Jan. 1, 1924

1,479,687

S. A. WILSON

WHEELED SCRAPER

Filed July 5, 1922

4 Sheets-Sheet 1

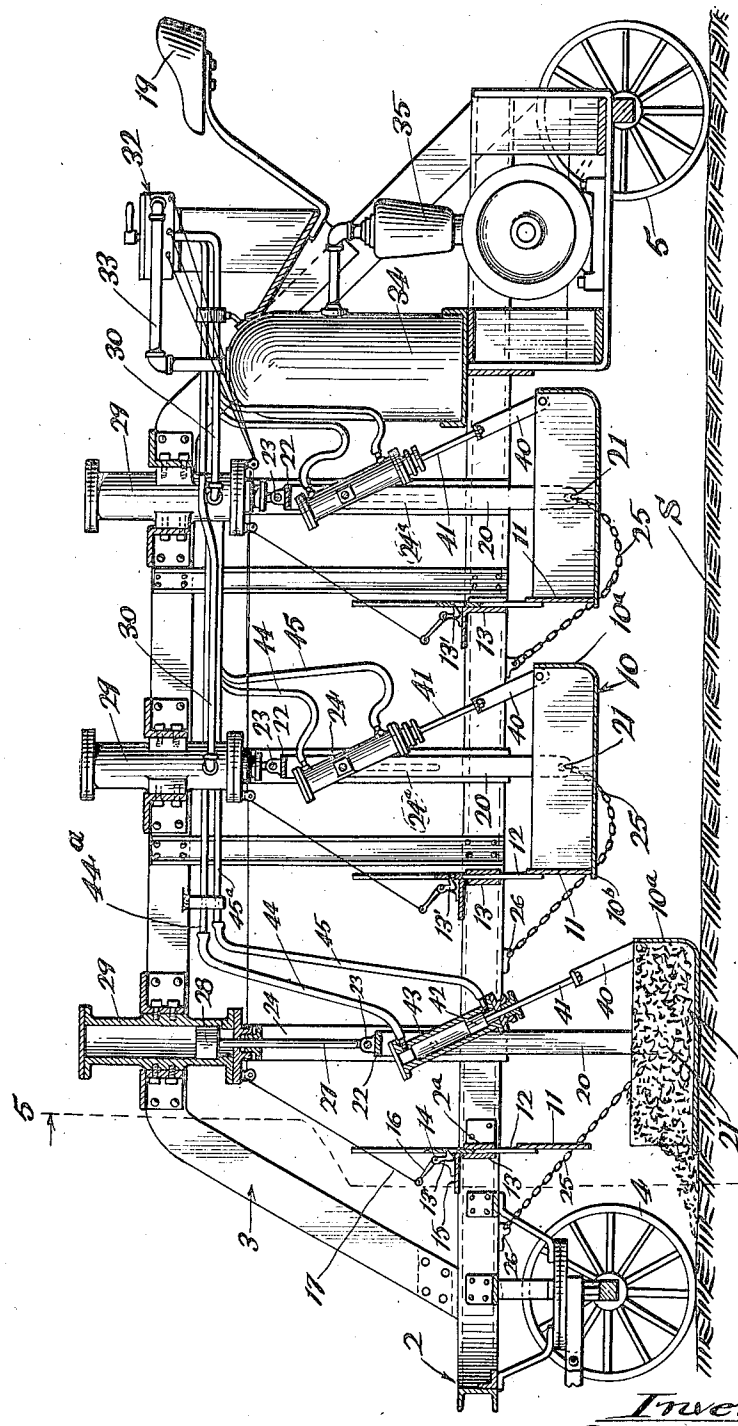


Fig. 1.

