June 7, 1932. V. L. MARTIN 1,861,639

MINE TRACK CLEANER

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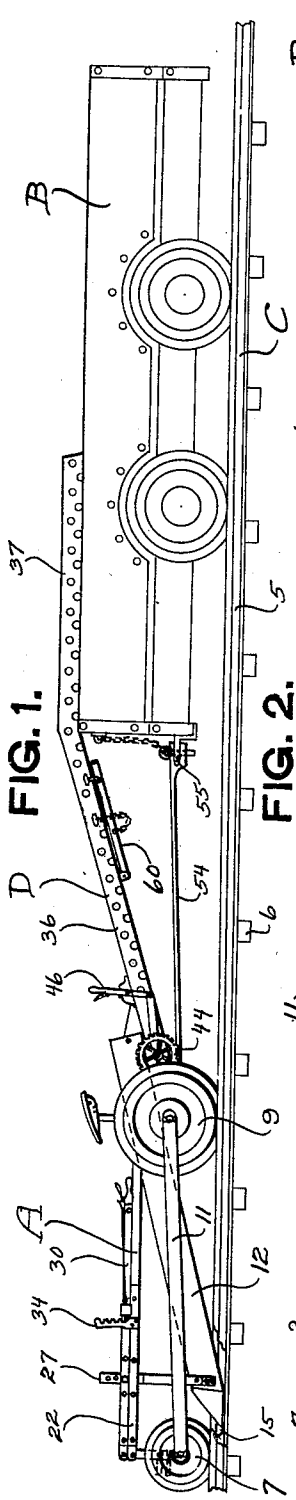


FIG. 1.

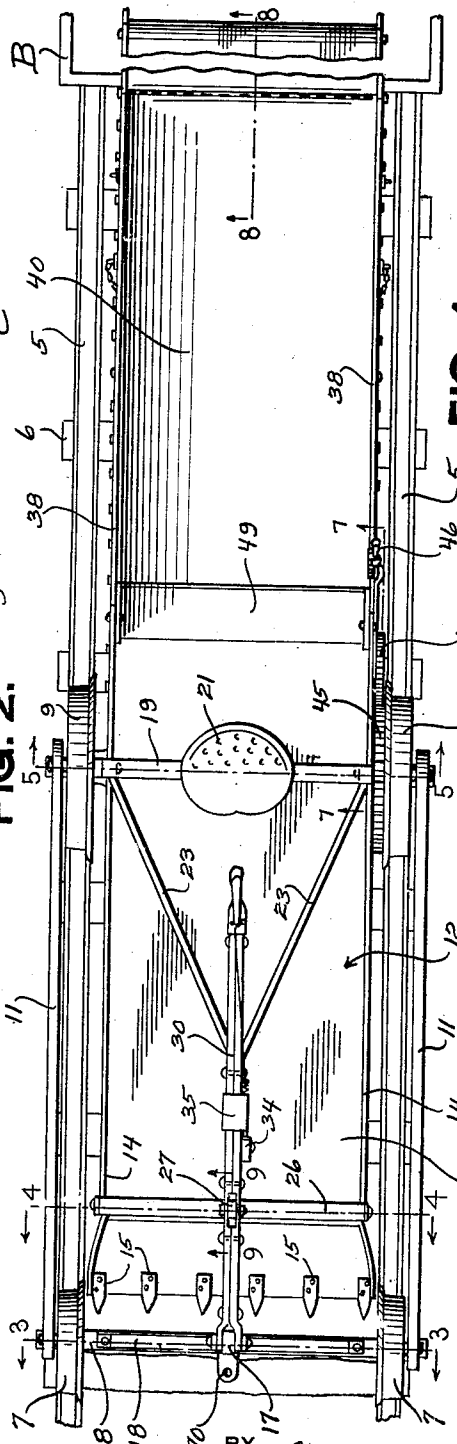


FIG. 2.

