

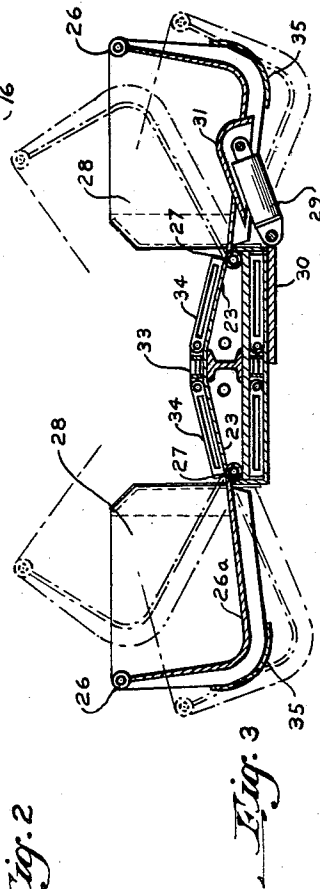
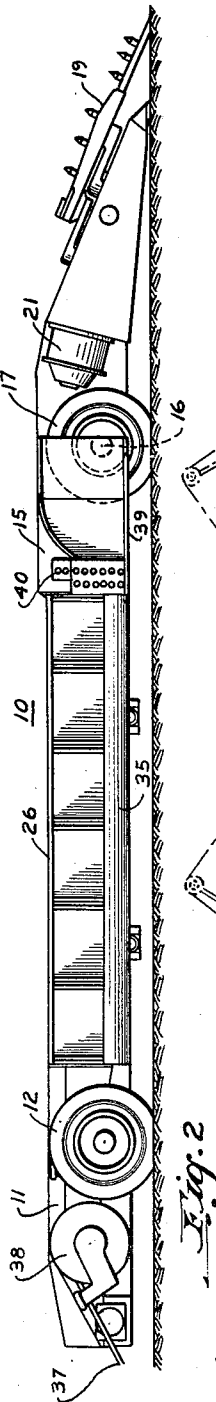
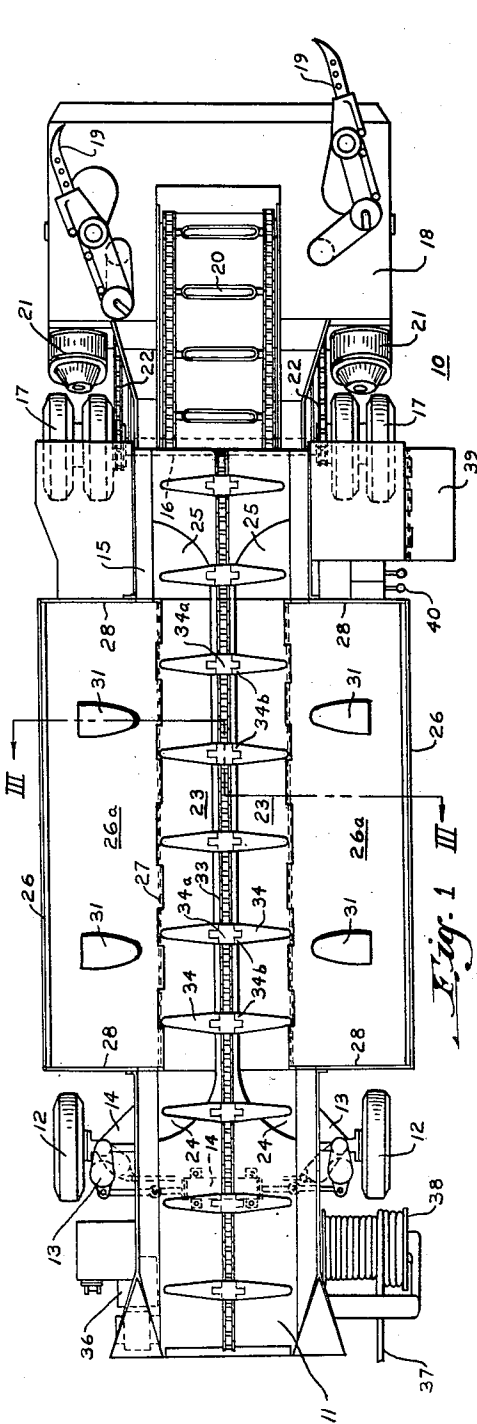
Aug. 22, 1944.

J. D. RUSSELL

2,356,434

SHUTTLE CAR

Filed March 8, 1943



John D. Russell
INVENTOR.

BY *Harold W. Hawkins*
his ATTORNEY.

UNITED STATES PATENT OFFICE

2,356,434

SHUTTLE CAR

John D. Russell, Cranberry Township, Venango County, Pa., assignor to Joy Manufacturing Company, a corporation of Pennsylvania

Application March 8, 1943, Serial No. 478,465

5 Claims. (Cl. 214—83)

This invention relates to vehicles for transporting materials and more particularly to a self propelled or automotive vehicle for gathering minerals at the working or producing area of an underground mine chamber and transporting the same to the main line haulage where the minerals are discharged onto such haulage unit for transportation to the preparation plant at the surface.