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4 Sheets-Sheet 2

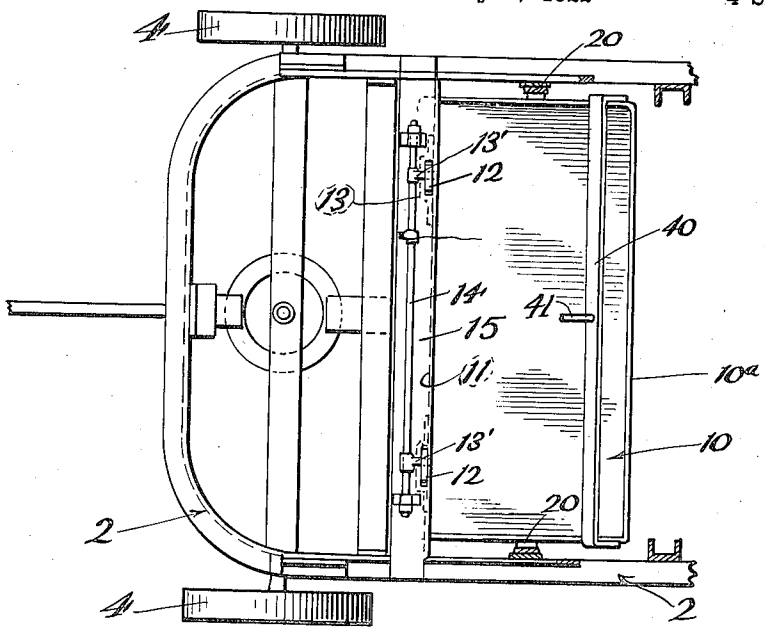


Fig. 2.

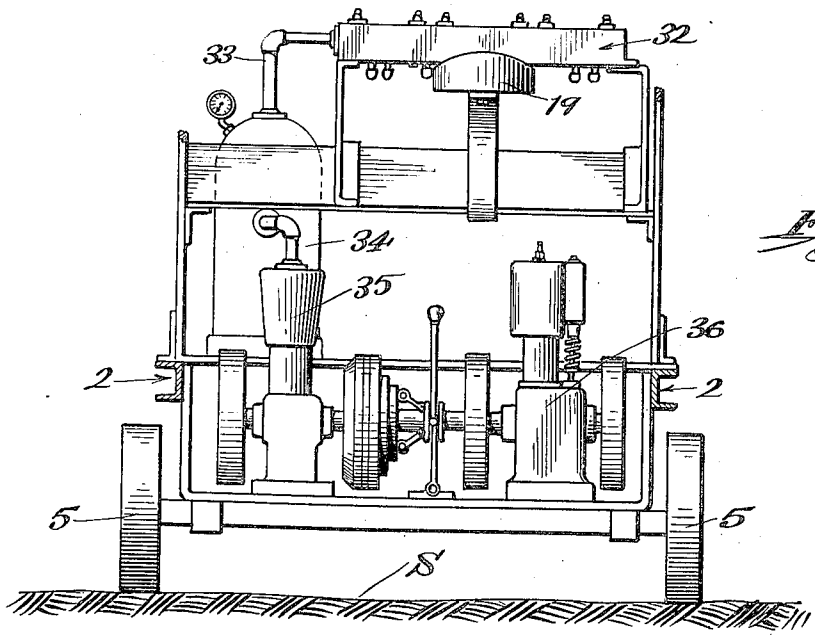


Fig. 3.

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Fig. 4.

