

July 17, 1934.

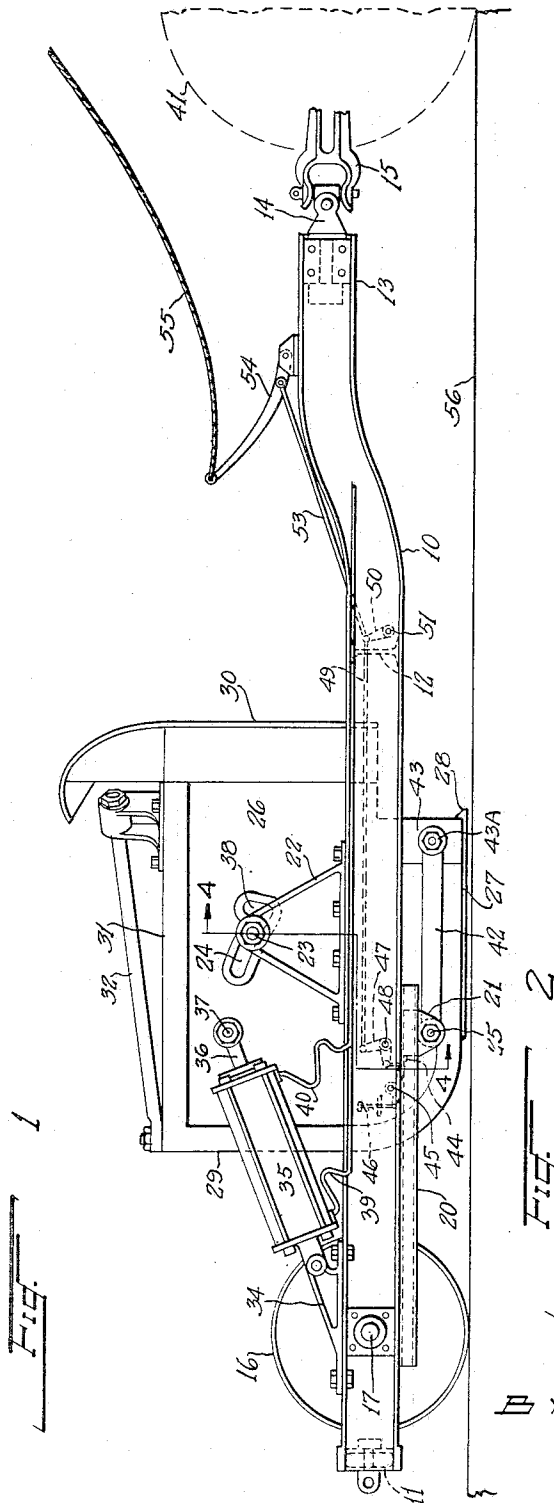
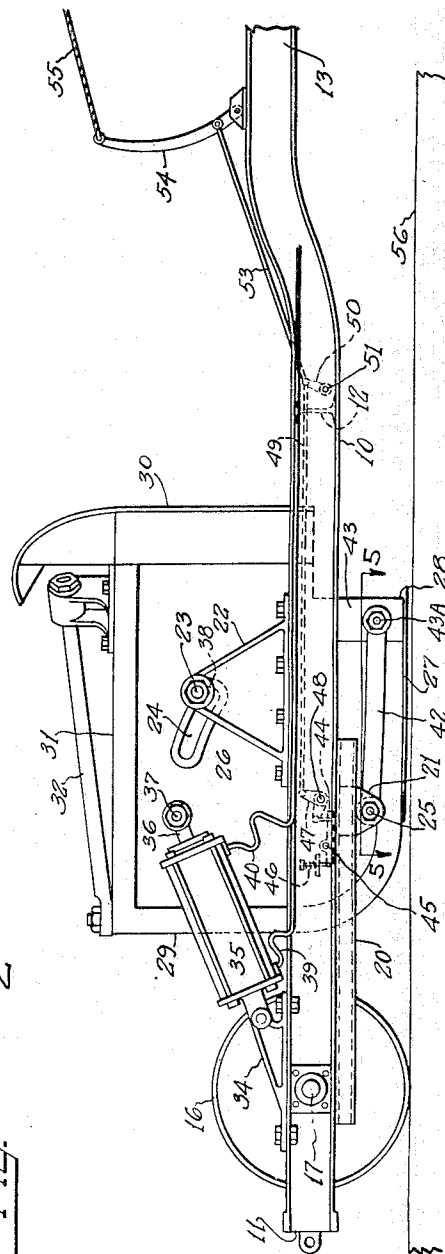
L. E. SMITH

