Aug. 11, 1931. P. E. SMITH 1,818,168

COAL LOADER

Filed Dec. 27, 1929 5 Sheets-Sheet 1

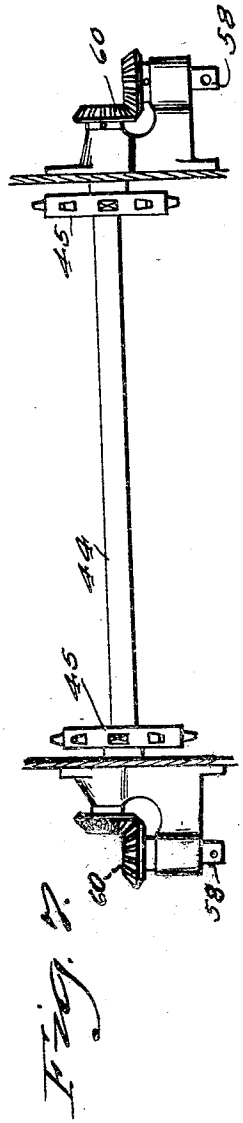


Fig. 4.

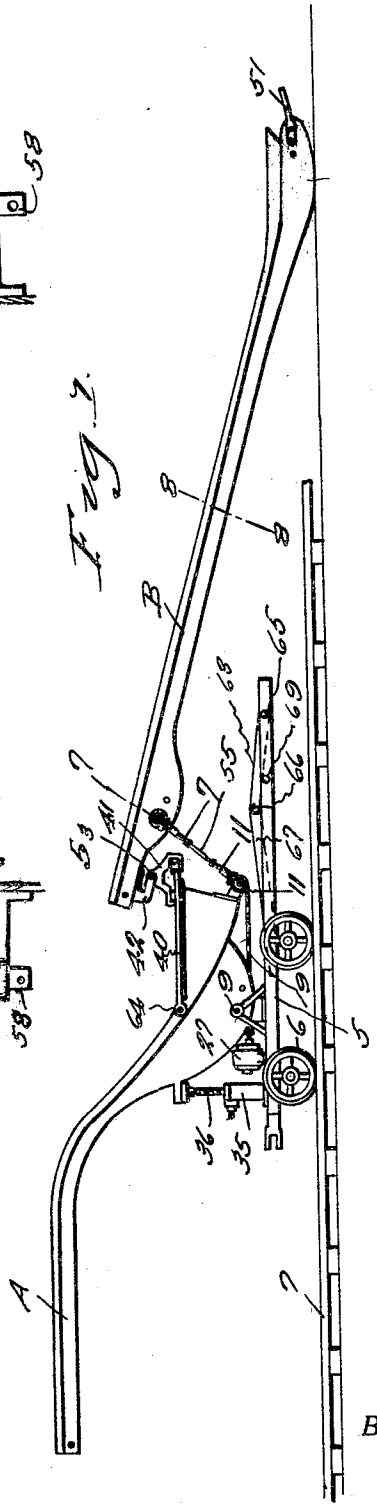


Fig. 7.

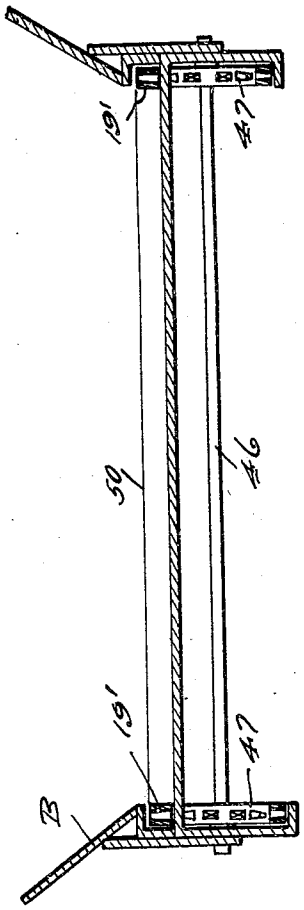


Fig. 8.

