

Dec. 11, 1923.

1,476,882

J. A. FORSYTH

APPARATUS FOR LOADING COAL

Filed Oct. 19, 1921

3 Sheets-Sheet 1

FIG. 1

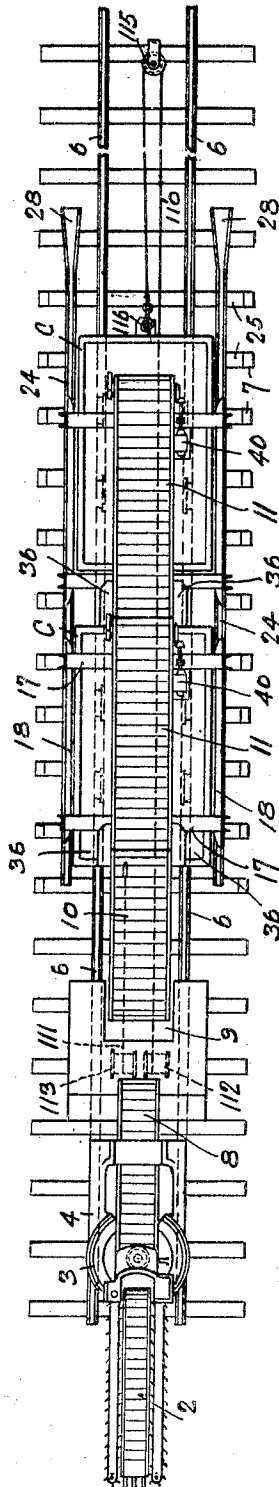
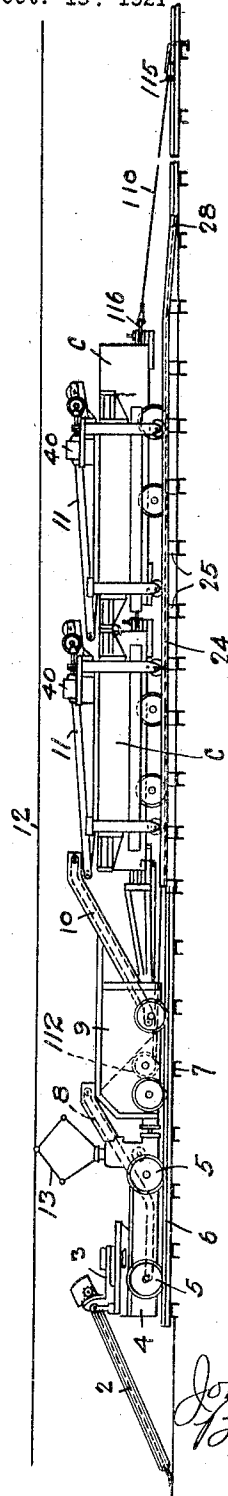