1,966,741

SCRAPER

Original Filed March 21, 1931

3 Sheets-Sheet 1



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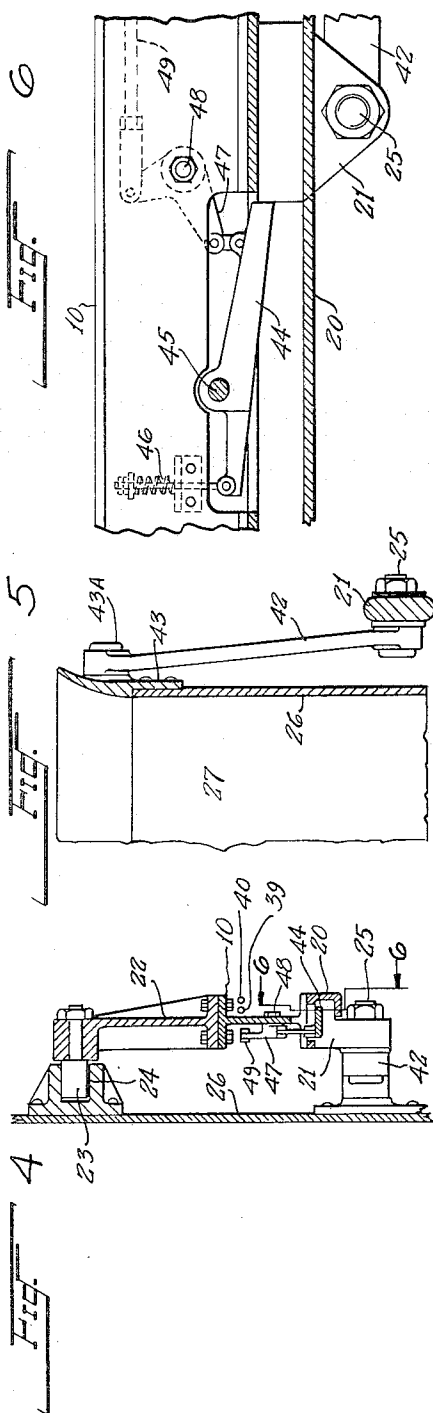
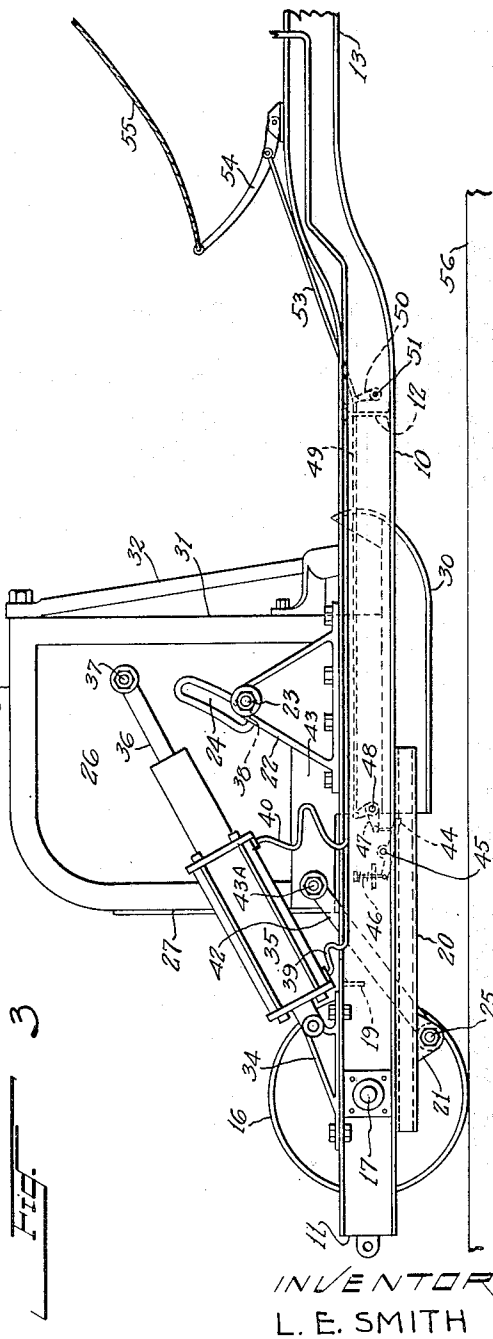
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SCRAPER

