Nov. 4, 1924.

1,514,097

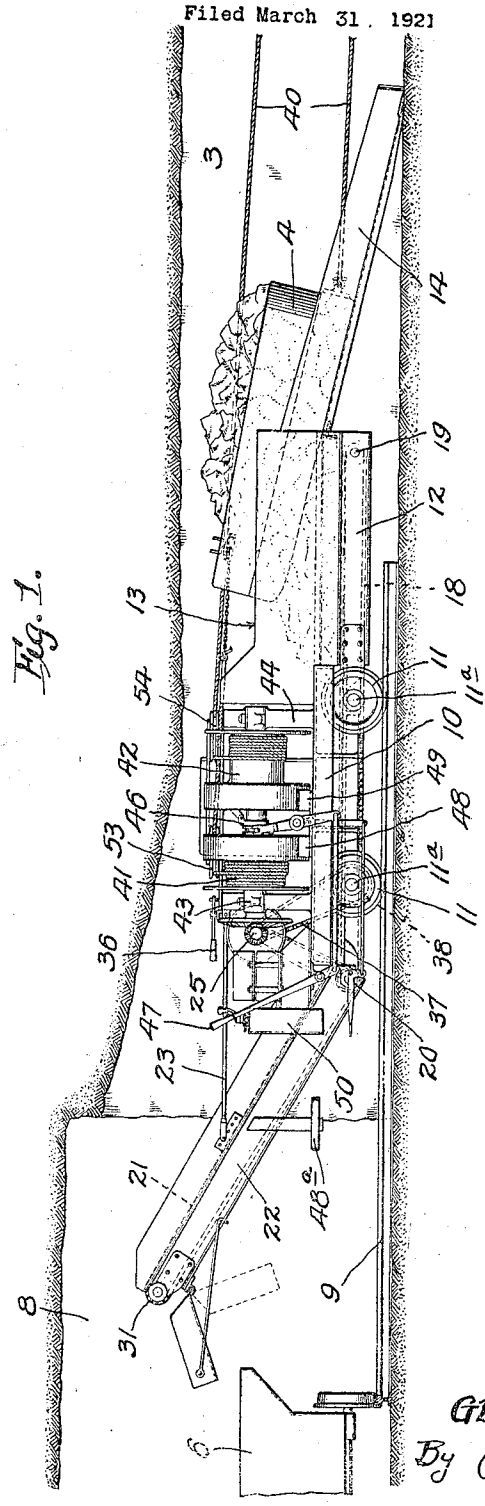
G. W. PACKER

LOADING APPARATUS

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Fig. 1.



