

1,382,001.

Patented June 21, 1921.

3 SHEETS—SHEET 1.

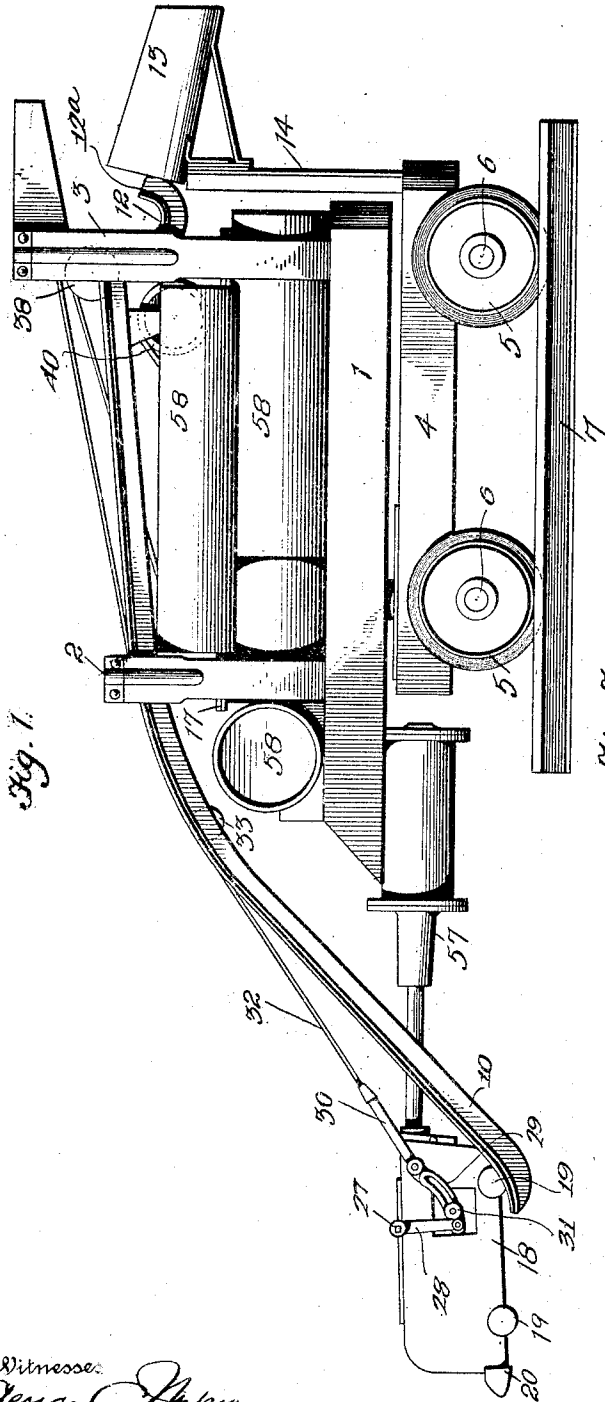


Fig. 1.

