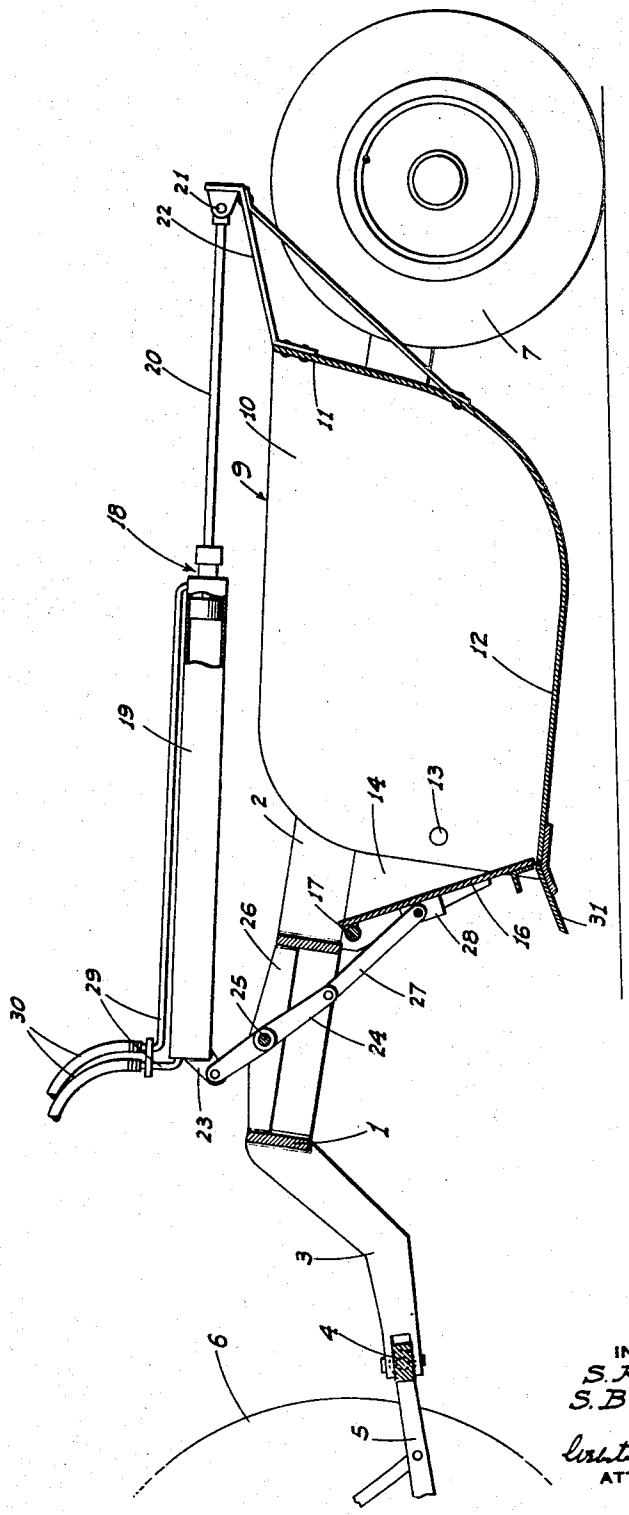
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Fig. 1



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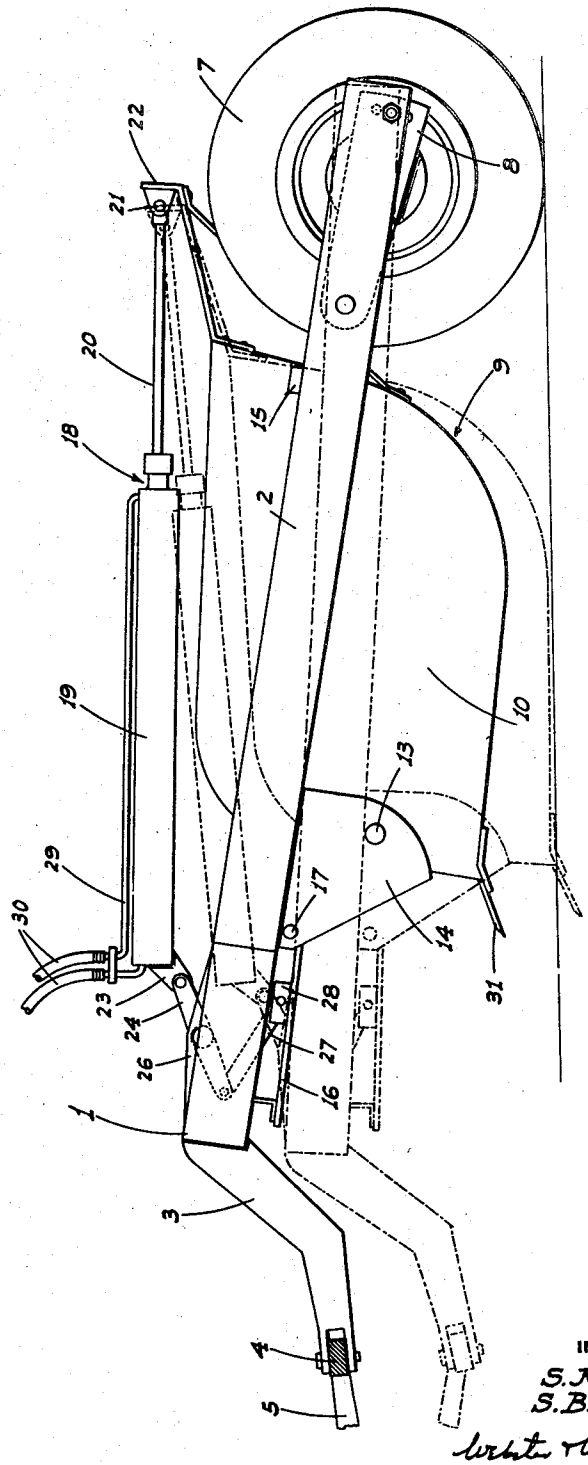
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Fig. 2



