May 19, 1942. D. E. STURGES 2,283,470

HYDRAULICALLY SELF-OPERATED EARTH MOVING SCRAPER

Filed Aug. 29, 1940

Fig. 1

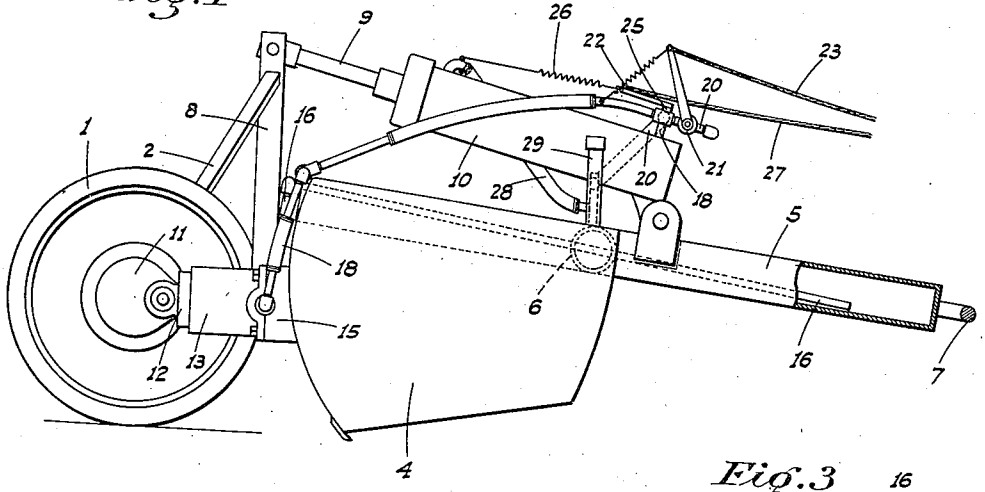


Fig. 3

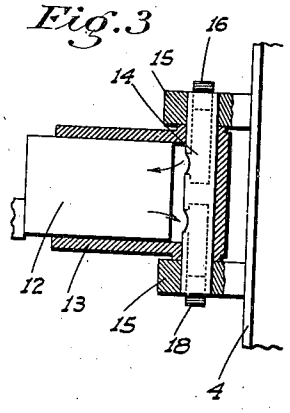


Fig. 2

INVENTOR.
Derelle E. Sturges

Webster & Webster
ATTORNEYS

Patented May 19, 1942 2,283,470

UNITED STATES PATENT OFFICE

2,283,470

HYDRAULICALLY SELF-OPERATED EARTH MOVING SCRAPER

Derelle Ellsworth Sturges, Sacramento, Calif.

Application August 29, 1940, Serial No. 354,687

2 Claims. (Cl. 37—169)

The invention relates to scrapers for moving earth; and the objects of the invention are, first, to provide a hydraulically self-operated, earth moving scraper, controlled from the tractor seat, lifting and dropping in certain desired positions, whether in forward or backward motion; and second, to provide a simple, self contained, hydraulically operated, dirt moving unit that may be operated from any tractor; and third, to provide a hydraulically operated scraper that needs no hydraulic power connection to the tractor; and, fourth, to provide a simple form of hydraulic power that may be used on various machines carried on wheels and drawn by attached tractive power.

One form of the invention is illustrated in the accompanying drawing, in which Figure 1 is a side view of the machine; Figure 2 a top view of the machine and Fig. 3 is a sectional plan of one of the hydraulic pump units.

Referring to the drawing, 1 denotes a pair of transversely spaced wheels turnably mounted on a forwardly projecting lever or frame assembly 2, which at its forward end is turnably supported by bearings 3 which are mounted on the back of the scraper bowl 4. The bowl is fixed in connection with and braced by a longitudinal central hollow beam 5 and a transverse hollow beam 6 at the front and top of the bowl, the beams communicating with each other and forming an oil reservoir. Beam 5 at its forward end is provided with an eye 7 adapted for supporting and draft connection with a tractor.

