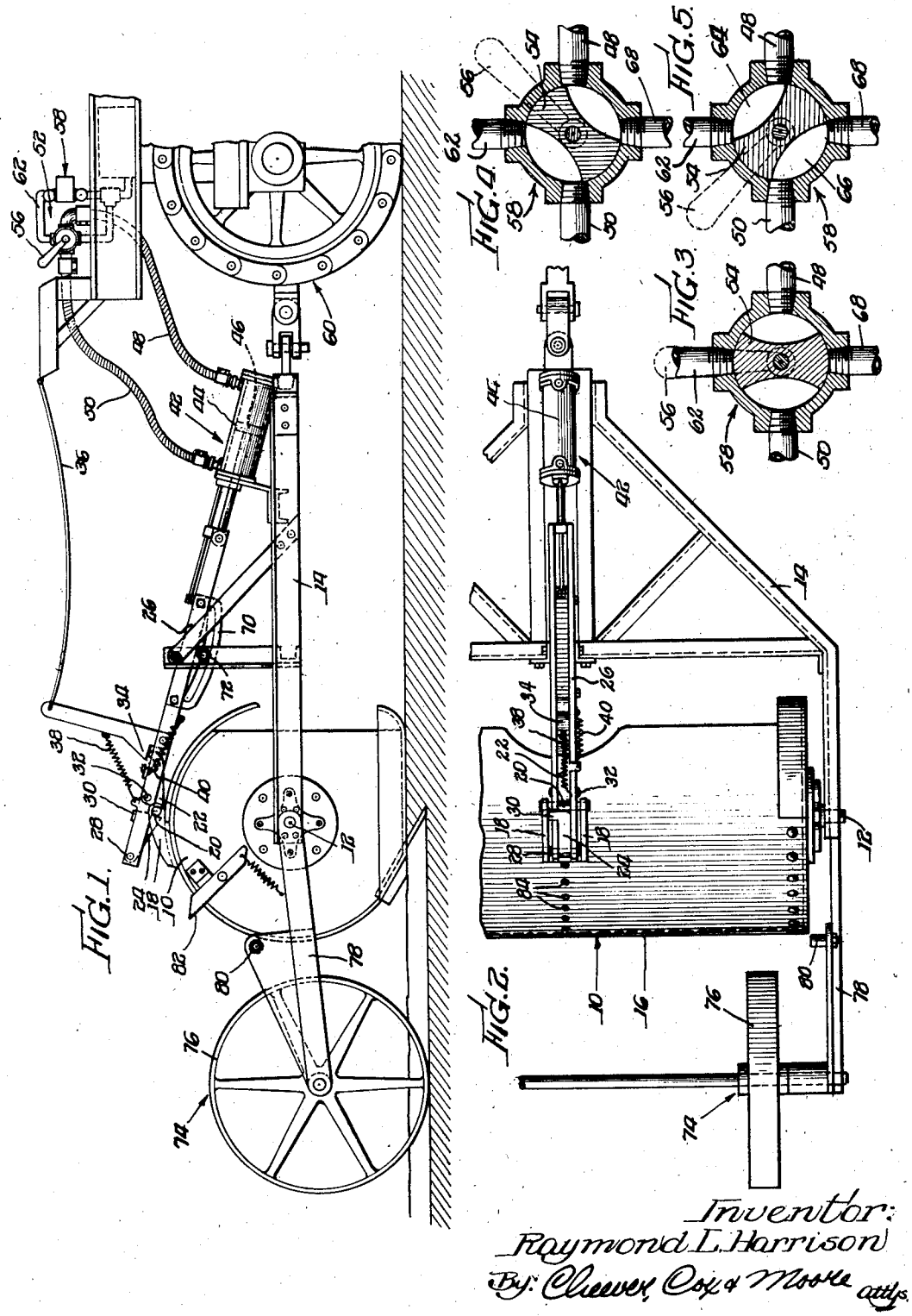
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EARTH MOVING DEVICE

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EARTH MOVING DEVICE

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My invention relates generally to earth moving devices or scrapers, and particularly to improvements in hydraulically controlled scrapers.

