

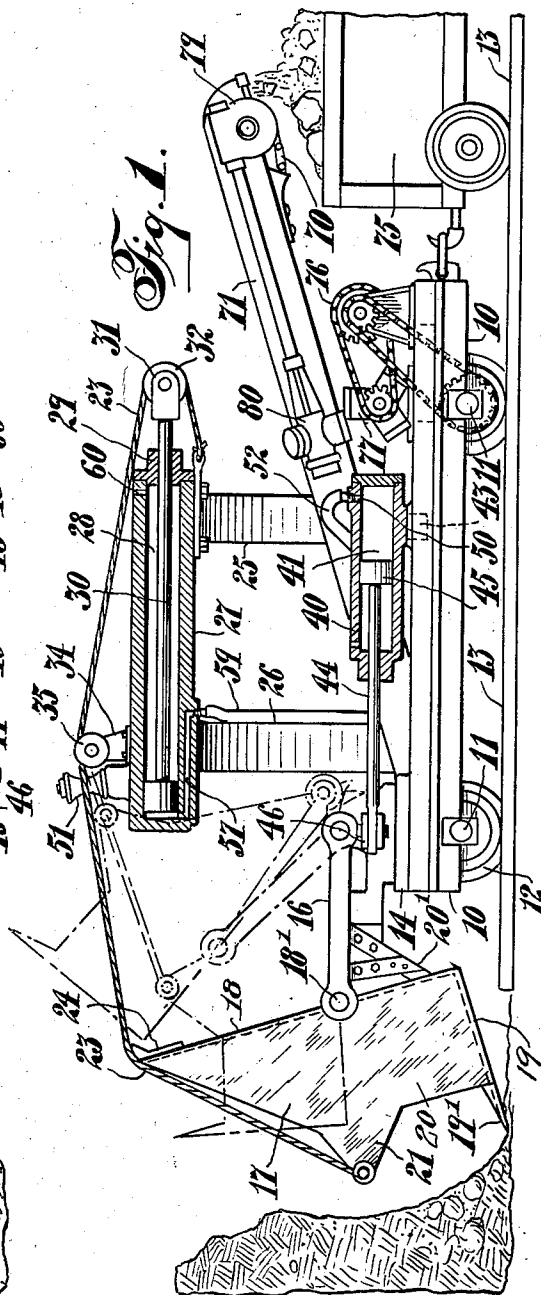
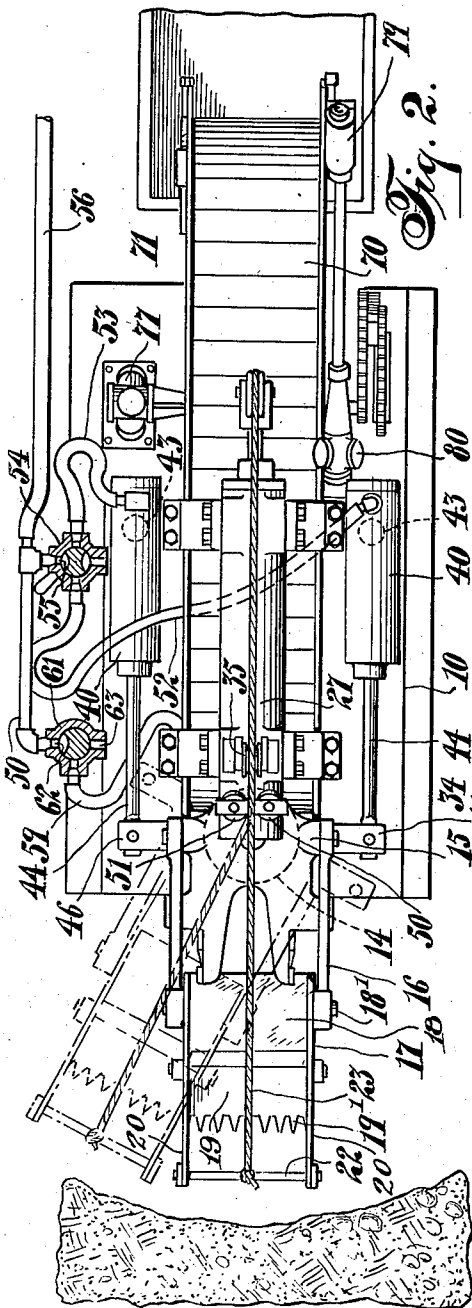
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C. C. HANSEN

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EXCAVATING MACHINE

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INVENTOR.