The self-propelled vehicles, commonly known as shuttle cars, now extensively used in underground mining operations have a conveyor extending lengthwise of the vehicle of substantially the same width as the bottom or floor of the car which is employed to load as well as to unload the car. In loading the shuttle car, the minerals are delivered into and piled at one end of the car and the conveyor is intermittently operated to carry the minerals toward the other end of the car, and this intermittent operation is repeated until the car is fully loaded.

In order that all of the minerals will be carried bodily toward the rear end of the car on the intermittent operation of the conveyor and the car fully loaded thereby, it is apparent that the side walls throughout the major portion of the length of the car must confine the material and prevent it from spreading laterally of the car, and to accomplish this purpose the cars now in use have the side walls extending upwardly from the edges of the conveyor in a substantially vertical plane or sloping at a slight angle from such plane. To secure a relatively large load carrying capacity in such cars, it is necessary that the car be of considerable length.

The primary object of this invention is to provide a self-propelled material-carrying vehicle having a relatively wide material-carrying section which may be completely loaded and unloaded by the operation of a conveyor extending lengthwise of the car and passing over the bottom thereof, and in which the conveyor is of substantially narrower width than the main material-carrying section of the car or vehicle.

Another object is to provide a self-propelled material-transporting vehicle having a bottom or floor of substantially inverted V shape in-section and a material-carrying portion connected to each side of the floor which is capable of being lowered during the loading operation to form, in effect, a continuation of the floor, and raised during the unloading operation to deliver the material thereon into the path of a conveyor extending over an inverted portion of the floor.

A further object is to provide a self-propelled

material-transporting car or vehicle having a floor sloping from the center to each side thereof and a material-carrying portion pivoted to each side of the floor which is capable of being lowered or raised to permit the material being carried by the conveyor extending over the floor of the car, to spill onto the material-carrying portions during the loading of the car and to return said material to said conveyor during the unloading of the car.

A still further object is to provide a self-propelled vehicle of novel construction which is easily loaded to its maximum capacity by delivering the material into one end of the car and carrying it forward by the intermittent operation of a conveyor, and unloaded by the continuous operation of the conveyor to discharge material from the opposite end thereof.

These and other objects which will hereinafter be made apparent to those skilled in this particular art, are accomplished by means of this invention, one embodiment of which is described in the following specification and illustrated in the accompanying drawing, where:

Fig. 1 is a top plan view of a self-propelled vehicle embodying my invention.

Fig. 2 is a side elevation of the view shown in Fig. 1, and

Fig. 3 is an enlarged section taken on line III—III of Fig. 1.

Referring now to the drawing in detail, 10 represents a shuttle car made in accordance with my invention and having a relatively narrow body portion 11 at one end thereof. The body portion 11 is supported on each side by suitable pneumatic tired steerable wheels 12 journaled on a wheel mounting device 13 which are carried by brackets 14 secured to the body portion 11 of the car. The wheel mounting devices are preferably of the character shown U. S. Letters Patent #2,301,144 issued on November 3, 1942, on an application filed by me on February 26, 1941, and serially numbered 380,593. A cylinder 14 having its piston pivotally connected to the wheel mounting devices 13 is mounted underneath the body section 11 for turning or steering the wheels 12.

The car 10 also has a relatively narrow body section 15 at the opposite end thereof from the body section 11. Body section 15 is supported on an axle 16 having pneumatic tired drive wheels 17 journaled thereon. Also journaled on the axle 16 is a gathering device 18 having arms 19 for gathering and delivering material from the floor of the mine chamber onto a conveyor 20 which

delivers the material into the body portion 15 of the car.

The arms 18 and conveyor 20 are driven through speed reduction mechanisms, not shown, by motors 21 carried by the gathering device 18 and the motors 21 are also connected by sprocket chains 22, to the wheels 17 to drive the same.

Between the body sections 11 and 15 of the car 10 is a relatively wide load-carrying compartment comprising a floor 23 of substantially inverted V shape in cross section which slopes from the center of the car to each side thereof. The floor 23 is of substantially the same width as the floor of the body sections 11 and 15, each of which has flared floor sections 24 and 25 for connecting the floor 23 with the floors of the body sections 11 and 15 respectively.

Pivoted at 27 to each side of the floor 23 and extending longitudinally of the car 10 are members 26 of substantially L shape in cross section which form the side walls of the car and provide additional floor areas 26a for the main load-carrying compartment of the car. The ends of each of the members 26 are partially closed by suitable closure members 28 which abut against the inner ends of the side walls of the body sections 11 and 15.

In order to turn the members 26 about the pivots 27, a series of hydraulic jacks 29 are pivoted between each of the members 26 and a frame 30 which extends longitudinally of the car and forms the support for the body sections 11 and 15 and the floor 23. Housings 31 protect and cover the ends of the jacks pivoted to the members 26.

