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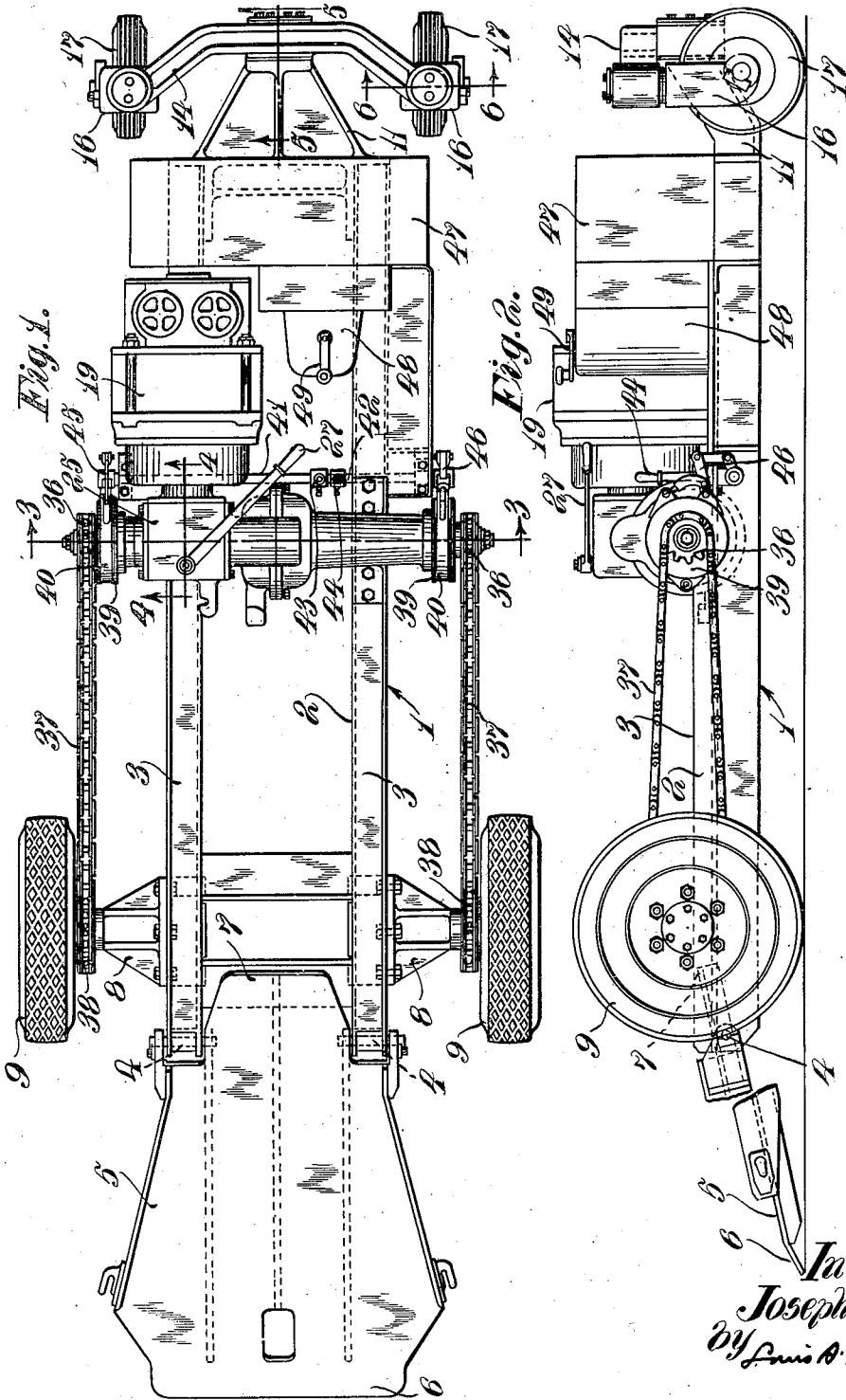
J. F. JOY

2,254,104

MINING MACHINE TRANSPORT TRUCK

Filed Oct. 18, 1938

2 Sheets-Sheet 1



Inventor:
Joseph F. Joy
By Louis A. Maxam
Att'y.