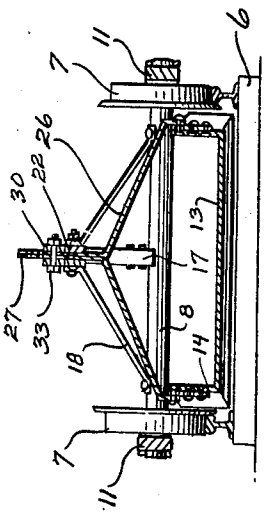


FIG. 4.

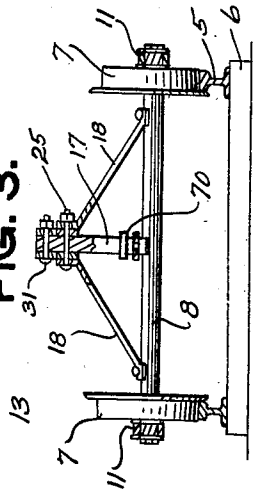


FIG. 3.

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FIG. 5.

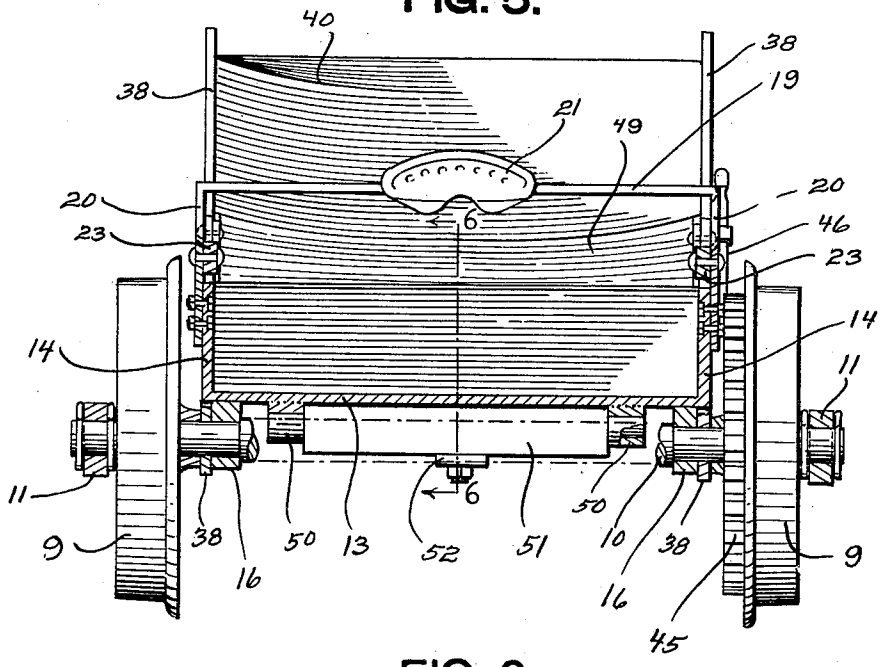



FIG. 6.