The frame assembly 2 includes closely spaced upstanding arms 8 substantially radial with bearings 3, which are engaged at their upper end by the piston rod 9 of a hydraulic cylinder 10. This cylinder extends lengthwise of and above beam 5, and at its forward end is pivotally mounted in connection therewith as shown. Since the beam 5 is maintained at a fixed level at its forward end, it will be seen that hydraulic pressure exerted in the cylinder at its rear end will force the piston rod rearwardly, causing frame assembly 2 to be swung about wheels 1 as an axis, and raising the bowl at its rear end; when such pressure is relieved, the bowl drops of its own weight.

The hydraulic pressure is created and controlled by the following means: Each wheel 1 has an eccentric or crank 11 thereon, connected to the piston 12 of a pump cylinder 13. A hollow pin 14 projects transversely through and is welded in the cylinder at the bottom thereof, and is journaled at its ends in bearings 15 secured on the bowl. These bearings are disposed so that the pin alines with bearings 3, thereby allowing the cylinder to oscillate and the piston to travel through its full stroke with rotation of the eccentric, and without binding irrespective of the tilted position of the bowl.

The pins of both cylinders have separated openings to allow of free flow of oil into and from the cylinders. At one end, the pins are connected by a suction line 16, which includes flexible portions near the cylinders and which leads to an open end within reservoir beam 5, the oil being prevented from return by check valves 17. On the outward movement of pistons 12, oil is therefore drawn into the cylinders. With the inward movement of the pistons, the oil is forced from the cylinders through the other end of pins 14 and into a pressure pipe line 18 common to both cylinders and leading to cylinder 10 near the bottom. Oil is held in the line and cylinder by suitably placed check valves 19 and 19a, the latter being near cylinder 10.

An exhaust line 20 taps line 18 just ahead of check valve 19a and leads to reservoir 6. A valve 21 is disposed in said exhaust line, being normally held open by a spring 22 and pulled closed by a rope 23. Line 18 is also connected, beyond check valve 19a, with the exhaust line by a bypass pipe 24 in which a valve 25 is interposed. Valve 25 is normally held closed by a spring 26 and opened by a pull rope 27.

Normally therefore, and when the scraper is traveling, the oil will circulate from the reservoir through cylinders 13 and back to the reservoir through pipe lines 9, 18 and 20. If the valve 21 is pulled closed, the oil is fed into cylinder 10 to advance the piston rod, from which cylinder the oil can escape only by opening valve 25 as will be evident, and which allows retraction of the piston. Oil leakage past the piston of cylinder 10 is returned to the reservoir by a bypass 28 connecting with exhaust line 20 near said reservoir. The reservoir is supplied with oil through a filler pipe 29.

Having thus described my invention, what I claim is:

1. In a scraper which includes a unit having a longitudinal beam adapted at its forward end to be maintained at a fixed level and a bowl rigid with the beam, rear supporting wheels, a lever assembly pivoted on and projecting forwardly from the wheels, a horizontal pivot connection between the unit at its rear end and the assembly at its forward end, and hydraulic means to swing the assembly about the wheels as an

axis to raise and lower said pivot connection; means to provide liquid pressure for the operation of the hydraulic means and including a liquid pressure pump, means operating the pump by rotation of one wheel and means mounting the pump on the unit in operative relation to the wheel irrespective of the level of said pivot connection and the corresponding position of the unit relative to the wheels.

2. In a scraper which includes a unit having a longitudinal beam adapted at its forward end to be maintained at a fixed level and a bowl rigid with the beam, rear supporting wheels, a lever assembly pivoted on and projecting forwardly from the wheels, a horizontal pivot connection between the unit at its rear end and the assembly at its forward end, and hydraulic means to swing the assembly about the wheels as an axis to raise and lower said pivot connection; means to provide liquid pressure for the operation of the hydraulic means and including a liquid pressure pump, said pump including a cylinder disposed radially of one wheel and a piston in the cylinder; a crank on the wheel, an element rigid with the piston and pivoted on the crank and a pivot mounting for the cylinder supported from the unit in axial alinement with said horizontal pivot connection.

DERELLE ELLSWORTH STURGES.