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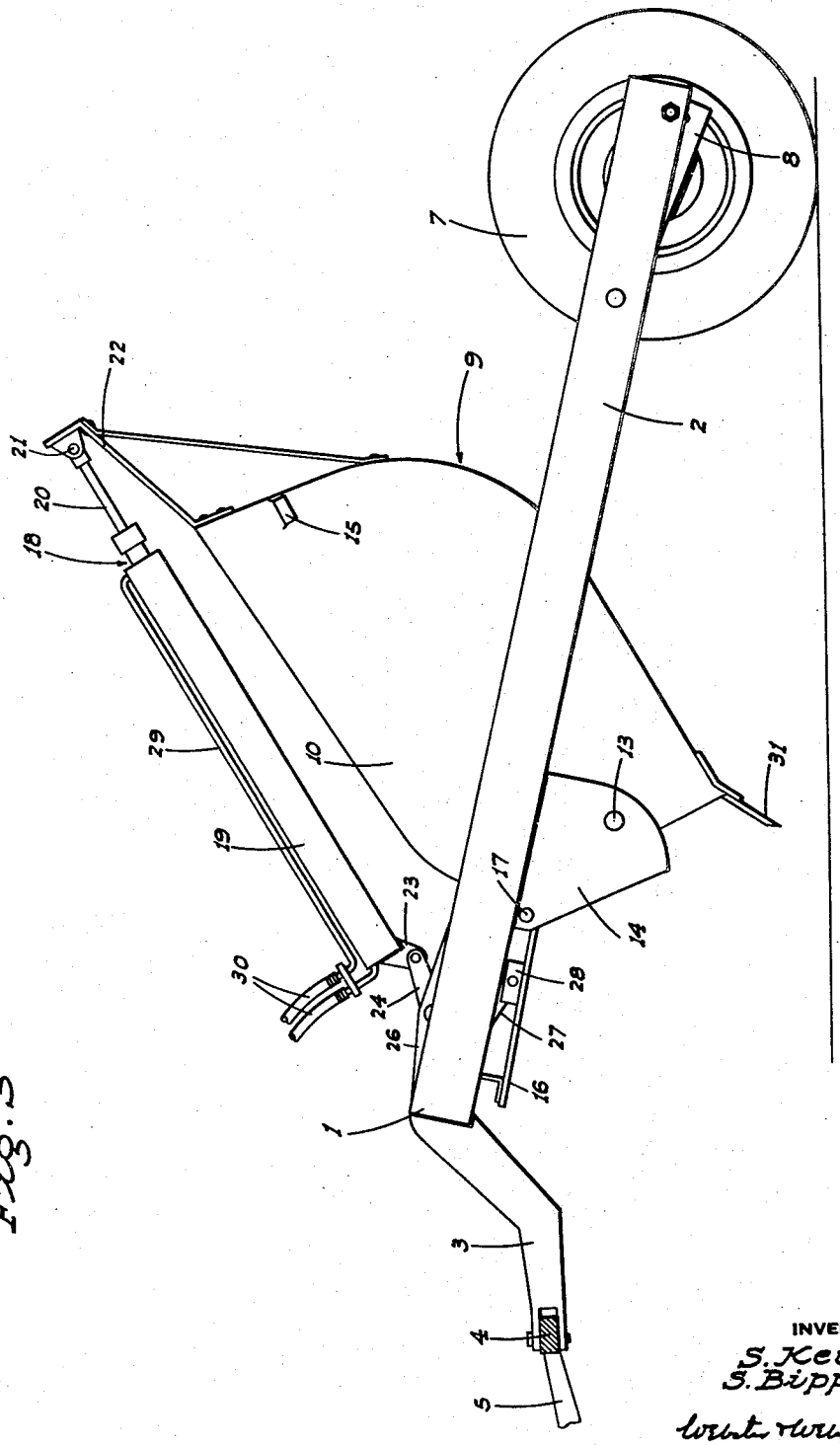