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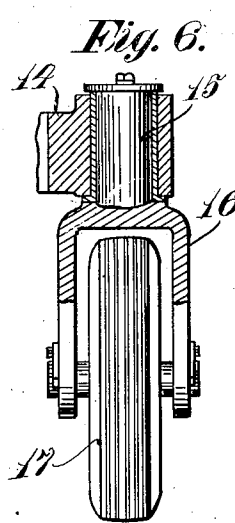
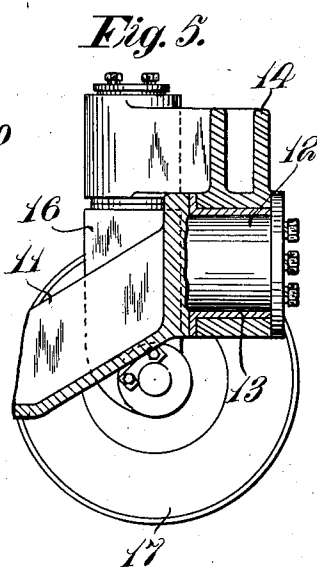
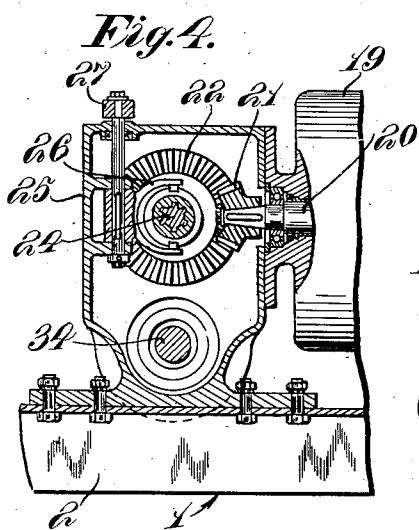
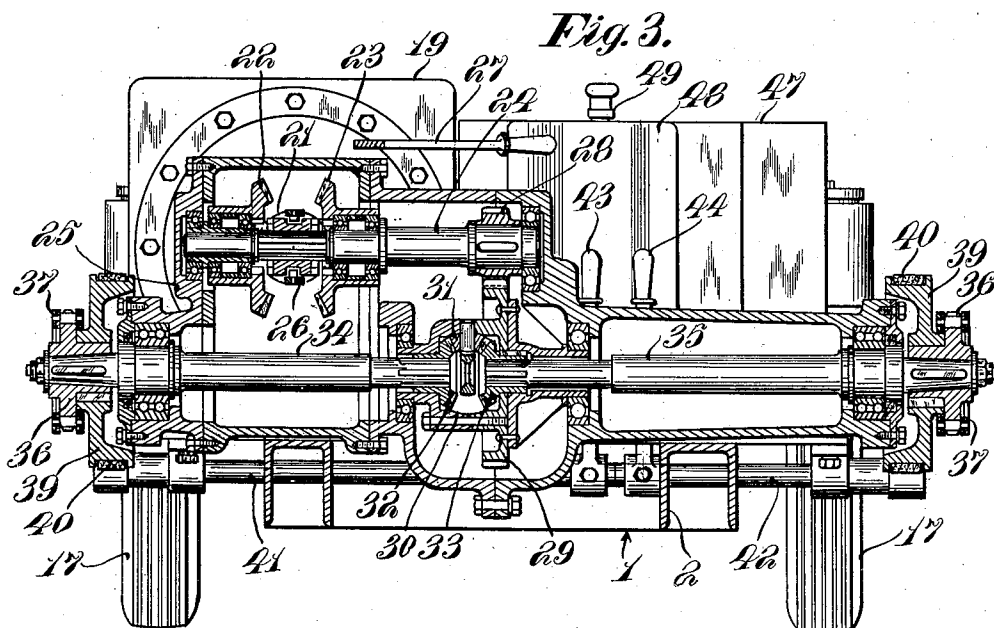
J. F. JOY

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MINING MACHINE TRANSPORT TRUCK

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2 Sheets-Sheet 2



Inventor:
Joseph F. Joy
By Ann A. Maxam.
Atty.

UNITED STATES PATENT OFFICE

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MINING MACHINE TRANSPORT TRUCK

Joseph F. Joy, Pittsburgh, Pa., assignor to Sullivan Machinery Company, a corporation of Massachusetts

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5 Claims. (Cl. 180-17)

This invention relates to mining machine transport trucks adapted for transporting coal cutting machines in mines and relates more particularly to an improved mining machine transport truck of the rubber-tired type especially adapted to use in trackless mines.