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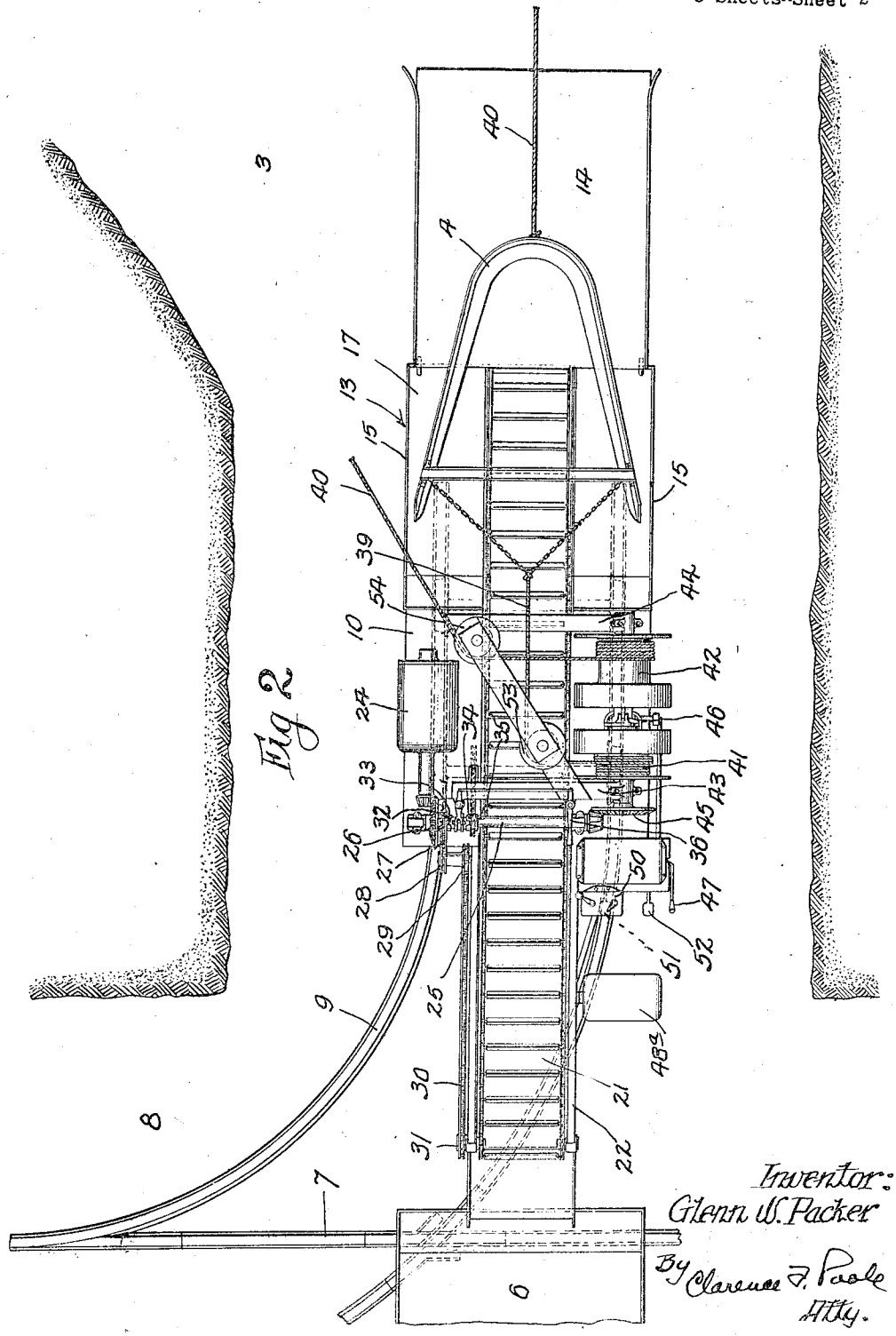


Fig 2

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Fig. 4.

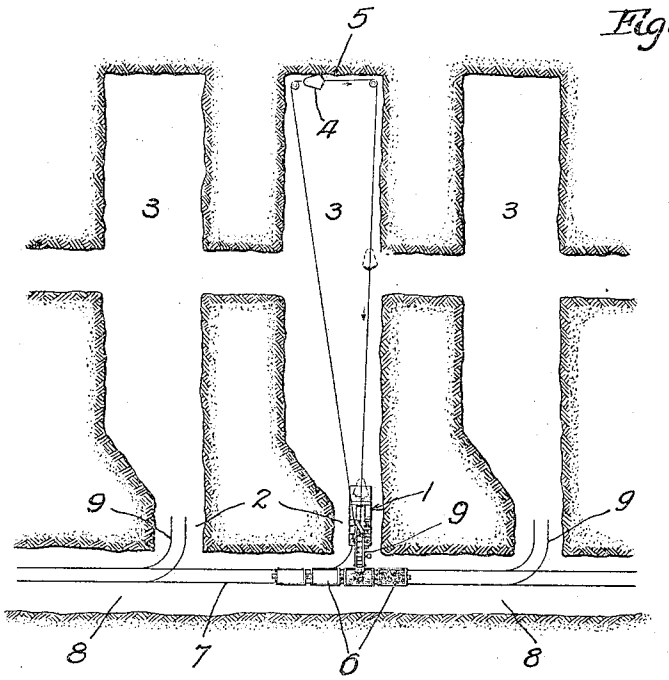
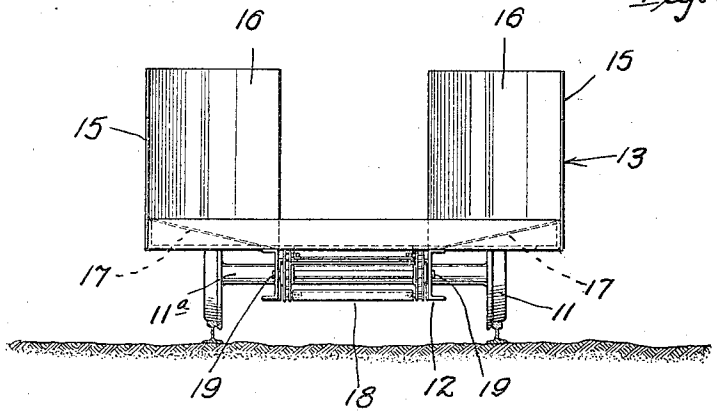


