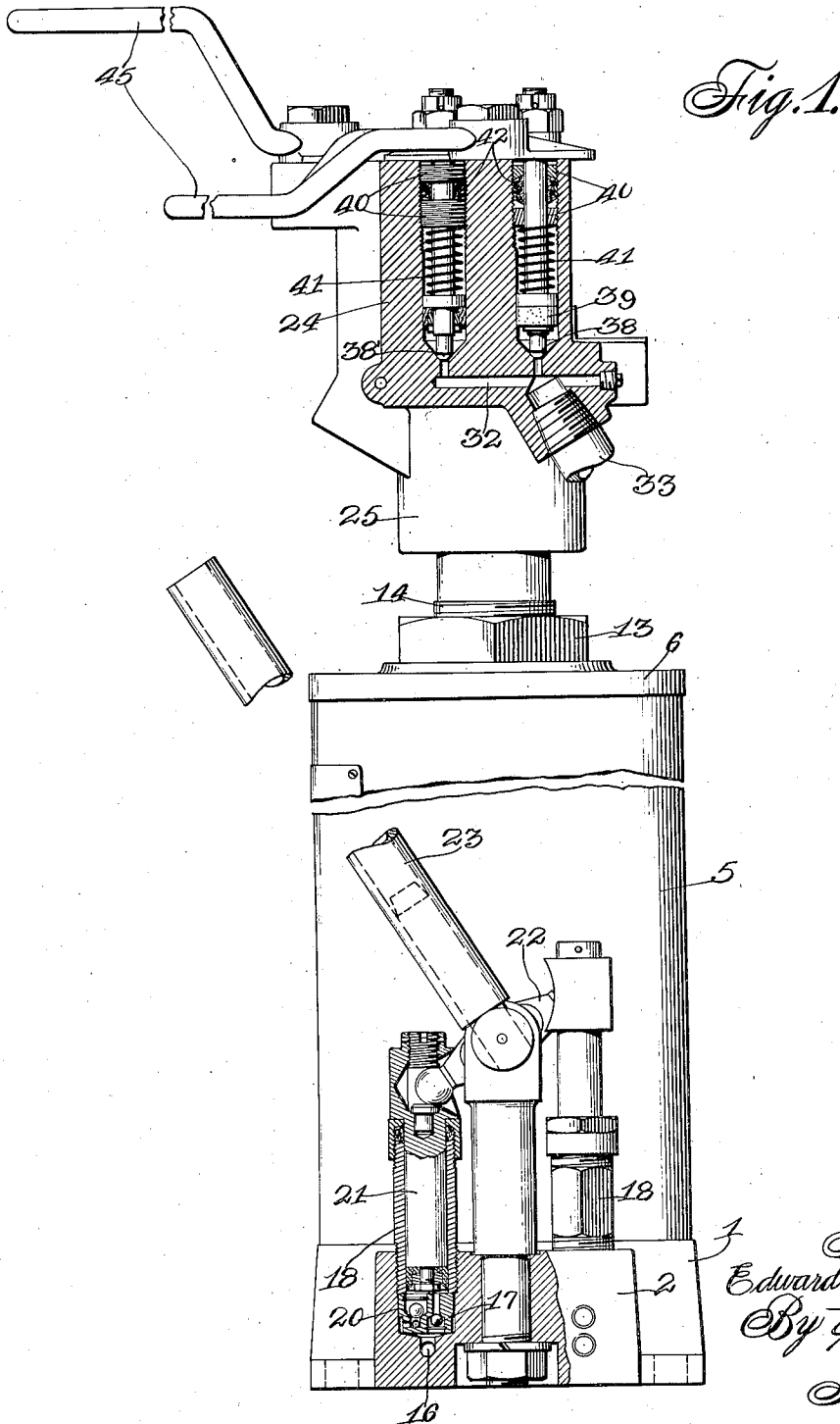


Sept. 5, 1933.

E. M. PFAUSER
CONTROL FOR HYDRAULIC RAMS
Filed Aug. 27, 1931

1,925,704

4 Sheets-Sheet 1



Sept. 5, 1933.

