J. L. MALONE.

PISTON ROD REMOVING DEVICE.

APPLICATION FILED MAR. 25, 1918.

1,277,450.

Patented Sept. 3, 1918.

3 SHEETS—SHEET 1.

FIG. 1

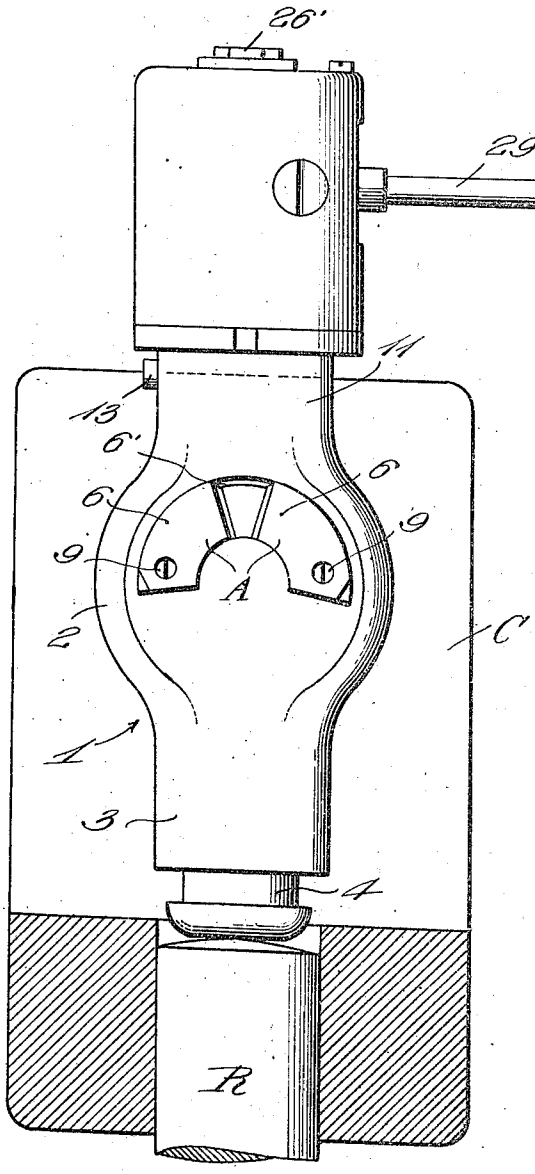
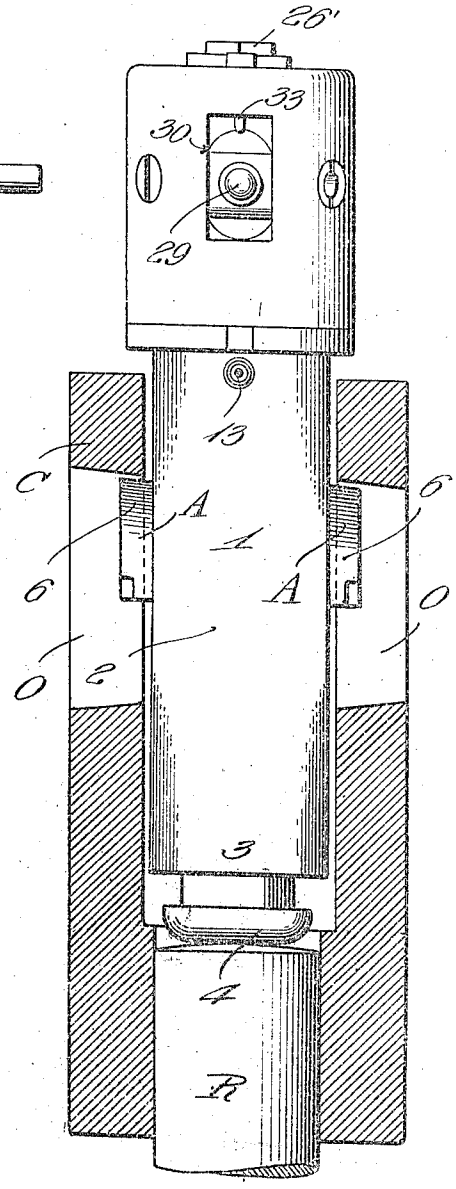


FIG. 2



Witness

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3 SHEETS—SHEET 2.