Fig. 3

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3 Claims. (Cl. 37—129)

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This invention relates in general to improvements in a carry-type, earth working scraper which includes a tiltable bowl open at its forward end and a front end-gate mounted for movement between a position closing said forward end of the bowl to a position clear thereof.

In particular the invention is directed to, and it is an object to provide, a novel actuating and control mechanism for the aforesaid bowl and front end-gate assembly; said mechanism being operative, through the medium of a single fluid pressure actuated power cylinder unit to cause operation of said bowl and gate in a predetermined working cycle.

Another object of this invention is to incorporate in a scraper which includes a bowl and a front end-gate in cooperative relation, a double acting fluid pressure actuated power cylinder unit disposed above the bowl and end-gate longitudinally of the scraper, means operatively connecting the cylinder unit at opposite ends with the bowl and end-gate respectively, and operator controlled means to cause extension or contraction of said cylinder unit selectively.

An additional object of the invention is to provide a structure, as in the preceding paragraph, in which the connecting means between the end-gate and corresponding end of the cylinder unit includes a unique lever and link assembly operative, upon actuation of the cylinder unit in one direction, to swing the end gate from a bowl closing position to a position clear of said bowl.

It is also an object to provide a novel arrangement for regulating the cutting depth of the digging blade on the bowl, and for raising or lowering the bowl between digging and carrying or dumping positions.

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 we 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 longitudinal sectional elevation of the implement.

Figure 2 is a side elevation of the implement; carrying position being shown in full lines and digging position being shown in broken lines.

Figure 3 is a side elevation of the implement in dumping position.

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Referring now more particularly to the characters of reference on the drawings, the numeral 1 indicates the main frame of the scraper, which main frame includes longitudinally extending rigid side beams 2. The side beams 2 converge at their forward end portions and connect with a draft tongue 3; said draft tongue being offset downwardly relative to the main frame 1 and connected at its forward end by a coupling 4 with a power actuated vertically movable draft unit 5 of a tractor, indicated generally, and in part, at 6. The coupling 4 is of a type which permits of steering movement of the tractor relative to the trailing scraper.

At the rear end the scraper is supported by a pair of transversely spaced wheels 7 which are disposed laterally inwardly of the rear end portions of the side beams 2. The spindles for wheels 7 are fixed in connection with pivotally mounted vertically adjustable supporting members 8 secured to said rear end portions of the side beams 2, whereby the main frame 1 at its rear end may be adjusted in height relative to ground level as working conditions may require.

Between the side beams 2 and ahead of the wheels 7 the scraper includes an earth carrying bowl indicated generally at 9 which is open on top and at its forward end; said bowl being of the tiltable type and including side plates 10, a back wall 11, and a bottom 12.

The bowl 9 is pivotally mounted adjacent its forward end and intermediate the top and bottom thereof, by means of pivot pins 13 which extend between side plates 10 and rigid ears 14, which are fixed in connection with and depend from the side beams 2.

Rearward tilting or lowering movement of the bowl is limited by means of stops 15 on the sides of the bowl at the back thereof, said stops being positioned to seat against the top of the side beams 2.

Ahead of but adjacent the forward end of the bowl 9, the scraper includes a transversely extending substantially full width front end-gate 16 which is pivotally mounted at its ends and adjacent its upper edge as at 17 to the ears 14 ahead of and above the bowl pivot pins 13. As so pivotally mounted, the front end-gate 16 is swingable from a downwardly extending slightly rearwardly inclined position in closing relation to the front end of the bowl 9 when the same is in carrying position, as shown in Fig. 1, to a forwardly and upwarldy disposed position clear of the bowl 9, as shown in Figs. 2 and 3. The front end-gate 16 when fully raised, as in Fig. 3, abuts

against the main frame 1 which positively limits upward swinging movement of said end-gate. The ears 14 are sufficiently large to form closures between the front sides of the bowl and the end-gate when the latter is closed, avoiding the need of side wings on said end-gate.

