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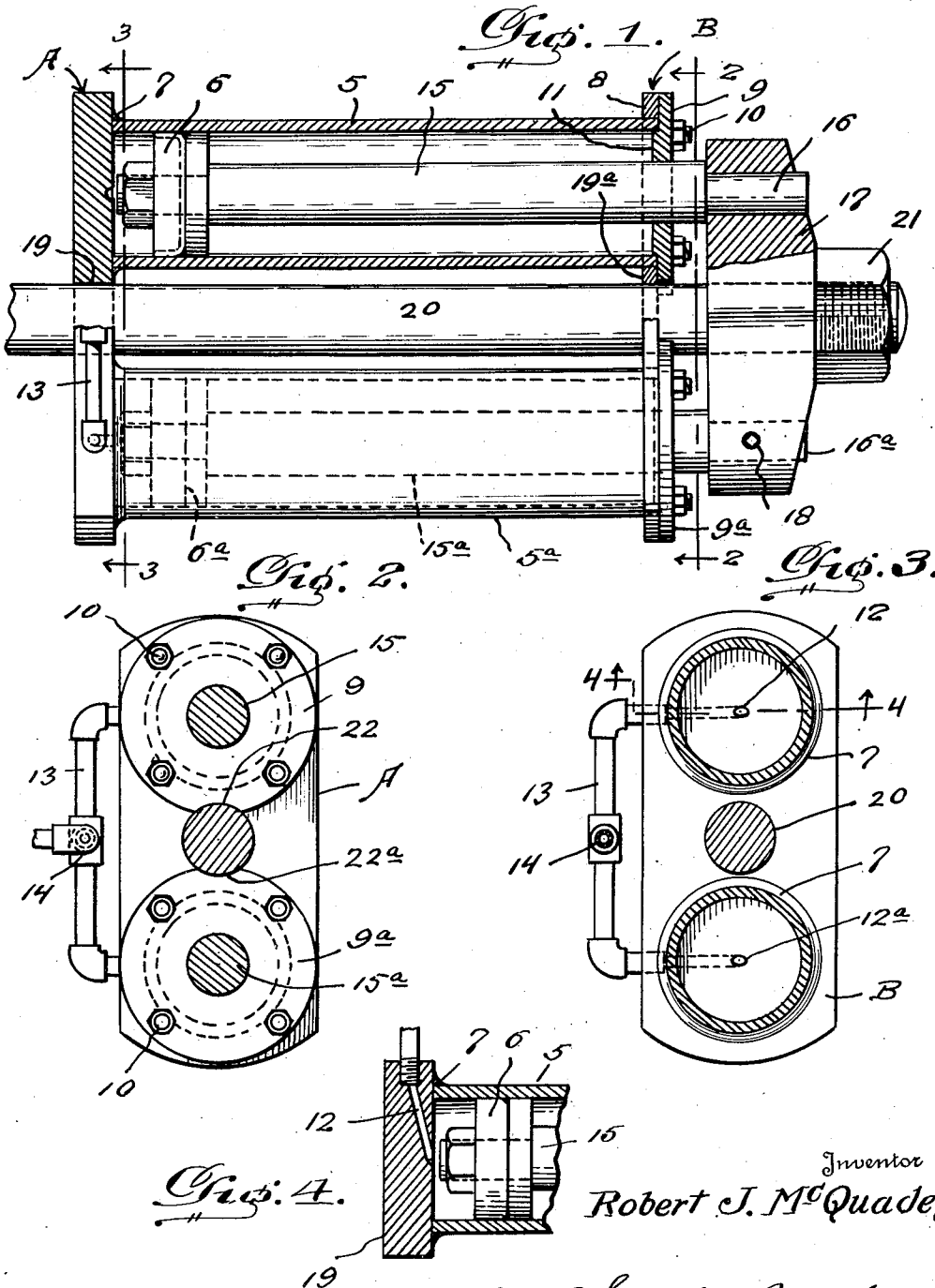
R. J. McQUADE