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UNITED STATES PATENT OFFICE

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EXCAVATING MACHINE

Application filed August 8, 1928. Serial No. 298,266.

This invention relates to excavating machines for removing and conveying material such as ore, coal, dirt and the like. The invention in its present aspect contemplates a machine that utilizes its own directional movement for loosening and removing the material to be conveyed.

This being the principal object of the invention, another object is to provide a machine having a scoop and an endless conveyor, means being provided for delivering material directly from the scoop onto the conveyor.

A third object of the invention is to provide a scoop mounted on a fifth wheel to enable the same to operate on material on either side of the path of the carriage.

Another object of the invention is to construct a shoveling and loading machine particularly adapted for use in mine rooms and tunnels where the ceilings are low and the head room necessarily limited.

With these and many other objects in view, which will more readily become apparent as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts to be more fully described, illustrated and claimed.

In the accompanying one sheet of drawings, forming part of this specification, like characters of reference are employed in all the separate views to designate like characters throughout, and;

Figure 1 is a side view partly in section of a machine constructed in accordance with the invention showing the same in actual use.

Figure 2 is a top plan view of the device showing the scoop in a plurality of positions.

The device includes in its general organization a carriage or main frame 10 supported on axles 11 carrying flanged wheels 12 supported on rails 13.

A fifth wheel 14 is mounted on the forward end of the frame. The fifth wheel is in the form of a casting having opposed laterally

extending trunnions 15 to which are pivoted a pair of links 16 that function as booms to support a scoop 17.

The scoop 17 has a pair of walls 18 and 19 which cooperate to form the heel of the scoop and which in the loading position of the scoop comprise the back and bottom respectively of the scoop. A pair of side walls 20 complete the structure of the scoop which as shown is open at its front to permit filling of the scoop and is also open at the end opposite the bottom 19 to permit discharge of the contents thereof. On each side 20, preferably adjacent the back 18 are lateral trunnions 18' which are adapted to extend through eye holes in the ends of the links 16, and thus serve as bearings for the scoop. The bearings are preferably spaced from the open end of the scoop at a distance somewhat greater than the length of the links so that the discharge end of the scoop may extend a considerable distance over the forward end of the carriage when the scoop is tilted to the requisite angle for dumping. Dipper teeth 19' are located at the forward end of the bottom wall 19 and a stop 20' may be provided on the fifth wheel 14 to limit downward movement of the scoop.

The sides 20 of the scoop are provided along their forward edge at a point preferably intermediate the ends of the scoop with angular protuberances 21 having aligned apertures formed therein through which there extends a bar 22 to which a hoisting cable 23 is attached. This cable passes over one end of the scoop and a bracket 24 secured to the under side of the scoop guides the cable and prevents damage to the same.

The main frame 10 of the carriage has a pair of standards 25 and a second pair of standards 26 mounted thereon. These standards support between them a cylinder casting 27 in elevated position longitudinally of the carriage. The casting 27 has a cylinder 28 therein, which is closed at one end and a suit-

able bushing 29 is mounted in the other end of the cylinder to slidably return a plunger 30 in position. The outer end of the plunger has a yoke 31 thereon and a pulley 32 is suspended in the yoke for guiding the cable 23. A stationary bracket 34 is mounted on the cylinder casting 27 and this bracket carries a pulley 35 for guiding the cable 23. Rollers 50 and 51 are mounted in front of the bracket 34 for aiding in retaining the cable 23.

A pair of cylinder castings 40 having cylinders 41 therein are pivoted at 43 to the carriage frame and plungers 44 having pistons 45 thereon are slidable in the cylinder. The outer ends of these plungers are connected to arms 46 on the fifth wheel 14, and by means of this combination of elements the scoop is caused to deviate from the axis of carriage.

The cylinders 41 each have inlet ports 50 that communicate through air lines 52 and 53 to a valve 54 and this valve has an inlet 55 from the main air line 56.