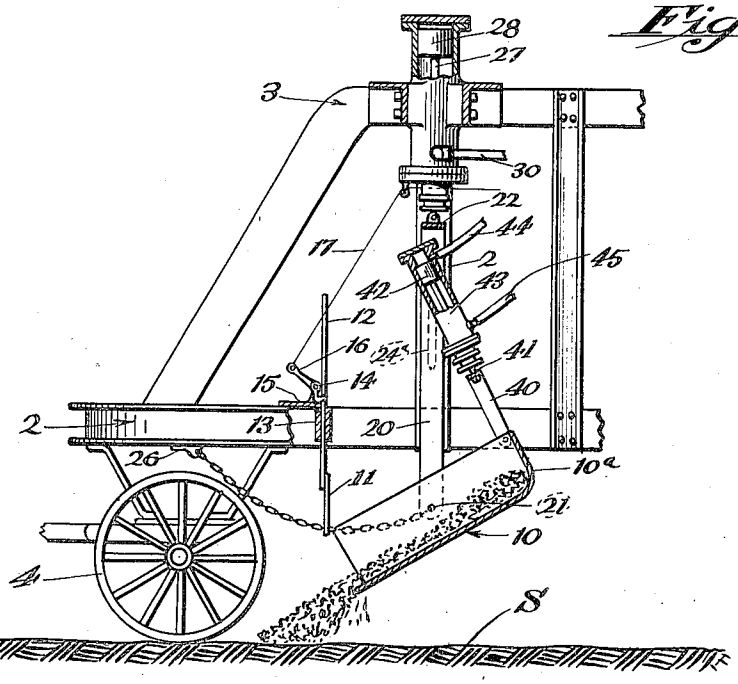
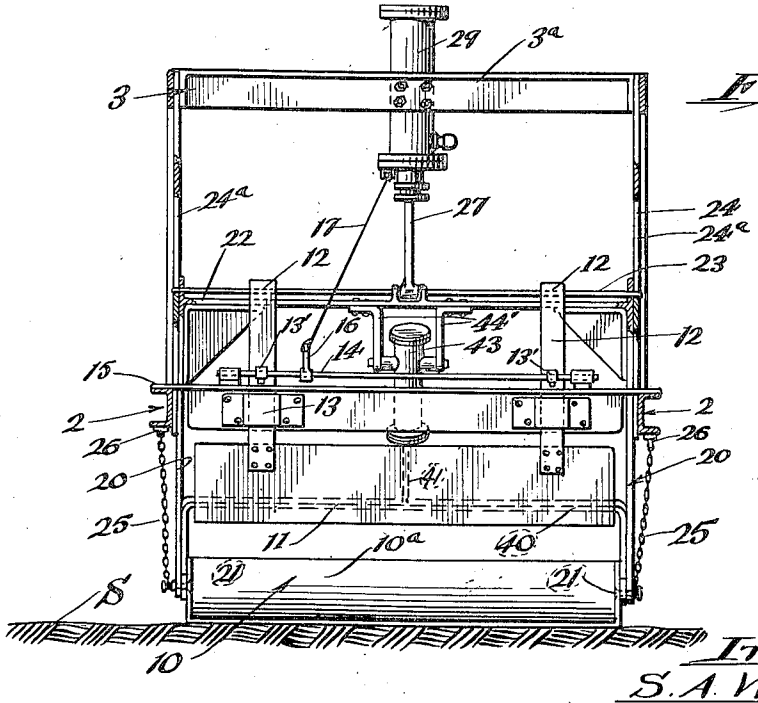


Fig. 5.



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Fig. 6.

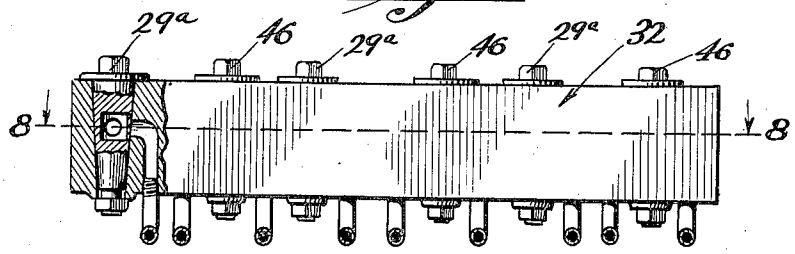


Fig. 7.

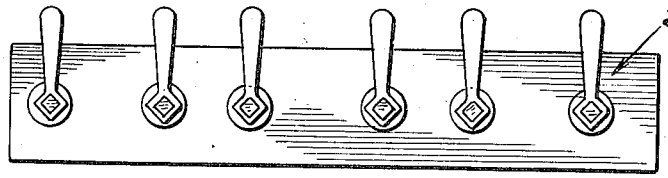
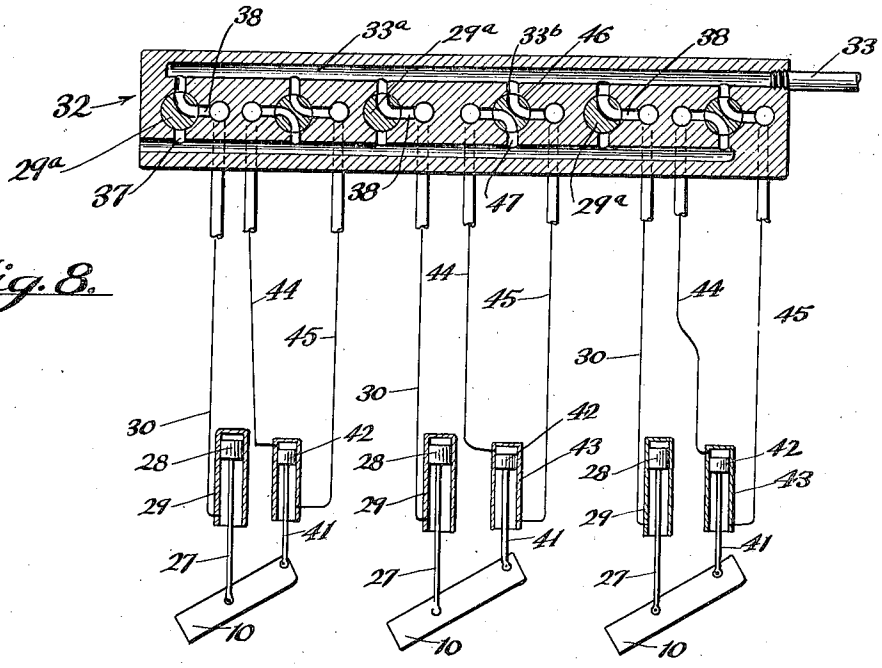