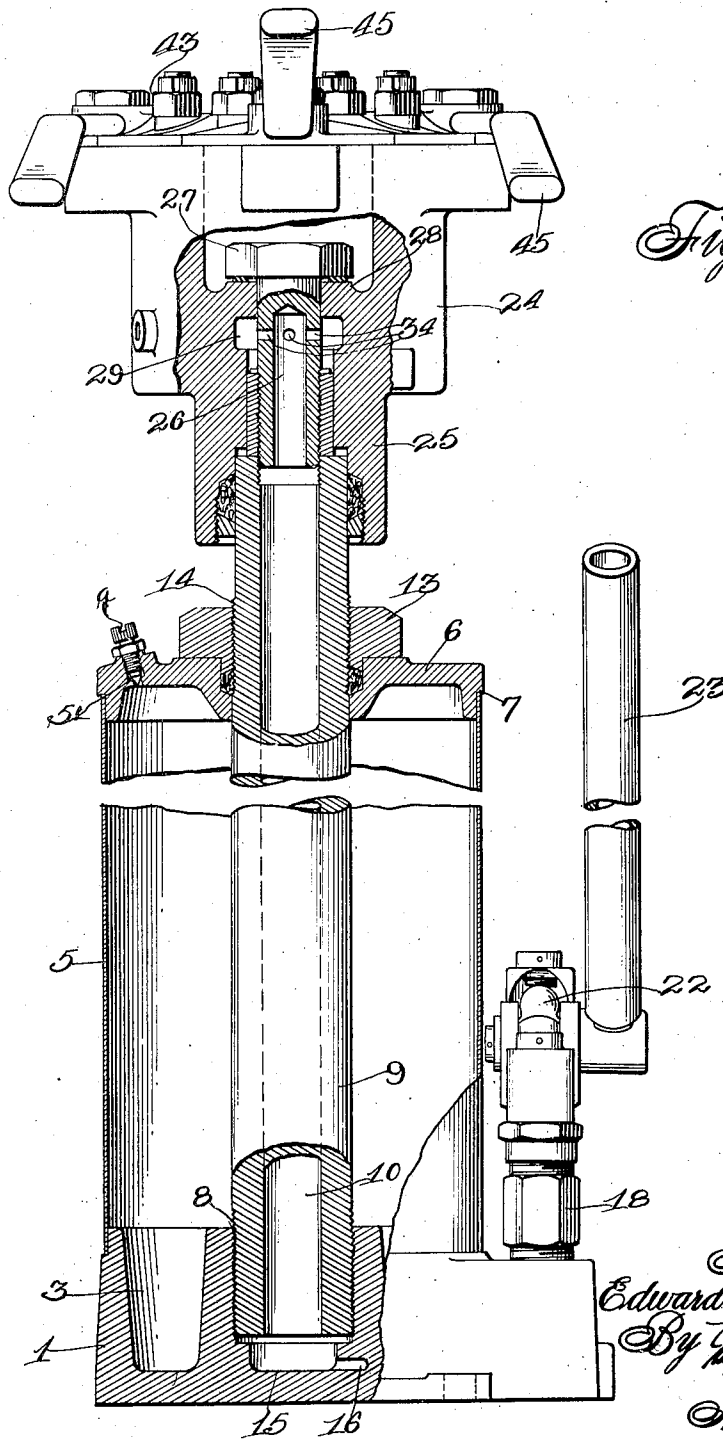
E. M. PFAUSER

1,925,704

CONTROL FOR HYDRAULIC RAMS

Filed Aug. 27, 1931

4 Sheets-Sheet 2



Inventor
Edward M. Pfäuser
By *Wm. H. H. H.*
Attorneys

Sept. 5, 1933.

E. M. PFAUSER

1,925,704

CONTROL FOR HYDRAULIC RAMS

Filed Aug. 27, 1931

4 Sheets-Sheet 3

Fig. 3.