2,238,424

HYDRAULIC MOTOR

Filed Nov. 25, 1933

2 Sheets-Sheet 1



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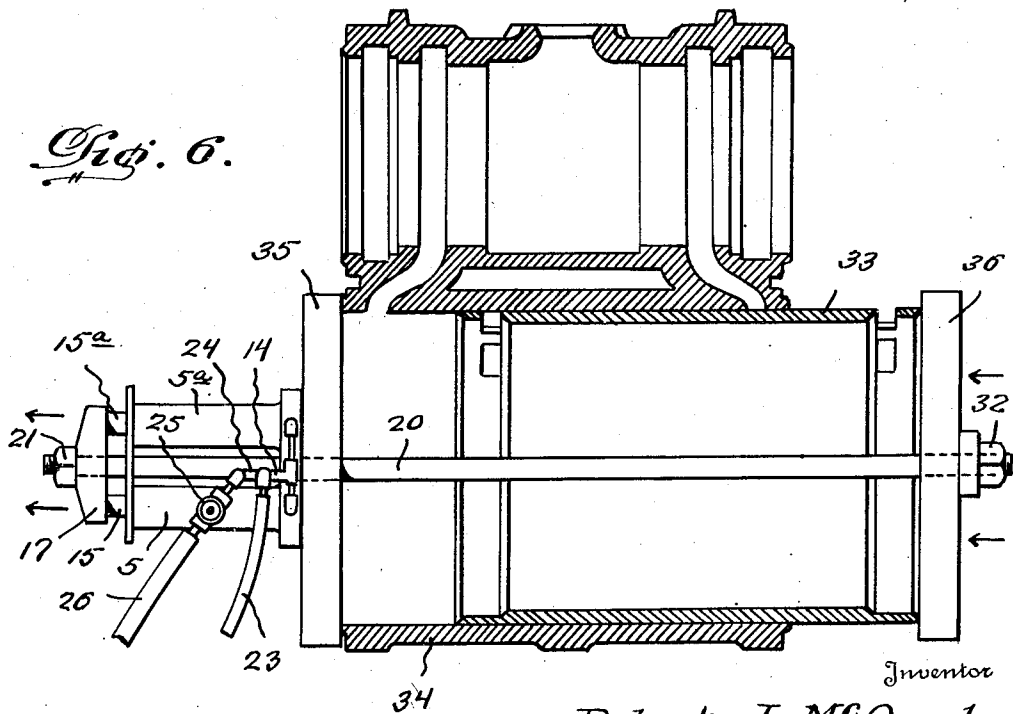
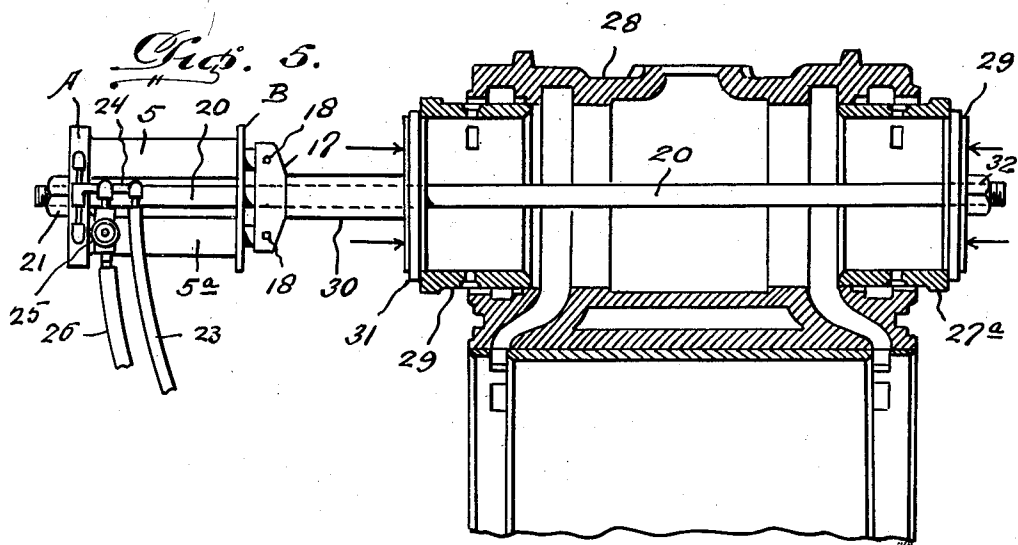
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HYDRAULIC MOTOR

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,238,424

HYDRAULIC MOTOR

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2 Claims. (Cl. 121—38)

This invention relates to improvements in hydraulic motors for sleeve presses, particularly adapted for use in applying and removing cylinder and valve bushings of locomotive steam engines.