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COAL LOADER

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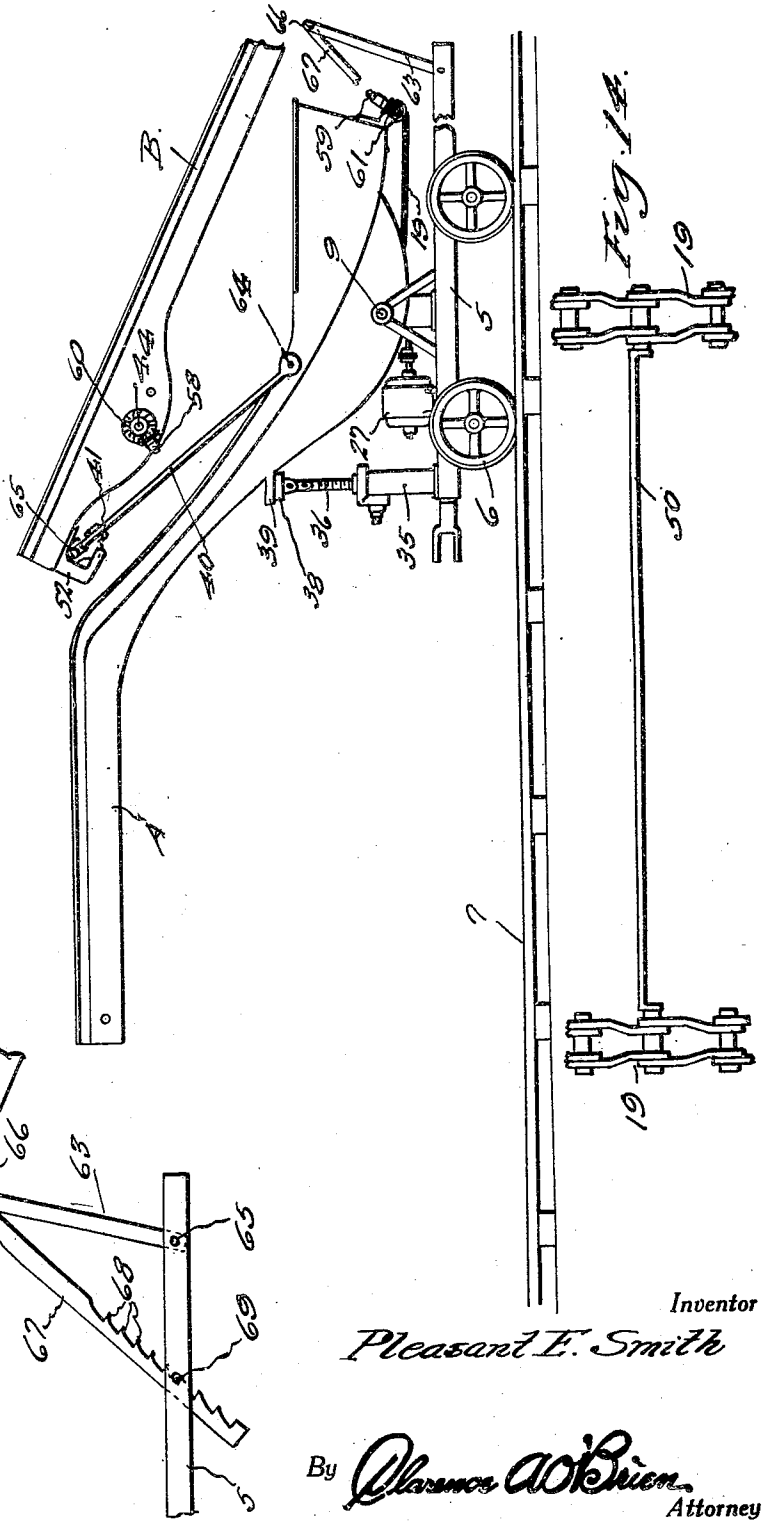


Fig. 1.

Fig. 1A.

Fig. 1B.