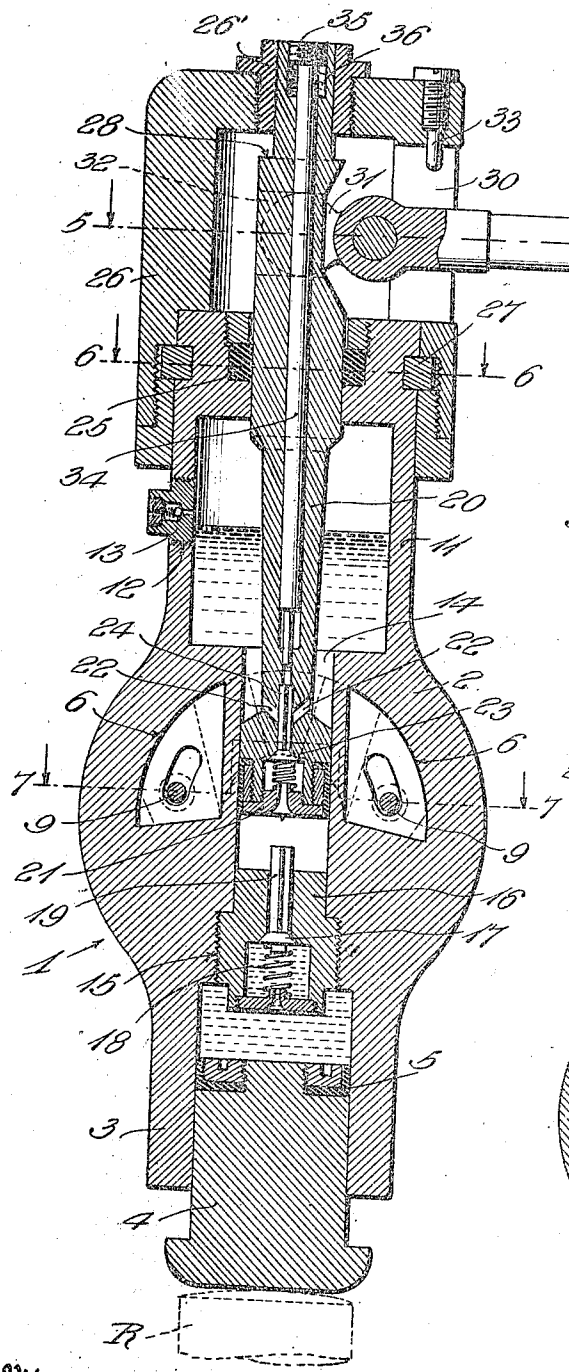


FIG. 5

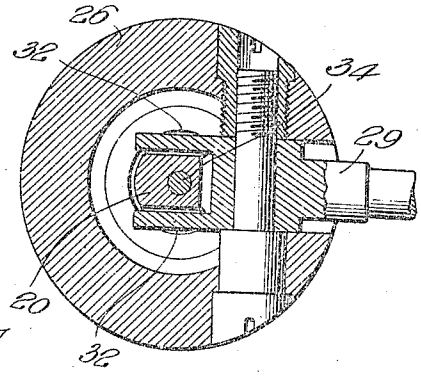
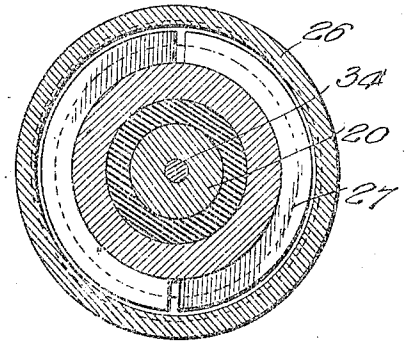


FIG. 6



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3 SHEETS—SHEET 3.