The primary object of the present invention is to provide an improved press of the above kind which is extremely simple, compact and durable in construction.

Another object of the present invention is to provide a press of the above kind which will operate efficiently and may be readily placed into use, as well as readily removed and transported from one place of use to another.

The present invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings:

Figure 1 is a view of a press constructed in accordance with the present invention, partly in side elevation and partly in longitudinal section.

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

Figure 3 is a transverse section on line 3—3 of Figure 1.

Figure 4 is a fragmentary section taken on the plane of line 4—4 of Figure 3.

Figure 5 illustrates the press of Figure 1 in use for applying valve bushings of a locomotive steam engine, the valve chest and associated parts of the engine being shown in longitudinal section; and

Figure 6 is a view similar to Figure 5 illustrating use of the present press in applying a cylinder bushing.

Referring in detail to the drawings, the present hydraulic press comprises heads A and B connected at corresponding ends by cylinders 5 and 5a having pistons 6 and 6a movable therein. The head A is in the nature of a relatively thick flat elongated plate to which the adjacent ends of the cylinders 5 and 5a are welded so as to provide a connecting fillet 7 at the joints between the cylinders and the head A in surrounding relation to the adjacent ends of said cylinders. The head B consists of a relatively thinner flat elongated plate 8 having openings snugly receiving the opposite ends of the cylinders 5 and 5a and welded to the latter, and closure plates 9 removably bolted to the plate 8 as at 10 and having central thicker portions 11 fitting slightly within the adjacent ends of the cylinders as shown clearly in Figure 1. The head A has transverse passages 12 and 12a leading from

points centrally of and communicating with the cylinders 5 and 5a to and through one longitudinal edge of said head A. These passages are connected by a manifold 13 with a pipe 14 extending from a suitable source of supply for fluid under pressure, whereby such fluid under pressure may be simultaneously introduced into corresponding ends of the cylinders 5 and 5a for actuation of the pistons 6 and 6a under like pressure.

The pistons 6 and 6a are carried by piston rods 15 and 15a that slidably project through central openings in the cover plates 9 and 9a, and the projecting outer end portions of piston rods 15 and 15a have terminal portions 16 and 16a of reduced size fitted within end openings of a cross bar 17 and secured therein by set screws 18 or the like.

The head A and the plate member 8 of head B are provided intermediate their ends with openings at 19 and 19a which are aligned and through which slidably extends a longitudinally disposed pull rod 20 that also extends through the cross bar 17 intermediate the ends of the latter and has a nut 21 threaded on the end thereof at the outer side of said cross bar 17. It will be noted that the cylinders 5 and 5a are arranged comparatively close together so as to leave very little clearance between the same and opposite sides of the pull rod 20. This produces a very compact and efficient arrangement, and in order to provide proper clearance for the pull rod 20, the closure plates 9 and 9a are provided in their adjacent sides with arcuate recesses 22 and 22a conforming to the rod 20. In this way, the walls of the opening 19a in plate member 8 and the walls of the slots 22 and 22a in the closure plates 9 and 9a provide relatively wide slide bearing surfaces for the rod 20 in the head B. At the same time, the closure plates 9 and 9a are separate for individual removal and access to the respective cylinders.

As shown in Figures 5 and 6, the pipe 14 may be connected with the source of fluid under pressure by means of a flexible hose 23, and may be provided with a branch 24 through which the fluid under pressure may be exhausted from the cylinders 5 and 5a, said branch 24 being equipped with a shut-off valve 25 and provided with a hose 26 for returning the exhausted fluid to the reservoir of the fluid pressure supplying means. These elements are generally common in hydraulic presses and form no specific part of the present invention.