Original Filed March 21, 1931

3 Sheets-Sheet 2



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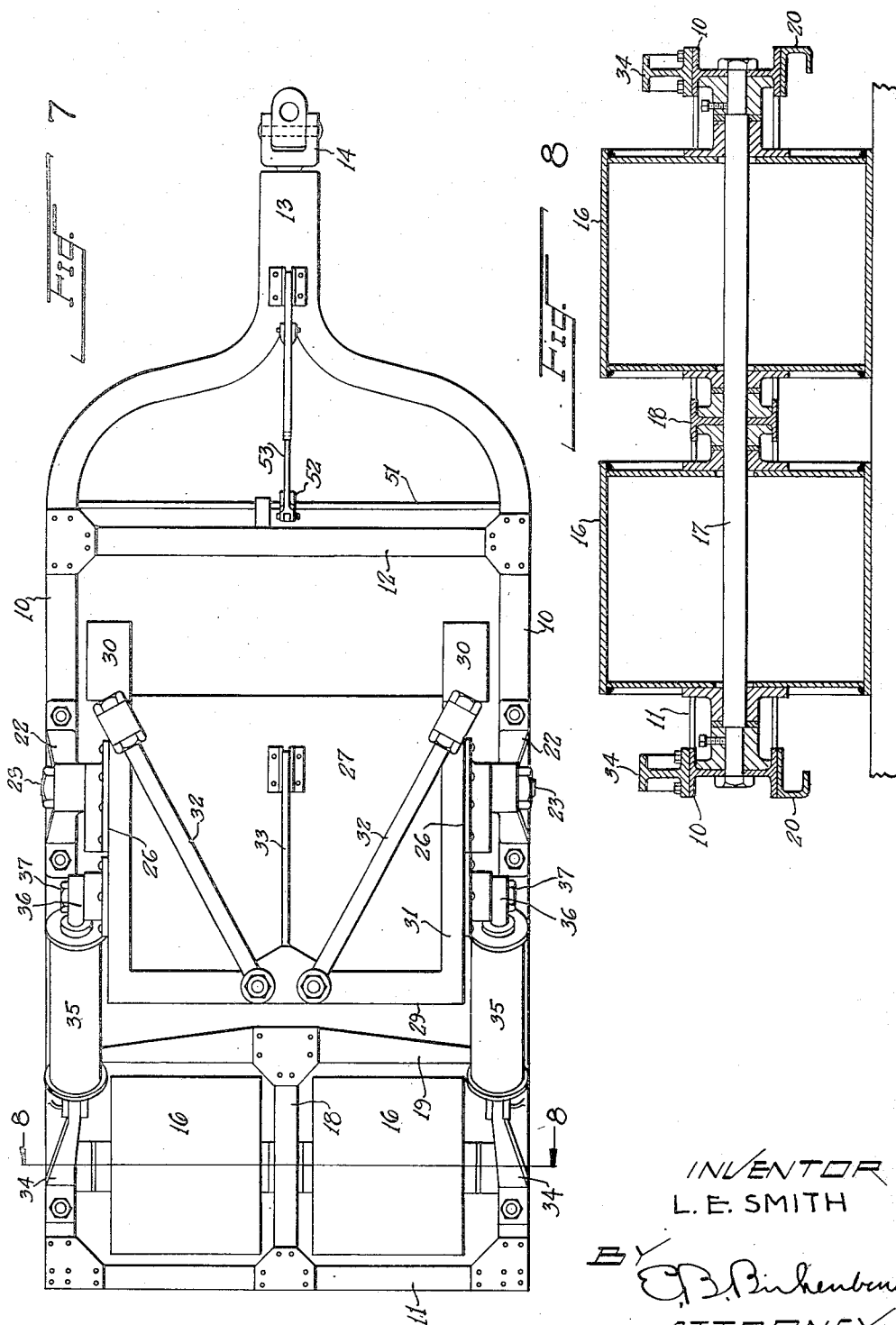
L. E. SMITH