Fig. 3.



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UNITED STATES PATENT OFFICE.

GLENN W. PACKER, OF CHICAGO, ILLINOIS, ASSIGNOR TO GOODMAN MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LOADING APPARATUS.

Application filed March 31, 1921. Serial No. 457,380.

To all whom it may concern:

Be it known that I, GLENN W. PACKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a Loading Apparatus, of which the following is a specification.

This invention relates to improvements in loading apparatus which is particularly adapted for use in mines.

The principal object of the invention is to provide means for moving loose material such as coal, ore, or the like, from the working face of a mine and to load it in mine cars.

Further objects will appear from the following description, reference being had to the accompanying drawings, in which Figure 1 is a side view of an embodiment of my invention, in which the loading apparatus is placed in operating position in a mine. Figure 2 is a top plan view of the loading machine shown in Figure 1. Figure 3 is a detail. Figure 4 is a diagrammatic view showing a typical installation of the apparatus in a mine.

In carrying out my invention, I employ a modified form of the so-called "scraper-loader" system of mining, which system includes a scraper, operated by suitable draft ropes for conveying the loose material from the working face of the mine to a main haulage entry, and there loading the material upon mine cars for transportation out of the mine. As heretofore practiced, it is usually necessary to provide an inclined chute adjacent the main haulage track and overhanging the mine cars, so that the scraper is hauled from the working face and up said chute to load the material in the car, and suitable guiding sheaves for the haulage ropes must be located in the entry and across the haulage tracks. The hoisting device for operating the haulage ropes is also placed in the main entry, or adjacent thereto, and usually so located that the man in control of the hoist cannot see the movement of the scraper. In my improved apparatus, I provide a wheeled machine carrying thereon a hoisting device and control mechanism for operating the scraper apparatus, together with a conveyor adapted to receive a load of material from the scraper at one end of the wheeled apparatus and convey said material to the other end thereof in position to be loaded in the mine car. The hoist and conveying apparatus is mounted on the mine track, and movable as a unit into position intermediate the mine car and the working face where the operator is in position to supervise both the movement of the scraper and the loading of the cars.

For a better understanding of the use of my device, reference is made to Figure 4, which illustrates a typical installation of my apparatus, as applied to a coal mine, operated on the "room and pillar" system. The loading device 1 is placed in room-neck 2 of a mine room 3. The coal is gathered by the scraper 4 along the working face 5 of the mine and is conveyed therefrom to the loading apparatus 1. Any one of many suitable arrangements of sheaves or guiding devices may be utilized for directing the course of the scraper 4 in the mine room. The mine cars 6, 6 run on track 7 in the haulage entry 8. The coal is discharged from the scraper 4 upon a suitable conveyor, carried on the loading device, and is loaded by said conveyor directly into the cars 6, 6.

The loading apparatus is provided with self-propelling means so that it can be moved at will over the tracks, and a spur track 9 is provided wherever it is desired to place the loading device in position adjacent the main haulage track 7.

Although I have above illustrated the use of my loading apparatus in connection with the room and pillar system of mining, it will be understood that it can be also used in other gathering and loading operations without substantial change in the construction or operation of the apparatus.

