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HYDRAULIC SCOOP

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2 Sheets-Sheet 1

Fig. 1.

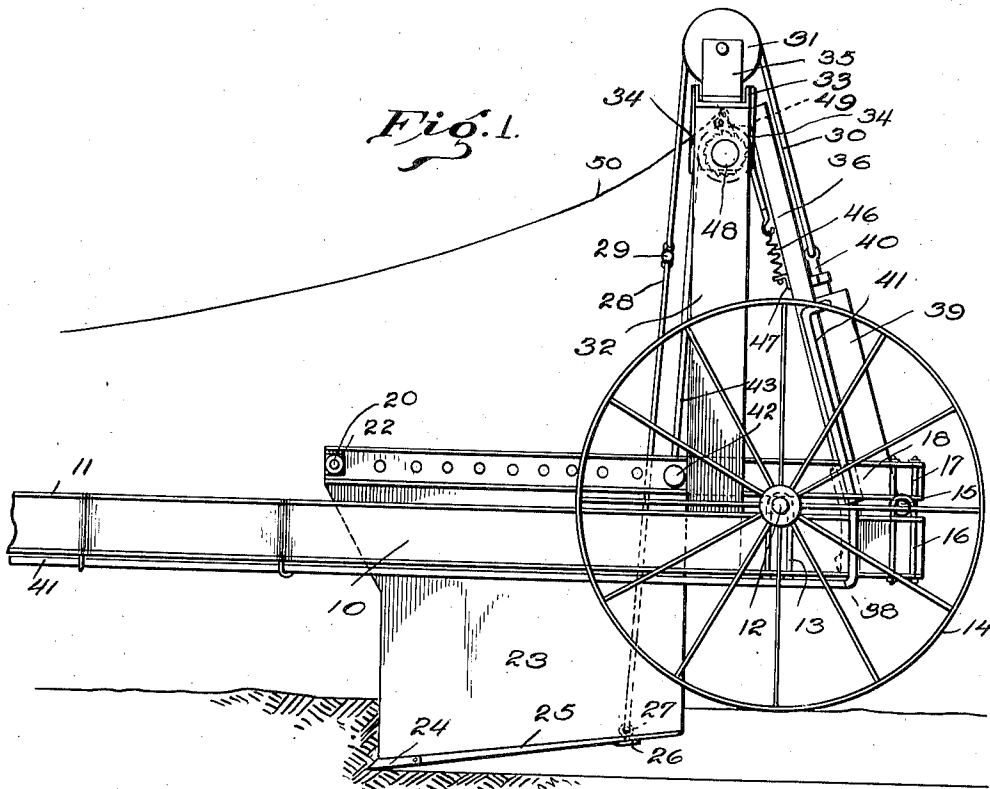
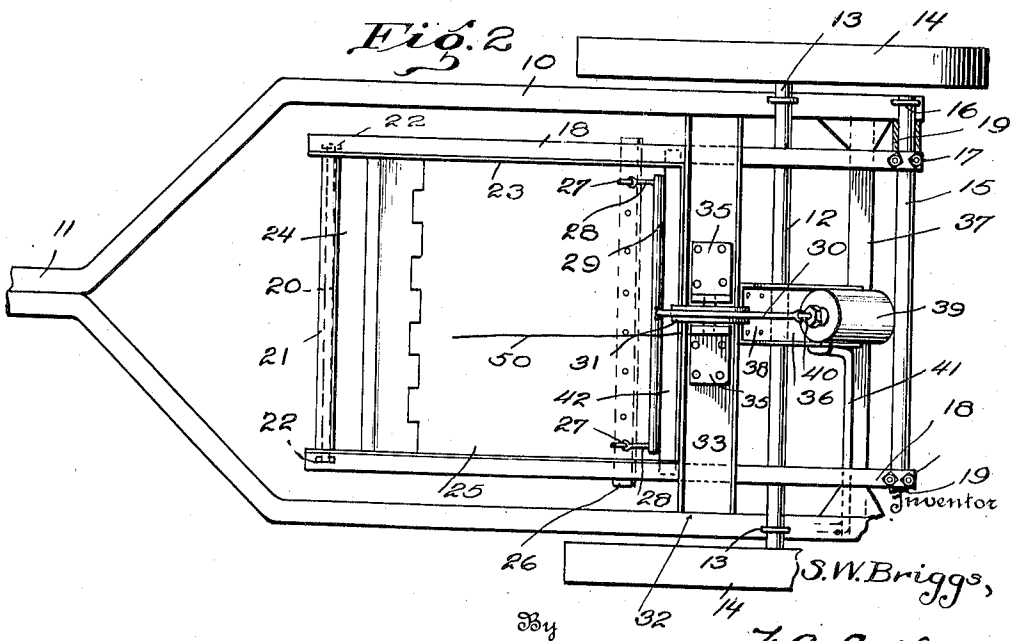