1,966,741

SCRAPER

Original Filed March 21, 1931

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,966,741

SCRAPER

Lee E. Smith, Portland, Oreg.

Application March 21, 1931, Serial No. 524,301

Renewed December 18, 1933

3 Claims. (Cl. 37-129)

This invention relates generally to excavating machinery, and particularly to a scraper.

The main object of this invention is the construction of a scraper which will handle dirt at a low cost per yard.

The second object is to construct a scraper which will be easy to maneuver and not readily capsized under ordinary working conditions.

The third object is the provision of a scraper which is adapted to be drawn by a tractor in which the load is carried free of the ground and in which the "bite" of the scraper, as well as its tipping action can be controlled to a nicety.

The fourth object is to eliminate the necessity of backing up the scraper after each unloading for the purpose of restoring it to its original position, as is commonly the practice.

These, and other objects, will become more apparent from the specification following as illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation of the device showing the scraper in a latched cleaning up position.

Fig. 2 is a view similar to Fig. 1 but showing the scraper in an unlatched position preparatory to dumping.

Fig. 3 is a view similar to Fig. 2 showing the scraper in a dumping position.

Fig. 4 is a section taken along the line 4-4 in Fig. 1.

Fig. 5 is a section taken along the line 5-5 in Fig. 2.

Fig. 6 is a section taken along the line 6-6 in Fig. 4.

Fig. 7 is a plan of the device.

Fig. 8 is a vertical section along the line 8-8 in Fig. 7.

Similar numbers of reference refer to similar parts throughout the several views.

Referring in detail to the drawings, there is shown a low spaced frame 10 joined at its rearward end by means of the cross tie 11 and at its forward end by means of the cross tie 12. The frame 10 is turned inwardly and joined to form a tongue 13 by means of which it may be attached to the draw bar of a tractor by means of a universal connection 14 and clevis 15. The rear end of the frame 10 is supported by a pair of wide wheels 16 on an axle 17 which passes through the side frame 10. The axle 17 is further supported at an intermediate point by a longitudinal member 18 which is secured at the rearward end to the cross tie 11 and at the forward end to the auxiliary cross tie 19.

Secured to the under side of each frame 10 is a horizontal guide 20 in which is mounted a slide

21. On each side frame 10 is secured a standard 22 from which projects inwardly the trunnion 23. The trunnion 23 projects into an arcuate slot 24 whose curve is struck from the center of the bolt 25 in the slide 21, in the position shown in Fig. 1. The slot 24 is formed in the side 26 of the scraper bucket whose bottom edge 27 is provided with teeth 28 which also serve as runners for the under side of the bucket. The rear edge 29 is curved to join the bottom 27. The forward side edges of the bucket are provided with runners 30 which curve upwardly and backwardly above the bucket top 31, as shown in Fig. 1.