As illustrated in Figure 5, one of the many uses

of the present press is to simultaneously apply bushings 27 and 27a within the opposite ends of the valve chest 28 of a locomotive steam engine. In making use of the invention for this purpose, the pull rod 20 is extended through the chest 28 and is provided on its outer end with an abutment member 29 arranged to engage the outer end of the bushing 27a. In this use, the pull rod 20 is preferably reversed so that it freely extends through the cross bar 17 and the nut 21 is threaded on the end of rod 20 so as to be disposed against the head A. A pipe or tube 30 loosely surrounds the rod 20 between the cross bar 17 and a second abutment member 31 through which the rod 20 loosely extends and which is disposed to engage the outer end of the bushing 27. When fluid under pressure is introduced in the cylinders 5 and 5a, the pistons 6 and 6a are forced outwardly and the cylinders 5 and 5a are forced in the opposite direction, or respectively to the right and left of Figure 5. This causes a pull to be exerted on the rod 20 to force the bushing 27a into place, while a pushing force is simultaneously applied against the abutment member 31 through the medium of cross bar 17 and pipe 30 so as to force the bushing 27 into place. When the bushings have been finally applied in this way, the nut 32 threaded on the outer end of rod 20 to hold the abutment member 29 in place, is removed so as to permit removal of the abutment member 29 and thereby allow the press to be dismounted for transportation to another point of use.

As shown in Figure 6, the present press may, among many other uses, also be used for applying a bushing 33 to the cylinder 34 of a locomotive steam engine. In this use, the assembly of the press with respect to the pull rod 20 remains the same as shown in Figure 1, and the head A is arranged or disposed to directly abut an abutment member 35 engaging one end of the cylinder 34 and through which the pull rod 20 slidably extends. The pull rod 20 extends axially through the cylinder 34 and has an abutment member 36 secured on the outer end thereof by means of the nut 32. Abutment member 36 engages the outer end of the cylinder bushing 33, and when fluid under pressure is supplied to the cylinders 5 and 5a, the piston rods 15 and 15a are forced outwardly so as to move the cross bar 17 therewith and exert a pull upon the rod 20. This pull is transmitted to the abutment member 36 which in turn forces the bushing 33 into the cylinder or toward the press proper. When the bushing 33 has thus been applied, the nut 32 may be removed to permit removal of the abutment member 36 so that the press may be dismounted and transported to another place of use. In both illustrated uses, the press is bodily applied to and supported by the work so that no separate or additional press support is required. The present press has been extensively employed in locomotive work for the illustrated and analogous uses, and has been found to have a long period of usefulness with-

out getting out of order, in addition to operating efficiently and expeditiously.

What I claim as new is:

1. In a hydraulic motor, heads comprising flat plates arranged in spaced parallel relation, a pair of cylinders respectively connecting corresponding ends of said heads and closed at opposite ends by the latter, one of said heads comprising a relatively thick plate having transverse fluid admission and exhaust passages leading through an edge thereof to the respective cylinders, a welded joint between said one head and the adjacent ends of said cylinders including a fillet surrounding each cylinder, pistons reciprocable in said cylinders and having rods slidably projecting through the other head, a cross bar having end openings, the outer terminals of the piston rods being reduced and fitted in said openings of the cross bar, a pull rod arranged parallel with and between said cylinders and slidably extending through said heads, an end of said pull rod extending through the intermediate portion of the cross bar, a nut on the said end of the pull rod engaging the outer side of the cross bar to retain the pull rod therein, said other head comprising a thin plate having apertures receiving the other ends of the cylinders and welded to the latter, and separate closure plates for said other ends of the cylinders bolted to the outer face of said other head, said closure plates being provided in their adjacent sides with arcuate recesses conforming to said pull rod.

2. In a hydraulic motor, plate-like heads arranged in spaced parallel relation, a pair of cylinders respectively connecting corresponding ends of said heads and closed at opposite ends by the latter, one of said heads comprising a relatively thick plate having transverse fluid admission and exhaust passages leading through an edge thereof to the respective cylinders, a welded joint between said one head and the adjacent ends of said cylinders including a fillet surrounding each cylinder, pistons reciprocable in said cylinders and having rods slidably projecting through the other head, a cross bar having end openings, the outer terminals of the piston rods being reduced and fitted in said openings of the cross bar, a pull rod arranged parallel with and between said cylinder and slidably extending through said heads, an end of said pull rod extending through the intermediate portion of the cross bar, means engaging the outer side of the cross bar to retain the pull rod therein, said other head comprising a thin plate having apertures receiving the other ends of the cylinders and welded to the latter, closure plates for said other ends of the cylinders bolted to said last-named plates, said cylinders and pull rod being in closely adjacent relation, and the adjacent sides of said closure plates having arcuate recesses so as to partially embrace the pull rod and afford increased slide bearing surfaces for the latter.

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