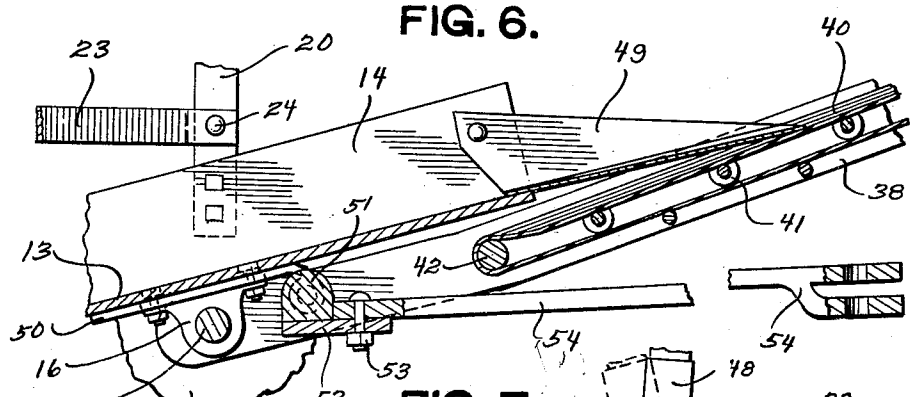
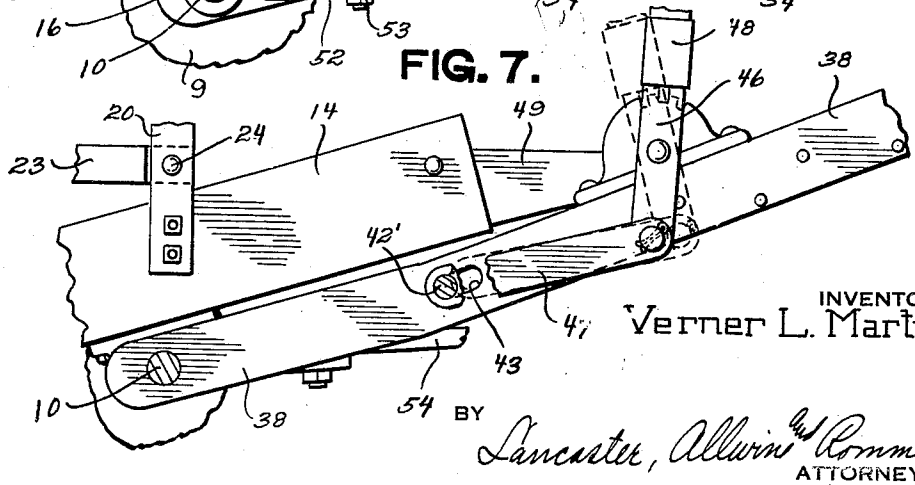



FIG. 7.




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MINE TRACK CLEANER

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FIG. 8.

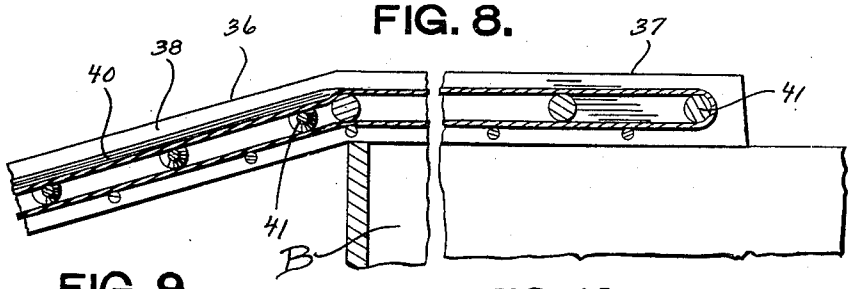



FIG. 9.

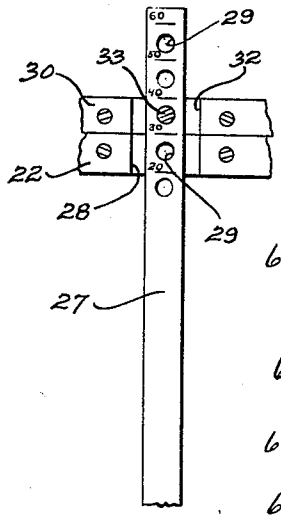



FIG. 10.

