April 28, 1925. 1,535,381

H. I. STAGE

SHOVELING MACHINE

Filed March 15, 1924 4 Sheets-Sheet 1

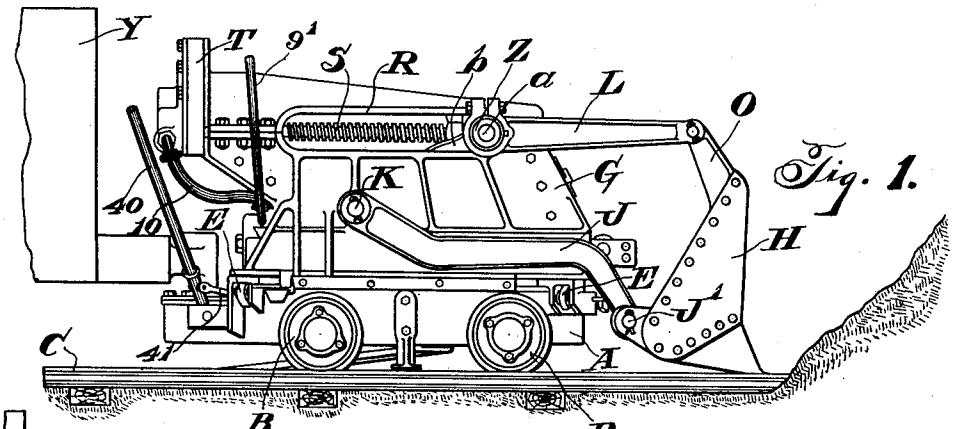


Fig. 1.

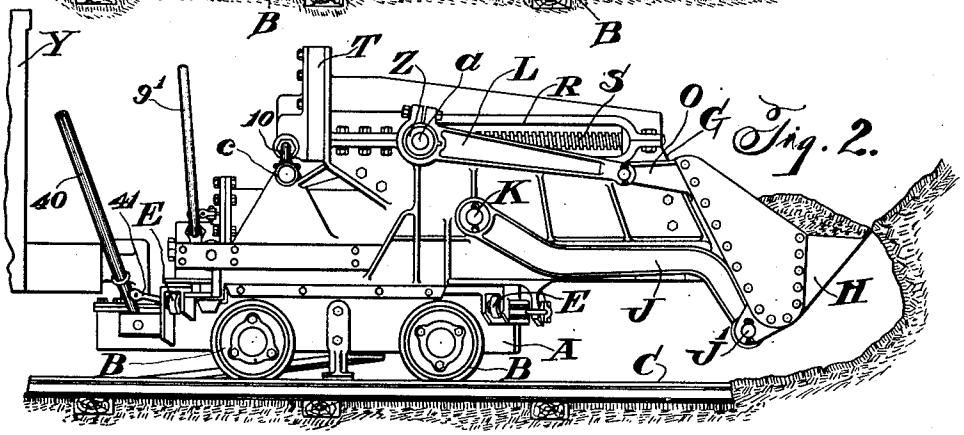


Fig. 2.

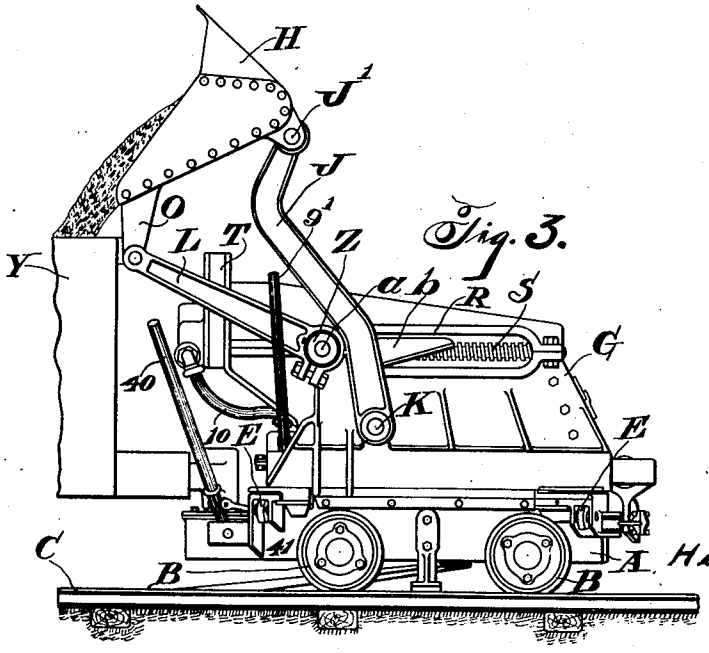


Fig. 3.

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H. I. STAGE

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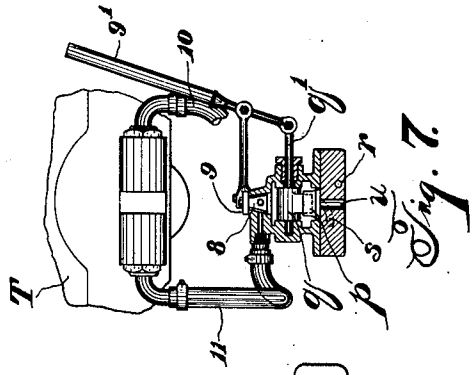


Fig. 7.