Fig. 8.



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Patented Jan. 1, 1924. 1,479,687

UNITED STATES PATENT OFFICE.

SPRUILLE A. WILSON, OF SHERMAN, CALIFORNIA.

WHEELED SCRAPER.

Application filed July 5, 1922. Serial No. 572,950.

To all whom it may concern:

Be it known that I, SPRUILLE A. WILSON, a citizen of the United States, residing at Sherman, in the county of Los Angeles and State of California, have invented new and useful Improvements in Wheeled Scrapers, of which the following is a specification.

This invention relates to earth scraping apparatus and particularly to wheeled scrapers.

It is an object of the present invention to provide a wheeled scraper of very large capacity and to provide for the rapid operation of the vehicle, both in the gathering and in the distribution of the gathered soil. Another object is to provide a scraper having power-operated scraping buckets and particularly to provide pneumatic means for elevating and for tilting the buckets to discharge the gathered earth or other material being handled. Another object of the invention is to provide a wheeled scraper having a plurality of independently operable scraping buckets or shovels, and an object is to provide means for enabling quick setting of the shovels in scraping position and to provide for the quick elevation of each bucket in its proper order as soon as loaded.

Other objects and advantages of the invention will be made manifest in the following specification of an embodiment of the invention illustrated in the accompanying drawings, wherein:

Figure 1 is a longitudinal, vertical section and partial elevation of the scraper.

Fig. 2 is a plan and partial section of the front portion of the scraper.

Fig. 3 is a rear elevation of the scraper.

Fig. 4 is an elevation and partial section of the front end of the scraper, showing one of the shovels in uplifted and tilted, dumping position.

Fig. 5 is a vertical transverse section approximately on line 5—5 of Fig. 1.

Fig. 6 is a side elevation and partial section of a valve block for controlling the operation of the mechanism.

Fig. 7 is a plan of the valve block.

Fig. 8 is a longitudinal section on line 8—8 of Fig. 6 showing the arrangement of the valve plugs and the ports in the valve plug and diagrammatically indicating the operation of the shovels.

The invention is embodied in a vehicle having any suitable, substantial chassis frame 2, from which may extend upwardly an overhead frame structure 3 providing for the substantial support and arrangement of various mechanisms of the scraper. The frame 2 is supported upon front and rear wheels 4 and 5 and is thereby held at the suitable elevation above the ground or roadway so as to provide ample clearance under the frame for the manipulation of scraping shovels 10 of suitable dimensions and form of construction. Each shovel has a substantial bottom, an upturned rear and end flanges 10^a; the front lip of the shovel serving as a cutter and preferably being projected slightly in advance of the ends of the end flanges so as to provide a rest upon which may bear the shutter or front gate 11. A series of the gates is provided and each gate is provided with guides 12 in the form of upwardly extending flat bars passing through guide boxes 13 attached to transverse members 2^a of the frame. The gates 11 are designed to be lowered into position in front of the respective shovels, as is shown in Fig. 1. While the shovels are being drawn along in gathering position, the respective gates 11 are maintained in elevated position by any simple and suitable device, which may consist of latches 13′ arranged in pairs on a rock-shaft 14, provided on a transverse shelf 15 of the frame. Each rock-shaft is provided with a suitable lever 16, to which is connected a leash or pull-rope 17 which extends over suitable guides rearwardly to the operator's station, at which is located a seat 19, from which point the several gates 11 may be released as necessary, so as to drop down into closing position in front of its respective shovel 10. When the loaded shovels 10 are lifted the gates 11 are carried by the respective shovels and become automatically latched at the uppermost position of each shovel. When the shovels are dumped, as in Fig. 4, the latched gates remain in elevated position without interfering with the discharge from the shovels. The shovels are arranged in a row, longitudinally of the vehicle, and therefore, one behind the other according to the forward direction of travel, and all of the shovels are designed to be lowered to gathering position over and on a surface S. As soon as the first shovel is sufficiently loaded and its gate 11 is lowered, the shovel is then lifted while remaining in a substantially horizontal position so as to permit the next

