May 8, 1934. C. LE BLEU 1,958,195

SCRAPER

Filed Aug. 12, 1933 2 Sheets-Sheet 1

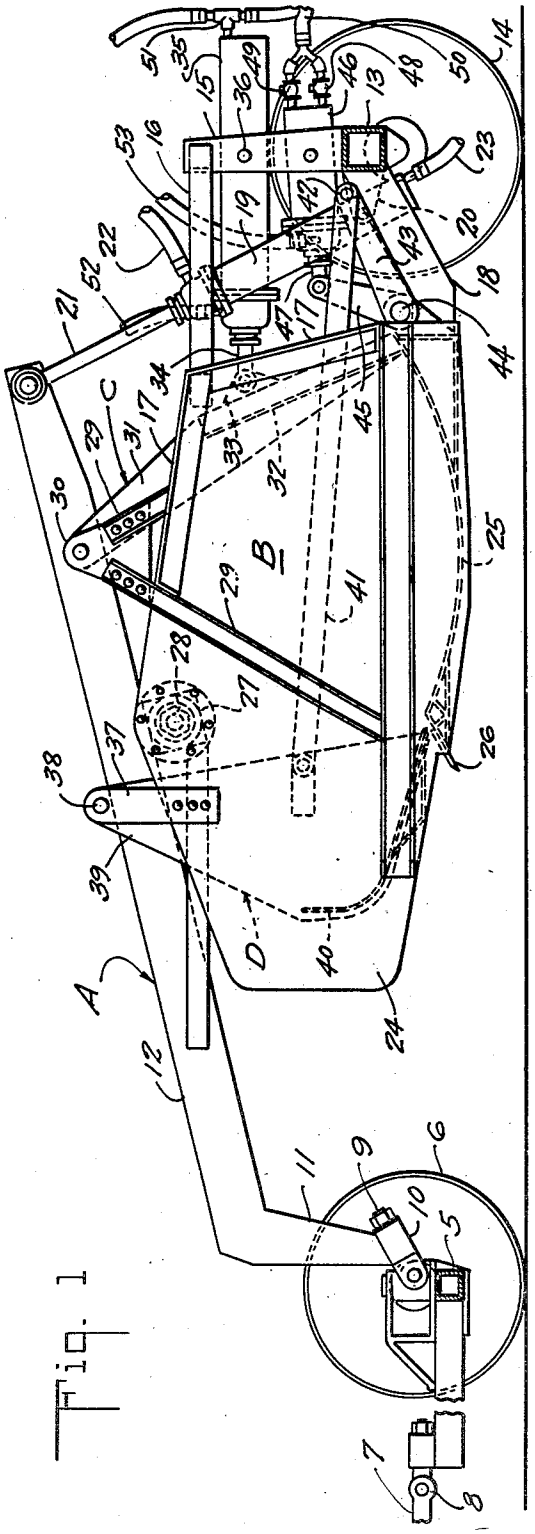


Fig. 1

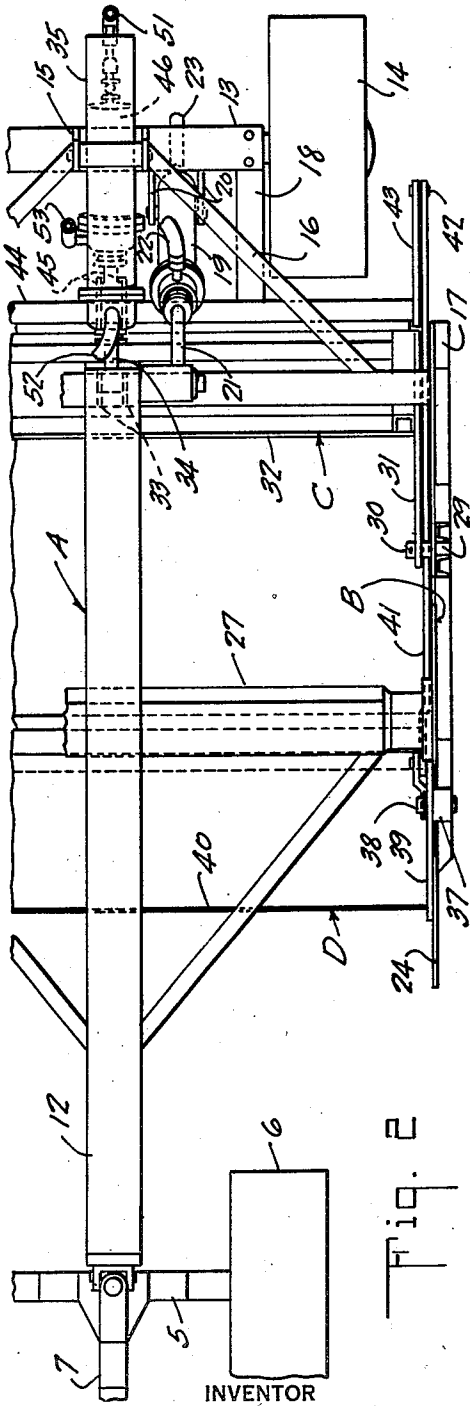


Fig. 2

INVENTOR
Charles Le Bleu
BY Ernest L. Wallace
ATTORNEY

May 8, 1934. C. LE BLEU 1,958,195

SCRAPER

Filed Aug. 12, 1933 2 Sheets-Sheet 2

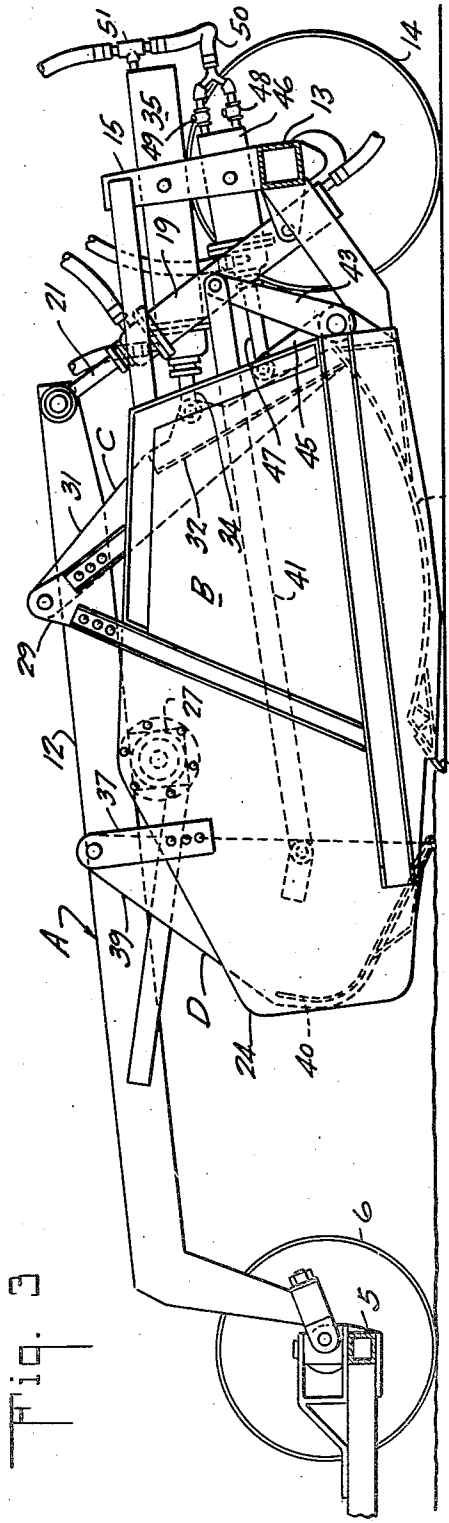


Fig. 3

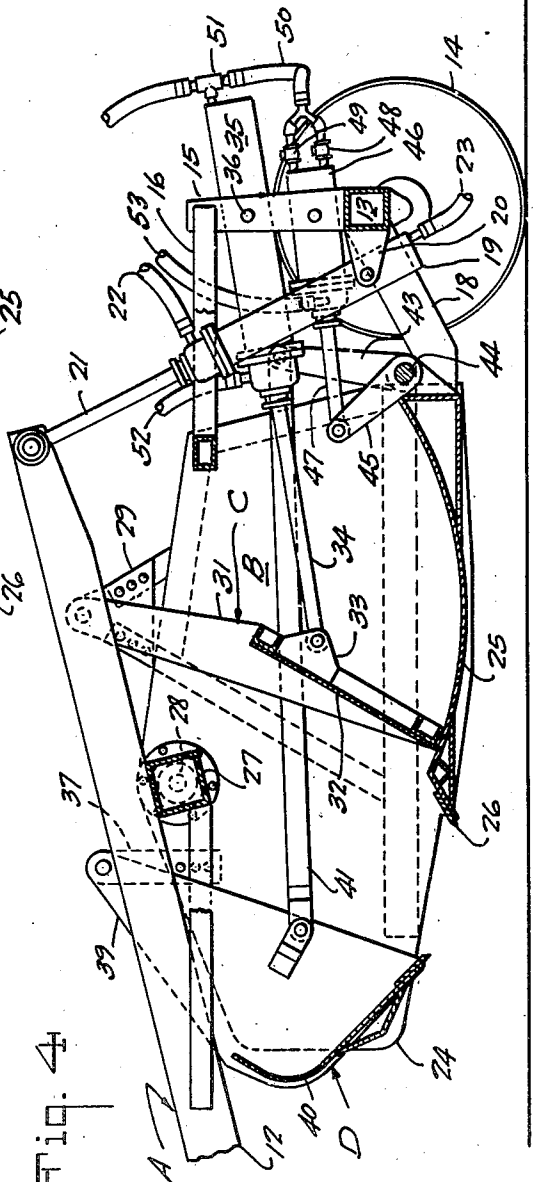


Fig. 4

INVENTOR
Charles Le Bleu
BY Ernest L. Wallace
ATTORNEY

Patented May 8, 1934 1,958,195

UNITED STATES PATENT OFFICE

1,958,195

SCRAPER

Charles Le Bleu, Los Angeles, Calif., assignor to Mack Wooldridge, Los Angeles, Calif.

Application August 12, 1933, Serial No. 684,847

14 Claims. (Cl. 37—126)

The invention relates to a scraper having a bucket or pan which may be raised and lowered. The present invention has for its objects the provision of a scraper having a frame provided with a boom adaptable to be operated for raising and lowering and tilting the bucket; a scraper having a gate for cleaning out the bucket and an apron to close the front of the bucket in load carrying position and to open the front in digging and clean-out positions; means to actuate the frame and hold the bucket in any selected position; and means to swing the gate and apron so that in unloading the apron first uncovers the bucket and the gate follows to clean out the bucket.