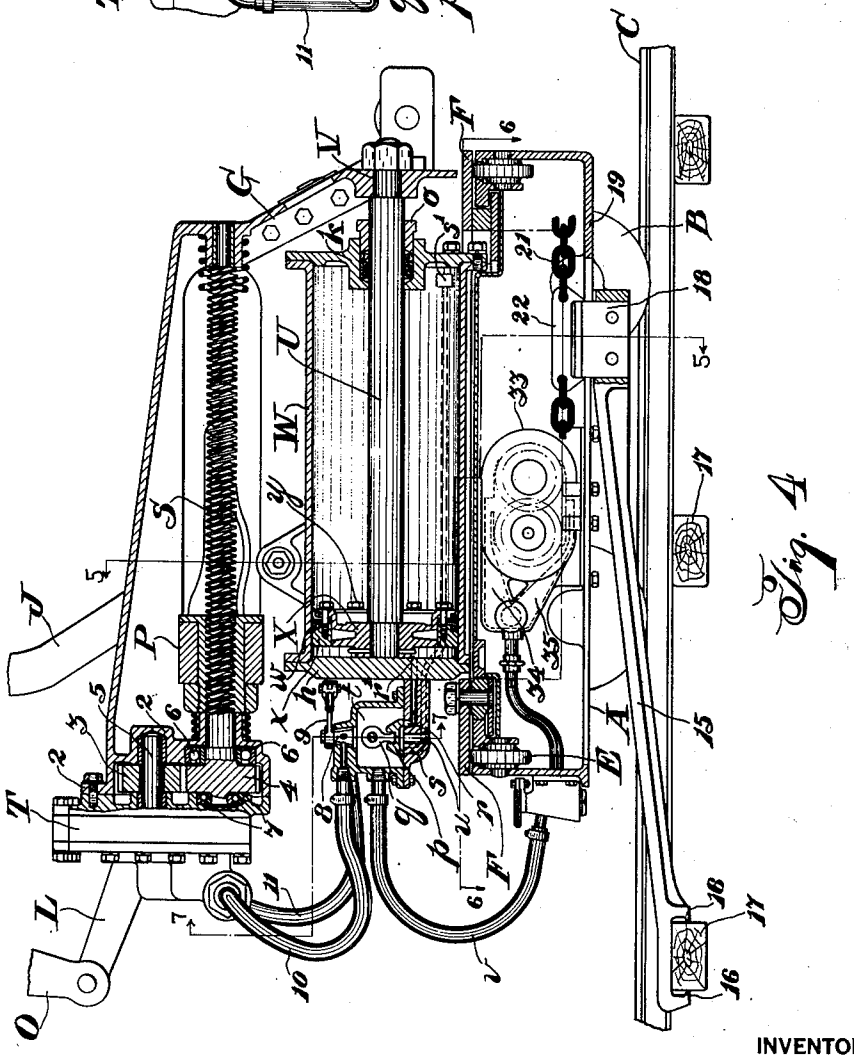


Fig. 4

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SHOVELING MACHINE

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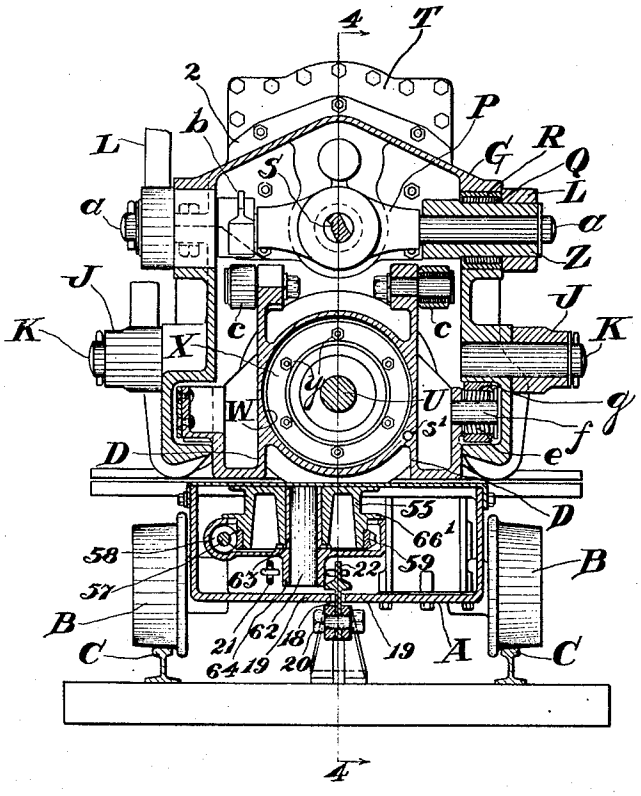


Fig. 5.