FIG. 4

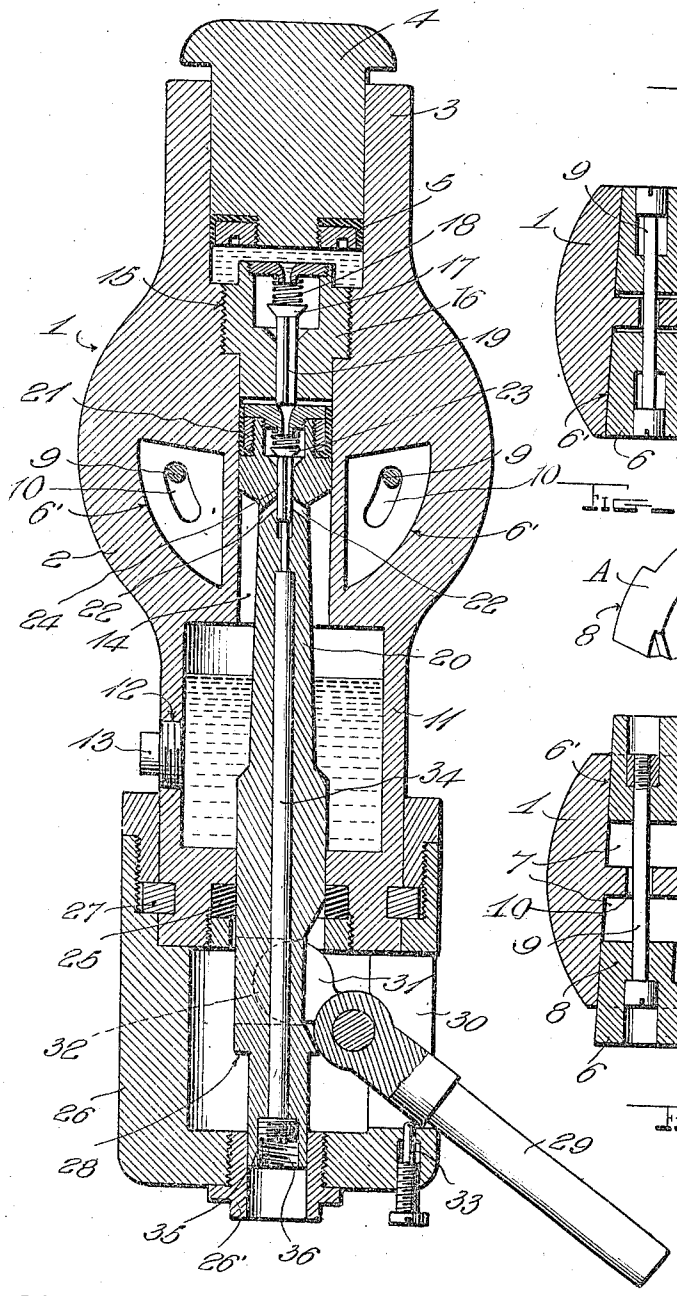


FIG. 7

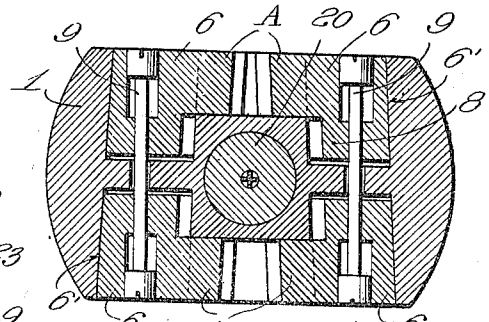
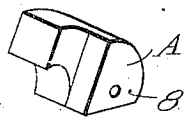


FIG. 9

FIG. 10



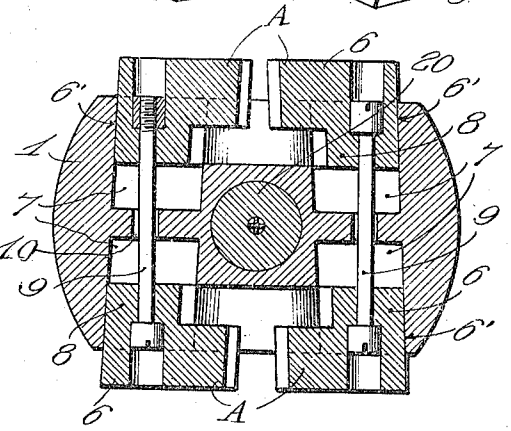


FIG. 8

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UNITED STATES PATENT OFFICE.