It is desirable to provide stiffening braces 32 between the middle of the back 29 and the top front corners of the sides 26. There is also provided a central brace 33 which ties the middle of the upper edge of the back 29 to the middle of the forward portion of the bottom 27.

On the rearward side of each frame 10 is mounted a bracket 34 to each of which is hinged one end of a hydraulic cylinder 35 whose piston 36 is hingedly connected to the side 26 of the bucket by means of the bolt 37. The position of the bolt 37 is approximately in the arc of the curved slot 24 and a short distance in back of the rear end thereof. Each of the slots 24 has an upturned portion 38 whose purpose will be explained later. Flexible fluid lines 39 and 40 extend from each hydraulic cylinder 35 to a control point on the tractor 41.

Each slide 21 is joined by a connecting link 42 and the bolts 25 and 43A to a plate 43 which is secured to its respective bucket side 26. The slides 21 are held in their extreme forward position (as shown in Fig. 1) by means of the latching levers 44 which are pivotally mounted on the pins 45 and are urged into engagement with the slides 21 by means of the springs 46. The latching levers 24 are rendered operative by the bell crank levers 47 which are mounted on the side frames 10 by means of the bolt 48. The bell crank levers 47 are operated by the pull rods 49 which, in turn, are connected to the levers 50 on the shaft 51, which shaft extends across the front of the frames 10 and is provided with a lever 52 at its middle portion, which lever 52 the single pull rod 53 connects to the lever 54 which is operated by a rope 55 from the tractor 41. In other words, the pull on the rope 55 will unlatch the slides 21 permitting same to move rearwardly.

The operation of the device is substantially as follows: Assuming the parts to be in the position shown in Fig. 1, that is, in which the teeth 28 are just skimming the ground 56, and it is desired to

load the scraper, and in this position the bucket is supported by the trunnions 23 which are within the slots 24. In other words, the bucket would swing on the trunnions were it not for the fact that it is held by the pistons 36 of the hydraulic cylinders 35, and the slides 21 which are held in their forward position by the latching levers 44. In order to load the bucket it is of course necessary to move the tractor 41 forward and at the same time force fluid through the lines 39 into the cylinders 35 causing the bucket to swing on the centers of the bolts 25, lowering the teeth 28 and tipping up the back end 29 of the bucket in proportion to the movement of the pistons 36.

If it is desired to discharge the bucket it is only necessary to pull on the rope 55 which will unlatch the slides 21 and, through the action of the cylinders 35, reverse the movement of the bucket to the position shown in Fig. 2—that is with the trunnions 23 occupying the upturned slots 38. Pressure is again applied to the rear end of the cylinders 35 causing the bucket to rock on a new center, namely the trunnions 23, and the now free slides 21 move backwardly along the guides 20. Obviously, the tilt of the bucket can be controlled to a nicety by the operation of the cylinders 35.

In order to return the bucket from the unloading position shown in Fig. 3 to the position shown in Fig. 1 it is first necessary to admit fluid to the forward end of the cylinders 35, causing the bucket to first rock to the position shown in Fig. 2 on the centers of the trunnions 23 which now occupy the upturned slot portions 38 until the slides 21 are automatically latched under the action of the springs 46. The action of the pistons 36 is now reversed causing the bucket to shift on new centers, namely the bolts 43—A and causing the trunnions 23 to leave the upturned portions 38 and enter the curved portions 24 thereof (as shown in Fig. 1) thereby restoring it to its original position. Obviously, the precise manner of handling the bucket will vary considerably according to the working conditions, but it can be readily seen that by this construction there is provided a scraper whose load is carried free of the ground and which can be unloaded and restored to its traveling position without backing or in any way moving the tractor or the supporting vehicle of the scraper.