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COAL LOADER

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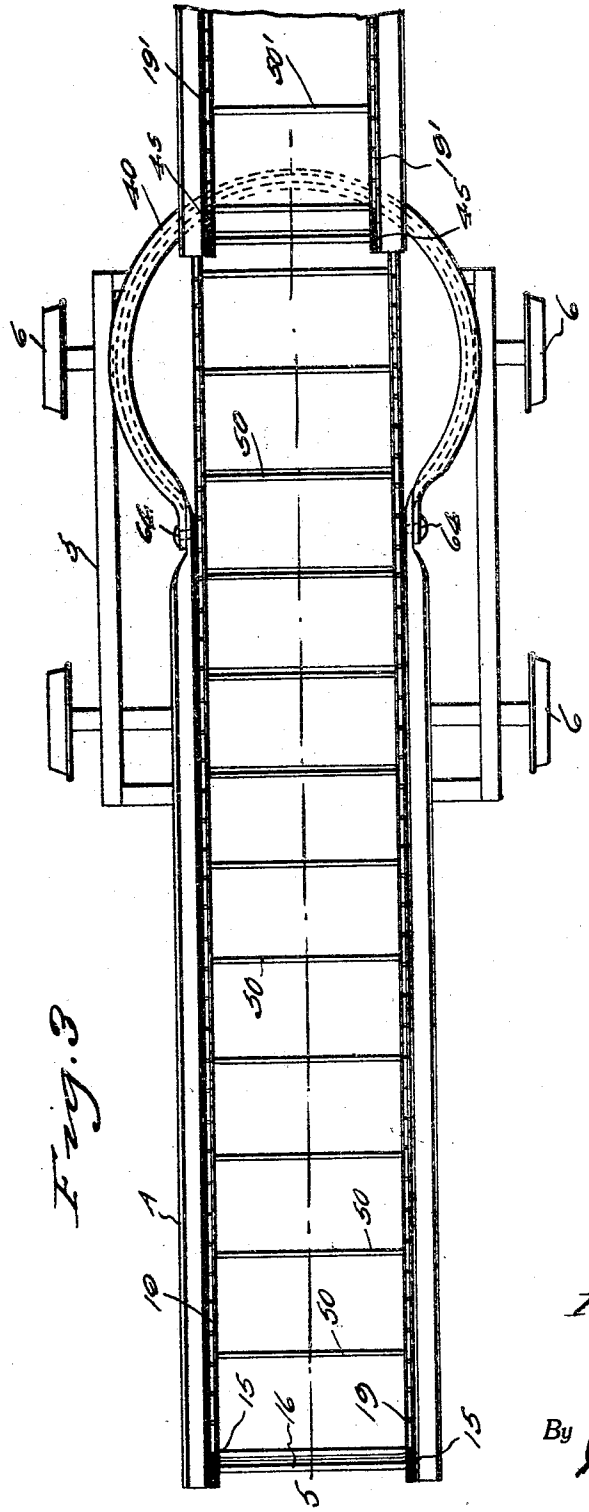