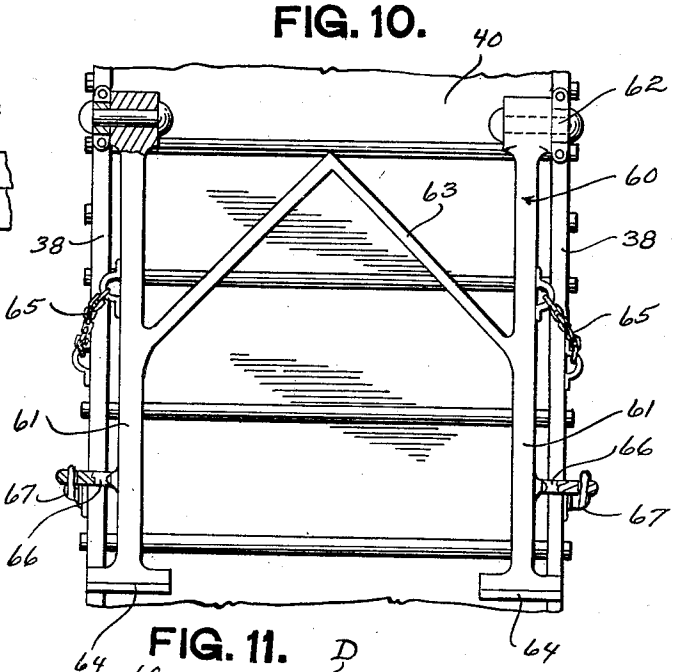



FIG. 11.

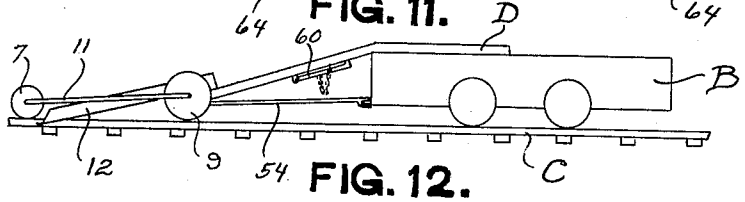



FIG. 12.

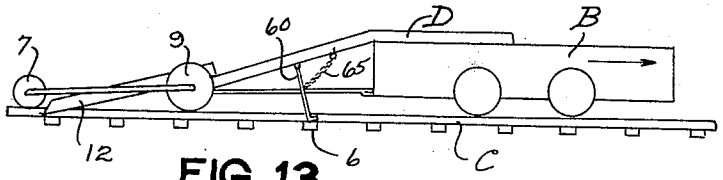
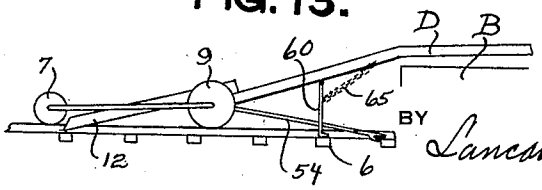



FIG. 13.




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# UNITED STATES PATENT OFFICE

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## MINE TRACK CLEANER

Application filed February 18, 1931. Serial No. 516,738.

The present invention relates primarily to mining equipment and more particularly to a track cleaning device for removing material from between the rails of a mine railway track.

In the removal of coal from mines, the mine tracks require frequent cleaning to remove the accumulation of coal spilled off the cars, small slate dropping from the mine roof and sand from the locomotive in order to permit proper travel of the cars and locomotives over the tracks. This accumulation of material between the rails of the tracks materially interferes with haulage by binding against the cars and locomotives and sometimes causing the cars and locomotives to be derailed and possibly resulting in serious accidents. The usual method of clearing the mine tracks of this accumulation of material is by means of men using shovels, and since this method is extremely expensive, the clearing of the track is often times neglected resulting in delays and wear upon parts of the cars and locomotive. It is therefore a primary object of the present invention to provide mechanically operated means for efficiently cleaning and removing accumulated material from between the tracks of mine railways.

A further object is to provide a mine road cleaner adapted to travel upon the tracks in a maner to remove excess material from between the rails of the tracks and deposit the same into a mine car coupled to the cleaner.

A further object of the invention resides in the simple and sturdy construction of the cleaner and the adjustable features permitting use of the cleaner upon tracks built of different size rails.

A further object of the invention resides in the novel arrangement whereby the conveyor of the cleaner may be raised from a position resting upon the mine car receiving the material, to permit easy placing of empty cars in a receiving position with respect to the conveyor.

A further and important object of the invention is to provide a mine road cleaner capable of use in relatively low mine tunnels and adapted for loading the gathered material into ordinary mine cars coupled to the cleaner.

A still further object resides in the provision of a mine road cleaner which may be easily pushed or pulled by a mine locomotive and when being pushed by the locomotive has the force applied directly to the gathering shovel and thereby relieving strain upon other parts of the cleaner.