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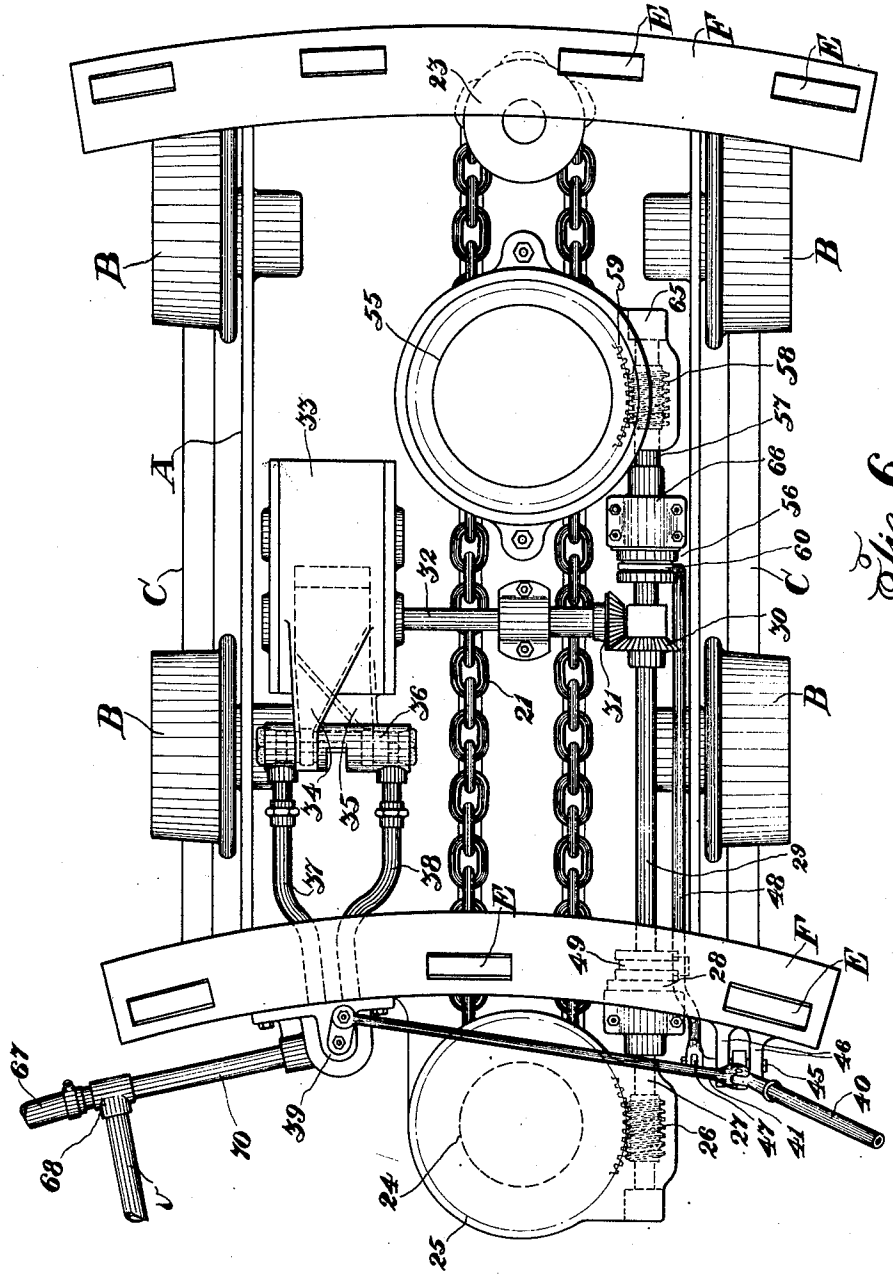


Fig. 6

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Patented Apr. 28, 1925. 1,535,381

UNITED STATES PATENT OFFICE.

HAROLD I. STAGE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHOVELING MACHINE.

Application filed March 15, 1924. Serial No. 699,392.

To all whom it may concern:

Be it known that I, HAROLD I. STAGE, a citizen of the United States, and a resident of San Francisco, county of San Francisco, State of California, have invented a certain Shoveling Machine, of which the following is a specification accompanied by drawings.

This invention relates to shoveling and loading apparatus and more particularly to that type of machine in which a scoop or shovel is operated through predetermined movements for digging and discharging, as for instance loading material forwardly of the machine and carrying it back over the top for dumping at the rear. The present invention is directed to machines particularly adapted for use in headers of mines where there is limited head room and relatively little clearance at the sides.

The object of the invention is to reduce the controls to as few as possible and to cause the shovel or scoop to move automatically through certain of its movements and functions. Another object of the invention is to enable a scoop to be moved mechanically through a cycle of operation in loading which is most effective to pick up material and carry it away with relatively little expenditure of power. In accomplishing these objects the scoop is forced into the pile of material to be removed without tilting before filling. Thereafter the scoop is tilted up to what may be termed a carrying position, after which the load is carried upward and over the machine to the rear for dumping. The apparatus is so arranged that the withdrawal of the scoop from the pile of material automatically causes the upward swinging motion before referred to, and therefore no additional control by the operator is necessary to cause the dumping of the scoop.

One form which the apparatus may assume in practice is shown in the accompanying drawings, in which

Figure 1 is a side elevation of the machine showing the scoop in position preparatory to being thrust forward into the pile of material to be removed;

Figure 2 is a side elevation of the machine showing the scoop thrust forward into the pile and tilted to its position convenient for carrying;

Figure 3 is a side elevation of the machine showing the scoop carried back over the machine and dumping material from the scoop into a suitable receptacle;

Figure 4 is a longitudinal vertical section through the machine on the line 4—4 of Figure 5 looking in the direction of the arrows and shows in detail the controlling mechanism and the actuating means for the scoop;

Figure 5 is a vertical cross section of the machine along the line 5—5 of Figure 4 looking in the direction of the arrows;

Figure 6 is a view of the machine showing more particularly the operator's controlling means and the means for propelling the machine, along the lines 6—6 of Figure 4 looking in the direction of the arrows, and

Figure 7 is a section along the line 7—7 of Figure 4 looking in the direction of the arrows and shows the interior of the controlling valve.