Referring now more particularly to the details of construction, my apparatus comprises a body portion 10 mounted on suitable wheels 11, 11, and axles 11^a, 11^a. Connected with said body portion and extending from one end thereof is a supporting member 12, carrying thereon a receiving hopper 13 open at the outer end thereof and adapted to receive material from the scraper 4. An inclined apron 14 is detachably connected to the outer edge of said receiving hopper and contacts with the ground to direct the scraper upwardly so as to deposit its load in the receiving hopper. Said receiving hopper comprises side walls 15, 15 and inner end walls 16, 16, and bottom wall portions 17, 17 inclined downwardly toward a longitudinally disposed conveyor member 18 nar-

rower than said receiving hopper extending the length thereof. The conveyor member 18 is preferably of the endless type. Said conveyor extends forwardly underneath the main body portion 10 of the machine, the rear end thereof being trained over suitable bearing sprockets 19, 19 carried in the supporting member 12, and the forward end thereof being carried by sprockets 20, 20. In the preferred arrangement shown, the upper flight of said conveyor 18 passes above the axles 11ª, 11ª of the supporting wheels, while the lower flight passes below said axles. A second conveyor member 21 is mounted on a vertically swinging or pivoted frame 22 on the front end of the machine, said conveyor member 21 being operatively connected with said conveyor member 18 and adapted to receive material therefrom to carry it upwardly to load the same in the mine car 6. The pivoted conveyor frame 22 may be adjusted in several positions by suitable means such as a rod 23 connected to the frame.

Operative means for the loading apparatus comprises a longitudinally disposed motor 24 arranged above and at one side of the conveyor 18 and having driving connection with a transverse shaft 25. Means for operating the conveyor members 18 and 21 comprise a sprocket 26 mounted loosely on the shaft 25 and operatively connected with said conveyors through suitable power transmission means such as chain 27, sprocket 28, sprocket 29, chain 30 and sprocket 31 connected with the conveyor member 21. A clutch member 32 is suitably keyed to the shaft 25 and is adapted to engage with clutch member 33 carried by sprocket 26 to operate the conveyors when desired. Means whereby the machine may be self-propelled comprises a sprocket 34 journaled on the shaft 25 and having a clutch member 35 adapted to be engaged by the before-mentioned clutch member 33 when the latter is disengaged from the conveyor clutch 33 and is thrown in the opposite direction by means of the operating handle 36. A driving connection between the sprocket 34 and the forward supporting wheel 11 comprises a chain 37 and a sprocket 38 mounted on the forward axle 11ª.

The scraper 4 is operated by a plurality of flexible draft ropes. In the present embodiment illustrated, two of such ropes are used, the rope 39 at the forward end of the scraper usually being termed the drag-rope and the rope 40 at the rear end of said scraper usually being termed the tail-rope. In Figure 2, it will be understood that the portion of the tail-rope 40 extending at an angle from one side of the machine is identical with the portion of the tail-rope 40 attached to the rear end of the scraper 4. The same is true of the two portions of the tail-rope appearing at the right of Figure 1. It will be understood, however, that more than two ropes may be employed for controlling the movement of the scraper if desired. The draft ropes are operated by a suitable winding engine mounted on the main frame 10. In the embodiment illustrated, two winding drums 41 and 42 are shown, the former drum having drag-rope 39 wound thereon and the latter drum having the tail-rope 40 wound thereon. Said drums are preferably arranged longitudinally in axial alignment with each other above and at one side of conveyor 18 opposite the motor 24, and are mounted between upwardly extending frame members 43 and 44 carried by the body portion 10. The drums may be operatively connected with the motor 24 by any suitable means such as beveled gear 45 connected with the transverse shaft 25 and clutch member 46 connected with the gear 45, and adapted to have selective engagement with either drum 41 or drum 42. Said clutch member 46, is controlled by the handle 47 mounted on the front end of the machine as shown. A plurality of brake devices 48 and 49 may also be provided to control the drums 41 and 42 respectively.