Other objects and advantages of the invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification and in which drawings:

Figure 1 is a side elevation of the mine track cleaner and showing the manner in which a mine car is associated with the cleaner for receiving the material gathered from between the rails of the track.

Figure 2 is an enlarged top plan view of the cleaner showing a fragmentary portion of the rear or delivery end of the conveyor broken away.

Figures 3 and 4 are sectional views on the respective lines in Figure 2.

Figure 5 is an enlarged transverse section on the line 5—5 of Figure 2.

Figure 6 is a fragmentary sectional view on the line 6—6 of Figure 5 and showing the manner in which the coupling bar is connected to the shovel.

Figure 7 is an enlarged fragmentary section on the line 7—7 of Figure 2 and showing the arrangement for disengaging the drive means for the conveyor.

Figure 8 is a fragmentary section on the line 8—8 of Figure 2 and showing the manner in which the delivery end of the conveyor rests freely upon the mine car for receiving the gathered material.

Figure 9 is an enlarged fragmentary section on the line 9—9 of Figure 2 and showing the arrangement for adjusting the shovel for cleaning between different size rails.

Figure 10 is a fragmentary bottom plan view of the conveyor showing the rest or pedestal for supporting the conveyor while substituting an empty mine car for a loaded one.

Figure 11 is a diagrammatic showing of the cleaner and a mine car associated therewith for receiving the material gathered from between the rails.

Figure 12 is a diagrammatic showing of the cleaner and a mine car and showing the conveyor rest lowered so as to rest upon one of the supporting ties for the rails.

Figure 13 is a diagrammatic view showing the manner in which the conveyor is automatically raised from a resting position upon the mine car by pulling the car and cleaner rearwardly for a short distance.

Referring to the drawings in detail, and wherein similar reference characters designate corresponding parts thruout the several views, the letter A designates the improved cleaner, B a mine car of conventional type and C a mine railway track embodying the rails 5 supported upon the cross ties or sleepers 6.

The cleaner A is adapted for travel upon the track C and comprises a running gear including a pair of flanged front wheels 7 rotatably mounted upon a front axle 8, and a pair of flanged rear wheels 9 fixed upon a rear axle 10. The rear wheels 9 may be fixed for rotation with the axle 10 in any preferred manner and are preferably of greater diameter than the front wheels 7. The axles 8 and 10 project beyond their respective wheels and are connected by a pair of longitudinal side beams or rails 11 serving to retain the axles in parallel relation.

Arranged inwardly of the wheels 7 and 9 is a trough-like shovel 12 embodying a flat bottom plate 13 and upstanding side plates 14. The forward end of the shovel may be flared slightly as shown in Figure 2 and is provided at its leading edge with a series of teeth 15 which project forwardly from the shovel and preferably have rounded lower edges for readily riding over the cross ties 6. The width of the shovel will depend upon the gage of the track upon which the cleaner is to be used and is of a width to clear the material from between the rails 5 as the cleaner is advanced along the track. The rear end of the shovel extends above and rearwardly beyond the rear axle 10 and is supported upon the axle by means of suitable boxes 16 preferably bolted to the bottom plate 13 adjacent the shovel side plates 14. The shovel is mounted by the boxes 16 so as to permit vertical swinging of the shovel about the axle 10 as an axis. The forward end of the shovel is disposed slightly rearward of the front axle 8.

Secured at its lower end as by welding or other suitable means to the center of the front axle 8 is an upstanding supporting post 17 braced by suitable diagonal brace members 18 having their outer or lower ends secured to the axle 8. Secured to the rear portion of the shovel 12 directly above its point of pivotal attachment to the rear axle 10 is a saddle-like bracket embodying a cross bar 19 extending transversely across the shovel and having at each end a downturned arm 20 which are secured as by riveting, bolting or the like to the upstanding side plates 14. The cross bar 19 aside from serving as a tie for the upper end of the arms 20 may also serve to support a suitable seat as at 21. Connecting the supporting post 17 and bracket arms 20 is a Y-shaped tie member providing a substantially horizontal rest bar portion 22 from the rear end of which extends diverging arms 23 which are pivotally connected at their rear ends as at 24, one to each of the saddle arms 20. The forward end of the rest bar 22 is pivotally connected as by bolt 25 to the post 17.