FIG. 2



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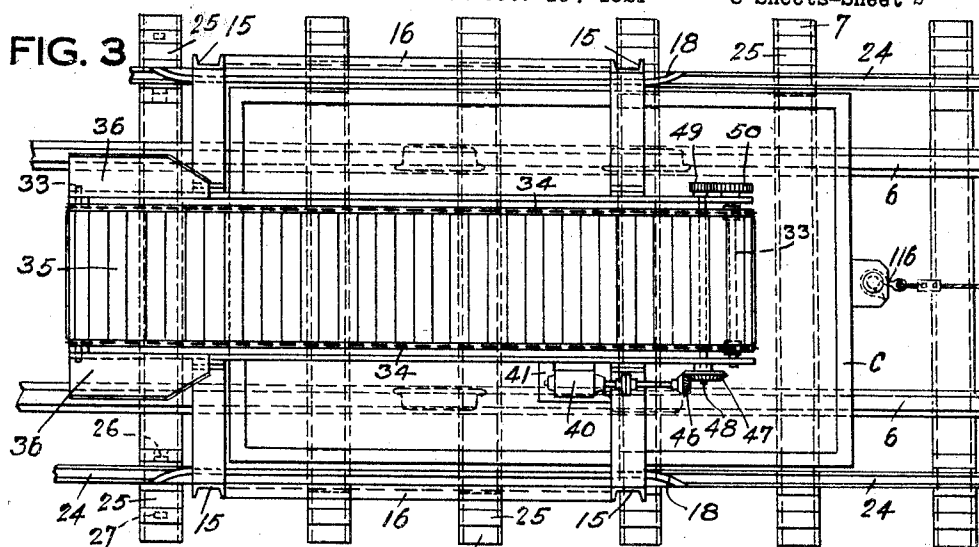
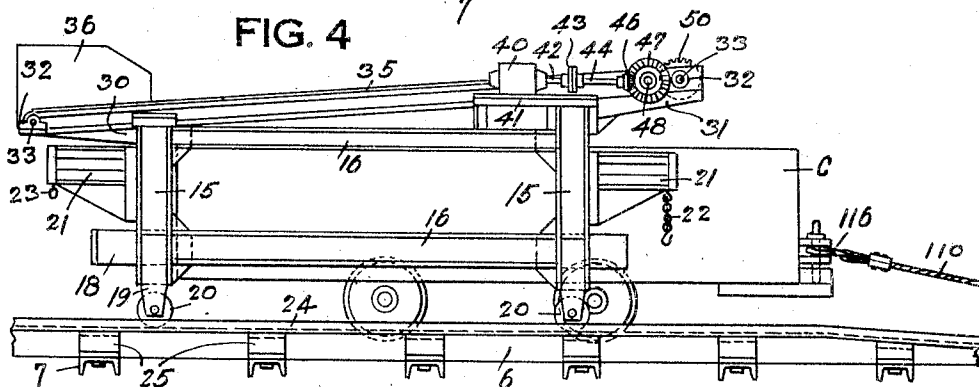
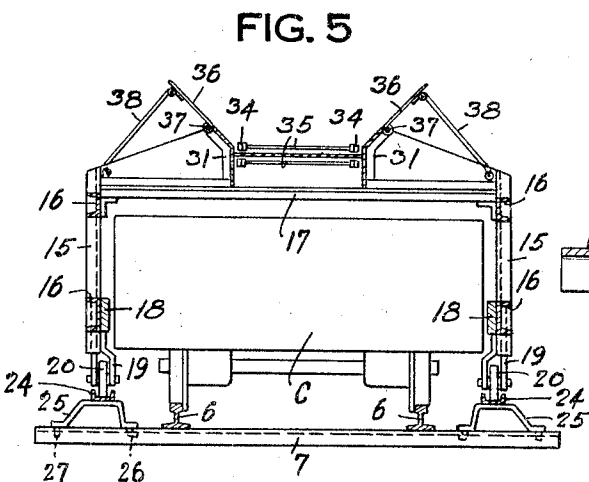
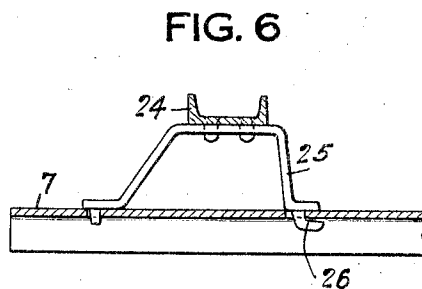
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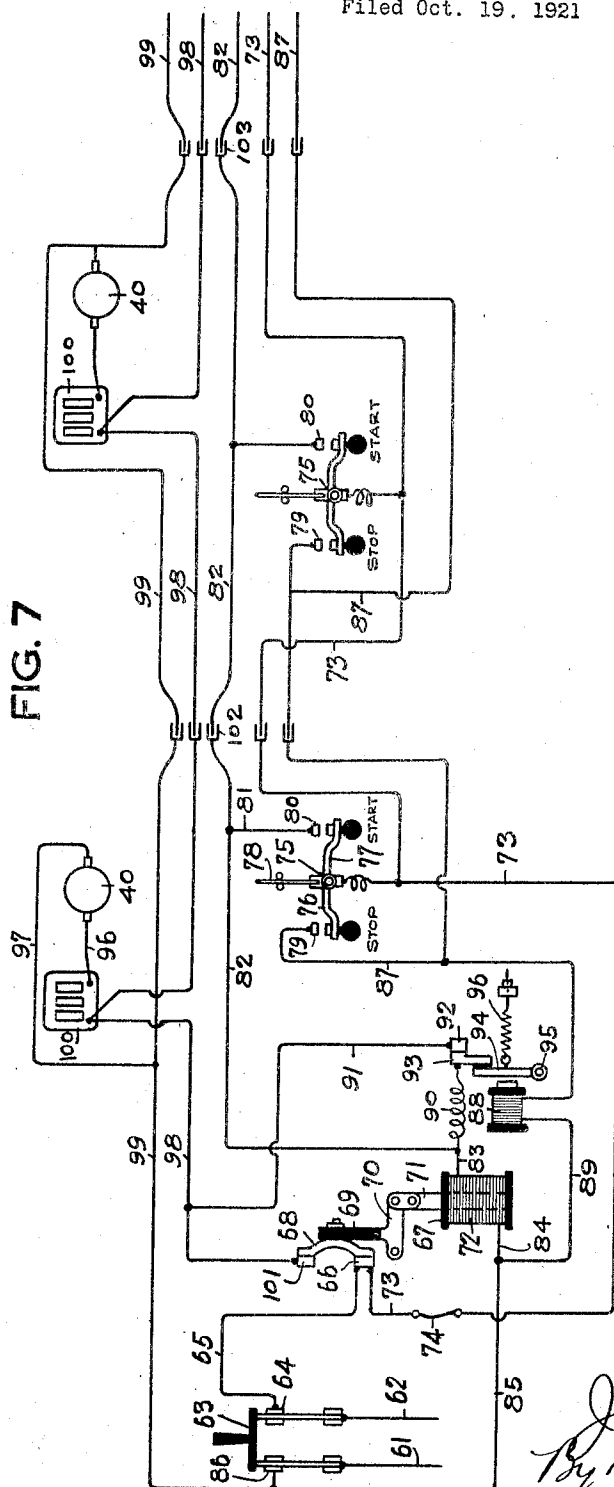
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3 Sheets-Sheet 3