Fig. 2.



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HYDRAULIC SCOOP.

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The present invention relates to scoops, and more particularly to that type adapted for use with a tractor, or the like.

An object of the present invention is to provide a scoop, which has a scraper pan or shovel, which may be controlled by hydraulic means operatively connected to the tractor, so that the operator may raise lower and control the movements of the scraper without leaving his position, or which may be controlled or actuated from any convenient point.

Another object of the invention is to provide a tractor scoop wherein the scraper has a frame so mounted in the scoop frame that the scraper is limited in its downward movement beyond a predetermined extent by, and the force exerted against the scraper during operation is transferred directly through, the supporting axle or shaft of the scoop frame, thus relieving the scoop frame from strains or stresses incident to accumulating leverages between the point of support of the scoop frame and the stop for the scraper.

Another object of the invention is to provide an improved and efficient supporting means for the scraper pan when elevated, and which may be easily and quickly tripped, and which embodies a strong, durable and economical structure capable of being compactly mounted upon the device.

The invention further aims at the provision of a hoisting or elevating structure for the scraper pan which may be utilized also for the operation and control of the hinged bottom or gate of the pan, so that the hoisting device may be operated to perform both the function of closing the bottom and of hoisting the scraper pan.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side elevation of a tractor scoop constructed according to the present invention and showing the scraper pan in lowered position and engaged beneath the surface of the ground.

Figure 2 is a top plan view of the same.

Figure 3 is a front elevation.

Figure 4 is a fragmentary view of the

scoop and scraper frame, showing a modified form of latch or support for holding the scraper frame when elevated, and

Figure 5 is a detail view of the crank lever or latch employed in the structure of Figure 4.

Referring to the drawings, 10 designates a scoop frame of any approved construction, but which in the main is horizontally rectangular with its forward portion converging into a tongue 11 which may be attached in any suitable manner to a tractor or the like. The scoop frame 10 is provided near its end with a transverse axle or shaft 12 secured across the upper edges of the sides of the frame 10 by U-bolts 13, or the like and which carry ground wheels 14 outwardly of the frame 10 for supporting the same.

A pivot rod 15 is secured by U-bolts 16 or the like across the rear end portions of the side bars of the frame 10 and receive intermediately thereabout a pair of U-bolts 17 carried upon the rear ends of a pair of side bars 18 forming the major portion of the scraper frame, which is arranged in spaced relation within the scoop frame, and which extends forwardly therein. Spacers 19, in the form of tubes or sleeves, are preferably placed about the pivot rod 15 between each pair of U-bolts 16 and 17 to center the scraper frame within the scoop frame.

The side bars 18 of the scraper frame preferably extend across the upper side of the pivot rod 15 and the lower edges of the side bars 18, when the latter are lowered, are adapted to rest across the axle 12 to limit the downward swinging movement of the scraper frame and to transfer directly to the axle 12 and wheels 14 the weight and strains which are imposed upon the scraper frame.

The forward ends of the side bars 18 are supported upon a cross rod or bolt 20, which passes through a spacing tube 21 fitted between the inner opposite faces of the side bars 18, nuts 22 or the like being employed upon the opposite ends of the rod 20 and seated in the channels of the side bars 18.