Pivotally connected at its lower end to the side plates 14 of the shovel and at a point closely adjacent the forward end of the shovel, is a yoke 26 formed with an upstanding hanger bar 27 having vertical sliding movement thru a guide way 28 formed vertically thru the tie member rest bar 22. The upper end portion of the bar 27 is provided with a series of spaced adjustment holes 29 which may be suitably marked as in Figure 9 for gauging the proper depth of the shovel for cleaning between rails of different sizes or height.

A raising and lowering lever 30 is provided for the shovel 12 to permit passage over switches, cross-overs and when moving the cleaner from one territory to another without stopping forward travel of the cleaner. This lifting lever 30 is pivotally mounted at its forward end as at 31 to the upper end of the post 17 directly above the pivot 25 so as to extend rearwardly in overlying relation to the tie member rest bar 22. The lever 30 is provided with an opening 32 thru which the hanger bar 27 extends and a removable adjusting bolt 33 serves to connect the hanger bar to the lever by extending the bolt thru the desired hole 29. The lever 30 when in its lowered operative position rests upon the bar 22 and it will be seen that the adjusting holes 29 will determine the position of the forward end of the shovel 22 with respect to the upper or tread surfaces of the rails 5. Secured to the bar 22 is a toothed sector 34 to be engaged by a suitable detent 35 carried by the lever 30 and operated by a suitable grip provided at the rear hand gripping portion of the lever. This sector 34 and detent 35 serve to retain the shovel in any desired elevated position. When the shovel 12 is raised and lowered at its forward end by the lever 30, the shovel will pivot about the rear axle 10 as an axis.

The cleaner A also embodies a conveyor D for conveying the material from the rear end of the shovel 12 and depositing the material in the mine car B coupled at the rear of the

cleaner. The conveyor D is preferably in the form of a belt conveyor formed with an inclined portion 36 and a horizontal delivery portion 37 at the rear upper end of the inclined portion. The conveyor is formed with a pair of parallel side bars 38 between which is mounted the endless carrier belt 40 arranged to travel upon suitable supporting idlers 41 journaled in the side bars 38. As will be observed in Figure 8, the shape of the side bars 38 provide inclined and horizontal run portions for the belt 40. It is preferred that the supporting idlers for the inclined run of the belt be of the trough type having the flared or bell-shaped ends. The conveyor is made as shallow as possible and the horizontal delivery portion 37 is intended to rest upon the mine car B with its delivery end extending to a point about midway the length of the car. The conveyor is formed relatively shallow so as not to project for any considerable distance above the top of the mine car and thereby provide sufficient clearance between the conveyor and roof of the mine and prevent contact of the conveyor with the mine roof or contacting with electric wiring.

The forward ends of the side bars 38 extend in spaced relation below the rear portion of the shovel 12 and are journaled upon the rear axle 10 between the boxes 16 and wheels 9. The forward lower end of the belt 40 is trained over a drive roller 42 preferably arranged beneath the rear end portion of the shovel and having one end journaled in one of the side bars 38 and its opposite end rotatably extended thru an elongated slot 43 as shown in Figure 7. Affixed to the shaft end 42′ of the drive roller 42 is a gear 44 adapted to mesh with a gear 45 fixed for rotation upon the rear axle 10 just inwardly of one of the rear wheels 9. The gear 44 is intended to be engaged and disengaged from the driving gear 45 by means of a lever 46 pivotally mounted upon one of the conveyor side bars 38 and connected by a link 47 with the shaft 42′ whereby upon movement of the lever the shaft may be moved laterally in the slot 43′ for moving the gear 44 toward and away from the gear 45. Suitable detent means 48 may be provided for the lever 46 for retaining the gear 44 engaged or disengaged from the driving gear 45. This releasing drive means for the conveyor belt is to prevent operation of the conveyor belt while the cleaner is being transported from place to place.