FIG. 7



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR LOADING COAL.

Application filed October 19, 1921. Serial No. 508,712.

To all whom it may concern:

Be it known that I, JOHN A. FORSYTH, a citizen of the United States, and resident of Nemacolin, in the county of Greene and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Loading Coal; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to methods and apparatus for loading into cars dislodged coal or other mineral which has been previously broken down in the mine.

The general object of my invention is to provide a machine which shall operate to load the coal into a connected train of cars, beginning with the car that is nearest to the mine entrance, so that when all of the cars of the train are filled the train is ready to be drawn out of the mine. Ordinary loading methods require that each car be individually brought to the working place, loaded, and taken away, which involves much loss of time in bringing up the empty cars one by one and taking away the loaded cars.

More specifically, one object of my invention is to provide a loading conveyer composed of any suitable number of similar units, and capable of conveying coal to a sufficient number of cars in a given working place to load out a cut of coal which has previously been broken down and which is delivered to the conveyer by means of a loading machine.

A further object of my invention is to provide a novel and effective method of loading out coal from a working place, whereby the coal is gathered up and conveyed along and above the mine track and loaded into a connected trip of empty cars, beginning with the last car, the cars being drawn out from beneath the conveyer as each car is loaded, and being ready to be taken out of the mine when all of the cars have been filled.

A further object of my invention is to provide a unit conveyer, composed of similar units of such length and size that they may be readily transported in the limited space available in a coal mine, and may be readily assembled to form a conveyer of proper length to convey the coal along and above the full length of a train of empty cars, whereby the coal may be loaded without uncou-

pling the cars, beginning with the car nearest the mine entrance.

Other objects and advantages of my invention will appear in the following description.

My invention is particularly, although not exclusively, intended for use in mining coal by the room and pillar system, wherein main entries are driven through the seam with face entries driven laterally from the main entries, and butt entries are turned off perpendicularly to the face entries to provide access to rooms which are driven off from the butt entries at suitable intervals. In driving the rooms, the mine track is laid adjacent to the rib of coal that is left unmined, and on account of the posts which support the roof, and the space taken up by slate and refuse, the space available for the tracks, cars, and locomotives is only about 10 feet wide. Mine cars and locomotives vary in width from 4 feet to 6 feet, and the bituminous mining laws require a clear space of 3 feet at one side of the cars for safety. It is therefore necessary to use but a single track in the working places. According to the loading methods now employed, only one car can be brought up to the working place at one time for loading. The gathering locomotive, horse, or mule, as the case may be, takes several empty cars from the side track provided elsewhere in the mine or outside of the mine, and goes from place to place, leaving one car at a time in each working place, until all of the cars are placed. It is then necessary to go over this same ground again and pick up the loaded cars, pull the loaded cars to a side track, which is usually a considerable distance away from the working places, and then start out again with a new string of empty cars. This operation consumes a great deal of time, and it has been found that the loss of time resulting from the placing of empty cars and taking away loaded cars more than offsets the advantage of mechanical loading machines. For this reason mechanical loaders have not met with much success, for although they are able to load coal rapidly, the cars cannot be brought to them fast enough to warrant their use.