Fig. 3

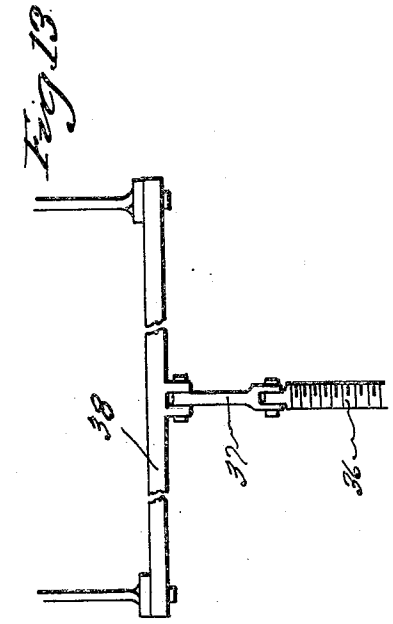


Fig. 13

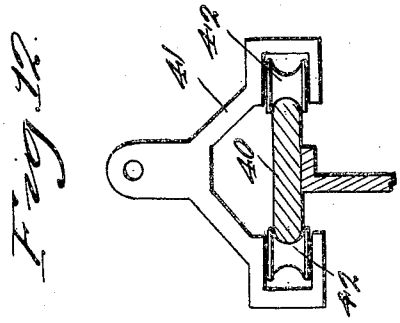


Fig. 12

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COAL LOADER

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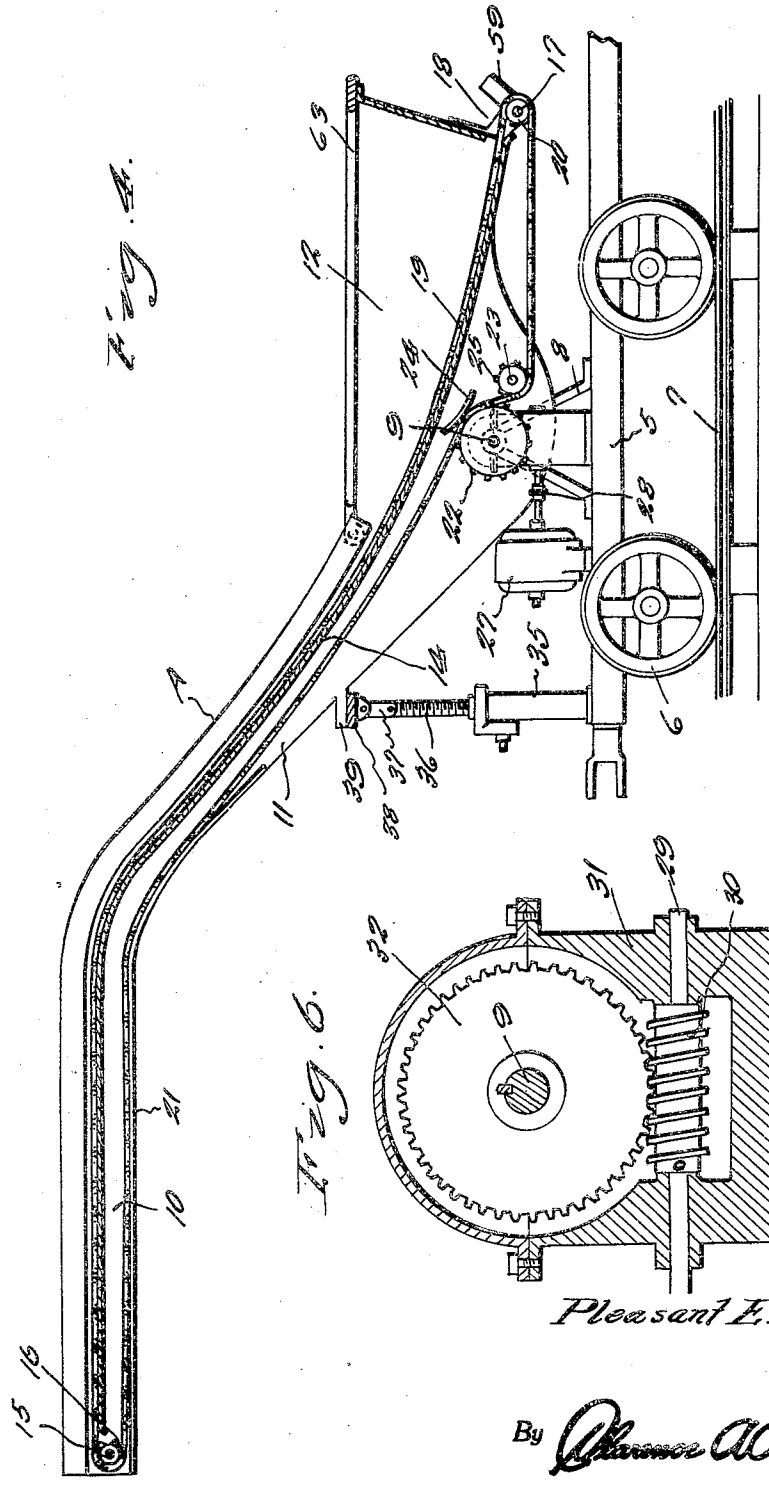


Fig. 4.