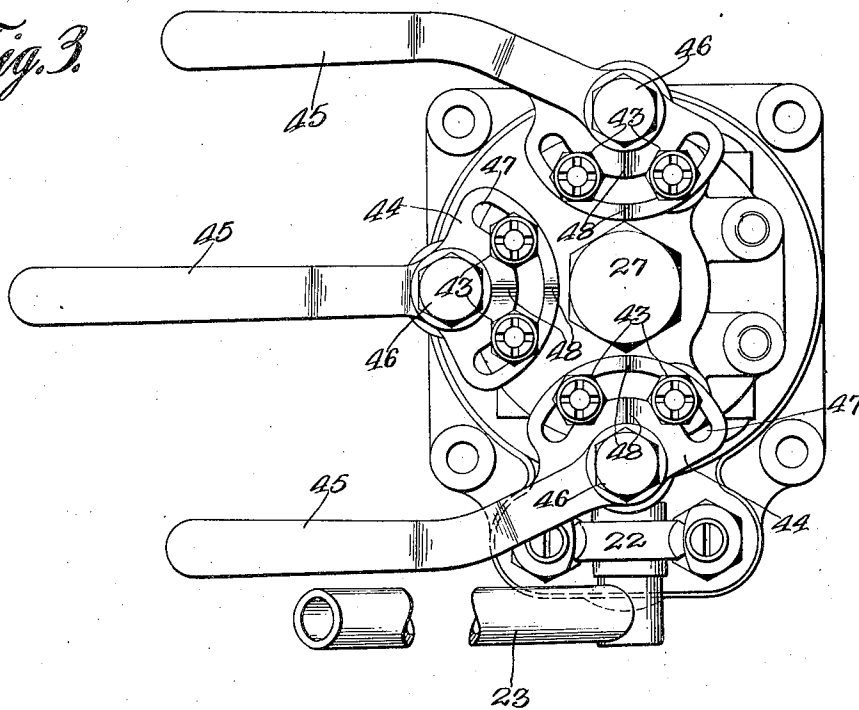
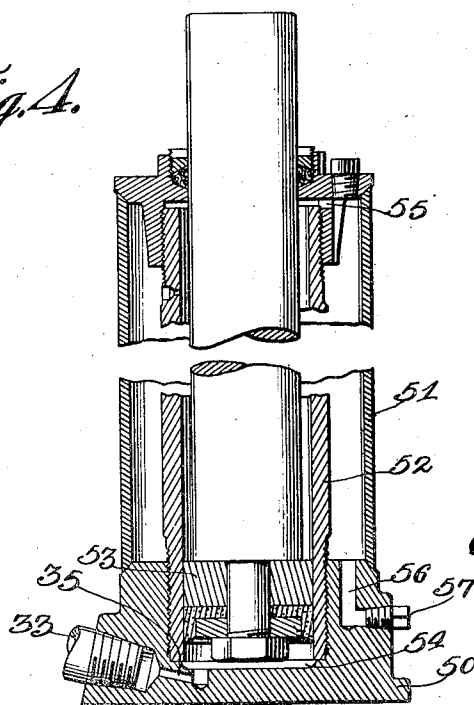


Fig. 4.



Inventor
Edward M. Pfauiser
By *[Signature]*
Attorneys

Sept. 5, 1933.