My present invention aims to overcome the difficulty just described and to enable a connected string of cars to be loaded at any

given working place, notwithstanding the limited space available. I accomplish this by means of a series of unit conveyers which receive the coal from any suitable mechanical loader and convey it to a point above the mine track which is far enough removed from the loader to enable a complete string of cars, sufficient in number to load out an entire cut of coal, to be passed beneath the conveyers. These unit conveyers are so mounted as to bridge the mine track, leaving sufficient clearance to permit the train of cars to be run beneath them. Unit conveyers transfer the coal from one to another, and a sufficient number of unit conveyers are employed to bring the discharge end of the last unit conveyer above the last car in the train. As each car is loaded the train is drawn out from beneath the conveyers to bring the next car in position for loading, and when the last car is loaded the entire train of loaded cars is ready to be drawn out of the mine without assembling or coupling the cars together.

In addition, I provide means for moving the unit conveyers on tracks outside of and raised above the mine tracks, so as to enable the unit conveyers to be moved toward the face of the coal as the mining proceeds, and also to enable the conveyers to be loaded upon ordinary coal cars and moved from working place to working place. Each of the unit conveyers is a self-contained unit with a driving motor and an endless conveyer, and I provide a system of electrical control whereby the entire series of unit conveyers may be started or stopped from any one of the units by the use of suitable push-button switches.

Another feature of my invention is the provision of means whereby the string of empty cars, when brought to the machine, may be drawn beneath the unit conveyers by power supplied by the machine itself, and after the first car is loaded may be drawn out from beneath the conveyers from time to time to permit the cars to be loaded successively. This device consists of a set of drums carried by a suitable part of the mechanism and provided with cables connected to the front and rear cars of the string, as will be more fully described below.

The accompanying drawing shows the form in which I now prefer to construct my invention, it being understood, however, that various changes in the construction and arrangement of parts may readily be made.

In the drawing Fig. 1 is a plan view of a complete loading machine with a set of conveyer units constructed in accordance with my invention; Fig. 2 is a side elevational view of the apparatus shown in Fig. 1; Fig. 3 is a plan view of one of the unit conveyers; Fig. 4 is a side elevational view of the unit conveyer of Fig. 3; Fig. 5 is an end eleva-

tional view of the same unit conveyer; Fig. 6 is a detail view of the auxiliary track construction; and Fig. 7 is a wiring diagram showing the control circuits for the several mechanisms.

It will be understood that the present application relates to the unit conveyers, and not to the loading mechanism which delivers the coal to the conveyers. This loading mechanism forms the subject of my co-pending application for Letters Patent, filed January 13, 1922, Serial No. 528,976, and is shown on Figs. 1 and 2 of the present application in a diagrammatic way, for the purpose of better illustrating the operation of my unit conveyers. The several mechanisms shown in Figs. 1 and 2 include an inclined conveyer 2 for gathering up the dislodged coal from the mine floor, the conveyer being pivotally mounted on a turntable 3 which is slidable on a carriage 4 having wheels 5 running on tracks 6 which may be ordinary mine tracks, and may be laid on metal ties 7. A conveyer 8 receives the material from the conveyer 2 and transfers it to a storage hopper 9 from which another conveyer 10 conveys the coal to the first of a series of unit conveyers 11, two of which are shown in the drawing. Electric power for operating the several mechanisms of the machine is taken from a mine trolley 12 suitably by means of a pantograph current-collector 13, or is brought to the machine by a cable leading from the mine trolley, which may not extend to the working place.

Each of the unit conveyers 11 comprises a frame composed of vertical members 15 connected together by means of longitudinal beams 16 and transverse beams 17 framed together as shown in Figs. 4 and 5. The transverse beams 17 extend across the upper ends only of the vertical members 15 so as to form a bridge structure beneath which a train of cars C may be run. Guide bars 18, having outwardly curved ends, as shown in Fig. 3, are secured to the inner sides of the frame in order to insure that the cars will enter properly beneath the conveyer, without striking the uprights. Bars 19 are secured to the vertical members 15 of the frame near their lower ends and are bent to co-operate with the members 15 to form bearings for wheels 20. Bumpers 21 extend from the front and rear of each conveyer unit and are provided with hook-chains 22 and eye-bolts 23 for connecting the units together.

