed one on each side of the cross bar, a valve seat engaging member mounted upon

the lower ends of the links and carried thereby, and means disposed at the end of the lever remote from the links engageable with one end of the cross bar to force the opposite end of the lever downward in fulcruming engagement with the cross bar to thereby lift upward on the links, said means comprising a screw having screw-threaded engagement with the lever and engaging the cross bar.

3. A valve seat pulling device comprising a cross bar adapted to be disposed across the mouth of a valve chamber, links disposed on each side of the cross bar, a lever pivotally mounted between said links at the upper ends thereof, one end of the lever being adapted to fulcrum against the cross bar, means at the other end of the lever engaging the cross bar and the lever and forcing this end of the lever upward to thereby lift upward on the links, and a lifting block pivoted between the links at the lower ends thereof and formed to engage beneath a valve seat, the lifting block being adapted to be turned into approximately parallel relation to the links to permit its passage through the valve seat or into a position at right angles to the links to permit it to engage beneath the valve seat.

4. A valve seat pulling device comprising a cross bar adapted to be disposed across the mouth of a valve chamber, links disposed on each side of the cross bar, a lever pivotally mounted between said links at the upper ends thereof, one end of the lever being adapted to fulcrum against the cross bar, means at the other end of the lever engaging the cross bar and the lever and forcing this end of the lever upward to thereby lift upward on the links, and a lifting block pivoted between the links at the lower ends thereof and formed to engage beneath a valve seat, the lifting block being adapted to be turned into approximately parallel relation to the links to permit its passage through the valve seat or into a position at right angles to the links to permit it to engage beneath the valve seat, said lifting block being formed at its opposite ends with outwardly projecting teeth adapted to engage beneath the valve seat.

5. A valve seat pulling device comprising a cross bar adapted to be disposed across the mouth of a valve chamber, links disposed on each side of the cross bar, a lever pivotally mounted between said links at the upper ends thereof, one end of the lever being adapted to fulcrum against the cross bar, means at the other end of the lever engaging the cross bar and the lever and forcing this end of the lever upward to thereby lift upward on the links, and a lifting block pivoted between the links at the lower ends thereof and formed to engage beneath a valve seat, the lifting block being adapted to be turned into approximately parallel relation to the links to permit its passage through the valve seat or into a position at right angles to the links to permit it to engage beneath the valve seat, the lifting block being of generally elliptical form and having rounded ends, the upper edge face of the lifting block being formed with oppositely disposed shoulders adapted to engage beneath the valve seat, the lifting block being freely pivoted upon the links whereby as the lifting block is lowered through the valve seat the curved under face of the lifting block will cause the lifting block to be turned into an approximately parallel relation to the links and then as the lifting block passes beneath the valve seat the lifting block will swing to a horizontal position.

6. A valve seat puller of the character described comprising a cross bar, a pair of links disposed on each side of the cross bar and each formed at its upper end with a vertical series of apertures, a lever formed at one end to fulcrum against the cross bar, the lever at this end being provided with a trunnion adapted to engage through any one of said apertures in the links, means at the opposite end of the lever adapted to engage the cross bar and force this end of the lever upward to thereby lift the links, and a valve seat engaging lifting block pivotally engaged for swinging movement with the lower ends of said links.

7. A valve seat puller comprising a cross bar adapted to be disposed across the mouth of a valve chamber, a lever, a link depending from the lever adjacent one end thereof and disposed to one side of the cross bar, said lever at one end being adapted to engage the cross bar, means at the other end of the lever bearing against the cross bar whereby this end of the lever may be raised or lowered, and a valve seat engaging member pivotally mounted upon the lower end of the link carried thereby, the member having a length greater than its width whereby the member may be turned into parallel relation to the link to be inserted through a valve seat opening and turned at right angles to the link to engage the valve seat.

8. A valve seat puller of the character described comprising a cross bar adapted to be disposed across the mouth of a valve chamber, a lever having a relatively long arm and a relatively short arm, means pivotally engaging the lever adjacent its short arm with the link, the short arm of the lever bearing against the cross bar, means at the long arm of the lever bearing against the cross bar whereby the long arm of the lever may be raised to thus raise the link, and a valve seat engaging member pivotally mounted upon the lower end of the link and carried thereby.

9. A valve seat puller comprising a cross bar adapted to be disposed across the mouth of a valve chamber, a pair of links disposed one on each side of the cross bar and having a vertical series of apertures, a lever disposed above the cross bar, a pin extending through the lever adjacent one end and through the links, the pin being adjustable into any one of the openings of the links and the adjacent end of the lever bearing against the top edge of the cross bar, and means at the outer end of the lever engaging the cross bar whereby this end of the lever may be raised or lowered, and a valve seat engaging member mounted upon the lower ends of the links.

In testimony whereof I hereunto affix my signature.

WALTER BRAUER.