The machine shown in the drawings is adapted to be actuated by a motive fluid as for instance steam or compressed air supplied from a suitable source not shown. It is understood, however, that the machine may be adapted to be operated by other motive power, such as electricity, when the operating conditions warrant.

The machine is provided with a bed or truck A having wheels B so that it may be propelled along a suitable track C. A frame D mounted on the truck A is adjustable laterally by sliding it horizontally on anti-friction rollers E so as to direct the machine properly toward the material to be loaded. Segmental plate members F are attached to the frame and form a path for the rollers E. A carriage G is slidable forwardly and rearwardly on the frame D and

is adapted to move the scoop H forwardly and rearwardly with respect to the truck A. The scoop H is supported on the carriage G by a lower pair of arms J which are pivotally attached at K to the carriage and at their other ends to the base of the scoop H. An upper pair of arms L are adapted to hold the scoop in its desired position with respect to the arms J, and in conjunction with the latter arms form the main support for the scoop H. Accordingly, the upper arms L are pivotally attached to a rearward extension O on the scoop H and at a point sufficiently distant from the pivotal connection of the arms J to exert a force sufficient to tilt the scoop upwardly or force it downwardly as desired. At their rearward ends the arms L are mounted on a cross head P having sliding bearings Q in the guide way R in the carriage G.

Means are provided for tilting the scoop H before withdrawing it and to this end a screw S threading through the cross head P and actuated by a suitable fluid operated motor T draws the arms L back rotating the scoop H about the pivoted connection J' between the arms J and the scoop H. Thus when the motor T is actuated to rotate the screw S in a forward direction the cross head P is forced forward and the arms L attached thereto tilt the scoop downwardly. When the motor T is reversed the screw S draws the arms L back and tilts the scoop H upwardly into its load carrying position. The carriage G is reciprocated by means of a piston rod U bolted at V to the forward end of the carriage G and working in a cylinder W rigidly supported by the frame D. The piston rod U is provided with a piston X which is adapted to receive motive fluid pressure on either side, so that the carriage G may be forced both forwardly and backwardly. Since the lower arms J are mounted on the carriage G the forward motion of the carriage thrusts the scoop into the pile of material which is to be removed and upon withdrawal of the carriage the scoop is also withdrawn.

Normally the scoop will be held in the position as shown in Figure 1 preparatory to being loaded. In this position the cross head P has been moved to its forward limit by means of the screw S and the motor T, and the scoop H is tilted downwardly. When the motive fluid is introduced into the cylinder W behind the piston X the carriage thrusts the scoop forward into the pile of material. Thereafter the motor T is reversed and the screw S draws back the upper arms L to tilt the scoop, as shown in Figure 2. The scoop is now in a position for carrying the material to the point at which it is to be dumped.

Upon the withdrawal of the carriage G, means are brought into action to swing the scoop H from the position shown in Figure 2 upwardly and over the machine back to the position shown in Figure 3 where the material will drop from the scoop into a suitable car or other receptacle Y. To this end there is provided a pair of short hollow shafts Z upon which the arms L are bolted and keyed, and which are journalled on the gudgeons *a* of the cross head P, having a lever or cam *b* which, when the carriage is being withdrawn, are engaged by a stationary abutment such as the rollers *c* mounted on the frame D above the cylinder W. Thus, as the carriage G is withdrawn the arms *b* strike against the rollers *c* and cause the upper arms L to swing upwardly, lifting the scoop H over the machine with the gudgeons *a* and the pivots K as centers. The spacing of these centers causes a slight tilting to unload the scoop H on arriving at its dumping position at the rearward limit of its motion. After having been unloaded, the scoop may be returned to its original position as shown in Figure 1 by operating the motor T to force the cross head P forwardly, whereupon the pivoted end of the arms L bear against the arms J and force the latter forwardly, returning the scoop to its original position, partly by gravity.

The carriage G is adapted to reciprocate forwardly and backwardly on the frame D as above described, and in order to prevent undue friction a plurality of rollers *e* mounted on trunnions *f* extending from the frame roll in the grooves *g* formed in the sides of the carriage. Thus, when the carriage is projected forwardly it rolls on the rollers *e*. To keep the carriage from overturning when the loaded scoop H is being raised, the rollers *e* are arranged to bear against the top of the groove *g*.

The cylinder W is provided at its rearward end with a head *h* and at its forward end with a head *k* having a gland *o*. For admitting the motive fluid into the cylinder W there is provided a D-slide valve *p* operated by a lever *q* which is adapted to uncover a port *r* leading to a port *r'* in the rear end of the cylinder W, and a port *s* leading to a port *s'* in the forward end of the cylinder. The valve *p* is provided with a chest *t* and a central exhaust passage *u* to atmosphere, the valve chest being always in communication with the supply of motive fluid admitted through the pipe *v*. Thus when the valve *p* is moved to the right of the port *s* motive fluid is supplied through the port *s'* to the forward end of the cylinder W, forcing the piston X back and causing the carriage to return to its withdrawn position (Fig. 4.) When the throttle valve *p* is moved to the left, motive fluid is admitted through the ports *r* and *r'* to the rear end of the cylinder W and the pis-

ton X moves forward carrying the carriage G therewith. The piston X is provided with suitable cup leathers *w* held in place by a ring *x* bolted to the piston X by means of bolts *y* extending through the piston and threading into the ring *x*.