The scraper frame is provided with a depending scraper pan or bucket 23 of sheet metal or the like, which is riveted or otherwise suitably secured at its lateral portions to the inner faces of the side bars 18. The scraper pan 23 is of gradually increasing depth from its rear to its forward end and

is provided across its bottom at its forward end with a cutting blade 24 the bevel edge of which preferably projects beyond the forward edge of the scraper pan 23 and is adapted to cut into the earth. A dump bottom or gate 25 is hinged to the rear edge of the cutting blade 24 and extends rearwardly from the blade to close the bottom of the scoop pan 23. The free end of the bottom 25 is provided, across its under side with a brace or strap 26, riveted or otherwise suitably secured to the bottom 25 and which projects slightly beyond the opposite lateral edges thereof to limit the upward swinging of the bottom. Spaced inwardly from the opposite sides of the scraper pan 23, the bottom 25 and the cross brace 26 are provided with eye bolts 27 to which cables 28, or other suitable connectors, are secured, the cables 28 being carried upwardly through the pan 23 to a cross bar 29, and the latter is connected at a suitable intermediate point to a cable 30, which extends upwardly and over a pulley 31 mounted on an upright structure 32 carried by the scoop frame 10.

The upright structure 32 may comprise a pair of channel beams riveted or otherwise suitably secured to the inner faces of the side bars of the frame 10, and which are connected together at their upper ends by a cross piece 33 secured to the channel beams by gusset plates 34 or the like to reinforce the upstanding structure. The cross piece 33 carries a pair of angle irons 35 spaced apart to provide a bracket in which the pulley 31 may be mounted.

In order to brace the upright structure 32 and provide a rear portion for the same, a channel bar 36 is secured to the rear cross piece 37 of the main frame 10, at an intermediate portion by an angle brace 38, which is riveted or otherwise suitably secured to the frame bar 37 and the channel beam 36. The channel beam 36 is inclined upwardly and forwardly from the frame bar 37 and is secured to the top cross piece or member 33 preferably in line with the pulley 31 and its bracket. The hydraulic cylinder 39 is mounted in the channel beam 36 preferably near its lower end and extends lengthwise therein and is provided with a piston rod 40 connected to the cable 30 for operating the same. A combined supply and relief pipe 41 is connected to the upper end of the cylinder 39 and led downwardly and in any suitable manner, such as along one side of the inclined beam 36 to the main frame 10, and thence along one side of the same to the tongue 11 where the pipe 41 may be connected to a suitable source of fluid control.

For the purpose of supporting the scraper frame in position when it is raised from the axle 12 on its pivot 15, the side bars 18

may be provided with a cross rod 42 and a cable 43 may be connected thereto and led upwardly over the larger diameter of a differential pulley 44 mounted in the upright structure 32 beneath the cross piece 33, or in any other suitable position. The smaller diameter of the differential pulley 44 carries a short cable 45, the free end of which is connected to a spring 46 anchored at 47 to the under side of the inclined beam 36 for normally urging the differential pulley to turn in one direction. The differential pulley has at one side a ratchet wheel 48 cooperating with a dog or latch 49 pivoted on the upright structure 32 for locking the differential pulley in position when turned under the influence of the spring 46. The latch 49 may be provided with a trip cord 50, which extends forwardly or to any other suitable position of easy access for releasing the differential pulley when desired.

In the operation of this improved tractor scoop, the same may be drawn forwardly by any suitable means, and when it is desired to take up a load of dirt or the like, the cylinder 39 is relieved of pressure, so that the piston rod 40 may rise and permit the cable 30 to move forwardly over the pulley 31. This operation permits the scraper pan 23 to move downwardly to the desired extent, the limit of its downward movement being determined by the axle 12. The scraper pan 23 may, of course, be held at any desired height in the ground by controlling the admission and outlet of the fluid to the cylinder 39. The scraper frame of course can not be lowered until the latch 49 is tripped to release the differential pulley, the spring 46 being sufficient for tensioning the pulley 43 only so that the weight of the scraper frame is sufficient to turn the differential pulley and expand the spring 46 until the hydraulic cylinder has been brought to a stop. As soon as the desired position of the scraper frame is obtained, the dog 49 may be released, so as to operate under tension of its spring against the ratchet wheel 48 to lock the differential pulley against further movement, so that the scraper frame is held by the differential pulley from moving further downward.