succeeding shovel to immediately become operative to take up the scraping where its leading shovel left off.

The shovels are each individually operative by power mechanism and this preferably includes a pneumatic mechanism for convenience, simplicity, reliability and economy of operation. To that end each of the shovels has at its end a suspension link 20, whose lower end is pivoted at 21 at about the diametrical center of the end flanges of the shovel, so that the shovel can tilt on the lower ends of its suspension links 20. The upper ends of these links are connected to a crosshead 22, along which extends a transverse pivot rod 23, the ends of which engage suitable guides as slotted frame members 24; the ends of the pivot rod 23 being adapted to rise and fall in the slots 24ª thereof. This insures the vertical guiding of the upper ends of the links 20 and enables the swinging of these links and the crosshead 22. The lower ends of the links are connected by stout chains 25 or other suitable means, which extend upwardly and forwardly to fastenings 26, so that when the shovels 10 are in the lowermost position, the chains 25, of which there is one at each end of each shovel, serve to limit the rearward movement of the shovels 10.

Means are provided for elevating the crosshead 22 and the links 20 and such means shown as including a piston rod 27, which may be connected to the center portion of the crosshead 22 or to the rockshaft 23, as is shown in Fig. 5. Each piston rod 27 is provided on its upper end with a piston 28 and this is operative in a cylinder 29. There is a cylinder for each shovel and the cylinders are mounted in substantial overhead frame girders 3ª. Each elevated cylinder 29 is provided with an air pipe connection 30 leading to a valve block 32, which is connected as by pipe 33 to a source of compressed air as a reservoir 34. The reservoir can be conveniently disposed at any desired location upon the vehicle and is connected to a suitable air compresser 35, which is designed to be driven at suitable intervals to maintain a desired pressure of air in the reservoir 34, as by means of a suitable motor 36.

There is provided in the valve block 32 a valve 29ª for each elevating cylinder 29; the valve block having for each valve plug 29ª triple ports, one leading to the live pressure passage 33ª in the block, one being an exhaust 37 and one being a connecting port 38 leading to the connection 30 for supplying air to the lower portion of the respective pneumatic cylinder 29, so that when the proper valve 29ª is turned to the open position, as seen in Fig. 7, then the air pressure becomes effective upon the piston 28 and forces the same upwardly and thereby to lift the loaded shovel 10. Turning a valve 29ª brings its ports so as to register with the exhaust port 37 and the pressure port 38 thereby permitting the escape of air from below the piston 28 of the related cylinder 29 and gravity will become operative to draw the shovel and its connected parts downwardly to the lowermost position.

After a loaded shovel has been elevated, it is maintained in such position until the vehicle is moved to the desired location at which the gathered material in the shovels is to be discharged. After such location is reached, the shovels are then adapted to be tilted, as shown in Fig. 4, to discharge the contents thereof and this action is obtained by a power-operative device, preferably pneumatic in type. To the rear of each shovel there is attached a bail 40 and to each bail there is attached a piston rod 41, which has a piston 42 operating in an oscillating cylinder 43, pivotally connected as by brackets 44′ to its respective crosshead 22. Each oscillating cylinder 43 is provided with pressure fluid hose 44 and 45. These hose are attached to pipes 44ª and 45ª, which extend rearwardly to the valve block 32. This is provided with a set of four-way valve plugs 46. Each plug, therefore, connects its pair of hose 44 and 45 with the pressure passage 33ª when the valve plug is set in alternate positions. In one position fluid under pressure passes through the valve plug 46 to the hose 45 and from this into the lower end of the tilting cylinder 43 and operates to push the piston therein upwardly; the exhaust occurring as through the hose 44 to the exhaust port 47 in the block; there being one exhaust port 47 and also one pressure port 33ᵇ for each valve plug 46. Reversing the position of a valve plug 46 reverses the flow of live pressure and exhaust air as to its cylinder 43, so that the shovels are operated by power in each oscillation.

