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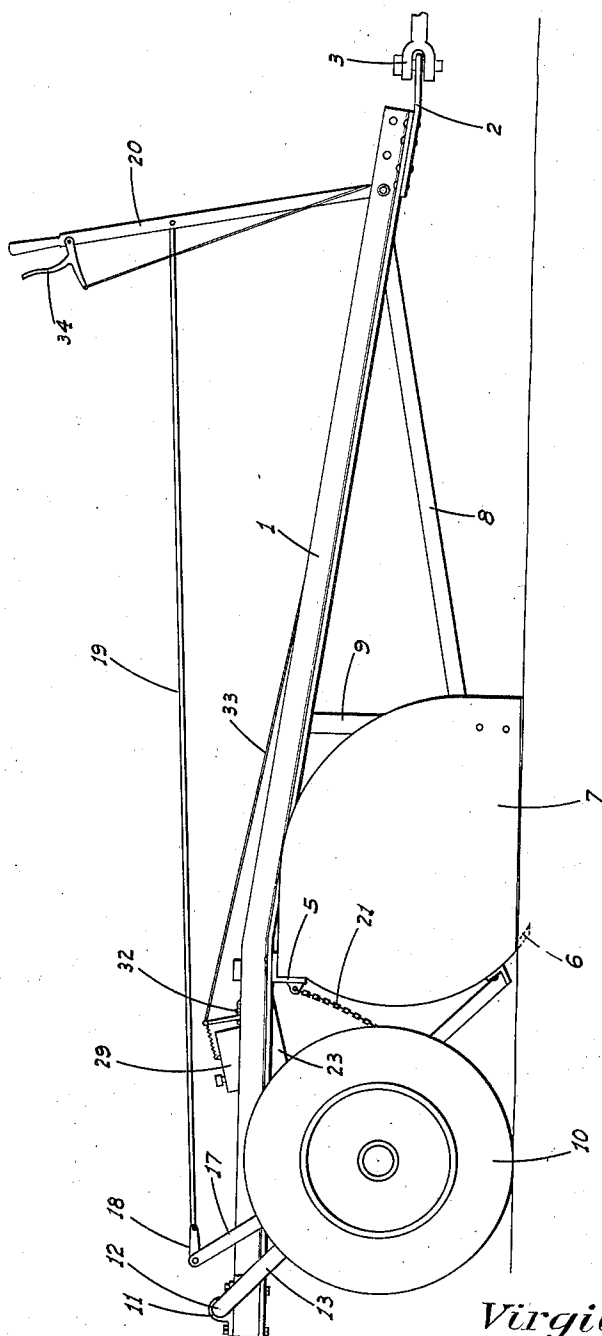
V. GIER

SCRAPER

2,147,696

Filed April 13, 1937

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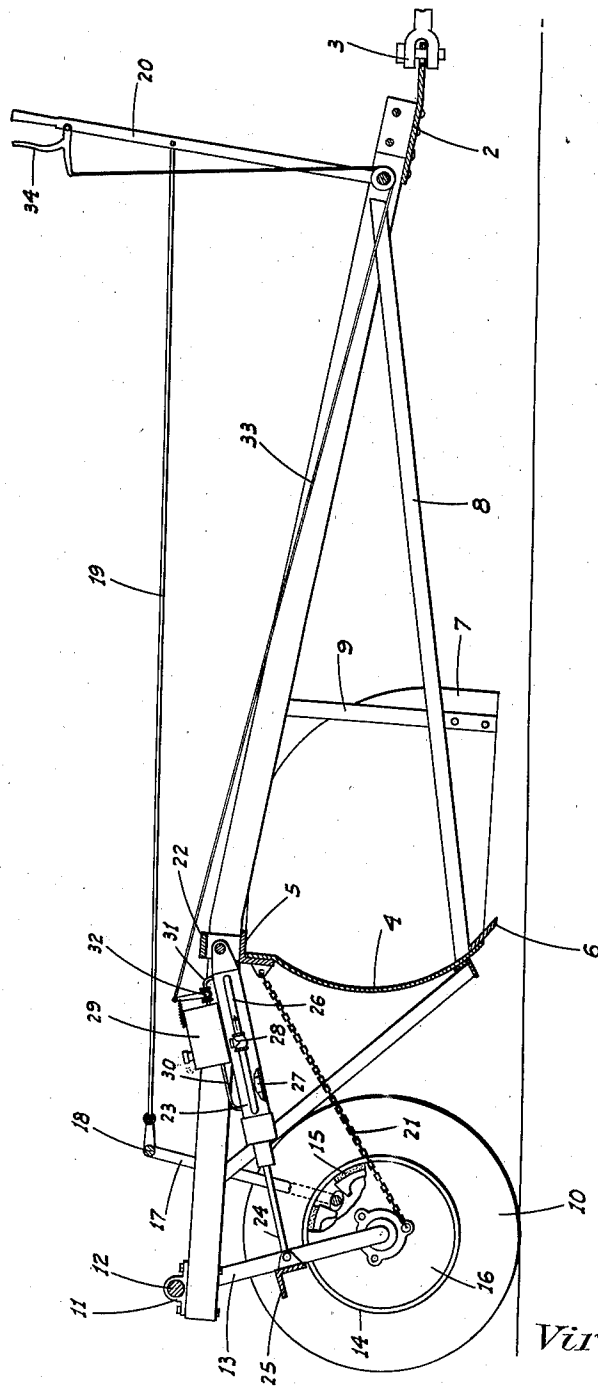
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Fig. 2