The wheels 20 run upon auxiliary tracks consisting of channel bars 24 laid end-to-end and supported at a level somewhat higher than the level of the tracks 6 by means of spaced U-shaped supports 25. The supports 25 may conveniently be supported on the ties 7 by means of curved projections 26 formed on the underside of their inner ends

and straight projections 27 formed on the underside of their outer ends. The ties 7 are made with suitable openings to receive the curved projections 26 and the straight projections 27, and the sections of the auxiliary tracks 24 may be placed in position on the ties 7 by merely inserting the curved projections 26 in their openings in the ties 7 and then lowering the auxiliary track section until the straight projections 27 engage the openings provided for them in the ties 7. The sections of the channels 24 may be connected at their ends by any suitable form of joint construction (not shown). By punching the openings for the projections 20 and 27 at the proper positions with reference to the tracks 6, and by spacing the supports 25 at suitable intervals corresponding to the spaces between the ties 7, the auxiliary tracks 24 when attached to the ties, will always be the proper distance apart, at the proper gauge to support the unit conveyers. The inclined approach end of the auxiliary track is widened as shown at 28, Fig. 1, so as to insure that the wheels 20 of the conveyers will register with the tracks.

The uprights 15 on each unit conveyer are made higher at one end than at the other. Brackets 30 and 31 extend beyond the frame at the front and rear, and support bearings 32 in which are journaled shafts 33 which carry sprocket wheels around which extend endless chains 34 carrying an endless flight conveyer 35. The brackets 30 at the lower end of the conveyer also support inclined wings 36 which are pivoted at 37 and are provided with supporting rods 38 so as to be raised when the conveyers are in operation to prevent the coal from escaping over the sides of the conveyer as it drops from the upper end of the preceding unit.

Each unit conveyer is provided with a separate driving motor 40 mounted on a convenient support 41 at the side of the conveyer frame, and having its armature shaft 42 connected by means of a coupling 43 to a shaft 44 which extends through a suitable gear housing (not shown) and carries at its end a bevel pinion 46 meshing with a bevel gear 47 on a countershaft 48 which extends across the frame and carries at its end opposite to the gear 47 a spur gear 49 meshing with a spur gear 50 on the drive shaft 33 at the upper end of the conveyer.

Fig. 7 is a diagram of an electric control system for controlling all of the unit conveyers together, and for enabling the entire set of unit conveyers to be started and stopped from any one of the individual unit switches. Power is brought to the machine from the trolley 12 through a cable containing conductors 61 and 62 which are controlled by means of a switch 63. From one of the contact members 64 of the switches 63

a conductor 65 leads to one of the stationary contact members 66 of a solenoid master switch 67, which has a movable contact member 68 mounted on an insulating support 69 carried by a pivoted arm 70 which is operated by the core 71 of the solenoid coil 72.

From the contact member 66 a conductor 73 leads through a suitable fuse 74 to a two-point momentary-contact push button switch 75 having two contact arms 76 and 77. A spring 78 normally keeps the arms 76 and 77 in their open position while permitting either of these arms to be moved into temporary contact with fixed contact members 79 and 80, respectively. The fixed contact member 80 is connected by means of conductors 81 and 82 to one terminal 83 of the solenoid coil 72, and the other terminal 84 of the solenoid is connected by means of a conductor 85 to the negative fixed contact member 86 of the main switch 63.

The fixed contact 79 of the push button switch 75 is connected by means of a conductor 87 to one terminal of a relay solenoid 88, the other terminal of which is connected by means of a conductor 89 to the return wire 85 which leads to the negative contact 86 of the main switch. The terminal 83 of the master switch solenoid 82 is connected not only to the conductor 82 but to the main wire 98 by means of conductors 90 and 91 in which is inserted a relay switch controlled by the solenoid 88 and consisting of a fixed contact member 92 and a movable contact member 93 which are connected to the conductors 91 and 90, respectively. The movable contact member 93 is carried by an insulating block on an armature 94 which is pivoted at 95 and is normally caused, by means of a spring 96, to bring the movable contact 93 into engagement with the fixed contact 92, thus completing the circuit through the solenoid 72. When the relay solenoid 88 is energized, the armature 94 is drawn toward the core of the solenoid 88, thereby separating the contact members 92 and 93 and breaking the circuit through the master switch solenoid 72.

The motor 40 of the first unit conveyer has its terminals connected by means of conductors 96 and 97 to the main conductors 98 and 99 respectively, a suitable automatic accelerator 100 being inserted in the motor circuit to permit the motor to build up speed at starting. The main conductor 98 is connected to the fixed terminal 101 of the master switch 67, while the main conductor 99 is connected to the negative contact 86 of the main switch 63.