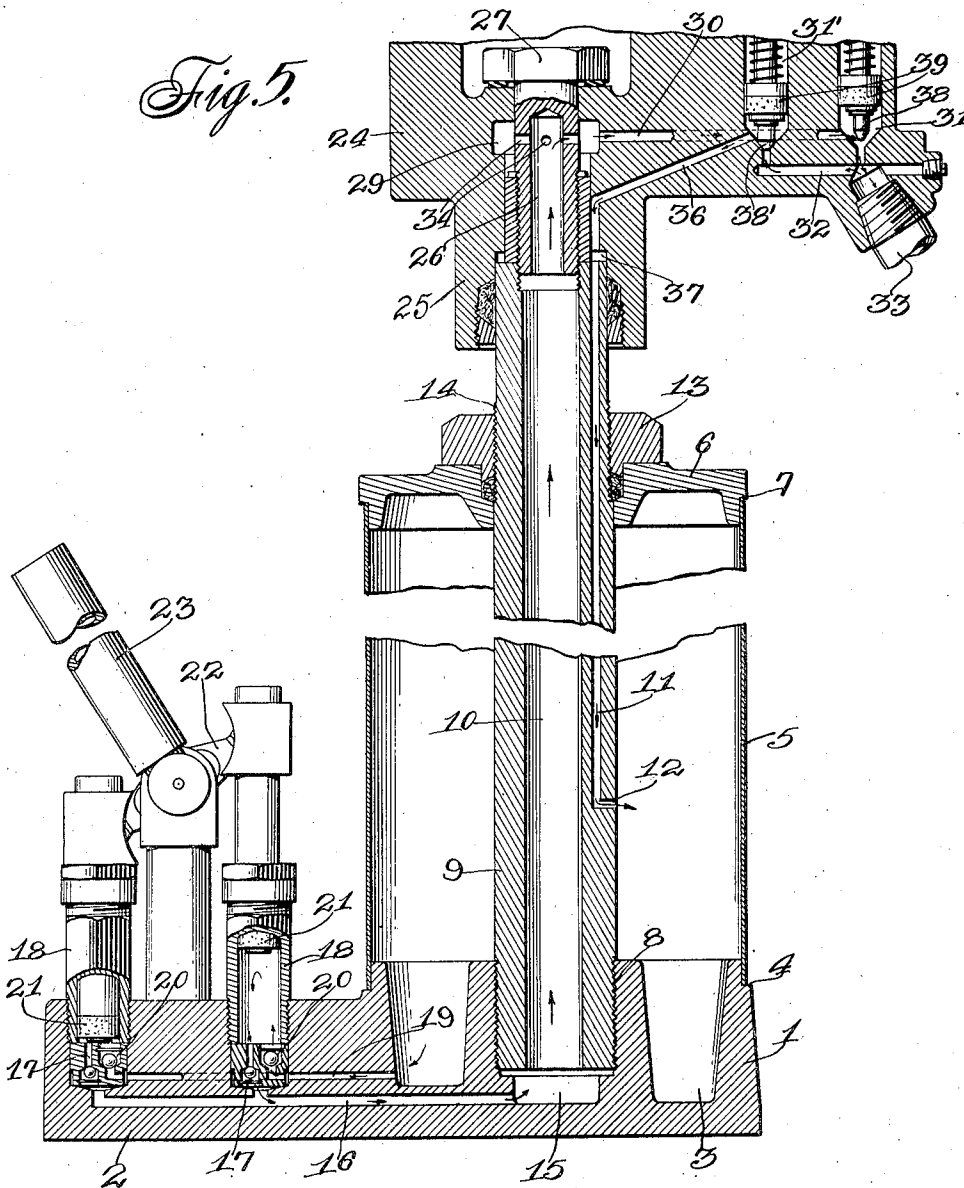
E. M. PFAUSER

1,925,704

CONTROL FOR HYDRAULIC RAMS

Filed Aug. 27, 1931

4 Sheets-Sheet 4



Inventor
Edward M. Pfauiser
By *Thos. H. Kelly*
Attorneys

UNITED STATES PATENT OFFICE

1,925,704

CONTROL FOR HYDRAULIC RAMS

Edward M. Pfauser, Milwaukee, Wis., assignor to
Blackhawk Manufacturing Company, Mil-
waukee, Wis.

Application August 27, 1931. Serial No. 559,712

1 Claim. (Cl. 138—9)

This invention relates to an improved unitary control for hydraulic rams.

The main object of the present invention is the provision of a unitary device for controlling the action of hydraulic rams and includes construction whereby the rams may be independently or collectively controlled for urging a fluid into the rams or releasing the same therefrom.

Another object of the present invention is the provision of a control device for hydraulic rams which includes a manually actuated pump adapted to pump fluid into connecting lines for hydraulic rams, and also includes independently actuated valves for controlling the flow of fluid to and from the rams, whereby the rams may be readily actuated by the fluid under pressure, or the fluid may be drained from the rams into the fluid supply reservoir.

A further object of the present invention is the provision of a control device for hydraulic rams which includes a main supply reservoir, manually controlled pumps for pumping the fluid from the supply reservoir to the hydraulic rams and also includes manually controlled valve members for each passageway which leads to the different rams, with means for actuating said valves, whereby the valves for each ram may be alternately opened and closed for controlling the passage of the fluid to and from the rams.

With the above and other objects in view, the invention consists in the novel features of construction, the combination and arrangement of parts hereinafter more fully set forth, pointed out in the claim and shown in the accompanying drawings wherein:

Figure 1 is a side elevation of my improved unitary control device for rams, with parts thereof broken away and illustrated in cross section;

Figure 2 is a front elevation at right angles to the showing in Figure 1, with parts thereof broken away and illustrated in cross section;

Figure 3 is a top plan view;

Figure 4 is a longitudinal section of one of the rams to be actuated by the improved control device; and,

Figure 5 is a vertical sectional view of a main portion of the control device, with portion of the pump in elevation.

Referring more particularly to the drawings, 1 indicates the main base portion of the device, which is provided with a lateral extension 2 preferably for supporting the pump unit. The base 1 is provided with an annular channel 3 and with a shoulder 4 positioned below the upper edge of the base and upon which rests the cylindrical

body 5 of the fluid chamber. The lower end of this fluid chamber may be welded or otherwise connected to the base 1 and is closed at its upper end by means of the top plate 6.