The cylinder 28 has an inlet port 57 which port communicates through an air line 59 to a valve 61 having an inlet 62 from the main air line 56 and an outlet port 63. A bleeder port 60 is formed in the cylinder casting 27.

An endless conveyor 70 is mounted on the carriage in a frame 71 in the manner shown and this conveyor leads from a point rearwardly of the scoop to an elevated point rearwardly of the carriage to enable material to be loaded on the mine car 75.

The carriage is driven through a chain and sprocket mechanism 76 operatively connected to a motor 77. Similarly the conveyor 70 is driven by a worm and gear mechanism 79 operated by a motor 80 on the conveyor frame 71.

In actual operation the carriage is brought to the foot of the excavation and the valve 61 is opened to permit air in the cylinder 28 to escape through the port 63. This operation permits the plunger 30 to be drawn into the cylinder 28 to lower the scoop to its operative position. The motor 77 is then started to advance the carriage and directional movement of the same serves to load the scoop. When the scoop is fully loaded, the valve 61 is again operated to admit air to the working side of the plunger 30. As the plunger is forced outwardly of the cylinder the scoop is tilted and the material therein is deposited directly on the conveyor 70 and carried to the mine car 75.

The invention having been described, it is to be understood that various modifications are contemplated without departing from the spirit of the invention and without sacrificing any of the advantages. For example, I contemplate employing electrical means for operating the device instead of compressed air, if desired. Only in so far as I have particularly pointed out my invention in the appended claims do I desire to be limited.

I claim:

1. In a shoveling and loading machine, the combination of a carriage, a fifth wheel mounted on the carriage for oscillation about a vertical axis, a conveyer, a scoop, a link pivotally connecting the scoop to the fifth wheel and adapted to translate oscillation of the fifth wheel into sidewise movement of the scoop, said scoop being adapted to deliver its contents onto the conveyer, a cylinder pivotally supported on the carriage for oscillation about a vertical axis and having a piston and piston rod, said piston rod being directly connected to the fifth wheel to effect the oscillation thereof.

2. In a shoveling and loading machine, the combination of a carriage, a fifth wheel mounted on the carriage for oscillation about a vertical axis, a conveyer, a scoop, a link pivotally connecting the scoop to the fifth wheel and adapted to translate oscillation of the fifth wheel into sidewise movement of the scoop, said scoop being adapted to deliver its contents onto the conveyer, a pair of cylinders pivotally supported on the carriage for oscillation about vertical axes and having pistons and piston rods, said piston rods being directly connected to the fifth wheel at opposite sides thereof to effect the oscillation of said fifth wheel.

3. In a shoveling and loading machine, the combination of a carriage, a fifth wheel mounted on the carriage for oscillation about a vertical axis, a conveyer, a scoop, a link pivotally connecting the scoop to the fifth wheel and adapted to translate oscillation of the fifth wheel into sidewise movement of the scoop, said scoop being adapted to deliver its contents onto the conveyer, a pair of cylinders pivotally supported on the carriage for oscillation about vertical axes and having pistons and piston rods, said piston rods being directly connected to the fifth wheel at opposite sides thereof, each piston rod having a single working stroke and being adapted to effect the oscillation of the fifth wheel in a direction contrary to the direction of oscillation of said fifth wheel which is effected by the other piston rod, and a valve for selectively admitting pressure fluid to one or the other of the cylinders to actuate the respective piston rod of the cylinder.

4. In a shoveling and loading machine, the combination of a carriage, a conveyer, a link pivotally supported on the carriage adjacent the receiving end of the conveyer for swinging movement in a vertical plane, a scoop having a front digger element and an open end for the discharge of the contents of the scoop, fixed bearings on the scoop for pivotally mounting the scoop on the end of the link, said bearings being located at the back of the scoop at a point sufficiently spaced from the discharge end of the scoop to permit the discharge of the contents of the scoop directly

onto the conveyer as the scoop is tilted to the requisite angle, a haulage mechanism supported on the carriage above the conveyer, a cable attached at one end to the front of the scoop at a point intermediate the ends of the scoop and at its other end to the haulage mechanism, said cable being entrained over the discharge end of the scoop during the loading thereof.

10 In testimony whereof I have signed this specification.

CHARLES C. HANSEN.

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