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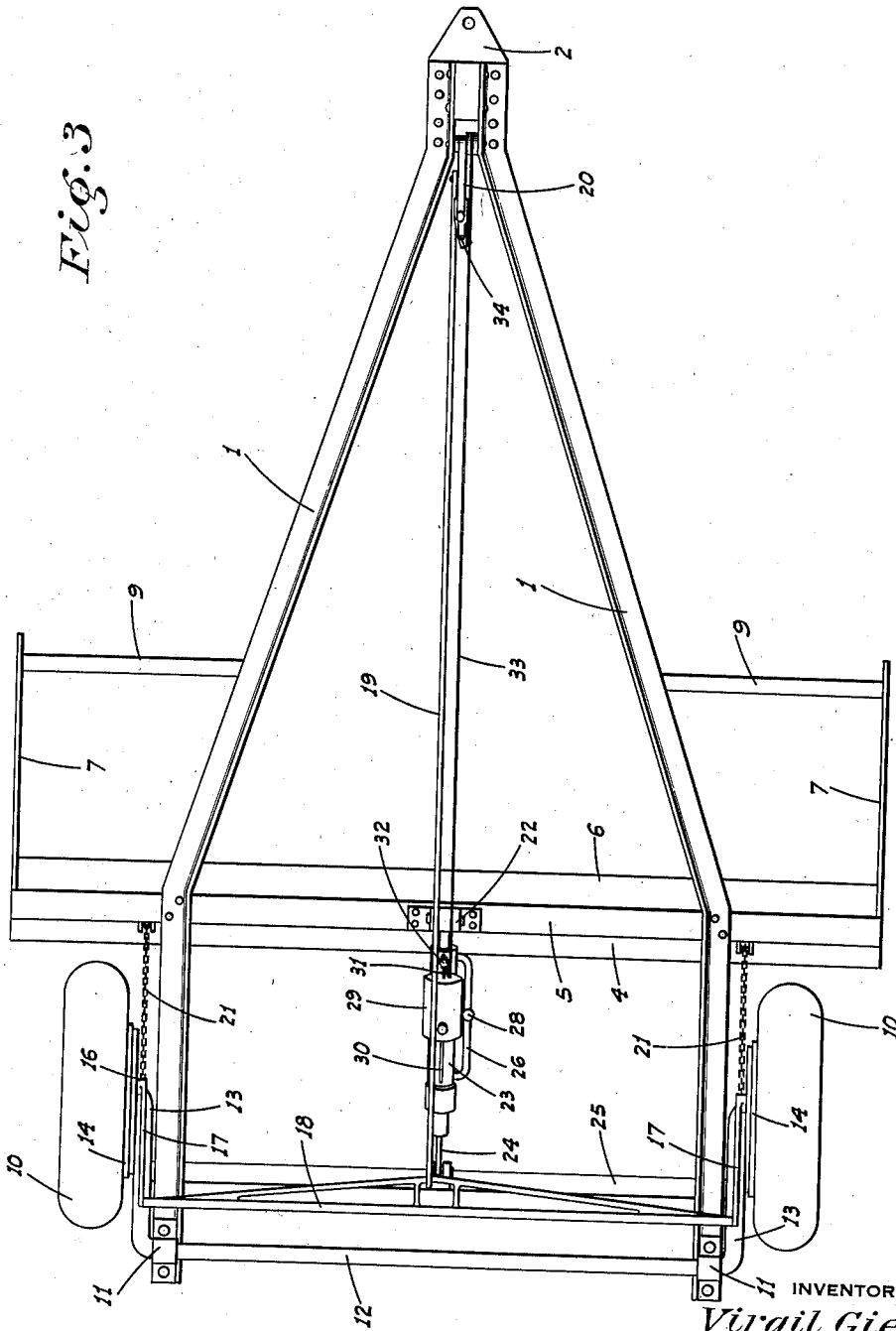
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SCRAPER