The top plate 6 is provided with a shoulder 7 adapted to engage the upper end of the cylinder body 4 of the fluid chamber. The base 1 is provided with a central threaded bore 8 into which is threaded the lower end of an upright conduit 9.

This conduit 9 is provided with a central bore 10 and with an auxiliary bore 11 which has a lateral outlet 12 at its lower end communicating with the interior of the fluid cylinder 5.

The plate 6 is retained in position relative to the upper end of the cylinder 5 by means of a lock nut screwed onto the threaded portion 14 on the exterior of the conduit 9, as shown in Figure 5. Both the bores 10 and 11 open at the upper end of the conduit 9, and the lower end of the bore 10 opens into a cavity 15, and leading from this cavity is a bore 16 which connects up with the outlet ports 17 of the pumps 18.

The annular recess 3 is connected by means of a bore 19 with the intake ports 20 of the pump members 18. The cylinders of the pump members are threaded into sockets or seats in the extension 2 of the base and mounted for reciprocating movement within the cylinders are the pistons 21 connected at their upper ends to a rockable cross head 22, actuated by a handle 23, whereby rocking movement of the handle 23 will impart alternate reciprocating movement to the pistons 21.

The upper end of the control device includes a head 24 having a depending sleeve or extension 25 adapted to receive the upper end of the conduit 9 and threaded into the upper end of the conduit is a guide sleeve 26 formed at its upper end with a head 27 resting upon a shoulder 28. The head 24 is provided with a small chamber 29 and leading from this chamber is a passageway 30 which communicates with a valve housing 31 leading into the short bore 32 that connects up with the conduit 33.

The sleeve 26 is provided adjacent its upper end with a plurality of lateral apertures 34 which lead into the chamber 29 and pass through passageway 30 to the valve chamber 31. The conduit 33 may be of any suitable type of material preferably of a flexible nature and has its other end connected with an inlet port 35 at the bottom of the ram shown in Figure 4. It will be noted that the head 24 is provided with the two parallel valve chambers 31 and 31' for each conduit 33. Attention is directed to the fact that there may be

any number of rams to be operated by this control unit, together with any number of pairs of valves for controlling the movement of the fluid to and from the rams, but in the present instance, I have illustrated and will describe the operation of three separate control means for three individual rams, and each ram is controlled by a pair of valves operating in the parallel chambers 31 and 31'. Each valve chamber has a port leading into the conduit or passage 32 which connects up with conduit 33. It will be apparent that there are a number of passages 30 and 32, the number corresponding to the number of conduits 33. The head 24 is also provided with a number of conduits or bores 36 which lead from a small chamber 37 at the upper end of conduit 11 and connect up with the valve chambers 31', as clearly shown in Figure 5.

It will be noted that the valve members 38 and 38' are of substantially the needle type valve and the stems thereof carry suitable plungerlike washers 39, while mounted upon the stems between the washers 39 and threaded collars 40, are suitable coil springs 41 which normally urge the valve members toward a seated position.

The sleeves 40 are arranged in spaced relation upon each one of the valve stems and are threaded into the upper ends of the chambers 31 and 31', as clearly shown in Figure 1, for providing a suitable positive guide for the valve stems, as well as retaining the packing 42 in place.

In Figure 3, a top plan view of the device is illustrated and it will be noted that the three pairs of valves are arranged in convenient relative relation to the head 24 and the valve stems of each pair have nuts 43 threaded upon the upper ends thereof which are adapted to be disposed upon the upper faces of the actuating heads 44. These heads are substantially arcuate, as shown in Figure 3, and have connected to one side thereof, a handle member 45 which is pivotally mounted at 46 whereby the sectors or actuating heads may be swung in the arc of a circle.

Each one of the heads or sectors 44 is provided with an arcuate slot 47 to receive the upper ends of the valve stems, as shown in Figure 3, with the nuts 43 arranged upon the upper face of each head. Each head 44 is provided upon opposite sides of the slot 47 with a cam portion 48, whereby movement of the head in either direction will cause either one of the valve members to be actuated.

It will be noted that each one of the actuating heads 44 is of the same construction and actuates each pair of valves in the same manner.

From the showing in Figure 3, it will be noted that when the lowermost handle member 45 is swung toward the central handle member, the valve 38 will be unseated as shown in Figure 5, while by swinging the handle member 45 in the opposite direction, the valve member 38' may be unseated leaving the valve 38 in a closed position, while the relative neutral positions of the several actuating heads are illustrated in Figure 3, with the cam points 48 disposed midway between the two valve stems or nuts 43.