JOHN L. MALONE, OF WHISTLER, ALABAMA.

PISTON-ROD-REMOVING DEVICE.

1,277,450. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed March 25, 1918. Serial No. 224,624.

To all whom it may concern:

Be it known that I, JOHN L. MALONE, a citizen of the United States, residing at Whistler, in the county of Mobile and State of Alabama, have invented certain new and useful Improvements in Piston-Rod-Removing Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which is appertains to make and use the same.

My invention has for its object to provide a comparatively simple yet a highly efficient and durable device for removing piston rods from cross heads by the action of a hydraulic ram.

In the construction of the device, a body is provided for reception in the cross head, said body having an oil reservoir, a hydraulic ram, and a plunger for forcing oil from the reservoir to operate the ram, the latter engaging the piston rod. A further object is to provide the aforesaid body with novel abutments for reception in the wrist pin openings of the cross head to anchor said body.

With the foregoing general objects in view, the invention resides in the novel features of construction and unique combinations of parts to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawings which form a part of this specification and in which:

Figure 1 is a side elevation of the invention showing its application in removing a piston rod from a cross head;

Fig. 2 is an edge view of the device in use;

Fig. 3 is an enlarged substantially central longitudinal section;

Fig. 4 is a similar view showing the device inverted for returning the oil from the hydraulic ram into the reservoir;

Figs. 5, 6 and 7 are horizontal sections on the planes of the lines 5—5, 6—6 and 7—7 respectively of Fig. 3;

Fig. 8 is a duplicate of Fig. 7 with the exception that it shows the abutments extended rather than retracted;

Fig. 9 is a perspective view showing the outer construction of one of the abutment sections; and

Fig. 10 is a similar view illustrating the inner construction.

In the drawings above briefly described, the numeral 1 designates an elongated metal body preferably of substantially cylindrical shape with its center enlarged at 2 and provided with flat sides. One end of body 1 forms a hydraulic cylinder 3 in which a hydraulic ram or plug 4 is slidably received, suitable packing means 5 being carried by the inner end of said ram or the like to prevent the leakage of fluid. By the means yet to be described, the ram 4 is projected against the piston rod R after the body 1 has been anchored in the cross head C. For so anchoring the body 1, the latter is provided on its opposite sides with abutments A adapted for reception in the usual wrist pin openings O of the cross head C, each of the abutments A being variable in size according to the diameter of the openings O; and since these openings are in most cases tapered, the abutments will be correspondingly shaped. As shown, the abutments A are each formed of two sections 6 movable toward and away from each other to vary the size of said abutments, said sections being of arcuate shape and receivable in arcuate sockets 6′ formed in the opposite sides of the body 1. The ends of the sockets 6′ are by preference increased in depth as shown at 7 and the abutment sections 6 are provided with preferably triangular extensions 8 receivable in said deepened ends. This arrangement imparts more rigidity to the abutments as will be obvious. The sockets 6′ are of such size as to permit the abutment sections 6 to be totally received therein when applying and removing the body 1, but when said body is in place, the sections in question are withdrawn and positioned in the opening O as shown most clearly in Fig. 2. To limit the outward movement of the abutments, transverse tie bolts 9 are provided, and in order that these bolts may not interfere with the movement of the sections 6 toward and away from each other, the body 1 is formed with arcuate slots 10 through which the bolts extend.

The end of the body 1 remote from the cylinder 3 is formed with an oil reservoir 11 having a filling opening 12 normally closed by a vented plug 13 which will permit the escape of any air from the reservoir without allowing the oil to leak therefrom. A central cylindrical bore 14 leads from the reservoir 11 into the cylinder 3, the end of said bore adjacent the cylinder being counterbored and threaded at 15 to receive a plug 16 in which a check valve 17 is mounted to prevent the passage of oil from the cylinder 3 after it is once forced into the latter, said valve being closed by a spring 18 and having a spider-like stem 19 which extends beyond the inner end of the plug 16 for a purpose to appear. A plunger 20 is provided to force the oil from reservoir 11 into cylinder 3 in order to project the ram 4, said plunger having a suitably packed piston 21 on its inner end received slidably in the bore 14. This piston is provided with ports 22 which, upon each receding stroke of the piston, permit oil to enter the aforesaid bore 14 in advance of the piston, these ports however being closed on the proceeding strokes of the piston by a spring-closed check valve 23 having a spider-like stem 24 slidable in the inner end of the plunger 20.