Fig. 6.

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COAL LOADER

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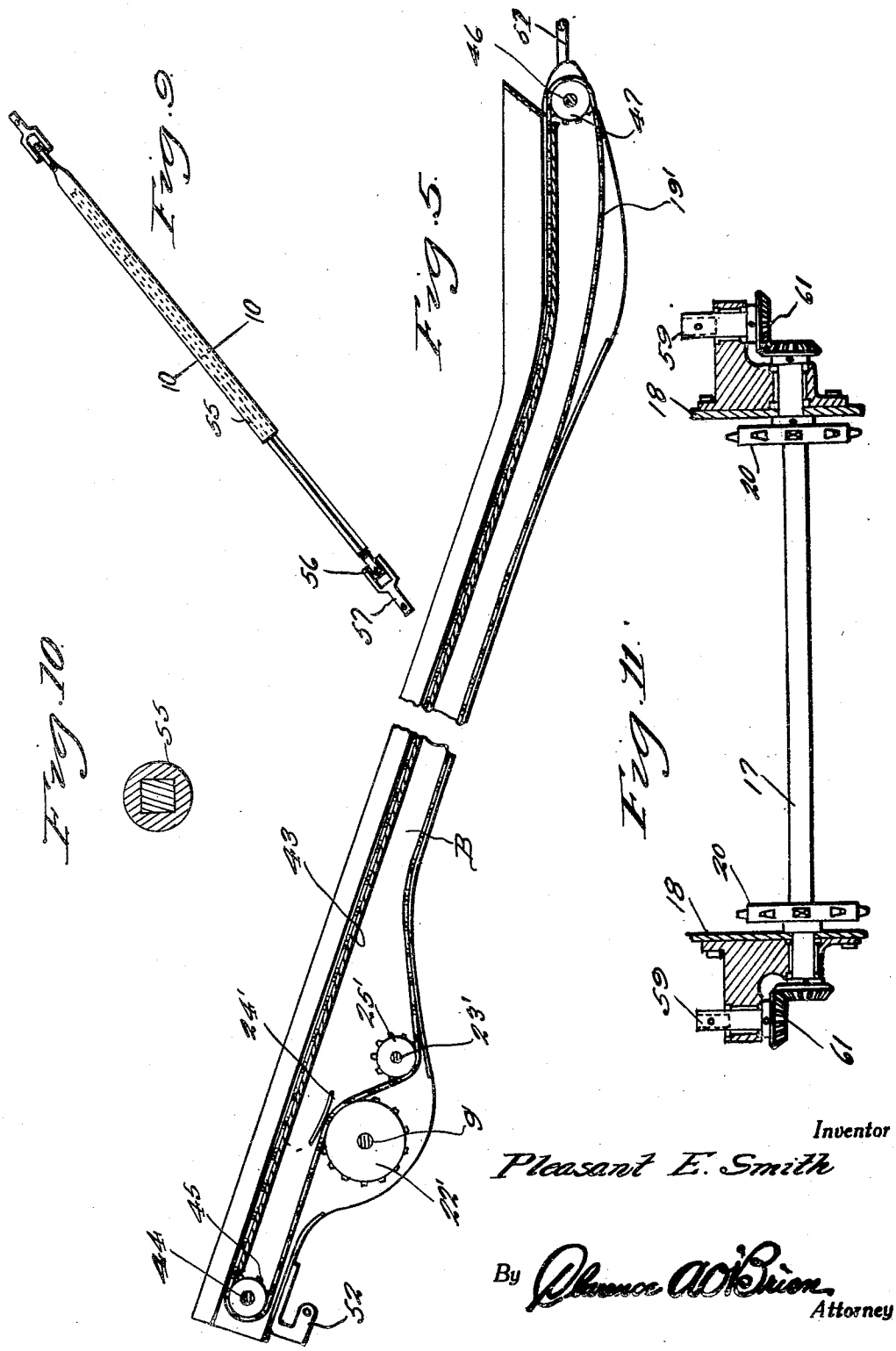


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 11.