These objects are accomplished by the embodiment of my invention illustrated in the accompanying drawings, in which:—

Fig. 1 is a side view of a scraper with bucket in load carrying position; Fig. 2 is a fragmentary plan view of the structure shown in Fig. 1; Fig. 3 is a side elevational view of the scraper with parts in digging position; and Fig. 4 is a side sectional view of the scraper with parts in dumping position.

Referring more particularly to the drawings, a frame A is provided with a front axle 5 having wheels 6 journalled thereon forming a front truck. A draft tongue 7 provides for connection of the scraper to any suitable means for drawing it along the ground, such as a tractor. The draft tongue may be secured to axle 5 by any suitable king pin structure 8. Mounted on the axle is a stub shaft 9 and journalled thereon is a bearing 10 formed on an arm 11. The arm 11 is a portion of a boom 12 extending toward the rear of frame A. An axle 13 has rear ground wheels 14 journalled thereon forming a rear truck. Standards 15 are supported on axle 14, and ranging forwardly therefrom are bridles 16 secured to the side walls of bucket B. The bucket may have suitable stiffening members such as angle irons 17. Secured to the bucket at its lower end and to axle 13 are braces 18 further fixing the bucket to axle 13. A hydraulic cylinder 19 is secured to axle 13 by means of brackets 20. Within the cylinder 19 is a piston having a piston rod 21 which is pivotally secured to boom 12. Hydraulic conduits 22 and 23 may lead to any suitable source of hydraulic pressure with convenient valve control whereby fluid under pressure may be directed to one or the other end of cylinder 19 and cause its piston to be moved so as to raise or lower the boom. The hydraulic cylinder 19, its piston and rod 21 constitute a longitudinally expansible strut mechanism causing the frame to buckle.

The bucket B comprises side walls 24 and a bottom wall 25 extending from the rear edge of the side walls to a position short of the front. At the front edge of the bottom is a digging lip 26. The bottom 25 is arcuate in shape, the side walls 24 overhanging portions thereof and being suitably braced cross-wise. A cross member 27 of box form is secured to boom 12 and has pintles 28 for pivotal mounting of the bucket on the boom. The construction is such that on extension of piston rod 21, the boom 12 is elevated, raising the bucket bodily and tilting the digging lip 26 upwardly. On contraction of the piston rod 21 the boom is lowered, the bucket bodily lowered and the digging lip tilted toward the ground. Various positions are shown in Figs. 1, 3 and 4.