An object of this invention is to provide an improved transport truck for a coal cutting machine. A further object is to provide an improved mining machine transport truck of the wheel-mounted, rubber-tired type especially designed for use in trackless mines. A further object is to provide an improved wheel-mounted transport truck adaptable to transport a coal cutting machine directly on the mine floor wholly without the use of guiding track rails. Yet another object is to provide an improved mining machine transport truck for transporting a coal cutting machine of the flexibly fed, floor cutter type adapted to rest upon its own bottom and slide in any direction over the mine floor both during maneuvering of the machine with respect to the coal face and the cutting operation, the improved transport truck adapted to receive the coal cutting machine for transport from one working place to another about the mine. A still further object is to provide an improved transport truck of the wheel-mounted, rubber-tired type adapted to move directly over the mine floor wholly without the use of a guiding mine trackway, and having an improved wheel mounting structure whereby the machine may be propelled and steered in an improved manner. These and other objects and advantages of the invention will, however, hereinafter more fully appear.

In the accompanying drawings there is shown for purposes of illustration one form which the invention may assume in practice.

In these drawings:

Fig. 1 is a plan view of a transport truck constructed in accordance with an illustrative embodiment of the invention.

Fig. 2 is a side elevational view of the transport truck shown in Fig. 1.

Fig. 3 is an enlarged cross sectional view taken substantially on line 3-3 of Fig. 1.

Fig. 4 is an enlarged longitudinally extending vertical sectional view taken substantially on line 4-4 of Fig. 1.

Fig. 5 is an enlarged longitudinally extending vertical sectional view taken substantially on line 5-5 of Fig. 1.

Fig. 6 is an enlarged transverse vertical sec-

tional view taken substantially on line 6-6 of Fig. 1.

In this illustrative embodiment of the invention, the improved transport truck, generally designated 1, is adapted to receive a coal cutting machine for transport about the mine, and while it may be employed for transporting coal cutting machines of various types, it is especially adapted to transport a coal cutting machine of the type disclosed in the patent to Joseph F. Joy and Leon E. Simmons, No. 2,131,178, patented September 27, 1938. The improved transport truck 1 comprises a truck frame 2 having parallel side frame members 3, 3 providing parallel guideways along which the bottom of a coal cutting machine is adapted to slide during loading and unloading of the machine with respect to the truck. Pivotaly mounted at 4 at the forward ends of these side frame members 3, 3 is a front loading and unloading pan or ramp 5 having a front nose 6 adapted to rest on the mine floor during the loading or unloading operation. This machine guiding pan or ramp has a rearwardly projecting lever arm portion 7 slidably engageable by the bottom of the coal cutting machine during the loading operation so that as the machine is loaded onto the parallel side frames 3, 3 of the truck, the weight of the machine, passing over the lever portion 7, automatically effects raising of the pan 5 into its elevated transport position and holds it there. The coal cutting machine may be loaded onto the truck and unloaded from the truck by means of the feeding cables of the machine, the truck being provided with appropriately located hooks or abutments, one on the gear housing and others on the opposite sides of the ramp 5, and the cables of the machine are connectible in different relations to these hooks or abutments during the loading or unloading operation, in the manner well known to those skilled in the art. Secured to and projecting laterally from the opposite sides of the truck frame, near the forward ends of the side frame members 3, 3, are rigid axle frames 8, 8 having stub axles on which a pair of front traction wheels 9 are journaled. These wheels are provided with pneumatic tires of the conventional automotive type, adapted to run directly over the mine floor wholly without the use of a guiding trackway. Secured to the rear end of the truck frame is a rigid frame 11 having located at the longitudinal vertical center of the truck a longitudinal swivel portion 12 journaled in a bearing sleeve 13 supported within a transverse equalizer bar or pivoted axle