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1,818,168

UNITED STATES PATENT OFFICE

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COAL LOADER

Application filed December 27, 1929. Serial No. 416,858.

The present invention relates to a coal loader and has for its prime object to provide a pair of conveyors one of which is fixed on a truck and the other is swingably connected thereto so as to be extended in different desired directions and also being capable of folding on top of the fixed conveyor when not in use.

Another very important object of the invention resides in the provision of a coal loader of this nature which is simple in its construction, inexpensive to manufacture, strong and durable, handy, compact and convenient in its arrangement of parts, thoroughly efficient and reliable in use and operation, and otherwise well adapted to the purpose for which it is designed.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a side elevation of the coal loader embodying the features of my invention showing the same ready for use,

Figure 2 is a fragmentary view showing the same folded ready for transportation,

Figure 3 is a top plan view thereof,

Figure 4 is a vertical longitudinal section through the primary conveyor,

Figure 5 is a longitudinal section through the auxiliary conveyor,

Figure 6 is an enlarged detail section through the gearing for operating the endless conveyor chain structure,

Figure 7 is a transverse section taken substantially on the line 7—7 of Figure 1,

Figure 8 is a transverse section taken substantially on the line 8—8 of Figure 1,

Figure 9 is a detail view of the coupling shaft between the endless conveyor chain structures of the two conveyors,

Figure 10 is an enlarged detail transverse section taken substantially on the line 10—10 of Figure 9,

Figure 11 is a detail transverse section taken substantially on the line 11—11 of Figure 1,

Figure 12 is an enlarged detail section through the track showing the carriage thereon,

Figure 13 is a detail elevation of the upper end of the jack structure, and

Figure 14 is a fragmentary view of the endless chain conveyor structure,

Figure 15 is a fragmentary side elevational view showing more clearly the adjustable support for the lower end portion of the auxiliary conveyor when the latter is in folded position.

Referring to the drawings in detail it will be seen that the numeral 5 denotes a truck mounted on wheels 6 adapted to ride on track rails 7. Brackets 8 rise from the truck 5 and have journaled therein a shaft 9 on which is rockably mounted sides A of the primary conveyor mechanism.

The sides A include upper substantially horizontal portions 10, inclined portions 11 merging from end portions 10 and terminating in a hopper structure 12 through the sides of which extend the shaft 9. A bottom 14 extends longitudinally between the sides A. A shaft 16 is mounted in the ends of the portions 10 remote from the portions 11 and has sprockets 15 mounted thereon.

A shaft 17 is mounted in brackets 18 extending from the bottom of the hopper portion 12. Chains 19 are trained over sprockets 20 on the shaft 17 and sprockets 16 so that the upper runs slide along the bottom 14 and the lower runs slide along flanges 21 formed on the portions 10 and 11 and engage with sprockets 22 on the shaft 9.

A shaft 23 is mounted between the sides of the hopper portion 12 and has sprockets 25 thereon adjacent the sprockets 22 but

with their axis lower than the axis of the shaft 9 so as to hold the lower runs of the chains in mesh with these sprockets 22.

Guides 24 project inwardly from the side walls of the hopper to assist in holding the lower runs of the chain in engagement with said sprockets 22. An electric motor 27 is mounted on the body 5 and has its armature shaft coupled as at 28 with shaft 29 having a worm 30 thereon.

The shaft 29 is journaled in a gear box 31 through which the shaft 9 extends and has a worm gear 32 thereon meshing with the worm 30. In order to tilt the primary conveyor mechanism, a jack structure 35 is mounted on the truck 5 and has a shank 36 connected by means of a link 37 with a cross member 38 fixed to projections 39 on the portions 11 of the sides A.