Upstanding from the bucket side walls 24 and fixed thereto are trusses 29 having journals 30 at the upper ends. The trusses serve for hanging the gate C thereon. Pivotally mounted on the journals are arms 31. The journals 30 and arms 31 constitute hinges supporting a gate plate 32 extending between the arms and fixed thereto, the hinges being concentric with the arcuate bottom 25. Brackets 33 are secured to gate plate 32 and secured thereto by a wrist pin is a piston rod 34 having a piston working in hydraulic cylinder 35. The standards 15 serve as bearings for trunnions 36 which pivotally support cylinder 35. It is apparent that gate plate 32 may serve as a back wall for bucket B and may be swung to sweep from one end of the bucket to the other.

Brackets 37 are secured to the side walls 24 of the bucket and support pintles 38 at their upper ends, upon which is hung an apron D. Apron side plates 39 are pivotally mounted on pintles 38. Extending between plates 39 across the bucket is an apron front plate 40 of scoop form with its rear edge adapted to be engaged with bottom plate 25 of the bucket. Pivotally secured to apron side plates 39 are connecting rods 41 secured by pivot pins 42 to crank arms 43 connected to a crank shaft 44. At the center of crank shaft 44 is a crank arm 45. Mounted on trunnions supported by standards 15 is a hydraulic cylinder 46 having a piston and a piston rod 47. A wrist pin secures piston rod 47 to crank arm 45. Upon outstroke movement of piston rod 47, the apron D will be swung away from the front of the bucket and on instroke toward the bucket to close the latter.

Cylinders 35 and 46 are connected to the same hydraulic conduit and the hydraulic mechanisms are double acting. Referring to the connections of cylinder 46. At the rear end of cylinder 46 is a conduit branch having a check valve 48 permitting free ingress of liquid. Another conduit branch is connected to the rear of cylinder 46 and has a spring loaded check valve 49 permitting egress of liquid after a selected hydraulic pressure has been attained. The conduit branches are connected to a common conduit 50 which has therein a T fitting 51 with a leg connected to cylinder 35. The front end of cylinder 35 has a conduit 52 connected thereto and the front end of cylinder 46 has a conduit 53. Upon the conduits 52 and 53 being connected to a discharge for liquids from the cylinders 35 and 46 and conduit 50 to a source of liquid under pressure, both the pistons of cylinders 35 and 46 will be moved outwardly and the apron D moved away from the front of the bucket while gate C will be swung forwardly through the bucket. Upon conduit 50 being connected to discharge, and conduits 52 and 53 being connected to the same source of fluid under hydraulic pressure, the piston in cylinder 35 will first be moved inwardly and gate C to the rear of the bucket. When the piston of cylinder 35 has reached the end of its stroke, pressure will build up sufficiently to move the piston in cylinder 46 inwardly against the action of spring loaded check valve 49 and the apron is swung to close the front of the bucket. It will thus be seen that in operation of the gate C and apron D, the gate C attains its rear position before the apron D closes. The same operation might be obtained by other mechanical expedients instead of the spring loaded check valve 49. Proper proportioning of sizes of cylinders 35 and 46 or of the crank arms 43 and 45, or both, will produce the effect, and I have herein shown one specific means to attain the result as illustrative of this broad feature.

In Fig. 1, the parts are shown in load carrying position. Dirt within bucket B is held from loss by the apron D. When it is desired to dump the load, the boom is raised, tilting the bucket with its nose downwardly. Hydraulic pressure is then introduced to the rear of cylinders 35 and 46 by conduit 50, and conduits 52 and 53 connected to discharge causing the apron D to be swung to open position and gate C forwardly to sweep the dirt forwardly out of the bucket B. Hydraulic pressure may then be reversed and introduced through conduits 52 and 53 while conduit 50 is connected to the discharge. Gate C will then be swung to the rear of the bucket and then fluid may be maintained static to hold the gate C at the rear of bucket B and apron D open. Boom 12 is then lowered to cause digging lip 26 to enter the ground and by forward movement of the scraper dirt will be caused to enter the bucket. After the bucket is loaded, further hydraulic pressure is exerted through conduits 52 and 53, and conduit 50 connected to the discharge to cause closure of apron D. The boom may then be elevated to tilt the front of bucket B and raise it bodily from the ground to carrying position.

It will be noted that I have shown a front truckle axle 5 and wheels 6. It is apparent that the front end of boom 12 might be supported on the rear of a tractor, the latter constituting a truck.

What I claim is:—

1. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at one end on one of said trucks, a longitudinally expansible strut mechanism mounted on the other of said trucks and supporting the other end of said boom, means to expand and contract said mechanism whereby to selectively raise and lower said boom, said bucket being secured to said other of said trucks, and a pivotal connection securing said bucket to said boom whereby the said bucket may be tilted downwardly toward digging position or raised to carrying position.

2. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at one end on one of said trucks, a hydraulically expansible chamber mounted on the other of said trucks and supporting the other end of said boom whereby to selectively raise and lower said boom, said bucket being secured to said other of said trucks, and a hanger securing said bucket to said boom whereby the said bucket may be tilted downwardly toward digging position or raised to carrying position.

3. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at one end on one of said trucks, a hydraulically expansible chamber mounted on the other end of the frame and supporting the other end of said boom whereby to selectively raise and lower said boom, said bucket being secured to said other of said trucks, and a pivotal connection securing said bucket to said boom whereby said bucket may be tilted downwardly toward digging position or raised to carrying position.

4. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a longitudinally expansible strut mechanism mounted on the rear truck and supporting the other end of said boom, means to expand and contract said mechanism whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, and a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position.

5. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a hydraulically expansible chamber mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, and a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position.

6. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame

having a boom supported at the front truck, a hydraulic cylinder and piston mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, and a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position.

7. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a longitudinally expansible strut mechanism mounted on the rear truck and supporting the other end of said boom, means to expand and contract said strut mechanism whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate adapted to be moved lengthwise of said bucket from end to end, and hydraulic means mounted between said frame and bucket to move said gate.

8. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a hydraulically expansible means mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate adapted to be moved lengthwise of said bucket from end to end, and a hydraulic means mounted between said frame and bucket to move said gate.

9. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a hydraulic cylinder and piston mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate pivotally supported on said bucket and adapted to be swung lengthwise of said bucket from end to end, and a second hydraulic cylinder and piston mounted between said frame and bucket to swing said gate.

10. A scraper comprising a frame, trucks supporting said frame at the front and rear and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a hydraulic cylinder and piston mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate pivotally supported on said bucket and adapted to be swung lengthwise of said bucket from end to end, a second hydraulic cylinder and piston mounted between said frame and bucket to swing said gate; an apron pivotally supported at the front end of said bucket for swinging movement to and from the bucket, a third hydraulic cylinder and piston interposed between said frame and said apron for actuating the latter; and a hydraulic conduit connecting said second and third cylinders for simultaneously subjecting their pistons to hydraulic pressure.

11. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear; said frame having a boom supported at the front truck, a longitudinally expansible strut mechanism mounted on the rear truck and supporting the other end of said boom, means to expand and contract said strut mechanism whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate adapted to be moved lengthwise of said bucket from end to end, a hydraulically expansible chamber mounted between said frame and bucket to move said gate; an apron for the front end of the bucket for movement to and from the bucket, hydraulic means interposed between said frame and said apron for actuating the latter; and a hydraulic conduit connecting said chamber and means for simultaneously subjecting them to hydraulic pressure.

12. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, hydraulic mechanism mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate adapted to be moved lengthwise of said bucket from end to end, a hydraulically expansible chamber mounted between said frame and bucket to move said gate; an apron for the front end of the bucket for movement to and from the bucket, hydraulic means interposed between said frame and said apron for actuating the latter; and a hydraulic conduit connecting said chamber and means for simultaneously subjecting them to hydraulic pressure.

13. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a hydraulic cylinder and piston mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate adapted to be moved lengthwise of said

bucket from end to end, a second hydraulic cylinder and piston mounted between said frame and bucket to move said gate; an apron for the front end of the bucket for movement to and from the bucket, a third hydraulic cylinder and piston interposed between said frame and said apron for actuating the latter; and a hydraulic conduit connecting said second and third cylinders for simultaneously subjecting their pistons to hydraulic pressure.

14. A scraper comprising a frame, trucks supporting said frame at the front and rear, and a bucket open at both ends mounted on said frame between the front and rear thereof; said frame having a boom supported at the front truck, a hydraulic cylinder and piston mounted on the rear truck and supporting the other end of said boom whereby to selectively raise and lower said boom, the rear of said bucket being secured to the rear truck, a pivotal connection securing said bucket adjacent its front end to said boom whereby the front end of said bucket may be tilted downwardly toward digging position or raised to carrying position; a gate pivotally supported on said bucket and adapted to be swung lengthwise of said bucket from end to end, a second hydraulic cylinder and piston mounted between said frame and bucket to swing said gate; an apron for the front end of the bucket for movement to and from the bucket, a third hydraulic cylinder and piston interposed between said frame and apron for actuating the latter; and a hydraulic conduit connecting said second and third cylinders for simultaneously subjecting their pistons to hydraulic pressure.

CHARLES LE BLEU.