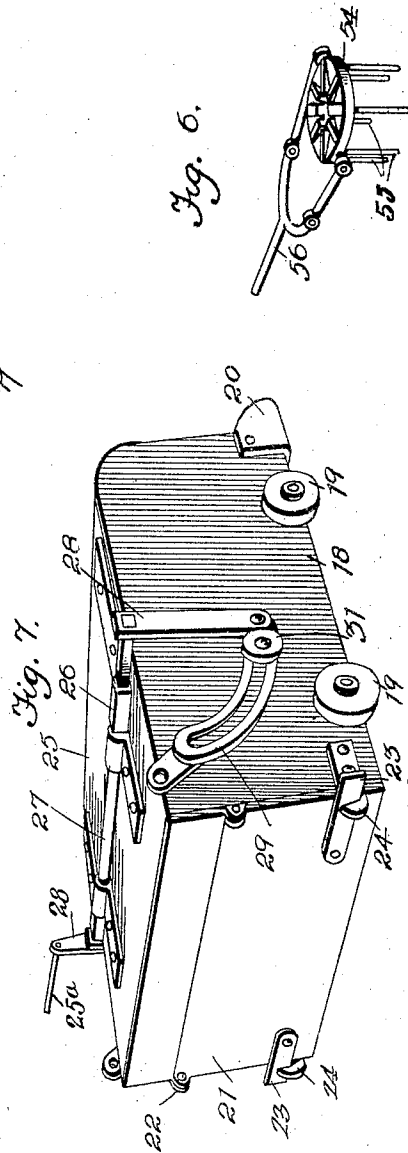


Fig. 6.

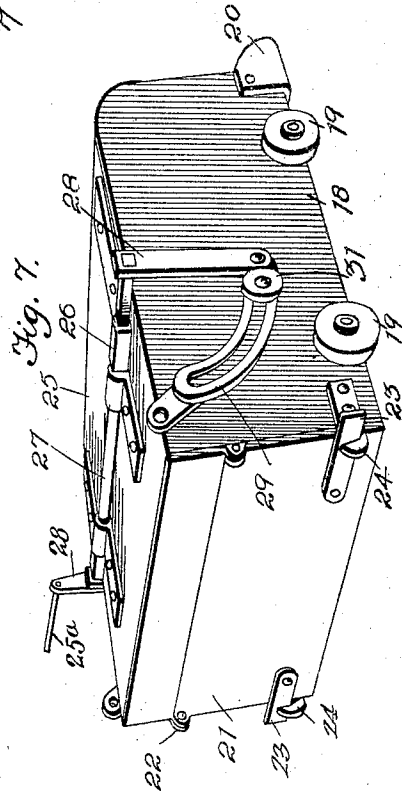


Fig. 7.

Witnesses:
George A. Myers.

Inventor
S. J. Kruly
Munn & Co.
Attorney

S. J. KRULY.
SHOVELING MACHINE.
APPLICATION FILED NOV. 17, 1917.

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3 SHEETS—SHEET 2.