The actuating and control mechanism for the above described bowl and front end-gate assembly comprises the following structural arrangement;

A double acting, fluid pressure actuated power cylinder unit 18, is disposed above the bowl and end-gate and extends lengthwise of the scraper centrally thereof; such power cylinder unit being of substantial length as shown. The unit 18 is disposed with its cylinder 19 foremost, and with the piston rod 20 projecting rearwardly.

At its outer end the piston rod 20 is pivotally connected as at 21 with the rear end of the bowl 9 by means of an extension bracket 22 which projects upwardly and rearwardly so as to maintain the cylinder unit 18 in clearance relation above the bowl 9.

At its forward end the cylinder 19 is pivotally connected by means of an attachment ear 23 with the upper end of a generally upstanding lever 24, said lever 24 being pivoted intermediate its ends as at 25 on a longitudinally extending frame member 26. The lever 24 is swingable in a plane lengthwise of the scraper and is disposed some distance ahead of pivots 17 of the front end-gate. A rigid link 27 is pivotally connected between the lower end of lever 24 and an attachment plate 28 on the front of the end-gate intermediate its top and bottom edges and below the pivots 17.

The power cylinder unit 18 includes fluid pressure supply conduits 29 which are connected with flexible conduits 30 leading to a valve controlled source of fluid under pressure on the tractor, and which valve (not shown) is actuated by the tractor operator. The conduits 29 lead to opposite ends of the cylinder 19, and by manipulation of the valve which is preferably a 4-way type with a neutral position, the operator is able to fully extend or contract the power cylinder unit 18 or to lock said unit in any desired intermediate position.

In operation the above described scraper functions as follows:

To load the bowl, the main frame 1 is lowered by suitable controlled vertical movement of the power actuated draft unit 5 of the tractor; the digging position of the bowl being shown in broken lines in Fig. 2, and in which position the digging blade 31 of the said bowl is in ground engagement. With the bowl so disposed the operator causes actuation of the power cylinder unit 18 to partially contract the same, and as the resistance of the bowl 9 to tilting is greater than the resistance to upward swinging movement of front end-gate 16, the latter swings upwardly to open position in abutting engagement against the main frame.

Thereafter, with advance of the scraper, the blade 31 digs earth which loads into the bowl.

When a load is obtained, the draft unit 5 is raised sufficiently to cause the frame 1 and bowl 9 to elevate to carrying position as shown in Fig. 1, and in full lines in Fig. 2. At this time, or just prior to elevation of the bowl to carrying position, the power cylinder unit is fully extended which returns the front end-gate 16 to bowl closing position and prevents spilling of the load from the bowl during the carrying portion of the cycle.

To dump the load, the operator sets the draft unit 5 at the desired elevation and then actuates the power cylinder unit 18 so as to cause full contraction thereof, as shown in Fig. 3. When this occurs, the front end-gate 16 first swings upwardly to abutment with the main frame and thereafter the bowl is tilted upwardly and forwardly about its pivots 13, causing the load to be discharged by gravity out of the bowl and onto the ground. The blade 31 spreads the discharging dirt to a depth controlled by the draft unit 5.

Return of the bowl and front end-gate to the position occupied in carrying or digging positions is accomplished by reversing the above described cycle of movements of the power cylinder unit 18.

From the foregoing description it will be readily seen that we 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 our invention, what we claim as new and useful and desire to secure by Letters Patent is:

1. A scraper comprising a rigid frame supported above the ground for movement therealong, a bowl pivotally suspended from the frame for forward tilting movement between lowered carrying position and raised dumping position, the bowl being open at the front, a front end-gate pivotally suspended from the frame for forward and upward swinging movement from a lowered position closing the front end of the bowl to a raised position clear of the bowl, means to positively limit said upward swinging movement of the front end-gate, a double acting power cylinder disposed above the bowl and end-gate lengthwise of the scraper, means operatively connecting the power cylinder at its rear end to the bowl rearwardly of the axis of the latter, a lever pivoted intermediate its ends on the frame ahead of the end-gate, said lever being swingable lengthwise of the scraper, means operatively connecting the power cylinder at its forward end to the upper end of said lever, and a link pivotally connected between the lower end of the lever and said end-gate below the axis of the latter; the bowl having greater resistance to upward and forward tilting than the resistance of the end-gate to forward and upward swinging movement.

2. A scraper as in claim 1 in which the power cylinder is fully extended when the bowl and end-gate are in lowered, cooperative positions.

3. A scraper as in claim 2 in which the power cylinder is extended when the bowl and end-gate are lowered; the link then extending at a downward and rearward incline from the lever.

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