Hingedly connected to the rear portion of the shovel 12 as upon the side plates 14, is an apron 49 which extends rearwardly over the belt 40 to prevent the material moving rearwardly over the shovel from sliding or rolling forwardly on the conveyor belt. The rear end of the apron may contact with the conveyor belt as shown in Figure 6 to prevent any forward movement of the material.

Secured as by welding or the like to the bottom plate 13 of the shovel at a point adjacent the boxes 16 is a pair of brackets 50 for supporting the ends of a heavy cross or pressure bar 51 provided midway its ends with a coupling bracket 52. Connected at one end to the coupling bracket 52 as by a suitable bolt 53 is a coupling bar 54, the opposite end of which is adapted for detachable connection with the draw bar 55 of the mine car B. This coupling bar 54 is of such length that when the cleaner is coupled to the mine car, the horizontal portion 37 of the conveyor will rest upon the top of the mine car and be supported thereby. It will be noted that the coupling bar 54 forms a direct coupling between the mine car B and the shovel 12 at a point immediately to the rear of the rear axle 10. With this arrangement the strain is directly upon the shovel and not upon any of the remaining portions of the cleaner.

Pivotally supported beneath the inclined conveyor portion 36 is a pedestal or prop 60 shown more clearly in Figure 10 and this prop is intended for supporting the conveyor during changing of the mine cars. The prop 60 comprises a pair of supporting legs 61 pivotally connected at one end to suitable brackets 62 secured to the under edges of the conveyor side bars 38. The legs 61 are braced by a pair of V-connected brace arms 63 which permit lowering of the prop without interfering with the coupling bar 54. Formed at the free end of each leg 61 is a foot piece 64 adapted to rest upon a cross tie 6 when the prop is lowered for supporting the conveyor. A suitable link chain 65 is connected between each of the legs 61 and its companion conveyor side bar 38 and these chains are of such length as to limit forward swinging movement of the prop beyond a substantially vertical position when lowered. Each leg 61 may be provided adjacent its free end with an extension 66 adapted to be engaged by suitable hooks 67 carried by the side bars 38 and serving to retain the prop in an elevated position beneath the conveyor.

The locomotive may either be coupled to the rear of the mine car for pushing the car and cleaner along the track way or if desired the locomotive may be connected to a coupling 70 provided on the supporting post 17 at the front of the cleaner so that the cleaner may be pulled along the track way.

Referring particularly to Figures 11, 12 and 13, the diagrammatic showing in Figure 11 shows the cleaner and mine car coupled in operative relation for use. In Figure 12, when desiring to uncouple the cleaner from the mine car such as when the car has been filled with the gathered material or when the

track cleaning operation has been completed, the prop 60 is lowered by releasing the hooks 67 and the feet 64 of the prop allowed to engage upon one of the cross ties 6. In this position it will be noted that the prop will be in an inclined position. With the prop lowered, as in Figure 12, the mine car is pulled for a short distance in the direction of the arrow which causes the prop to move to a vertical position and raise the conveyor to an extent whereby the horizontal portion 37 of the conveyor is lifted out of engagement with the mine car. The coupling pin connecting the coupling bar 54 to the draw bar 55 may then be removed and the mine car drawn from beneath the rear portion of the conveyor. If an empty car is to be placed for loading, the empty car may be readily moved beneath the horizontal portion of the conveyor and after connecting the coupling bar to the car, a slight forward movement of the car and cleaner will free the prop and allow the horizontal portion of the conveyor to be lowered upon the top of the car. Thus it will be seen that loaded cars may be easily and quickly removed and empty cars coupled to the cleaner with little or no effort upon the part of the operator. The pivotal coupling of the car to the cleaner by the bar 54 permits the horizontal portion 37 of the conveyor to slide slightly on the top of the mine car when rounding curves.