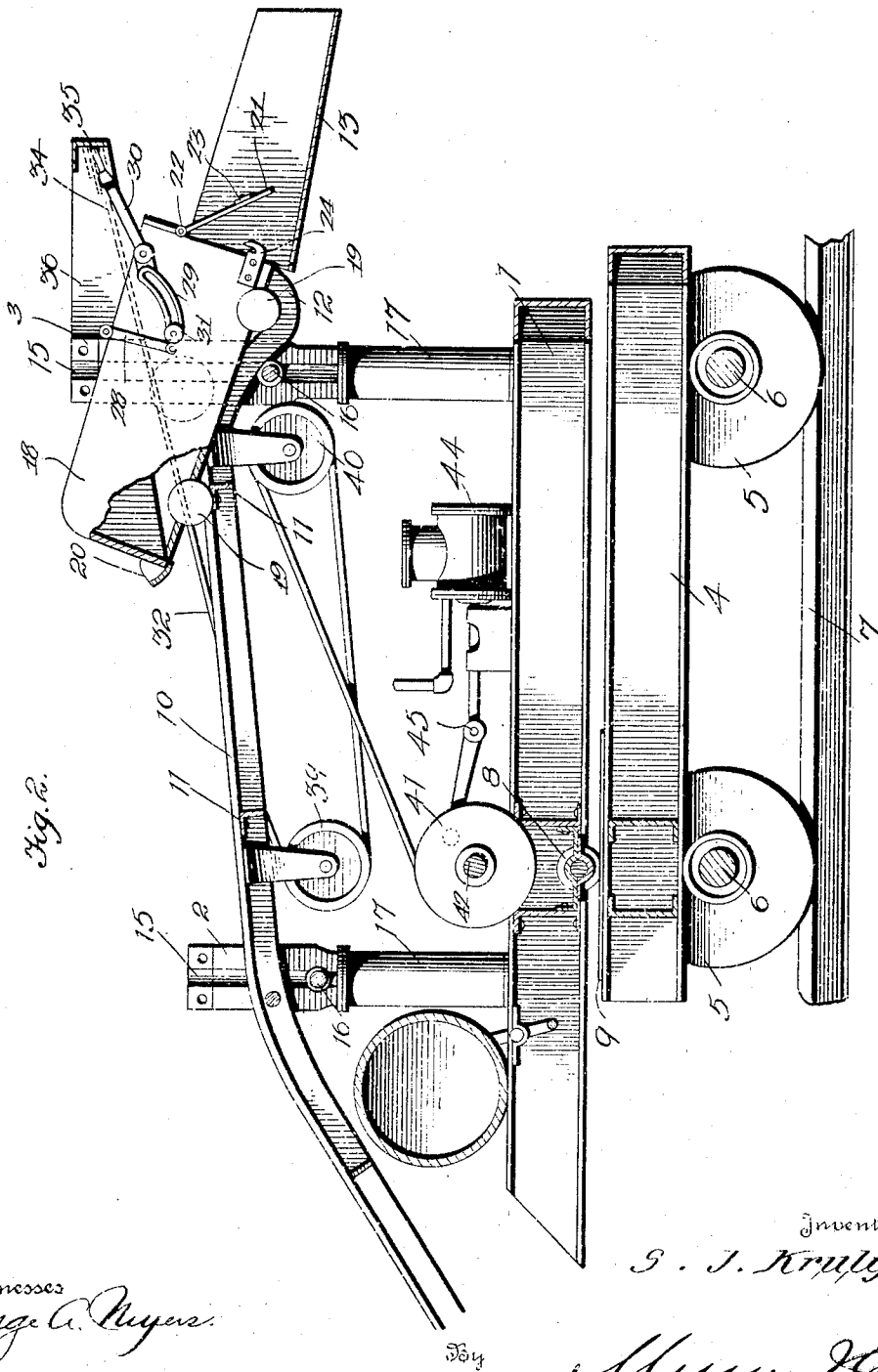


Fig. 2.

Witnesses
George A. Myers.