The main wires 98 and 99 and the control wires 74, 82 and 87 are all connected to suitable terminals in a plug connector 102 which connects the several wires to the corresponding wires of the next unit conveyer,

these wires being numbered on Fig. 7 to correspond with the similar wires in the circuit of the first unit conveyer. Similarly, the five wires of the second unit conveyer are brought to the terminals of a plug connector 103 and the system may be extended indefinitely according to the number of conveyers that are to be used.

When the switch 63 is closed, no current flows through the main circuit because the master switch 67 is open, and no current flows through the control circuits because these circuits are broken at the push button switch. When any one of the push button switches 75 is operated by means of the button marked "Start" to bring the movable contact 77 into engagement with the fixed contact 80, the circuit is completed through the terminal 64, the conductor 65, the terminal 66, the conductor 73, the switch terminals 77 and 80, the conductors 81, 82 and 83, the solenoid 72 and conductors 84 and 85 to the negative terminal 86 of the main switch 63. The solenoid 72 of the master switch 67 being thus energized, the main circuit through the conductors 66 and 101 is completed and current flows in the main circuit through conductors 65, terminals 66 and 101, conductor 98, accelerator 100, and conductor 96 to the motor 40; returning through conductors 97 and 99 to the negative terminal 86 of the main switch 63. As the motors 40 of all the succeeding unit conveyers are connected across the main wires 98 and 99, all of the motors are simultaneously energized and all of the conveyers are placed in operation.

At the same time that the main circuit is energized, the auxiliary control circuit through the solenoid 72 is completed, the current flowing from the main wire 98 through wire 91 contacts 92 and 93, and wires 90 and 83, to the solenoid coil 72, returning as before through wires 84 and 85 to the terminal 86 of the main switch 63. On account of the provision of this last-named auxiliary control circuit through the solenoid 72 the push button switch may be operated only momentarily and may be released as soon as the motors begin to operate. The motors will continue to operate until the "Stop" button of one of the push button switches 75 is operated to bring its contact 76 into engagement with the fixed contact 79, which completes the circuit through the solenoid 72, the current passing from the switch 75 through the contacts 76 and 79 and wire 87 to the solenoid coil 88 and thence through wires 89 and 85 to the negative contact 86 of the main switch. The solenoid 88, being thus energized, attracts the armature 94 and the movable contact 93 is thereby separated from the fixed contact 92, thereby breaking the circuit through the solenoid 72, whereupon the core 71 falls

by gravity and withdraws the movable contact member 68 from the fixed contact members 66 and 101, thus breaking the main circuit through the motors and stopping all of the conveyers simultaneously.

In order to move the cars C so as to move them beneath the unit conveyer and then advance them at the proper times to be loaded in succession, I provide two cables 110 and 111 which are carried by drums 112 and 113, respectively, carried by a suitable part of the machine. As shown on Figs. 1 and 2, these drums are carried by the storage hopper 9, but it is to be understood that they may also be mounted elsewhere in advance of the unit conveyers. A suitable motor, not shown, is provided for rotating the drums 112 and 113 simultaneously, and the drums may be provided with a solenoid brake or other suitable braking means. These driving and braking arrangements are such as are commonly used in hoisting machinery and the like, and are therefore not illustrated in detail herein. The cable 110 extends from the drum 112 to a sheave 115 which is attached to one of the cross-ties 7 at a distance beyond the end of the unit conveyer at least as great as the length of the string of cars to be loaded, and from the sheave 115 the cable 110 is brought back and hooked or otherwise connected at 116 to the last car C of the string to be loaded. The cable 111 extends from the drum 113 to the end of the first car of the string, that is, the first car which enters beneath the conveyer and is the last to leave.

The string of cars is brought to the working place by the usual locomotive, horse or mule, and the cables 110 and 111 are connected up in the manner described. Then, by rotating the drums 112 and 113, the cars may be drawn beneath the unit conveyer, the cable 111 being shortened to draw the cars and the cable 110 being lengthened to correspond to this movement. As each car is loaded the drums 112 and 113 are rotated in the reverse direction to draw the string of cars out from beneath the unit conveyer sufficiently to bring the next car into loading position. When all of the cars have been filled, the cables are disconnected and the locomotive or animal draws the loaded train from the working place.