In operation, the adjusting pin 33 is placed in the proper opening 29 of the hanger bar 27 in accordance with the size of the rails of the track to be cleaned and the lever 30 lowered to rest upon the bar 22 and held in a lowered position by the detent 35. With a mine car coupled to the rear of the cleaner, the car and cleaner are moved along the track by means of a locomotive coupled either at the rear of the mine car or to the front of the cleaner. As the cleaner is advanced the material from between the rails is gathered and forced rearwardly over the shovel to the belt conveyor where it is elevated and deposited in the mine car. After the mine car has been filled, an empty car may be coupled to the cleaner in the manner previously described.

It is to be noted that the rear portion of the shovel 12 and the forward portion of the conveyor D are supported upon the rear axle 10 and this is to provide sufficient weight upon the rear wheels 9 as to afford sufficient traction for operation of the conveyor belt.

From the foregoing description it will be apparent that an improved type of track cleaning device has been provided which will quickly and efficiently remove accumulated material from between the rails of a trackway. It will also be apparent that an improved track cleaner has been provided which will be found especially well adapted for use in cleaning mine trackways owing to the specific construction of the cleaner permitting use in mine passageways having a low roof. It will also be apparent that a novel and simple arrangement has been provided permitting use of the cleaner upon various types of tracks, and which cleaner operates for transferring the material into an ordinary mine car connected in a novel manner to the cleaner so as to permit ready placing of an empty mine car for one having been filled thru travel of the cleaner along the roadway.

Changes in detail may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In mine track cleaning apparatus the combination of a cleaner comprising a running gear including front and rear track wheels, an inclined shovel supported between the wheels, a mine car, means detachably coupling the mine car at the rear of the cleaner, a conveyor including an inclined forward portion pivotally supported beneath the rear portion of the shovel and a horizontal rear delivery portion for resting upon the top of the mine car, releasable drive means between the conveyor and rear track wheels of the cleaner, and a prop pivotally carried by the conveyor for engagement with the supporting ties of the track to raise the conveyor out of contact with the mine car thru a slight rearward travel of the apparatus.

2. In a track cleaner, front and rear track wheels, axles for the wheels, side beams connecting the axles, a post supported upright upon the front axle, an inclined shovel pivotally mounted at its rear portion upon the rear axle, a bracket secured to the rear portion of the shovel including side arms, a tie member including a rest bar pivotally connected at its forward end to said post and rearwardly diverging arms pivotally connected at their rear ends one to each of said bracket side arms, a lever pivotally mounted at its forward end to the upper end of said post in overlying relation to said rest bar, a yoke pivotally connected to the forward portion of the shovel, a hanger bar connected to the yoke and extending upwardly for connection to said lever, and means for retaining the lever in vertically adjusted positions.

3. In a mine track cleaner, a running gear including front and rear axles, front track wheels rotatable on the front axle, rear track wheels fixed on the rear axle, a shovel pivotally supported adjacent its rear end upon the rear axle, a post carried by and extending upwardly from the front axle, a horizontal tie member pivotally connected between the post and rear portion of the shovel, a lever pivotally mounted for vertical swinging movement at its forward end upon the upper end of said post for resting upon said tie member, a yoke pivotally connected with

the forward portion of the shovel, a hanger bar projecting upwardly from the yoke and provided with adjustment openings, and a removable coupling pin for connecting the lever to the hanger bar at a selected adjustment opening.

4. In mine track cleaning apparatus, the combination of a cleaner comprising a running gear including front and rear axles, track wheels for the axles, framing connecting the axles, an inclined shovel pivotally supported adjacent its rear end upon the rear axle, a mine car disposed rearwardly of the cleaner, a conveyor pivoted at its forward end to the rear portion of the shovel and having its rear delivery end resting upon the top of the mine car, and a push bar connected between the mine car and the rear portion of the shovel closely adjacent the rear axle of the running gear.

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