14. Swivelled at 15 on vertical axes at the opposite ends of the equalizer bar or pivoted axle 14 are frames 16 of rear caster wheels 17. These caster wheels likewise have pneumatic tires of the conventional automotive type. It will thus be seen that the equalizer bar or pivoted axle 14 may swing in transverse vertical planes about an axis extending longitudinally of the truck and that the caster wheels may swivel in any direction about vertical axes with respect to the pivoted axle, thereby to facilitate guiding and steering of the machine in an obvious manner. Mounted on the rearward portion of the truck frame is a motor 19, herein preferably of the electric type, having fixed to the forward end of its horizontal power shaft 20 a bevel gear 21. This bevel gear meshes with reverse bevels 22 and 23 journaled on bearings supported by a transverse shaft 24 in turn suitably journaled in a gear housing 25 mounted on the truck frame in advance of the motor. These reverse bevels 22 and 23 are selectively connectible by a sliding jaw clutch 26 to the shaft 24. This jaw clutch has suitable operating means including an operating handle 27 located at the top of the gear housing. Keyed to and driven by the shaft 24 is a spur gear 28 meshing with a spur gear 29 having its oppositely extending hub portions suitably journaled within bearings supported within the gear housing. Enclosed within one of the gear hubs is a conventional differential mechanism 30 of the conventional automotive type. This differential mechanism comprises a plurality of planet gears 31 meshing with bevel gears 32 and 33 secured to relatively rotatable shafts 34 and 35, respectively. These shafts are arranged in axial alignment and are suitably journaled within the gear housing 25 and have secured thereto, at their remote ends, chain sprockets 36 connected by endless drive chains 37 to chain sprockets 38 secured to the hubs of the front traction wheels 9. Keyed to the hubs of the chain sprockets 36 are brake drums 39 having cooperating therewith conventional brake bands 40. The operating means for these brake bands comprises operating shafts 41 and 42 arranged in axial alignment and suitably rotatably mounted within the lower portion of the truck frame, and these operating shafts are provided with operating handles 43 and 44, respectively, and are connected through suitable toggle link operating means 45 and 46 to their respective brake bands. It will thus be seen that the brakes for the sprockets 36 may be either independently or simultaneously operated by the levers 43 and 44. Located at the rear end of the truck frame is a conventional controller box 47 having associated therewith a suitable controller apparatus 48 provided with a control handle 49, and this controlling apparatus is adapted to control the supply of electricity to the motor 19, in a well known manner.

The mode of use of the improved transport truck will be clearly apparent from the description given. When the coal cutting machine to be transported is loaded in transport position on the transport truck, it is suitably locked against movement relative to the truck, and, of course, at that time the pan or ramp 5 is in its elevated transport position and held therein by means of the weight of the mining machine on the lever portion 7 thereof. When the motor 19 is running and one or the other of the reverse bevels 22, 23 is connected to the shaft 24, the front truck wheels 9 may be driven through the spur gearing

28, 29, the differential mechanism 30, shafts 34, 35, chain sprockets 36, drive chains 37 and chain sprockets 38 secured to the wheels; and upon control of the brake bands 40 and through the differential mechanism, the front traction wheels may be independently driven at different speeds, thereby to effect steering of the machine. By the control of the reversing clutch 26, the direction of drive of the front traction wheels 9 may be controlled so that the truck may be propelled by the traction wheels either forwardly or rearwardly over the mine floor. During the propelling of the truck about the mine, the swivel caster wheels 17 supporting the rear end of the truck facilitate negotiation of the truck through the sharply curved passages of a mine and over an uneven mine floor, and these caster wheels aid the front traction wheels in the steering of the machine. It will be evident that when the shaft 34 is held against rotation by its brake band, the shaft 35 may be driven through the differential mechanism so that one of the front traction wheels is driven while the other remains stationary, and as a result the truck may be steered about the stationary traction wheel as a pivot, and by independently controlling the drives of the front traction wheels, the transport truck may be turned in one direction or the other, as desired, in a well known manner. During unloading of the coal cutting machine from the truck, the machine moves forwardly from its guideways on the truck frame, and when the machine passes its center of gravity on the ramp 5, the latter tilts downwardly to permit the machine to move off from the truck onto the mine floor.

As a result of this invention, it will be noted that an improved transport truck for a coal cutting machine is provided whereby the machine may be transported from one working place to another in an improved manner. It will further be noted that by providing the transport truck with traction and steering wheels of the rubber-tired type engageable directly with the mine floor, the transport truck may be propelled directly over the mine floor wholly without the use of a guiding mine trackway. It will still further be evident that an improved mining machine transport truck is provided of the wheel-mounted, rubber-tired type especially adapted to use in trackless mines. Other uses and advantages of the improved transport truck will be clearly apparent to those skilled in the art.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

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

1. A mining machine transport truck comprising, in combination, a horizontal truck frame provided with horizontal longitudinally extending guideways for slidably receiving a unitary mining machine for transport, a plurality of wheels for supporting said truck frame and all directly engaging the mine floor, said wheels comprising a pair of front traction wheels located at the opposite sides of the forward portion of said truck frame and a pair of rear caster wheels located at the opposite sides of the rear

end of the truck frame, means for freely swivelly mounting said caster wheels each about an upright axis and both about a longitudinal axis, and motor driven mechanism mounted on said truck frame for independently driving said front traction wheels whereby the truck may be propelled and steered thereby.