The intermediate portion of the plunger 20 slides through an appropriate stuffing box 25 and projects through a hollow head 26 which is swiveled at 27 to the end of the body 1 opposite the ram 4. The outer end of head 26 is provided with a guide 26′ through which the outer end of plunger 24 slides, said plunger having an external cylinder 28 adapted to strike the inner end of said guide to limit the receding movement of said plunger. An operating lever 29 extends through a slot 30 in one side of the head 26 and is provided with furcations 31 on its inner end receivable in notches 32 in the opposite sides of the plunger 20, whereby oscillation of said lever will reciprocate the plunger, thus forcing oil form the reservoir 11 into the cylinder 3 and projecting the ram 4 to remove the piston rod R. Since the head 26 is swiveled to the body 1 and lever 29 is fulcrumed to said head, this lever may be swung around into the most convenient relation with the device. To limit the proceeding movement of the plunger, a stop 33 preferably in the form of a set screw, is provided in the path of lever 29 as shown clearly in Fig. 3.

After operation of the device, it is necessary to return the oil or other fluid used from the cylinder 3 to the reservoir 11. In order to accomplish this, it is necessary to withdraw the stop 33 sufficiently to permit an excessive proceeding movement of the piston 21, with the result that this piston will strike the stem 19 and open the check valve 17 (see Fig. 4). At the same time, it is necessary to open the valve 23 and in order to obtain this end, a stem 34 is housed in the plunger 20, the inner end of said stem being arranged to strike the stem 24 of said valve 23 while the outer end of said stem 34 is provided with a plug or head 35 threaded into a socket 36 in the outer end of the plunger. When this plug or head is so turned as to force the stem 34 inwardly as shown in Fig. 4, the valve 23 will be held in open position. Then, by inverting the entire device (see again Fig. 4) the oil will flow from the cylinder 3 back into the reservoir 11.

In operation, the body 1 is inserted in the cross head while the abutments A are in retracted position, said abutments being then withdrawn and suitably adjusted to adapt them to the size of the wrist pin openings O. This having been done, the lever 29 is oscillated so that the plunger 20 forces oil into the cylinder 3 to project the hydraulic ram 4 against the piston rod, thus forcing the latter from the opening in which it has been held. To remove the device, the abutments A are again forced into the sockets 6′ and after such removal, the oil is returned to the reservoir 11 by inverting the device and opening the check valves in the manner above set forth.

From the foregoing, taken in connection with the accompanying drawing, it will be obvious that although my invention is of comparatively simple and inexpensive nature, it will be highly efficient and reliable. Since probably the best results are obtained from the several details shown and described, these details are preferably employed, but within the scope of the invention as claimed, considerable latitude is allowed for development.

I claim:

1. A device for removing piston rods from cross heads comprising a body receivable in the cross head, a ram carried by said body to thrust against the piston rod, means for operating said ram, and abutments extending from opposite sides of said body and receivable in the wrist pin openings of the cross head to anchor said body.

2. A structure as specified in claim 1, said abutments being retractable into said body for applying and removing the latter.

3. A structure as specified in claim 1, said abutments being variable in size for reception in wrist pin openings of different diameters.

4. A structure as specified in claim 1, said abutments being each formed of a plurality of sections movable toward and away from each other to vary the size of said abutments according to the size of the wrist pin openings.

5. A structure as specified in claim 1, said

body having arcuate sockets in which said abutments are slidable and said abutments being each formed of a plurality of sections movable toward and away from each other to vary the size of said abutments according to the size of the wrist pin openings.

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

JOHN L. MALONE.

Witnesses:
MARY L. WINDLEY,
J. IRWIN BURGETT.