In Figure 4, I have illustrated a longitudinal sectional view of a preferred type of ram to be used in connection with my improved control device and this ram includes a base 50 having a housing 51 mounted thereon, while threaded into the base is an inner cylinder 52 in which is mounted a plunger 53. Within the base 50 at the inner end of the plunger 53 is a small recess or depression 54 which has communication with the

inlet port 35 which in turn connects up with the conduit 33.

The plunger 53 is adapted to be reciprocated within the cylinder 52 and the cylinder 52 has an outlet port 55 at the top which leads into the housing 51 and the base member 50 is provided with a drain port 56 normally closed by means of a threaded plug 57.

In the operation of my improved control for hydraulic rams, it will be noted that when any one of the rams is to be actuated, one of the handles 45 is moved in the proper direction for bringing the cam points 48 beneath the nut 43 of one of the valve stems of any pair of valves for opening communication between the passageway 30 and passageway 32.

After communication has been established between the conduit 9 and the conduit 33, the handle 23 of the pump is actuated for operating in the cylinders of the pump which will pump fluid from the cylindrical body 5, through the bore 19 into the pump cylinders and be forced out through the outlet ports 17 into the bore 16 and up through the conduit 9 where the fluid will pass out through the openings 34 into the chamber 29 and through the respective passage 30 into the valve chamber 31 and thence into the conduit 33 where it will pass directly to the inlet port 35 of the respective ram.

As the pumping of the fluid continues, the plunger 53 of the ram will be moved outwardly in the cylinder 52.

When it is desired to release the ram, the handle 45 is reciprocated or moved in the opposite direction, closing the valve 38 and opening the valve 38', or after the ram has been moved to the proper operative position, the valve 38 can be closed by moving the actuating head 44 to a neutral position, as shown in Figure 3.

However, upon draining the fluid from each ram, the valve 38' is opened, while valve 38 remains closed, thus allowing the fluid from behind the plunger 53 to return to the conduit 33 and through passage 32 into bore 11 back into the cylindrical housing 5.

It will be apparent from the foregoing that the fluid in the cylindrical body 5 may be readily pumped therefrom into the cylinders 52 of the rams by opening the valve 38 of each pair of valves to permit the fluid to be pumped into the ram.

However, the fluid can be quickly released by closing the valve 38 and opening the valve 38'. Attention is also directed to the fact that the rams can be operated independently or collectively and a fluid used for actuating the rams can be readily returned to the cylindrical body 4. One of the principal features of this invention is the arrangement of the control valves 38 and 38' and the particular mounting of these valves. It will be noted that by using a substantially needle-type valve, there will be very little, if any, leakage past these valves, and any leakage will be taken up through the medium of the washers 39 and a packing 42, as well as the sleeves 40. This construction and mounting of the valves 38 and 38', therefore, assures the retaining of the fluid within its proper conduits and passageways for operating upon the rams as specified and assures the return of the fluid from the rams to the cylindrical housing 5.

Another feature of this invention is the fact that a unitary structure is provided for controlling a plurality of rams which may be used on various types of structure, such as road graders

and the like, and wherein the rams will be operated independently or collectively.

The fluid reservoir 5 is provided with a filling opening 5' which is normally closed by means of a plug *a*, whereby the supply of fluid in the reservoir may be replenished at any time.

While I have shown and described the preferred embodiment of my invention, it will be apparent from the foregoing that slight changes may be made in the construction when putting the invention into practice without departing from the spirit of the same or the scope of the appended claim.

I claim:

15 In a hydraulic control device for rams, a base having an annular recess formed in its upper face, a lateral extension on the base at one side of the

annular recess, a reservoir casing carried by the base surrounding and housing the annular recess, a pump carried by the extension, means forming communication between the intake of the pump and the annular recess, a tubular standard carried by the base and leading up through the reservoir having a central bore communicating with the outlet of the pump, said standard having therein a return conduit communicating with the reservoir, a head connected with the upper end of the standard, said head having a port for communication with a ram, and passageways connecting the port with the bore and conduit of the standard, and manually controlled valves for controlling the flow of fluid in the passageways.

EDWARD M. PFAUSER.

20 95

25 100

30 105

35 110

40 115

45 120

50 125

55 130

60 135

65 140

70 145

75 150