From the above it will be seen that I have provided a very simple, practicable and convenient machine of large capacity and of rapid operation for collecting and distributing collected earth and other material to be handled, and further, the arrangement of the shovels provides for the accurate leveling, surfacing or topping and grading of the surface or material over which the machine is being operated.

Various modifications may be resorted to within the spirit of the invention and scope of the claims.

What is claimed is:

1. A wheeled scraper having, in combination, a scraping shovel, and fluid pressure means for raising and lowering the shovel to effective position and a fluid pressure means for tilting the shovel when in its elevated position.

2. A wheeled scraper having, in combina-

tion, a scraping shovel and pneumatically operative means for raising the loaded shovel to effective position, and a pneumatically operative means for tilting the shovel to discharge the load.

3. A wheeled scraper having a plurality of scraping shovels arranged to be lowered into effective position, one behind the other, and manually controlled, fluid pressure operated means for individually elevating each shovel as it is loaded.

4. A wheeled scraper having a plurality of scraping shovels arranged to be lowered into effective position, one behind the other, means consisting of engines for individually elevating each shovel as it is loaded, and a pneumatic means for individually tilting the loaded and lifted shovels to discharge the same.

5. A scraper having, in combination, a shovel adapted to be lowered to scraping position and elevated while loaded, and a slidably mounted, drop gate for the open front of the shovel.

6. A scraper having, in combination, a shovel adapted to be lowered to scraping position and elevated while loaded, means for vertically guiding the shovel and means for vertically lifting it, and a gate for the open front of the shovel, said shovel being mounted so as to permit the filling of the shovel while the scraper is moving and the shovel is in contact with the material to be collected, and vertical guide means in which the gate is adapted to drop vertically over the front of the shovel and move up therewith.

7. A wheeled scraper having, in combination, a scraping and transporting shovel, a frame, a vertically movable and guided carrier mounted on the frame and to which the shovel is connected and by which it is raised and lowered, means for raising and lowering the carrier, and a motor mounted on the carrier for tilting the shovel after it has been elevated.

8. A wheeled scraper having, in combination, a scraping and transporting shovel, a frame, a vertically movable and guided carrier mounted on the frame and to which the shovel is connected and by which it is raised and lowered, means for raising and lowering the carrier, and an oscillating motor mounted on the carrier for tilting the shovel after it has been elevated.

9. A wheeled scraper having, in combination, a scraping and transporting shovel, a frame, a vertically movable and guided carrier mounted on the frame and to which the shovel is connected and by which it is raised and lowered, means for raising and lowering the carrier, and a pneumatic oscillating motor mounted on the carrier for tilting the shovel after it has been elevated.

10. A wheeled scraper having, in combination, a scraping and transporting shovel, a frame having a cross beam, a vertically movable and guided carrier mounted transversely on the frame and under the beam and to which the shovel is connected and is raised and lowered, a pneumatic engine mounted in the center of said beam for raising and lowering the carrier, and oscillating engine means mounted on the carrier for tilting the shovel after it has been elevated.

11. A wheeled scraper having, in combination, a frame, a plurality of vertically movable and guided carriers arranged transversely one behind the other on the frame, separate engines on said frame for independently raising and lowering the carriers with their shovels, and independent engines mounted on the carriers for tilting or elevating the shovels, and being independently operated.

12. A wheeled scraper having, in combination, a frame, a plurality of vertically movable and guided carriers arranged one upon the other on the frame, means for independently raising and lowering the carriers with their shovels, and means mounted on the carriers for tilting or elevating the shovels, and being independently operated, said means including oscillating pressure fluid devices.

13. A wheeled scraper having, in combination, a frame, a plurality of vertically movable and guided carriers arranged one upon the other on the frame, means for independently raising and lowering the carriers with their shovels, and separate motors mounted on the carriers for tilting or elevating the shovels, and being independently operated, the raising and lowering means including an individual fluid operated engine for each carrier.

In testimony whereof I have signed my name to this specification.

SPRUILLE A. WILSON.