The present invention is particularly concerned with scrapers commonly referred to as "rotary" or "roll-over" type scrapers, namely, devices in which the scraper bowl is adapted to revolve completely about its axis. It has been the practice in certain instances to effect the dumping of these roll-over type scraper bowls by merely unlatching the shiftable actuator bar so as to permit the rolling of the scraper bowl across the surface of the soil in response to the pulling force exerted by the tractor. As the bowl rolls forwardly, its load is automatically dumped, and upon subsequently reaching a cutting position, said bowl becomes automatically latched in this position. It is desirable in certain instances to positively control not only the rearward tilting of the bowl, but also the forward tilting thereof, or, in other words, to positively control the dumping of the bowl. Mechanical devices with which I am familiar and which have been employed heretofore to shift scrapers, shovels, and other earth moving devices, are extremely slow in operation, due to the fact that a large amount of power is required to shift a loaded scraper, and hence it has been impractical to provide mechanical devices to effect a quick or sudden shifting of the bowl. I have found that by employing a hydraulic mechanism for shifting the scraper bowl, said bowl may be instantly shifted from carrying position to another forward position by the mere manipulation of a control handle conveniently positioned adjacent the operator.

It is one of the primary objects of my present invention, therefore, to provide improved hydraulic control means for positively shifting the scraper bowl forwardly with a minimum amount of effort and skill on the part of the operator, and to this end I propose to provide a latch mechanism for engaging a projection on the scraper bowl, which latch mechanism may be positively shifted either forwardly or rearwardly through the action of a hydraulic mechanism, such as a piston shiftable within a cylinder.

More specifically, my invention contemplates the provision of a scraper mechanism as above set forth, in which the hydraulic actuator is coupled with a reciprocable actuating mechanism for engaging an abutment or stop on the scraper bowl, said hydraulic actuator being positively shiftable in either direction to rotate the bowl actuating mechanism in either direction.

Still more specifically, my invention contemplates the provision of a hydraulic actuator, as above set forth, which may be controlled by a manually operable valve mechanism conveniently positioned adjacent the operator's seat on the tractor.

These and numerous other objects and advantages will be more apparent from the following detailed description when considered in connection with the accompanying drawing, wherein—

Figure 1 is a side elevational view of a mechanism which represents one embodiment of my invention;

Figure 2 is a fragmentary plan view of the structure disclosed in Figure 1; and

Figures 3 to 5 inclusive are sectional views of the control valve disclosing the various positions occupied thereby, Figure 3 disclosing the closed position of the valve; Figure 4, the position occupied by the valve to effect the forward shifting of the actuator piston, and Figure 5, the position occupied by the valve for shifting said actuator piston rearwardly.

Referring now to the drawing more in detail, wherein like numerals have been employed to designate similar parts throughout the various figures, it will be seen that for the purpose of illustrating one practical embodiment of my invention, I have shown the same in combination with a scraper device, which is similar in many respects to the scraper mechanism disclosed in my co-pending application, Serial No. 529,378, filed April 11, 1931. I have disclosed an earth carrying means or scraper bowl 10, which is rotatable upon trunnions 12 supported by a draft frame 14. This scraper bowl 10 includes a casing 16, which is substantially semi-circular in cross section, and mounted upon the periphery of this casing intermediate the ends thereof is a bracket 18. This bracket 18 is adjustably positioned along the periphery of the casing 16, and carries a pin or stop member 20 which is adapted to be positioned between a pair of dogs 22 and 24 supported at the free end of a reciprocable actuating bar 26. The dog 24 is pivoted at 28 so as to permit the free upward tilting thereof when the stop or abutment 20 is moved thereagainst as said stop shifts in a clockwise direction as viewed in Figure 1. The dog 24 is prevented from shifting downwardly by means of a lug 30, and the weight of the dog serves to normally urge it toward the position disclosed in Figure 1. The dog 22 is pivoted at 32 upon the bar 26 and is adapted at its free extremity to engage a latch lever 34, which is also pivotally supported by the bar 26. When the lever 34 occupies the position shown in Figure 1 it prevents the counter-clockwise rotation of the dog 22, and thereby presents a positive abutment for the stop 20. When the lever 34 is tripped by exerting a pull on a cord 36, the dog 22 is released to permit forward movement of the pin 20. A spring 38 serves to normally urge the

latch lever 34 to the left, Figure 1, and a spring 40 operates to retain the pivoted dog 22 in its normal position shown in Figure 1.

A hydraulic actuator 42 which includes a cylinder 44 and a piston 46, is connected with the latch bar 26. The flow of fluid, such as oil through flexible conduits 48 and 50, is controlled by a valve 52. This valve 52 includes a rotary valve member 54, Figures 3 to 5 inclusive, which is shifted by means of a manually manipulated handle 56. When the valve member 54 occupies the position shown in Figure 3, oil from a suitable pump 58 driven by suitable mechanism (not shown) provided on a tractor designated generally by the numeral 60, is prevented from flowing through a discharge pipe 62, Figure 1. When the valve 54 is shifted to the left, as indicated in Figures 1 and 5, a valve port 64 connects the pipe 62 with the flexible conduit 48, and a valve port 66 connects the flexible conduit 50 with a return pipe line 68. Thus fluid under pressure is directed against the right end of the piston 46, thereby urging said piston rearwardly or to the left, Figure 1. When the valve member 54 occupies the position shown in Figure 4, a reversal of fluid flow takes places, which causes the piston 46 to be shifted forwardly or to the right, Figure 1.