I am of course aware that there are many forms of excavating devices employing dumping buckets mounted on land traveling vehicles; I therefore do not intend to cover such devices broadly, but I do intend to cover all such forms and modifications thereof as fall fairly within the appended claims:

I claim:

1. A scraper having in combination a land traveling vehicle including a pair of spaced side frames, a bucket tiltably mounted between said side frames, said bucket having arcuate slots formed in the side thereof, said side frames having inturned trunnions engaging said slots, said slots having the forward ends thereof upturned, said side frames having guides formed on same, a slide in each guide, a connecting rod from each slide to the forward end of the bucket, latch means for holding said slides in their foremost positions, and a pair of hydraulically operated pistons connected to said bucket behind said arcuate slots.

2. In a scraper, the combination of a land traveling vehicle having a pair of spaced side frames provided with longitudinal parallel guides, a slide

in each of said guides, a spring latch for holding each of said guides in a forward position, a bucket mounted between said side frames having arcuate slots formed in the sides thereof, each of said slots having an upturned forward end, said side frames having trunnions extending into said slots, the forward lower edges of said bucket having links attached thereto whose rearward ends are attached to said slides, and hydraulic cylinders hingedly mounted one over the rear end of each side frame and having the pistons thereof attached to the sides of said bucket in the path of said arcuate slots behind the rearmost ends thereof.

3. A scraper bucket having an open front and top and having closed sides, said closed sides having arcuate slots formed therein struck from a center behind the fore and aft center of the bucket and close to the bottom thereof, each of said arcuate slots having its front end upturned, said bucket having means for attaching a link to the lower forward portion of each side thereof, and means for attaching an operating piston to each side thereof in the path of said arcuate slots opposite from their upturned ends.

4. The substance matter of claim 3, and a pair of runners secured to the forward edges of the sides of the bucket along the upper portion thereof and having the rounded upper ends curving backwardly over the sides of the bucket.

5. In a scraper the combination of a land traveling vehicle having a pair of side frames, each of said side frames having longitudinal guides formed along same, a slide in each guide, a latch adapted to hold each of said slides in a forward position, means for releasing said latches simultaneously under the manual control of the operator, a bucket rockably mounted between said side frames having hydraulic means for rocking same whereby a latched position of said slides will cause a forward rocking of said bucket to move same to a digging position and an unlatched position of said slides with a similar forward movement of said bucket will cause same to discharge the contents thereof.

6. A scraper having in combination a wheeled vehicle having an upper stationary axis and a lower horizontally slidable axis, a bucket having rocker mountings for both of said axes, and selective means for rocking said bucket on either of said axes whereby said bucket may tilt forward on the lower axis for digging or on the upper axis for dumping consisting of a latch for holding said bucket to rock on its lower axis or to permit same to rock on its upper axis, together with hydraulic cylinders for rocking said bucket about its respective axes.

7. A scraper having in combination a wheeled vehicle having an upwardly and forwardly disposed stationary axis and a lower and rearwardly disposed horizontally slidable axis, a bucket having rocker mountings for both of said axes, and selective means for rocking said bucket on either of said axes whereby said bucket may tilt forwardly on its lower axis in its foremost position for digging purposes and on its upper axis for dumping purposes consisting of a latch for holding said bucket to rock on its lower axis or to permit same to rock on its upper axis, together with hydraulic cylinders for rocking said bucket about its respective axes.

8. A scraper having in combination a wheeled vehicle having an upwardly and forwardly disposed stationary axis and a rearwardly disposed horizontal axis capable of movement in a hori-

zontal plane, latch means for normally holding said lower axis in a forward position, a bucket having rocker mountings for both of said axes, and selective means for rocking said bucket on either of said axes whereby said bucket may tilt forwardly on the lower rearmost axis for digging, said upper axis being slidably relative to the bucket and fixed in relation to the vehicle consisting of a latch for holding said bucket to rock on its lower axis or to permit same to rock on its upper axis, together with hydraulic cylinders for rocking said bucket about its respective axes.

LEE E. SMITH.

10	85
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20	95
25	100
30	105
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45	120
50	125
55	130
60	135
65	140
70	145
75	150