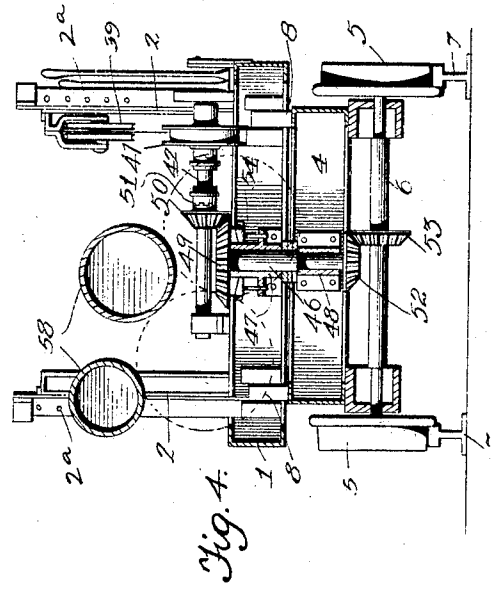
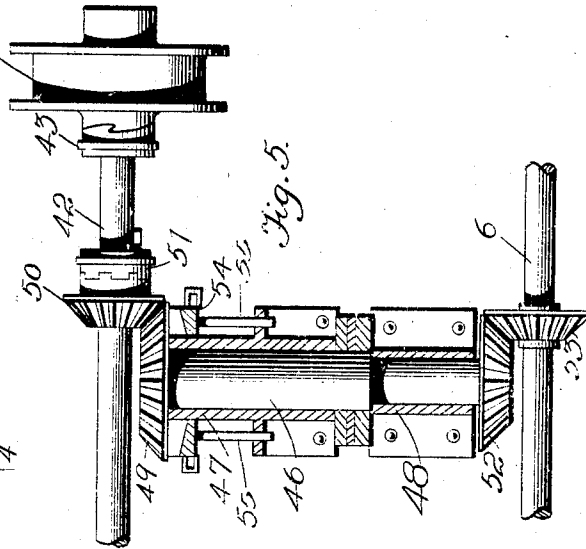
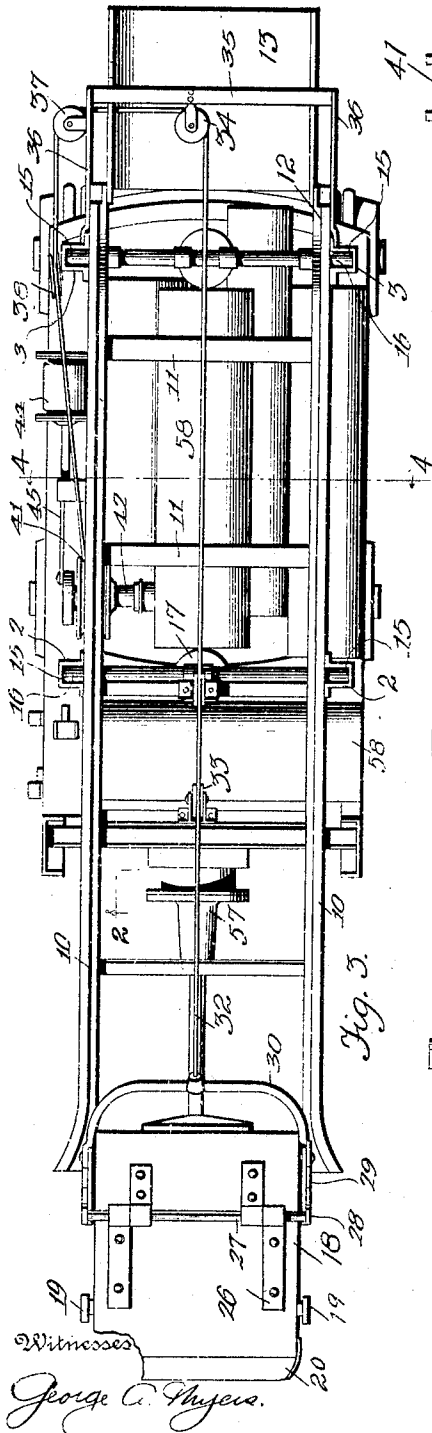
By

Inventor
S. J. Kruly
Mum Ho,
Attorney

1,382,001.

Patented June 21, 1921.

3 SHEETS—SHEET 3.



Inventor
S. J. Kruly

Munn & Co.
Attorney

UNITED STATES PATENT OFFICE.

SPASOJE JOSEPH KRULY, OF MIAMI, ARIZONA.

SHOVELING-MACHINE.

1,382,001.

Specification of Letters Patent. Patented June 21, 1921.

Application filed November 17, 1917. Serial No. 202,476.

To all whom it may concern:

Be it known that I, SPASOJE JOSEPH KRULY, a citizen of the United States, and a resident of Miami, in the county of Gila and State of Arizona, have invented certain new and useful Improvements in Shoveling-Machines, of which the following is a specification.

My invention is an improvement in shoveling machines, and has for its object to provide mechanism of the character specified for shoveling ore, dirt and the like, wherein a supporting platform is provided, having an inclined track on which the shovel runs, the car carrying a ram for loading the shovel, and power operated means for raising the shovel, the platform being mounted on a car and adjustable with respect to the car, and the operating means for the shovel being connected to the platform and to the car to control the movement of the platform and of the car.