The motor T for rotating the screw S is preferably of the square or flat piston type, as indicated in Figure 4, and is bolted to a flange 2 on the carriage G. The flange 2 also forms a housing for the reduction gears 3 and 4 mounted on the drive shaft 5 and the end of the screw S, respectively. Suitable journals and thrust bearings may be provided for the screw S as indicated at 6 and 7. Motive fluid for driving the motor T is supplied from the valve chest *t* under the control of a throttle valve 8 adapted to be actuated by an arm 9. Two flexible tubes 10 and 11 lead from the valve 8 to the motor. One of these tubes is adapted to be used as the motive fluid supply and the other is for the motive fluid exhausted from the motor, depending upon the direction in which it is desired to operate the motor. The valve 8 is of the two-way type and is adapted to admit motive fluid from the valve chest *t* to one of the tubes 10 or 11 and simultaneously to connect the other tube to the exhaust.

Means are provided for advancing the truck A forward on the tracks C so as to bring the machine closer to the pile of material to be loaded, including a bar 15 having jaws 16 at one end to engage a suitable object such as a tie 17 upon which the track C is fastened, and at the other end having a sliding shoe 18 adapted to travel in a guide formed by the opposed edges of the plates 19 forming the body of the truck A (Figure 5). The shoe 18 is fastened to the end of the bar 15 by suitable means, such as bolts 20 and is movable longitudinally in its guide by means of a chain 21 attached at both ends to an upwardly extending plate 22 of the shoe 18, and passing around a forward idler pulley 23 on the truck A and a rearward driving pulley 24 also mounted on the truck A. The driving pulley 24 is formed integrally with a worm wheel 25 cooperating with a worm 26 on a shaft 27. A clutch 28 connects the shaft 27 with a driving shaft 29 associated by means of bevel gears 30 and 31 with a motor driven shaft 32 of a motor preferably of the gear type shown at 33 (Figure 6). Inlet and exhaust passages 34 and 35, respectively, for the motor 33 lead to a flexible joint 36 and thence through the pipes 37 and 38 respectively, to a throttle valve 39. A lever 40 pivotally mounted at the side of the loading machine for the convenience of the operator, is adapted to control the throttle valve 39 through a link 41. Preferably the throttle valve 39 is of a type adapted to reverse the supply of motive fluid to the motor 33 by alternatively admitting the fluid to the pipe 37 or the pipe 38, depending upon the direction in which it is desired to rotate the motor on the shaft 32. The lever 40 is mounted upon a shaft 45 journaled upon bosses 46 at the rear of the segments F so that when the lever 40 is pushed forwardly or rearwardly with respect to the truck A the shaft 45 is rotated. The shaft 45 is provided at its end with an arm 47 to which is pivotally connected a clutch rod 48 associated with the clutch collar 49 for engaging and disengaging the clutch 28. The arrangement of the operating mechanism for the clutch 28 is such that when the lever 40 is pushed forwardly the clutch 28 is disengaged, and when pressed in the opposite direction the clutch is engaged so as to connect the drive shaft 29 operatively with the shaft 27, whereby the driving pulley 24 causes the chain 21 to pull against the shoe 18, and the truck A is forced forwardly or rearwardly depending upon the direction of rotation of the motor 33, the rod 15 being anchored by means of its jaws 16 on the tie 17.

The operations of the clutch and the throttle valve 39 is independent, although controlled by the same lever 40, the throttle valve 39 being operated by pulling the lever 40 sidewise with respect to the truck A of the machine, and the clutch 28 being controlled by forward and rearward motions of the lever 40. Both the clutch 28 and the throttle 39 may, however, be operated simultaneously as will be evident, by proper simultaneous sidewise and forward or rearward motions of the lever 40.

The shaft 29 is also adapted to drive a winding drum 55 and to this end there is provided a second clutch 56 for connecting the shaft 29 to a shaft 57 upon which is mounted a worm 58 cooperating with a worm wheel 59 on the drum 55. The drum 55 may be used to draw the carriage G sidewise on the rollers E, suitable cables or ropes (not shown) being provided for this purpose. The clutch 56 is arranged to be engaged or disengaged by a yoke 60 on the end of the rod 48. The clutch 56 is engaged by forcing the lever 40 forward and disengaged by pulling it back. These motions of the lever 40 are the reverse of those required to engage and disengage the clutch 28. In other words, when the lever 40 is shoved forward the clutch 56 engages and the clutch 28 disengages; when pushed rearwardly the lever 40 engages the clutch 28 and disengages the clutch 56. At a central position of the lever 40 neither the clutch 28 nor the clutch 56 are engaged.