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Application April 13, 1937, Serial No. 136,572

5 Claims. (Cl. 37-169)

This invention relates to drag scrapers and is a continuation in part of my copending application No. 115,271 filed December 11, 1936. My principal object is to provide a simple mechanism, controlled at the option of the operator, for raising the bowl of the scraper for discharge or transportation purposes by power derived from the said movement of the scraper along the ground.

A further object is to provide a releasable means also under the control of the operator to prevent undesired lowering movement of the bowl when once it has been raised, and to enable such lowering to be smoothly and accurately controlled, so that the depth of cut may be adjusted to a nicety.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of my improved scraper in its operating position.

Figure 2 is a sectional elevation of the scraper with the bowl raised.

Figure 3 is a top plan view of the scraper with the bowl in its operating position.

Referring now more particularly to the characters of reference on the drawings, the frame of the scraper comprises a pair of side beams 1 the rear portions of which are parallel and normally horizontal and the forward portions of which converge toward each other and also slope toward the ground. At the forward converged ends of the beams they are rigidly connected together and supporting horizontal coupling plate 2 adapted for engagement with the coupling clevis or draw bar 3 of a tractor.

The bowl or ground working member of the scraper comprises a concavely curved back plate 4 depending from a top beam 5 which is secured to and under the beams 1 adjacent the forward termination of their rear parallel portion, a blade 6 across the bottom of the back plate and side wings 7 projecting forwardly from the back plate. The back plate is braced against rearward deflection adjacent the bottom by tension straps 8 secured to and diverging from the said end of the beams 1, and the wings are braced by vertical straps 9 depending from the adjacent portions of the beams 1.

The front end of the frame is of course supported at a fixed level by the tractor, while the rear end is supported on wheels 10 which are mounted in a particular manner as follows: journaled in bearings 11 mounted on the beams 1 at their rear end is a transverse shaft 12. Radial arms 13 are secured on and depend from the shaft outwardly of the beams 1 and support the wheels 10 on their lower ends and on the outside thereof. These arms are normally disposed at a considerable forward slope to the ground as shown in Fig. 1.

Brake drums 14 are fixed with the wheels on their inner sides and cooperate with internal brake bands 15 of conventional character which are anchored on end plates or discs 16 fixed with the arms 14.

The bands are expanded into frictional engagement with the drums by means of operating levers 17 mounted on said discs 16 and projecting upwardly a certain distance, being connected at their upper end by a rigid cross member 18. Centrally of its ends this member is engaged by a pull rod 19 which extends forwardly to a connection with a manual control lever 20 pivoted in connection with the beams 1 adjacent their forward end. This lever is positioned and is of such a height as to be convenient to the operator of the tractor to which the scraper is connected.

In operation when the brakes are released and the arms are disposed at said forward slant the blade 6 is then in an operative position in contact with the ground and the wheels are of course freely turnable. If however the brakes are applied by a pull on the lever 20, the wheels are locked to the arms 13 and their continued rotation causes said arms to be swung about the wheels as an axis. This of course causes the arms to move toward a vertical position raising the frames accordingly and also raising the bowl clear of the ground as shown in Fig. 2. The arms are prevented from moving to a vertical position by chains 21 or the like and the brakes must then of course be released to prevent the wheels from skidding.

To prevent such release of the brakes from causing the arms to again swing down and forwardly by reason of the weight of the structure thereon, if such downward movement is not desired, I provide the following holding mechanism: pivoted in a yoke 22 mounted on the cross beam 5 centrally of its length is a rearwardly extending hydraulic cylinder 23, the piston rod 24 of the cylinder being pivoted on a cross bar 25 connecting the arms 13 intermediate its ends. A conduit of somewhat great capacity connects the ends of

the cylinder and by-passes the piston 27, a check valve 28 opening toward the forward end of the cylinder being interposed in said conduit.