In the drawings:

Figure 1 is a side view of the improved machine;

Fig. 2 is an enlarged longitudinal section;

Fig. 3 is a top plan view;

Fig. 4 is a section on the line 4-4 of Fig. 3, looking in the direction of the arrows adjacent the line;

Fig. 5 is an enlarged detail sectional view of a portion of Fig. 4;

Fig. 6 is a perspective view of a portion of the clutch shown in Figs. 4 and 5;

Fig. 7 is a perspective view of the shovel or dipper.

In the present embodiment of the invention a table or platform 1 is provided, which is provided with pairs of uprights or standards 2 and 3 near its ends, and the table is mounted on the body 4 of a car, which is provided with wheels 5 mounted on axles 6 and adapted to engage a track 7 upon which the car runs.

It will be noticed that the table extends beyond the front of the car, and rollers 8 are journaled on the table, and the said rollers run upon arch shaped tracks 9 on the car body. The pairs of standards 2 and 3 support rails 10, the said rails being connected together in spaced relation by cross

bars 11 to form a track upon which the shovel or dipper, to be described, runs. These rails dip down at the forward end of the car, as shown in Fig. 1, to the level of the rails in order that the dipper may be filled at this point and run to dumping position at the uprights 3.

At their rear ends the rails have downwardly curved dips or extensions 12, and these extensions are adapted to receive the rear wheels of the bucket to tilt the same in order to discharge the load. A chute 13 is supported by standards 14 at the rear of the car, and into this chute the material is dumped by the bucket or dipper.

Referring to Figs. 1 and 2, it will be noticed that each standard 2 and 3 has a vertical groove 15 on its inner face, and the grooves of each pair of standards are engaged by the ends of rollers 16, the rollers supporting the track. These rollers are connected to the pistons of cylinders 17, arranged between the standards, and it will be evident that by means of the cylinders the track may be raised or lowered. Openings 18 are provided in the walls of the grooves 15 for receiving pins to hold the rollers in adjusted position, with the ends of the rollers resting on the pins.

The improved bucket or dipper 18 is of substantially rectangular cross section, having wheels 19 at its bottom which run upon the rails, and the bucket or dipper has a cutting shoe 20 at its open front. The rear of the dipper is closed by a door 21 which is hinged at 22 to the dipper, and this door is held closed by latch plates 23 pivoted to the door and engaging catches 24 on the body of the dipper. The front and the top of the bucket are closed by a door or gate 25 which has bearings 26 squared in cross section for engaging similarly shaped portions of a shaft 27 journaled on the top. This door or gate 25 extends from its hinge connection to the cutting shoe 20, as indicated in Fig. 2. This shaft has a depending arm 28 at each end, and these arms are pivoted to link 29 to which the bail 30 of the bucket is connected. When the bucket or dipper is drawn by the bail rearwardly, it will be evident that the pull on the bail will close the door 25 and hold it tightly closed. The links 29

are slotted and the slot of each link is engaged by a headed pin 31 on the dipper body. When the loaded dipper is drawn up the rails, the headed pins 31 bear the strain, the said pins engaging the forward ends of the slots in the links 29 when the cover is closed.

A cable 32 has one end connected with the bail, and this cable passes rearwardly over a pulley 33 held between the rails 2 and around a pulley 34 journaled on the cross bar 35 supported by the standards 3 and spaced rearwardly therefrom by holding plates 36. From the pulley 34 the cable passes outwardly around a pulley 37 journaled on one of the plates 36 and then forwardly over a pulley 38 on the adjacent standard. The cable passes forwardly from this pulley 38 over a pulley 39, and then passes rearwardly over a pulley 40 near the rear standards to a reel 41 upon which it winds, the said reel being supported by the table.

The reel is journaled on a shaft 42, and may be connected to the shaft by means of a clutch 43. The reel is driven by a fluid controlled motor 44, the piston of the motor being connected to the reel, as indicated at 45, and it will be evident that when the motor is in operation the reel will be rotated to wind up the cable. The weight of the dipper will unwind the cable from the reel when the dipper descends. The shaft 42 is connected with the front wheels of the car, and with the car and table in such manner that it may shift the car on the track and the table on the car.