The details of the winding drum 55 are shown in Figure 5. A central bearing upon which the drum is adapted to rotate is provided by a vertical shaft 62 having a bush-

ing 63 of suitable material to form a journal. The drum is held on the shaft 62 by a casing 64 which houses the worm wheel 59 and also supports the shaft 57 and bearing 65. The other end of the shaft 57 is supported in the bearing 66 bolted to the underside of the frame of the truck A. The upper side of the casing 64 is enclosed by the flange 66′ of the drum 55.

Motive fluid for operating the motors T and 33 and the piston X is supplied from a main supply pipe 67 branching at a T 68 through a hose *v* to the valve chest *t* and through a pipe 70 to the throttle valve 39.

The machine is operated as follows: Assuming that the machine is initially in the position shown in Figure 1, the carriage G is pushed forwardly into the pile of material to be removed by admitting air to the cylinder W through the port *r′*. This is accomplished by pushing the lever 9′ forwardly to operate the slide valve *p*, admitting the motive fluid from the chest *t* through the ports *r* and *r′* into the cylinder W. The pressure of the motive fluid thrusts the piston X forwardly carrying the carriage G, and the scoop H drives into the pile of material to be loaded. When the edge of the scoop H has been thrust into the pile far enough to load the scoop, the latter is tilted by rotating the screw S drawing the arms L back, whereupon the scoop H is tipped up about its pivotal connection J′ on the arm J, as shown in Figure 2. As has been before described, motive fluid is admitted to the motor T which rotates the screw S by opening the throttle valve 8, which is accomplished by moving the lever 9′ sidewise (Figure 7).

With the scoop H in this position the carriage G is withdrawn by admitting motive fluid to the forward end of the cylinder W, this being accomplished by moving the lever 9′ rearwardly to rotate the rod *q′* carrying the lever *q* causing the slide valve *p* to uncover the ports. Motive fluid then passes from the valve chest *t* through the port *s* into the forward end of the cylinder W by way of the port *s′*. The pressure fluid behind the piston X is exhausted through the port *r′* in the rear of the cylinder W through the slide valve *p* and out to atmosphere through the port *u*.

As the carriage G is drawn back, the cam *b* is engaged by the stationary rollers *c* causing the arms L to be turned upwardly, swinging the scoop H upwardly and rearwardly over the carriage G to its dumping position, as shown in Figure 3. During the raising of the scoop H and while the latter is being carried back to the rearward position, the arms J maintain the scoop H generally upright to prevent the falling of material from the scoop until it has reached the end of its path. The pivotal connection K of the arms J is located so as to maintain this generally upright position of the scoop H.

After returning the scoop H to its original position in Figure 1, the screw S is again operated by the motor T by a suitable manipulation of the lever 9′ pushing forward the crosshead P. This causes the pivoted ends of the arms L to bear against the arms J, pushing the latter forward. Consequently the scoop H falls forward, dropping back to its starting position as in Figure 1.

When it is desired to move the truck A forward the lever 40 is manipulated sidewise, opening the throttle 39 to admit motive fluid to the motor 33 and approximately simultaneously the lever 40 is pulled back causing the clutch 28 to engage. Thereupon the driving pulley 24 operating upon the chain 21 pulls backwardly upon the rod 15 to force the truck A forward. Preferably the guide in which the shoe 18 works should be at least as long as the distance between two consecutive ties 17, so that after the machine has been stepped forward as far as possible, the jaws 16 of the rod 15 may be engaged with the next succeeding tie 17.

I claim:

1. A shoveling and loading machine comprising, in combination, a frame, a scoop, means for thrusting the scoop forward in a lineal, substantially horizontal direction, means for withdrawing the scoop in a swinging direction over and to the rear of the frame and means independently controllable for tilting the scoop before withdrawal.

2. A shoveling and loading machine, comprising, in combination, a frame, a scoop, means for thrusting the scoop forward in a lineal, substantially, horizontal direction, means for withdrawing the scoop in a swinging direction over and to the rear of the frame and means controllable independently of the withdrawing and thrusting means for tilting the scoop before withdrawal.

3. A shoveling and loading machine comprising, in combination, a scoop, a pair of arms pivotally supporting said scoop, means to move said arms to tilt said scoop and means independent of said tilting means for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

4. A shoveling and loading machine comprising, in combination, a scoop, a pair of pivoted arms pivotally supporting said scoop, means to move said arms relative to each other and means independent of said tilting means for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

5. A shoveling and loading machine comprising, in combination, a scoop, a pair of

pivoted arms pivotally supporting said scoop, means including a feed screw to move said arms to tilt said scoop and means for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

6. A shoveling and loading machine comprising, in combination, a scoop, a pair of pivoted arms pivotally supporting said scoop, means including a feed screw to move said arms relative to each other to tilt said scoop and means for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

7. A shoveling and loading machine comprising in combination, a scoop, a pair of pivoted arms pivotally supporting said scoop, means including a motor driven feed screw to move said arms to tilt said scoop and means for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

8. A shoveling and loading machine comprising in combination, a scoop, a pair of pivoted arms pivotally supporting said scoop, means including a motor driven feed screw to move said arms relative to each other to tilt said scoop and means for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

9. A shoveling and loading machine comprising, in combination, a scoop, a pair of pivoted arms pivotally supporting said scoop, means including a feed screw to move said arms relative to each other to tilt said scoop and a cam for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

10. A shoveling and loading machine comprising, in combination, a scoop, a pair of pivoted arms, pivotally supporting said scoop, means including a motor driven feed screw to move said arms relative to each other to tilt said scoop and means including a cam for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

11. A shoveling and loading machine comprising, in combination, a scoop, a pair of pivoted arms pivotally supporting said scoop, means to move said arms relative to each other to tilt said scoop and means including a carriage supporting said arms and a cam for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

12. A shoveling and loading machine comprising, in combination, a frame, a carriage slidably mounted on said frame, a scoop, a pair of pivoted arms pivotally supporting said scoop and mounted on said carriage, means to move said arms relative to each other to tilt said scoop, a stationary abutment and a cam on one of said arms cooperative with said abutment to swing said scoop vertically and rearwardly to dumping position.