In the operation of the conveyer which I have shown and described, it is intended that the coal be broken down in the working place by ordinary methods, such as by undercutting and shooting, by automatic pick-machines, or any other desired way. When a cut of coal has been broken down at the working place, a loading machine, which may be of the type described and claimed in my copending application No. 528,976, or may be of any other desired construction, is brought to the working place and made

ready to load out the coal. Meanwhile, the units of my conveyer have been loaded on empty cars for transportation. The supports 15 hang freely over the sides of the cars, and the empty cars carrying the conveyers are pushed into the working place behind the loading machine. The track has previously been prepared in the manner described above, by laying the auxiliary tracks 24, and as the cars with the conveyer units approach the auxiliary tracks, the ends of which are widened at the approach to insure that the wheels of the conveyer will register with the track, the conveyers roll up the inclined ends of the auxiliary tracks, thus raising the units of the conveyer a sufficient distance above the cars to enable the cars to be withdrawn when they are loaded. When all of the unit conveyers 20 have been run upon the auxiliary track they are coupled together, and to the loading machine, and the plug connectors 102, 103, etc., are connected together so as to complete the electric circuit through the several motors of the units. One of the starting push buttons is then operated to set the unit conveyers in motion, and the loading machine is set in operation to gather up the coal and deliver it to the conveyers. The coal is conveyed along and above the empty cars, drops from the upper end of each unit upon the lower end of the next unit, and is finally deposited in the last car to enter beneath the conveyer. When this car is loaded the drums 112 and 113 are so operated as to draw out the cars and present the next empty car to be loaded, and the operation proceeds in this manner until the whole string of cars has been filled and removed. If a single train of cars is not sufficient to load out the cut of coal which has been broken down, a second string may be brought to the conveyer and loaded in a similar manner.

When the working place has been loaded out, a string of empty cars sufficient in number to support the units of the conveyer is brought beneath the conveyer and the conveyer is uncoupled from the loading machine. The first unit in (which is the last unit out) is hooked to the front car of the empty train, and the locomotive starts outward. As each conveyer unit rolls down from the auxiliary track it settles on the car directly under it, and the trip of cars carrying the units is ready to be shifted to the next working place which is to be loaded out.

Since the cars in each string or trip do not need to be uncoupled during the loading operation, my invention accomplishes a great saving in time as compared with the loading methods now in use. Also, a single gathering locomotive can handle a great deal more coal in a given time than is pos-

sible by ordinary methods, because it is not necessary to shift the cars and set them in the working places one at a time.

The sectional construction of my unit conveyers permits the coal to be carried a considerable distance before being deposited in the cars, while at the same time the sections are made small enough to be taken around corners and over irregular track sections in the mine.

Another important advantage of my loading system is the ease with which conveyer units may be transported to and from the working place. A string of empty cars is employed for this purpose and is ready to be loaded as soon as the conveyer is in place.

While I have shown and described the construction which I now prefer to employ in carrying out my invention it will be understood that numerous changes may readily be made and I therefore desire that no limitations be imposed upon my invention except such as are indicated in the appended claims.

I claim as my invention:

1. In combination, a conveyer unit adapted to receive and convey coal, and means for supporting the said unit over a mine track and parallel thereto, the said supporting means comprising a frame bridging the said track, and having supporting portions defining an unobstructed space for the entrance of cars on said track.

2. A conveyer composed of a plurality of unit sections adapted to transfer coal successively from one section to the next, and wheeled frames for supporting the said sections, each of the said frames being adapted to bridge a mine track and to define an unobstructed space for the entrance of cars on said track.

3. A conveyer composed of a plurality of connected unit sections, each of said sections comprising an endless conveyer, and wheeled frames for supporting the said conveyer sections, each of the said frames being adapted to bridge a mine track and to define an unobstructed opening for the entrance of cars on said track.

4. A conveyer adapted to transfer coal from a loading machine to cars, and means for supporting said conveyer above a mine track independently of the loading machine, the said supporting means comprising auxiliary tracks supported by the ties of the said mine track.

5. A conveyer unit adapted to receive and convey coal, and a frame of inverted U-shape in cross section for supporting the said unit over a mine track and parallel thereto, leaving the said track unobstructed for the entrance of cars.

6. A coal conveyer composed of a plurality of unit sections adapted to transfer the coal successively from one section to the next, and a wheeled frame of inverted U-shape

in cross section for supporting each of the said sections over a mine track, leaving the said track unobstructed for the entrance of cars.

7. A conveyer composed of a plurality of connected unit sections, each of the said unit sections comprising an endless conveyer, a frame supporting the said conveyer, a track for supporting the said frame, and means for removably attaching the said track to the ties of a mine track.