A shaft 46 is journaled vertically in bearings 47 and 48 in the table and car, respectively, and the upper end of the shaft has a bevel gear 49 which meshes with a gear 50 on the shaft 42. The gear 50 is loose on the shaft but may be connected thereto by means of a clutch 51, and the lower end of the shaft has a bevel gear 52 which meshes with a gear 53 on the front axle of the car. When the bevel gear 50 is connected to the gear 52 by the clutch 51 the axle 6 will be rotated to drive the car.

A disk 54 is mounted to slide vertically on the bearing 47, and this disk has a series of depending pins 55, and bearing 47, as shown, has a web through which the pins extend, and the upper face of the disk has clutch teeth, as shown in Fig. 6, which are adapted to engage similar teeth on the lower face of the bevel gear 49. The disk is raised and lowered by means of a lever 56, and when it is raised to engage the clutch teeth with those of the bevel pinion 49, movement of the shaft 42 will rotate the platform on the shaft 47 as a center. Thus the table or platform may be swung from side to side, as in trench work.

The bucket or dipper is filled by means

of a ram indicated at 57, and this ram, the rams 17 and the motor 44 are supplied with fluid under pressure, as, for instance, air or water from reservoirs 58 which are supported on the table.

In operation, with the parts in the position of Fig. 2, the reel is released from the shaft 42 and the bucket is permitted to run down to the position of Fig. 1. At this point the ram 57 comes into operation, pushing the bucket or dipper into the material to be shoveled. When the bucket is filled the reel 41 is clutched to the shaft 42 and the bucket is drawn into the position of Fig. 2. The rear wheels of the bucket drop into the depressions of the extensions 7 and at the same moment trips 12^a in the form of upwardly curved portions at the rear ends of the extensions engage the latches 23, releasing them from the catches 24 and permitting the load to dump into the chute 13. The dipper may be worked laterally with respect to the car by swinging the table.

The door or gate 25 is opened by means of a rope or cable 25^a which is connected to an extension 28^a from one of the elements 28. This rope is handled by the operator of the machine. After the door is initially opened the entering ore will keep it open until it is closed and clamped shut by the upward movement of the bucket. In order to start the bucket or dipper downwardly after dumping, the operator will raise the rearmost shaft 16 or lower the front shaft 16 or combine the two operations to impart a sufficient inclination to the track 10 to cause the bucket or dipper to move down the incline. The tilting of the track is under the control of the operator.

I claim:

1. In a machine of the character specified, a trackway, a dipper moving on the trackway, said dipper being open at its forward end and having a gate closing the front of the top thereof, means for moving the dipper on the trackway, and a connection between the said means and the gate for holding the gate closed when the dipper is moved in loaded condition, the dipper having a gravity-controlled discharge gate at its rear end, means in connection with the trackway for inclining the dipper at the discharge end of the trackway, latches for holding the gate closed, and means controlled by the inclining of the dipper for releasing the latches.

2. In a machine of the character specified, a trackway, a dipper moving on the trackway, said dipper being open at its forward end and having a gate closing the front of the top thereof, means for moving the dipper on the trackway, a connection between the said means and the gate for holding the gate closed when the dipper is moved in loaded condition, the dipper having a gravity-controlled discharge gate at its rear

end, and means in connection with the trackway for inclining the dipper at the discharge end of the trackway.

5 3. In a machine of the character specified, a wheel supported car, a table on the car, said car having an arc shaped trackway and the table having wheels movable thereon, a driving shaft on the table, and a connection between the said shaft and the
10 wheels, and between the said shaft, the table

and the car for driving the wheels or for turning the table on the car, said connection comprising a vertical shaft having a driving connection at one end of the wheels and at the other end with the shaft, said last 15 named connection being normally inoperative, and means for clutching the said vertical shaft to the table.

SPASOJE JOSEPH KRULY.