13. A shoveling and loading machine comprising, in combination, a frame, a carriage slidably mounted on said frame, a scoop, a pair of arms pivoted on said carriage and pivotally supporting said scoop, means including a feed screw to move said arms relative to each other to tilt said scoop, a stationary abutment on said frame and a cam on one of said arms cooperative with said abutment for actuating one of said arms to swing said scoop vertically and rearwardly to dumping position.

14. A shoveling and loading machine comprising, in combination, a frame, a carriage slidably mounted on said frame, a scoop, a pair of arms mounted on said carriage and pivotally supporting said scoop, a feed screw on said carriage to move one of said arms to tilt said scoop, a stationary abutment on said frame, a cam on one of said arms and cooperative with said abutment upon withdrawal of said carriage on said frame for actuating said arms to swing said scoop vertically and rearwardly to dumping position.

15. A shoveling and loading machine comprising, in combination, a scoop, two sets of arms constituting the main support for said scoop, means to move one of said sets of arms with respect to the other set to tilt the scoop and means independent of said tilting means for actuating one of said sets of arms to swing said scoop upwardly and rearwardly to dumping position.

16. A shoveling and loading machine comprising, in combination, a scoop, a pair of lower arms constituting the main support for said scoop, an upper pair of arms, means to move said upper pair of arms with respect to said lower arms to tilt the scoop without raising it and means independent of said tilting means for actuating said pair of arms to swing said scoop upwardly and rearwardly to dumping position.

17. A shoveling and loading machine comprising, in combination, a, scoop, a pair of lower arms constituting the main support for said scoop, an upper pair of arms, means including a screw and a cross head to move said upper arms with respect to said lower arms to tilt the scoop without raising it and means independent of said tilting means for actuating the upper arms to swing said scoop upwardly and rearwardly to dumping position.

18. A shoveling and loading machine comprising, in combination, a scoop, a pair of lower arms constituting the main support for the scoop, an upper pair of arms, means including a screw and a cross head to move said upper arms with respect to said lower arms to tilt the scoop without raising it and

means including an abutment and a cam on one of said upper arms engageable by said abutment for actuating said upper arms to move said scoop upwardly and rearwardly to dumping position.

19. A shoveling and loading machine comprising, in combination, a truck, a frame laterally adjustable on said truck, a carriage movable forwardly and rearwardly on said frame, a scoop, arms mounted on said carriage to support said scoop and means to actuate said scoop upwardly and rearwardly to dumping position.

20. A shoveling and loading machine comprising, in combination, a truck, a frame laterally adjustable on said truck, a carriage movable forwardly and rearwardly on said frame, a scoop, arms mounted on said carriage to support said scoop and means including a screw to actuate said arms to tilt said scoop and a cam on one end of said arms to swing said scoop upwardly and rearwardly to dumping position.

21. A shoveling and loading machine comprising, in combination, a truck, a frame laterally adjustable on said truck, a carriage movable forwardly and rearwardly on said frame, a scoop, arms pivotally mounted on said carriage to support said scoop, means including a motor operated screw to actuate said arms to tilt said scoop and means including an abutment on said frame and a cam on one of said arms cooperative with said abutment to swing said scoop upwardly and rearwardly to dumping position.

22. A shoveling and loading machine comprising, in combination a wheeled truck, a frame laterally adjustable on said truck, a carriage movable forwardly and rearwardly on said frame, a scoop, arms pivotally mounted on said carriage to support said scoop, means including a motor operated screw to actuate said arms to tilt said scoop and means including an abutment on said frame and a cam on one of said arms to swing said scoop upwardly and rearwardly to dumping position.

23. A shoveling and loading machine comprising, in combination, a carriage, a cylinder and piston for moving said carriage forwardly and rearwardly on said frame, a scoop, arms pivotally mounted on said carriage supporting said scoop, means including a screw for moving said arms relative to each other to tilt said scoop and means to swing said scoop upwardly and rearwardly to dumping position.

24. A shoveling and loading machine comprising, in combination, a frame, a carriage on said frame, a cylinder and piston for moving said carriage forwardly and rearwardly on said frame, a scoop, a pair of arms pivotally mounted on said carriage and supporting said scoop, means including a feed screw for moving said arms relative to each other for tilting said scoop, a stationary abutment on said frame and a cam on one end of one of said arms cooperative with said abutment upon withdrawal of said carriage to swing said scoop upwardly and rearwardly to dumping position.