A reservoir 29 for hydraulic liquid is secured on top of the cylinder and is connected with the rear end of the same by a small conduit 30. Another small conduit 31 connects the reservoir with the forward end of the cylinder, said conduit 31 having a normally closed control valve 32 therein. This valve is connected by a pull member 33 with an operating handle 34 mounted on the lever 20. This handle is disposed adjacent the top of the lever in such a position as to be convenient to the hand grasping the same and yet the handle and its connection with the valve are not such as to necessitate the operation of the valve with the movement of the lever, and said valve will not be opened by movement of the lever alone.

In operation, as the arms 13 straighten up with the lifting of the frame and scraper, the piston rod advances from the cylinder, causing the liquid to be by-passed through the conduit 26 to the opposite end of the cylinder, the check valve and closed valve 32 preventing the return of the liquid. When the lifting of the structure is halted, the load is taken by the liquid in the head end of the cylinder, which liquid being unable to escape holds the scraper in a raised position.

When it is desired to lower the scraper (whose weight is tending of itself to cause such lowering movement) the valve 32 is opened by manipulation of the handle 34. This allows a certain amount of fluid to escape from the head end of the cylinder, permitting of a corresponding movement of the piston. On account of the small size of the valve and its conduit, the liquid may be let out in minute quantities if desired, giving an advantageous accurate control of the lowering movement of the scraper. Also such movement is always cushioned by the liquid and takes place without sudden shocks.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A scraper comprising a forwardly movable frame adapted at its forward end to be supported at a fixed level, a bowl mounted on the frame, wheels supporting the rear end of the frame, means between the wheels and frame to lift the latter at its rear end and adapted to function with the rotation of the wheels while the frame is moving forward, manual means to control the operation of said lifting means, the frame tending to drop of its own weight, a hydraulic unit to hold the frame from dropping when lifted and placed in holding relationship by the lifting movement of the frame, and manual means to control the subsequent holding action of the hydraulic means.

2. A scraper comprising a forwardly movable frame adapted at its forward end to be sup-

ported at a fixed level, a bowl mounted on the frame, wheels supporting the rear end of the frame, means between the wheels and frame to lift the latter at its rear end and adapted to function with the rotation of the wheels while the frame is moving forward, manual means to control the operation of said lifting means, the frame tending to drop of its own weight, a hydraulic unit to hold the frame from dropping when lifted, said hydraulic unit including a cylinder, a piston therein and liquid in the cylinder, means mounting the unit in connection with the frame and wheels to cause the piston to exert a compression against the fluid in one direction when the frame is lifted, and manually controlled means to by-pass the liquid from one side of the piston to the other.

3. A device as in claim 2, in which said last named means comprises a relatively small conduit, and a normally closed manually operated valve in said conduit.

4. A scraper comprising a forwardly movable frame adapted at its forward end to be supported at a fixed level, a bowl mounted on the frame, arms pivoted on the frame adjacent its rear end and projecting thence forwardly, wheels on the forward end of the arms, manually controlled means to lock the arms to the wheels while the latter are rotating, whereby to cause the arms to swing toward a vertical position to thus raise the frame, the latter tending to drop of its own weight, a hydraulic unit including a cylinder, a piston therein, a piston rod projecting from the cylinder and a liquid in the cylinder, means connecting the unit to the arms and frame ahead of the arms so as to cause the piston rod to be advanced from the cylinder with a frame lifting movement of the arms and the liquid in one end of the cylinder to be placed under compression by the piston when the action of the lifting means is discontinued, and manually controlled means to release the fluid from said end of the cylinder.

5. A scraper comprising a forwardly movable frame adapted at its forward end to be supported at a fixed level, a bowl mounted on the frame, arms pivoted on the frame adjacent its rear end and projecting thence forwardly, wheels on the forward end of the arms, manually controlled means to lock the arms to the wheels while the latter are rotating, whereby to cause the arms to swing toward a vertical position to thus raise the frame, the latter tending to drop of its own weight, a hydraulic unit including a cylinder, a piston therein, a piston rod projecting from the cylinder and a liquid in the cylinder, means connecting the unit to the arms and frame ahead of the arms so as to cause the piston rod to be advanced from the cylinder with a frame lifting movement of the arms and the liquid in one end of the cylinder to be placed under compression by the piston when the action of the lifting means is discontinued, means to automatically and freely by-pass the liquid around the piston with said advancing movement of the piston rod and only in the direction of said one end of the cylinder, a fluid passage unit connecting the cylinder at points beyond the limits of movement of the piston, and a manual normally closed valve in said conduit.

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