Suitable guiding sheaves 53 and 54 are suitably mounted on the frame, about which the head rope 39 and the tail-rope 40, respectively, are trained.

In the above described arrangement, it will be seen that the operator places himself at the forward end of the machine and to the right of the conveyor where a seat 48ª, preferably attached to the conveyor frame 22, is provided for him. Within reach of the seat 48ª is the clutch handle 36 which operates both the conveyor and the driving connections, the handle 47 which operates the winding drum driving connection, the motor controller 50 and brake pedals 51 and 52, which operate the drum brakes 48 and 49 respectively.

From the above description, it will be seen that the loading apparatus has several advantages over devices heretofore used. It has already been indicated that the conveyor and winding engine is movable as a unit on a self-propelled frame into and out of position for operation as desired, and that the use of such apparatus eliminates the necessity of constructing inclined chutes and the setting up of the necessary guiding sheaves and hoisting engine at each place where the loading apparatus is to be used.

The construction described provides a simple and compact arrangement having a minimum overhang, particularly at the forward end thereof, so that the machine is readily moved around curved portions of track, such as a spur 9, with a minimum requirement of clearance with respect to the

side walls. Furthermore, my device is particularly adapted for use in mines having a low roof, as is illustrated in Figure 1, in which the mine room 3, representing the height of the coal seam which is mined, is relatively lower than the main entry 8 which must be high enough to allow ready transportation, ventilation, etc., in the mine. Under such conditions the mining apparatus is placed in the room-neck 2, and the forward end thereof requires a minimum amount of head space, or overhead clearance, so that the scraper 4 can be unloaded onto the conveyor without coming in contact with the roof of the mine.

While moving from place to place, the scraper 4 and the apron 14 may be carried in the compartment 13 together with the draft ropes and guiding sheaves associated therewith.

I claim as my invention:

1. In a device of the class described, the combination of support having a pair of supporting wheels and axles, a scraper adapted to be moved along the ground, draft means for said scraper, winding devices for said draft means mounted on one side of said wheeled support, a receiving compartment at one end of said wheeled support adapted to receive material from said scraper, and a longitudinally disposed conveyor having oppositely moving portions above and below the supporting axles and communicating with said receiving compartment and adapted to discharge the material at a distance therefrom.

2. In a device of the class described, the combination of a wheeled support, a scraper adapted to be moved along the ground, draft means for said scraper, a pair of winding devices for said draft means mounted on one side of said wheeled support and on longitudinally disposed axes, a motor on the opposite side of said wheeled support having operative connection with said winding devices, a receiving compartment at one end of said wheeled support adapted to receive material from said scraper, and a longitudinally disposed conveyor extending between said winding devices and said motor and communicating with said receiving compartment and adapted to discharge the material at a distance therefrom.

3. In a device of the class described, the combination of a wheeled support, a scraper adapted to be moved along the ground having draft means therefor; a relatively wide receiving compartment at one end of said wheeled support adapted to receive said scraper while the latter is discharging its load, winding devices for said draft means arranged on longitudinal axes, a longitudinally disposed motor for said winding devices, and a conveyor narrower than said receiving compartment, said winding devices, motor, and conveyor being arranged substantially within the lateral boundaries of said receiving compartment.

4. In a device of the class described, the combination of a wheeled support, a scraper adapted to be moved along the ground, draft means for said scraper having operative mechanism mounted on said wheeled support, a relatively low receiving compartment at one end of said support adapted to receive said scraper, a conveyor having a substantially horizontal portion extending underneath said compartment and said operative mechanism, and a second portion inclined upwardly at the opposite end of said support.

5. In a device of the class described, the combination of a wheeled support, a scraper adapted to be moved along the ground, draft means for said scraper having operative mechanism mounted on said wheeled support, a relatively low receiving compartment at one end of said support adapted to receive said scraper, a conveyor having a substantially horizontal portion extending underneath said compartment and said operative mechanism, and a second portion at the opposite end of said support and pivoted to swing in a vertical plane.

Signed at Chicago, Illinois, this 26 day of March, 1921.

GLENN W. PACKER.