25. A shoveling and loading machine comprising, in combination, a truck, a frame laterally adjustable on said truck, a carriage, a cylinder and piston for moving said carriage forwardly and rearwardly on said frame, a scoop, arms pivotally mounted on said carriage for supporting said scoop, a motor driven feed screw associated with one of said arms to tilt said scoop, an abutment on said frame and a cam on one end of said arms cooperative with said abutment upon withdrawal of said carriage to swing said scoop upwardly and rearwardly to dumping position.

26. A shoveling and loading machine comprising, in combination, a frame, a carriage, a cylinder and piston for moving said carriage forwardly and rearwardly on said frame, a scoop, a pair of arms pivotally mounted on said carriage and supporting said scoop, a feed screw on said carriage and a cross head associated with one of said arms slidably mounted on said carriage for withdrawing one of said arms to tilt said scoop.

27. A shoveling and loading machine comprising, in combination, a frame, a carriage, a cylinder and piston for moving said carriage forwardly and backwardly to said frame, a scoop, a pair of arms pivotally mounted on said carriage for supporting said scoop, a motor driven screw on said carriage, a cross head for said screw associated with one of said arms and slidable in said carriage for tilting said scoop, an abutment on said frame and a cam on one of said arms cooperative with said abutment to swing said scoop upwardly and rearwardly to dumping position.

28. A shoveling and loading machine comprising, in combination, a truck, rollers on said truck, a frame having segmental members cooperative with said rollers for laterally adjusting said frame on said truck, a carriage mounted on said frame, a piston and cylinder for moving said carriage forwardly and rearwardly on said frame, a scoop, arms pivotally mounted on said carriage and supporting said scoop, means for moving said arms relative to each other to tilt said scoop and means to swing said scoop upwardly and rearwardly to dumping position.

29. A shoveling and loading machine comprising, in combination, a truck, rollers mounted on said truck, a frame, segmental members on said frame cooperative with said rollers to adjust said frame laterally with respect to said truck, a carriage on said frame, a cylinder and piston for moving said

carriage forwardly and rearwardly on said frame, a scoop, arms pivotally mounted on said carriage to support said scoop, a motor driven screw for moving said arms with respect to each other to tilt said scoop and means for swinging said scoop upwardly and rearwardly to dumping position.

30. A shoveling and loading machine comprising, in combination, a truck, rollers on said truck, a frame, segmental members on said frame cooperative with said rollers to adjust said frame laterally with respect to said truck, a carriage on said frame, a cylinder and piston to move said carriage forwardly and rearwardly on said frame, a scoop, a pair of arms pivotally mounted on said carriage to support said scoop, means to tilt said scoop, a stationary abutment on said frame, and a cam on one of said arms cooperative with said abutment upon withdrawal of said carriage to swing said screw upwardly and rearwardly to dumping position.

31. A shoveling and loading machine comprising, in combination, a truck, rollers on said truck, a frame, segmental members on said frame cooperative with said rollers for laterally adjusting said frame with respect to said truck, a carriage on said frame, a cylinder and piston for moving said carriage forwardly and rearwardly on said frame, a scoop, a pair of arms pivotally mounted on said carriage to support said scoop, a motor driven screw associated with one of said arms to tilt said scoop, a stationary abutment on said frame and a cam on one of said arms cooperative with said abutment to swing said scoop upwardly and rearwardly to dumping position.

32. A shoveling and loading machine comprising, in combination, a frame, a carriage mounted on said frame, a cylinder and piston for reciprocating said carriage on said frame, a scoop, levers pivotally mounted on said carriage to support said scoop, a motor, a screw operated device actuated by said motor to move said arms with respect to each other for tilting said scoop, a throttle valve for said motor, a second valve for said cylinder and a single lever to independently control said throttle valve and said second valve.

33. A shoveling and loading machine comprising, in combination, a frame, a carriage, a cylinder and piston for reciprocating said carriage on said frame, a scoop, a pair of arms pivotally mounted on said frame for supporting said scoop, a motor, a screw operated by said motor for moving said levers with respect to each other to tilt said scoop, a throttle valve for said cylinder, a stationary abutment on said frame, a cam on one of said arms cooperative with said abutment upon withdrawal of said carriage to swing said scoop upwardly and rearwardly to dumping position and a single lever adapted to selectively control said throttle valve and said second valve.

34. A shoveling and loading machine comprising a truck adapted to be mounted on rails supported by ties, means for advancing said truck along said rails including a bar having jaws at one end to engage said ties, a chain attached to the other end of said rod and a driving pulley for said chain, a winding drum, a source of power for said driving pulley and said winding drum, clutches to associate said source of power with said driving pulley and said winding drum, a throttle valve for said source of power, a lever selectively engaging said clutches and independently controlling said throttle valve, a frame laterally adjustable on said truck, a carriage, a cylinder and piston for reciprocating said carriage on said frame, a controlling valve for said cylinder, a scoop, a pair of arms pivotally mounted on said carriage and supporting said scoop, a motor, a screw operated by said motor for moving said arms relative to each other to tilt said scoop, a throttle valve for said motor, a stationary abutment on said frame, a cam on one of said arms cooperative with said abutment on withdrawal of said carriage to swing said scoop upwardly and rearwardly to dumping position and a lever to control said motor throttle valve and said cylinder controlling valve independently.

In testimony whereof I have signed this specification.

HAROLD I. STAGE.