When a load has been taken up by the scraper pan 23, the hydraulic cylinder 39 may be operated to lift the cross bar 29 and its cable 28 and not only hold the bottom 25 in closed position against the scraper pan 23, but may also be utilized for lifting the scraper pan and its frame so as to clear the ground. During this operation the spring 47 turns the differential pulley to take up the slack in the cable 43 and to so adjust the differential pulley that it may be locked from retrograde movement should the hydraulic cylinder 39 be released or stopped.

The scraper may thus be conveyed to any desired point where it is to be dumped. In dumping the scraper, the pressure in the cylinder 39 is relieved which relaxes the cable 30, so that the bottom 25, under pressure of the load within the scraper pan 23, is permitted to swing downwardly into open position for discharging the load. The hydraulic cylinder 30 may be relieved to the desired extent in order to open the bottom 25 to a more or less extent so as to spread the contents of the scraper pan over a relatively large surface area to completely dump the same at once.

In Figures 4 and 5 there is disclosed another form of latch or supporting means for the scraper frame which may be used independently of or together with the differential pulley arrangement shown in the preferred form.

In Figure 4 the scraper frame 51 is provided with a crank bar or shaft 52, which is secured across the upper edges of the frame 51 and has its crank portions at its ends and provided with supporting arms which extend downwardly with their out-turned ends 53 in position to engage the upper edges of the main frame 10. A spring 54 is mounted on the crank bar 52 and normally urges the free crank ends thereof to swing rearwardly into engagement with the forward edges of the upright structure 32. The intermediate portion of the crank bar 52 is secured by straps 55 or the like in position on the frame 51 slightly in advance of the upright structure 32, so that the free ends 53 of the bar when swung backwardly will be beyond the vertical plane of the straps 55 and beyond dead center, so as to lock the scraper frame 51 in raised position. The crank ends of the bar 52 are provided with eyes 56 or the like to which may be attached a cord 57 extending forwardly to any suitable point for tripping the bar 52 to release the scraper frame 51.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. A tractor scoop comprising a main frame having a supporting axle thereon, a scraper frame, a non-shiftable hinged con-

nection between the main and scraper frames located rearwardly of and at a point not lower than the normal horizontal plane of the axle to take up longitudinal loading thrust imposed on the scraper frame, a scraper pan carried on the scraper frame, and hydraulic means independent of said hinged connection between the main frame and the scraper frame at a point on the latter forwardly of the axle for raising and lowering the scraper frame.

2. A tractor scoop comprising a main frame having a supporting axle thereon and a super-structure rising above the axle, a non-shiftable scraper frame hinged to said main frame and extending forwardly above the axle, a hydraulic cylinder mounted on the main frame, and a connection between the cylinder and the scraper frame at a point of the latter forwardly of the axle and supported on the super-structure to raise and lower the scraper frame at a rate of speed substantially equal to that of the piston of the cylinder.

3. A tractor scoop comprising a main frame, a supporting axle mounted on the main frame, a scraper frame hingedly mounted in the main frame and extending forwardly over said axle in position to engage the same and limit the downward swinging movement of the scraper frame, a scraper pan carried by the scraper frame, and hydraulic means between said frames for raising and lowering the scraper frame.

4. A tractor scoop comprising a main frame, a second frame mounted on the main frame and having a scoop pan thereon, a bottom hinged to the scoop pan, a hydraulic cylinder carried by the main frame, and a connection between the hydraulic cylinder and the bottom for closing the latter and for elevating the scoop and the second frame.

5. A tractor scoop comprising a main frame, a second frame hinged to the main frame and having a scoop pan thereon, a hinged bottom carried at the forward part of the scoop pan for closing the latter, a hydraulic cylinder mounted on the main frame, a connection between the cylinder and the free end of the bottom for opening and closing the same to the desired extent, and independent means for supporting the second frame and the scoop at the desired elevation.

In testimony whereof I affix my signature.

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