An arcuate track 40 has its ends pivotally secured as at 64 with the sides A and rests on the upper edges of the wall of the hopper 12. Carriages 41 have grooved wheels 42 journaled thereon to engage the side edges of the track.

The secondary conveyor mechanism comprises sides B with a bottom 43 arranged longitudinally therein. A shaft 44 is mounted between the upper ends of the sides B and has sprockets 45 thereon.

A shaft 46 is mounted between the lower ends of the sides B and has a shaft 47 mounted thereon. Endless chains 19′ are trained over the sprockets 45 and 47, the upper runs riding on the bottom 43. A shaft 9′ is journaled between upper portions of the sides B and have sprockets 22′ thereon with which the lower runs of the chains mesh.

A shaft 23′ is journaled between the sides B and has sprockets 25′ thereon meshing with the chains to hold them in mesh with the sprockets 22′. Guides 24′ project from the sides to assist in holding the chains in mesh with the sprockets 22′. Thus it will be seen that the endless chain structure in the primary and secondary conveyor structures are very similar.

The chains 19 have cross members 50 therebetween while the chains 19′ have cross members 50′ therebetween.

A bail 51 is provided on the lower ends of the walls B so that the secondary conveyor structure may be easily handled as will be more apparent as the description proceeds. Brackets 52 are provided below the upper ends of the side walls B and are pivotally connected with the carriages 41 as is indicated at 53.

A telescopic extension shaft structure 55 has universal couplings 56 at its ends with extensions 57 adapted to be received in sockets 58 and 59. The socket 58 is connected by gearing 60 with the shaft 44 while sockets 59 are connected by gearing 61 with the shaft 17.

From the above detailed description, it will be readily apparent that the bottom end of the secondary conveyor structure may be swung from side to side as to be positioned where desired and will convey coal up into the hopper and of course the hopper will convey the coal into cars or any receiving receptacle or the like.

The telescopic shaft structure 55 may be used on either or both sides as may be desired or found necessary. The jack structure 35 may be operated as circumstances demand for placing the conveyor structures at the desired inclination.

An adjustable supporting structure or jack comprises a bar 63 pivotally connected at one end as at 65 between the forward end of the sides of the carriage 5, forwardly of the hopper structure 12, while at its other end, said bar 63 is pivotally connected as at 66 with one end of an adjusting and supporting bar 67.

Said adjusting and supporting bar 67 is provided with rack teeth 68 adapted to engage a cross bar 69 extending horizontally between the forward end of the sides of the carriage 5 and shown to advantage in Figure 15.

As shown to advantage in Figure 2, when the loader is to be moved from one place to another within the mine, the auxiliary or secondary conveyor structure may be folded into the position shown in Figure 2, that is with the rear end of the secondary conveyor extending above and in overlapping position of the forward end of the primary conveyor structure, the arcuate track 40 having been swung upon its pivot 64 for disposition in an upwardly and rearwardly extending position between said primary and secondary conveyor structures from its position of rest and the upper edges of the wall of the hopper structure 12.

When in said folded position, to maintain the forward or lower end of the secondary conveyor structure out of contact with the track rails 7 or the ground over which the lower is traversing, the jack or supporting structure recently referred to may be moved to a supporting position, or that position shown in Figure 15 so that the bottom of the secondary structure adjacent its lower end may rest on said jack or supporting structure at the upper pivotally connected end of the bars 63 and 67, the angularity of the bar 63 with respect to the carriage 5 being maintained in a predetermined position through the medium of the rack teeth 68 engaging with the cross bar 69 as will be apparent.

It is thought that the construction, operation, utility and advantages of this invention will now be quite apparent to those

skilled in this art without a more detailed description thereof.