8. A conveyer comprising a material-carrier, a frame supporting the said carrier and adapted to bridge a mine track, and means for supporting the said carrier at an elevation above the height of cars on the said track, and for permitting the said carrier and supporting frame to descend and rest upon a car on said track when the said frame is moved beyond the said elevating means.

9. A coal conveyer comprising a plurality of connected unit sections, each of the said sections comprising an endless carrier, frames of inverted U-shape in cross-section for bridging a mine track and for supporting the said carriers, and auxiliary tracks beside the mine tracks for supporting the said frames with the said carriers higher than the tops of cars on said tracks, whereby when said frames are moved beyond the ends of said auxiliary tracks, the said frames and carriers are permitted to descend and rest upon the tops of cars on the mine track.

10. A conveyer adapted to transfer coal from a loading machine to cars, and means for supporting the said conveyer independently of the said loading machine, the said supporting means comprising auxiliary tracks disposed beside the tracks for the said cars and carried by the ties of said mine tracks.

11. A conveyer composed of a series of connected unit sections, each of the said sections consisting of an inclined endless conveyer adapted to deliver the coal from its upper end upon the lower end of the next conveyer, and means for supporting the said conveyers above a mine track while leaving the said track unobstructed for the entrance of cars; said supporting means comprising auxiliary tracks carried by the ties of the said mine tracks.

12. A conveyer composed of a plurality of connected unit sections, each of the said unit sections comprising an inclined endless conveyer, a wheeled frame supporting the said conveyer, a temporary track for supporting the said frame, and means for removably attaching the said temporary track to the ties of a mine track.

13. A conveyer unit comprising an inclined endless carrier, a wheeled frame supporting the said carrier, temporary tracks for supporting the said frame over a mine track while leaving the said mine track un-

obstructed for the entrance of cars, and means for removably attaching the said temporary track to the ties of the said mine track.

14. A conveyer unit composed of an inclined endless conveyer, a wheeled frame supporting the said conveyer, temporary tracks for supporting the said frame over a mine track while leaving the said mine track unobstructed, the said temporary tracks being composed of channel bars and supports for the said bars having legs adapted to rest on the ties of the said mine track, and projections formed on the said supporting legs and adapted to enter openings in the said ties.

15. A conveyer comprising a connected series of unit sections, each of the said sections comprising an endless conveyer adapted to deliver the coal from its outer end upon the lower end of the next conveyer, a wheeled frame for supporting the said inclined conveyer, and temporary tracks for the wheels of the said conveyers, the said tracks being removably mounted on the ties of a mine track outside of the rails of the said track and elevated above the said rails.

16. A conveyer comprising a plurality of conveyer units, each unit being mounted on wheeled supports and auxiliary tracks adapted to be temporarily attached to the ties of an ordinary mine track for supporting the said conveyers, the said tracks being composed of channel bars and having their approach ends inclined downwardly and widened to receive the wheels of the said conveyers.

17. An auxiliary track construction for coal conveyers comprising channeled rails, supports secured at intervals to the underside of said rails, and projections extending from the underside of said supports and adapted to enter openings in the cross ties of ordinary mine tracks.

18. An auxiliary track construction for coal conveyers comprising channeled rails, supports secured at intervals to the underside of said rails, U-shaped supports secured at intervals to the underside of said rails, and projections extending from the underside of said supports and adapted to enter openings in the cross ties of ordinary mine tracks.

19. A conveyer comprising a plurality of units each having an endless motor-driven carrier, and an electric circuit including the motors of the said conveyers, the said electric circuit also including switches for the individual conveyer units so arranged that all of the said motors may be started and stopped from any one of the said unit switches.

20. A conveyer comprising a plurality of units each having a motor-driven endless carrier, means for electrically connecting

the motors of the said units, and a two-point momentary contact push button switch associated with each of said units and connections, whereby all of the said motors 5 may be started and stopped by means of any one of the said switches.

21. A conveyer composed of a plurality of connected unit sections, each of the said unit sections comprising an inclined endless 10 conveyer, a wheeled frame supporting the said endless conveyer, an electric motor carried by the said frame, a control circuit

including all of the motors of the said unit sections, and switches for each of the said motors, the said control circuit being so connected that the entire series of motors may be started and stopped by means of any one of the said motor switches.

In testimony whereof, I, the said JOHN A. FORSYTH, have hereunto set my hand.

JOHN A. FORSYTH.

Witnesses:

ALFRED W. HESSE,
ALBERT R. MORGAN.