When the car is being loaded, the minerals are delivered by the conveyor 20 into the body section 15 of the car and as soon as it has been completely filled, an endless conveyor chain 33 extending lengthwise of the car and having flights 34 pivoted to each side thereof at intervals throughout its length, is operated momentarily to carry the minerals rearwardly in the car.

The flights 34 are preferably of the type shown in my copending application Serially Numbered 380,593 filed February 26, 1941, and are so pivoted to the chain that as the flights pass over surfaces 25 connecting the body section 15 to the floor 23, they will follow the contour of the surface and will drop downwardly into engagement with the downwardly sloping floor section 23. As the flights leave the floor 23, they pass over the surfaces 24 and are raised until they lie in the same plane as the top of the flight connectors 34a. Lugs 34b on the flights 34 which engage sides of the connectors 34a, limit the upward movement of the flights 34.

At the start of the loading operation, the jacks 29 are actuated to lower the L shaped members 26 so that the portions 26a form, in effect, a continuation of the sloping floor 23, and the minerals conveyed by the chain 33 onto the floor 23 slide laterally onto the members 26. The conveyor 33 is operated each time the body section 15 is filled and the operation above described is repeated until the minerals have been carried throughout the full length of the car and the body section 11 has been substantially filled.

After the car has been loaded, the jacks 29 are actuated to raise the members 26 to an intermediate position so that the car may be free to travel through the mine chambers to the unloading station at the main line haulage. When it is desired to unload the car, the members 26

are raised by the jacks 29 to their highest position at which time the floor portions 26a slope toward the floor 23 and the minerals carried by the members 26 fall or slide onto the floor 23 into the path of the conveyor flights 34.

In order to protect the members 26 when in their lowered position, curved skid plates 35 are welded or otherwise secured to the outer surfaces of the members 26 which are adapted to rest on the floor of the mine chamber during the loading operation.

The conveyor 33 is driven through a suitable speed reduction mechanism, not shown, by a motor 36 secured to the outer surface of the body section 11 of the car. Power for operating the various motors is supplied through a cable 37 which is connected to a suitable source of supply and is wound on a reel 38 adapted to play out the cable when the car is moving in a direction away from the source of power, and to wind in or reel up the cable when the car is moving toward the source of power.

From the foregoing description, it is apparent that a shuttle car made in accordance with my invention has an exceptionally large load-carrying capacity in relation to its length and since the side members are capable of being freely raised and lowered, the car may be readily loaded to its maximum capacity and completely unloaded since the lowering and raising of the side walls moves the minerals laterally to the sides of car during the loading operation, and to the center of the car during the unloading thereof respectively.

While I have shown the car as having a gathering and loading device as an integral part thereof, it is apparent that the gathering device may be eliminated and the car loaded by other means without departing from my invention.

During the operation of the car, the operator rides on a platform 39 adjacent the forward end thereof in position to operate the control levers 40 mounted on the side of the body section 15.

While I have described one embodiment of my invention, it is apparent that certain modifications, additions, substitutions, and omission may be made therein without departing from the spirit of my invention or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A material-carrying vehicle having a floor sloping downwardly from the center to each side thereof, a conveyor chain passing over the center of said floor and having scrapers attached thereto adapted to engage said sloping portions, a member pivoted to each side of said floor, and means for turning said members about their pivots to raise and lower the same whereby when said members are lowered the material will slide from said floor onto said members and when said members are raised will slide from said members back onto said floor into position to be engaged by said scrapers.

2. In a material-carrying vehicle, the combination comprising a floor sloping downwardly from the center to each side thereof, a conveyor passing over said floor lengthwise of said vehicle, an L shaped member forming each side wall of said vehicle and having one leg pivoted to said floor on each side thereof, and means for turning said members about their respective pivots.

3. In a material-carrying vehicle, the combination comprising a floor sloping downwardly from a center ridge to each side thereof, a chain

extending lengthwise of said vehicle over said center ridge, and having flights pivoted to each side thereof for engaging said downwardly sloping portions of said floor, an L shaped member pivoted to each side of said floor and means for turning said members about their pivots, said L shaped members forming the side walls and portions of the bottom of said car.

4. A material carrying vehicle having a floor sloping downwardly from the center toward the sides thereof, a conveyor chain passing over the center of said floor and having scrapers pivoted to opposite sides thereof for engaging said sloping portions, a side wall pivoted to each side of said floor having a projecting member forming a movable floor portion for said vehicle, and means for turning said side walls about their pivots whereby when said side walls are lowered

material will slide from said floor onto said moveable floor portions and when raised the material will move back onto the sloping portions of said floor into position to be engaged by said scrapers.

5. A material carrying vehicle having a flat floor section at each end thereof connected to downwardly and outwardly sloping floor sections in the central part thereof, a conveyor chain passing lengthwise of said vehicle over the center of said floor, flights pivoted to opposite sides of said chain for scraping over the flat and sloping sections of said floor, sidewalls secured to said vehicle on each side of the flat floor sections thereof, and moveable members forming the side walls for the central portion of said vehicle pivoted to the sides of the sloping floor sections.

JOHN D. RUSSELL.