The present embodiment of the invention has been described in considerable detail merely for the purposes of exemplification since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:

1. In a coal loader of the class described, a truck, brackets rising from the truck, a shaft journaled in said brackets, sides rockable on the shaft, sprockets on the shaft between the sides, a prime mover on the truck, means operatively connecting the prime mover with the shaft, shafts mounted in the ends of the sides and having sprockets thereon, chains trained over said sprockets, a bottom between the sides and under the upper runs of the chains, a jack structure on the truck, means operatively engaging the jack structure with the sides to rock the same, an auxiliary conveyor structure comprising sides with an endless conveyor mechanism mounted therebetween, gearing for operating the mechanism, said gearing including sockets, one of the shafts first mentioned having gearing including sockets, a telescopic extension shaft having universal couplings at the ends thereof with projections receivable in the sockets.

2. In a coal loader of the class described, a truck, brackets rising from the truck, a shaft journaled in said brackets, sides rockable on the shaft, sprockets on the shaft between the sides, a prime mover on the truck, means operatively connecting the prime mover with the shaft, shafts mounted in the ends of the sides and having sprockets thereon, chains trained over said sprockets, a bottom between the sides and under the upper runs of the chains, a jack structure on the truck, means operatively engaging the jack structure with the sides to rock the same, an auxiliary conveyor structure comprising sides with an endless conveyor mechanism mounted therebetween, gearing for operating the mechanism, said gearing including sockets, one of the shafts first mentioned having gearing including sockets, a telescopic extension shaft having universal couplings at the ends thereof with projections receivable in the sockets, an arcuate track on the ends of the first mentioned side, carriages ridable thereon, and means for pivotally connecting the sides of the secondary conveyor structure with the carriage so that the secondary conveyor structure may be swung from side to side and may be swung vertically.

3. In a coal loader of the class described, an endless conveyor structure, a second endless conveyor structure, said first mentioned endless conveyor structure having a hopper structure formed thereon at one end thereof, an arcuate track pivoted at its ends to opposite sides of the first mentioned endless conveyor structure for rest on the upper edge of the wall of said hopper structure, carriages ridable on said arcuate track, means pivotally connecting said second conveyor structure at one end thereof with said carriages whereby said second endless conveyor, and said arcuate track may be swung to a folded position at one end of the first mentioned conveyor for disposing said secondary conveyor in overlapping position at one end with the adjacent end of the first mentioned conveyor.

4. In a coal loader of the class described an endless conveyor structure, a second endless conveyor structure, said first mentioned endless conveyor structure having a hopper structure formed thereon at one end thereof, an arcuate track pivoted at its ends to opposite sides of the first mentioned endless conveyor structure for rest on the upper edge of the wall of said hopper structure, carriages ridable on said arcuate track, means pivotally connecting said second conveyor structure at one end thereof with said carriages whereby said second endless conveyor, and said arcuate track may be swung to a folded position at one end of the first mentioned conveyor for disposing said secondary conveyor in overlapping position at one end with the adjacent end of the first mentioned conveyor, and an adjustable support for said hopper for engagement with said secondary conveyor for supporting said secondary conveyor in a raised position when the latter is in the last referred to position.

5. In a loading device of the character described, a pair of conveyors, means for rockably mounting one of said conveyors, a track, means for pivotally mounting said track adjacent one end of said one conveyor, carriages carried by the other of said conveyors ridable on said track.

6. In a loading device of the character described, a rockably mounted conveyor, supporting means therefor, a track, means for pivotally mounting said track adjacent one end of said conveyor, carriages movable over said track, a second conveyor, means operatively connecting said second conveyor with said carriages, and means for simultaneously operating both of said conveyors.

7. A loading device comprising in combination a hopper, a track, means for pivotally mounting said track adjacent said hopper whereby said track may be positioned

on the upper edge of said hopper, a conveyor, and carriages carried by said conveyor and ridably engaging said track for movement thereover and for operatively connecting said conveyor with said track whereby said conveyor may be swung simultaneously with said track when the latter is swung about its pivot.

8. A loading device of the character described, comprising in combination a pivotally mounted track, supporting means for said track, a conveyor, carriages carried by said conveyor and engaging said track for movement relative to the track, and for operatively connecting said conveyor with said track for swinging movement with the latter.

In testimony whereof I affix my signature.

PLEASANT E. SMITH.