With the pin or stop 20 positioned between the dogs 22 and 24, as shown in Figure 1, it will be apparent that the hydraulic actuator 44 is adapted to effect rotation of the scraper bowl 10 in either direction. In other words, it requires only the manual manipulation of the valve handle 56 to positively control the shifting of the scraper bowl in either direction. In the disclosed embodiment I have shown a cam 70 which cooperates with a pin 72 to cause the latch dogs 22 and 24 to follow an arcuate path, which corresponds to the periphery of the bowl 10 during the reciprocation of the bar 26. I have also shown a trailer mechanism 74, which includes a pair of trailer wheels 76 pivotally connected with the trunnions 12 through the agency of frame members or links 78. Pins or abutments 80 supported by the frames or links 78 are adapted to be engaged by a pivoted member 82 when the bowl is shifted rearwardly so as to effect the upward shifting of the bowl. Obviously the invention is not limited to the specific trailer construction shown in the drawing, but contemplates the use of a hydraulic mechanism, which is positively shiftable in either direction in combination with various types of rotary scraper devices.

From the foregoing it will be apparent that my invention contemplates a very simple hydraulic control for a scraper or bowl which is particularly adaptable for use in connection with scraper bowls of the roll-over-type. By employing a hydaulic mechanism for shifting the bowl, a very positive and quick movement is obtained. By effecting the sudden shifting of the bowl in either direction a great amount of time is saved and the bowl may be dumped or shifted to any other position when a predetermined or desired location has been reached. That is to say, in instances where it is desired to dump a load of soil in a predetermined position, this can be accomplished by merely shifting the control handle 56 to the right, Figure 1, so as to apply fluid pressure to the left side of the piston 46, thereby effecting the forward or clockwise rotation of the bowl. The positive control of the bowl in its forward rotation may not be required for dumping purposes, but may be required in shifting the bowl from carrying to cutting position, and this may be accomplished by merely positioning the bracket 18, which supports the stop or pin 20 at the proper position along the peripheral surface of the bowl casing 16. It will be noted that I have provided a plurality of apertures 84 within the casing 16 so as to enable the convenient shifting of the bracket 18 to any desired position.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a rotary earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, a hydraulic actuator including a cylinder and a piston which is positively shiftable in either direction therein, a latch mechanism including a pair of oppositely disposed dogs, an abutment movable with the tiltable earth receiving means adapted to be positioned between said dogs, means connecting said latch mechanism with said hydraulic actuator, means for controlling the operative effectiveness of at least one of said dogs, and a valve mechanism for controlling the delivery of fluid under pressure to either side of the piston in said actuator, whereby to positively control the tilting of the earth carrying means in either direction.

2. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a rotary earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, a hydraulic actuator including a cylinder and piston construction, said actuator being positively shiftable in either direction, a latch mechanism including a pair of oppositely disposed dogs, an abutment movable with the tiltable earth receiving means adapted to be positioned between said dogs, means connecting said latch mechanism with said hydraulic actuator, means for controlling the operative effectiveness of at least one of said dogs, and a valve mechanism for controlling the delivery of fluid under pressure to either side of the piston in said actuator, whereby to positively control the tilting of the earth carrying means in either direction.

3. In an earth moving device of the class described adapted to be drawn across the surface of the ground, a rotary earth carrying means having a material receiving edge, a frame pivotally supporting said earth carrying means, a hydraulic actuator including a cylinder and piston construction, said actuator being positively shiftable in either direction, a latch mechanism including a pair of oppositely disposed dogs, an abutment movable with the tiltable earth receiving means adapted to be positioned between said dogs, means connecting said latch mechanism with said hydraulic actuator, means for controlling the operative effectiveness of at least one of said dogs, a valve mechanism for controlling the delivery of fluid under pressure to either side of the piston in said actuator, whereby to positively control the tilting of the earth carrying means in either direction, and a trailer device cooperatively associated with the rotary earth carrying means to effect the vertical disposition thereof in response to the movement of said hydraulic actuator.

RAYMOND L. HARRISON.