2. A mining machine transport truck comprising, in combination, a horizontal truck frame provided with horizontal longitudinally extending guideways for slidably receiving a unitary mining machine for transport, a plurality of wheels for supporting said truck frame and all directly engaging the mine floor, said wheels comprising a pair of front traction wheels located at the opposite sides of the forward portion of said truck frame and a pair of rear caster wheels located at the opposite sides of the rear end of the truck frame, means for freely swivelly mounting said caster wheels including a member pivotally mounted to rock on a longitudinal axis at the rear end of said truck frame and swivelled caster wheel frames pivotally connected to said pivoted member to swing about upright axes, and motor driven mechanism mounted on said truck frame for independently driving said front traction wheels whereby the truck may be propelled and steered thereby.

3. A mining machine transport truck comprising, in combination, a horizontal truck frame provided with horizontal longitudinally extending guideways for slidably receiving a unitary mining machine for transport, a plurality of wheels for supporting said truck frame and all directly engaging the mine floor, said wheels comprising a pair of front traction wheels located at the opposite sides of the forward portion of said truck frame and a pair of rear caster wheels located at the opposite sides of the rear end of the truck frame, means for freely swivelly mounting said caster wheels including a transverse equalizer bar pivotally mounted to rock on a longitudinal axis located at the longitudinal vertical center of the truck at the rear end of said truck frame and swivelled caster wheel frames pivotally connected to the ends of said equalizer bar to swing about upright axes, and motor driven mechanism mounted on said truck frame for independently driving said front traction wheels whereby the truck may be propelled and steered thereby.

4. A mining machine transport truck comprising, in combination, a low compact horizontal truck frame provided with horizontal, longitudinally extending guideways for slidably receiving a unitary mining machine for transport, said truck frame projecting rearwardly a substantial distance with respect to said machine guideways, a plurality of wheels for supporting said truck frame and all directly engaging the mine floor, said wheels comprising a pair of relatively large diameter front traction wheels located at the opposite sides of the forward portion of the truck frame rearwardly of the forward ends of said machine-receiving guideways and a pair of rela-

tively small diameter rear caster wheels located at the opposite sides of the truck frame rearwardly of the rear end of the truck frame, said wheels being so arranged with respect to said guideways that the major portion of the weight of a mining machine thereon is received by the front traction wheels, means for freely swivelly mounting said caster wheels comprising a bracket secured to the rear end of said truck frame and projecting rearwardly therefrom, a transverse equalizer bar pivotally connected to said bracket to rock on a longitudinal axis located at the longitudinal vertical center of the truck and swivelled caster wheel frames pivotally connected to the ends of said equalizer bar to swing freely about upright axes, and motor driven mechanism mounted on said truck and operatively connected to said front traction wheels for independently driving the latter whereby the truck may be propelled and steered thereby, said caster wheels cooperating with said traction wheels to facilitate sharp turning of the truck.

5. A mining transport truck comprising, in combination, a low compact horizontal truck frame provided with horizontal, longitudinally extending guideways for slidably receiving a unitary mining machine for transport, said truck frame projecting rearwardly a substantial distance with respect to said machine guideways to provide a platform located rearwardly of a machine supported on said guideways, a plurality of wheels for supporting said truck frame and all directly engaging the mine floor, said wheels comprising a pair of relatively large diameter front traction wheels located at the opposite sides of the forward portion of said truck frame rearwardly of the forward ends of said machine-receiving guideways and a pair of relatively small diameter rear caster wheels located at the opposite sides of the truck frame rearwardly of the rear end of said rearwardly extending platform-providing portion of said truck frame, said wheels being so arranged with respect to said guideways that the major portion of the weight of a mining machine thereon is received by the front traction wheels, means for freely swivelly mounting said caster wheels comprising a bracket projecting rearwardly from the rear end of said truck at the rear of said platform-providing portion thereof, a transverse equalizer bar pivotally connected to said bracket to rock on a longitudinal axis located at the longitudinal vertical center of the truck and swivelled caster wheel frames pivotally connected to the ends of said equalizer bar to swing freely about upright axes, and motor driven mechanism mounted on said platform-providing portion of said truck rearwardly of said machine-receiving guideways and operatively connected to said front traction wheels for independently driving the latter whereby the truck may be propelled and steered thereby, said caster wheels cooperating with said traction wheels to facilitate sharp turning of the truck.

JOSEPH. F. JOY.