May 30, 1961 S. C. MOON 2,986,265

MINING APPARATUS

Filed Sept. 25, 1958 2 Sheets-Sheet 1

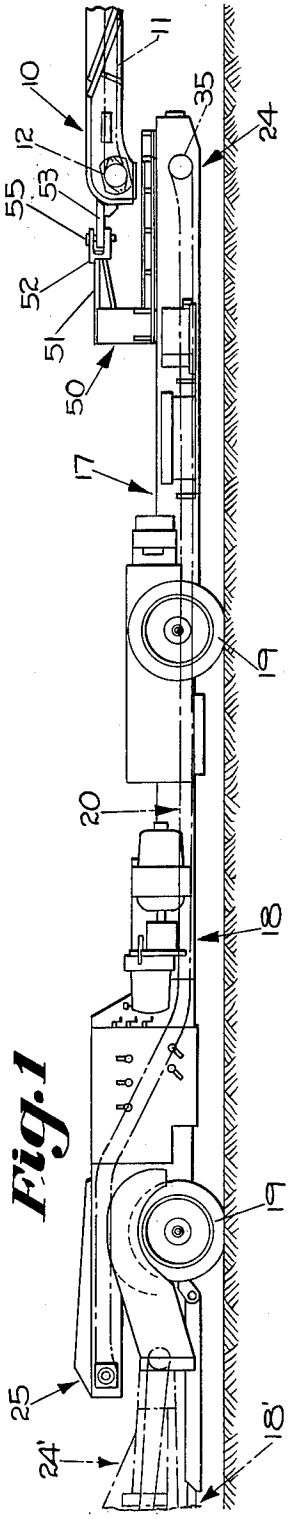


Fig. 1

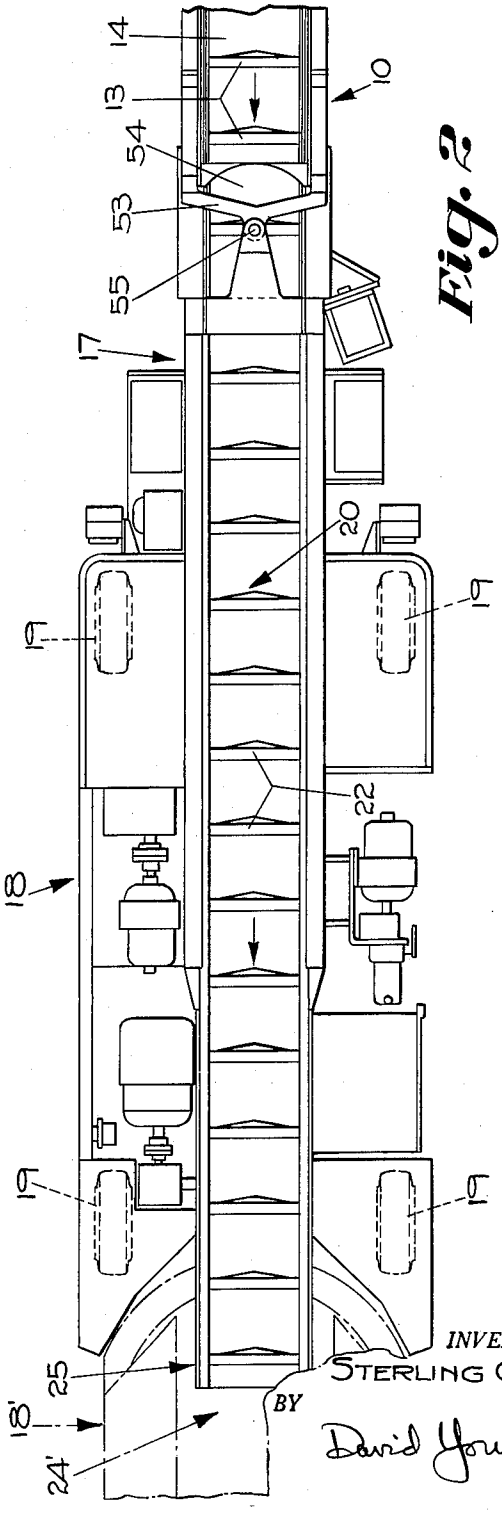


Fig. 2

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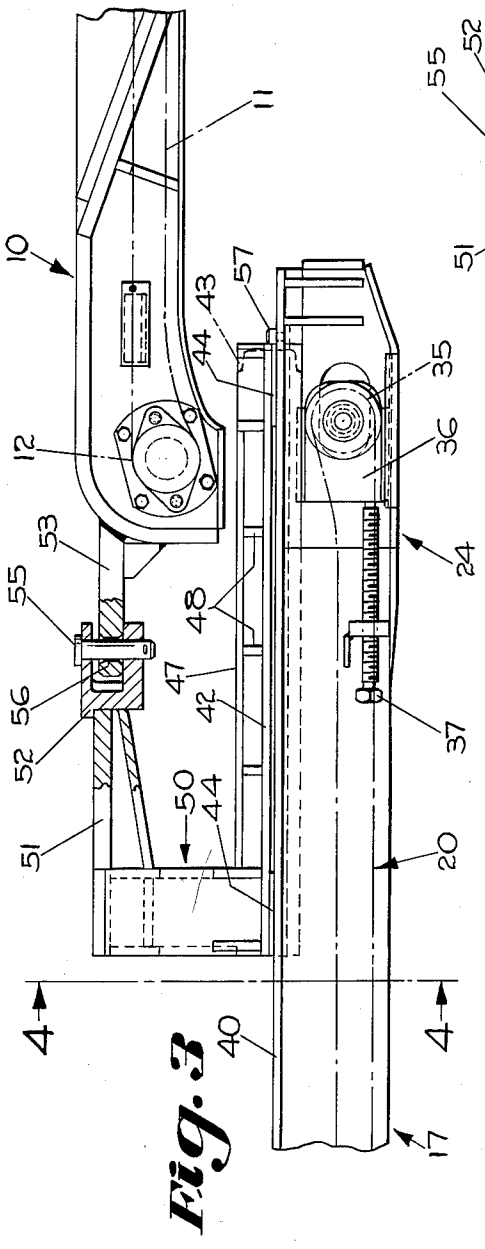


Fig. 3

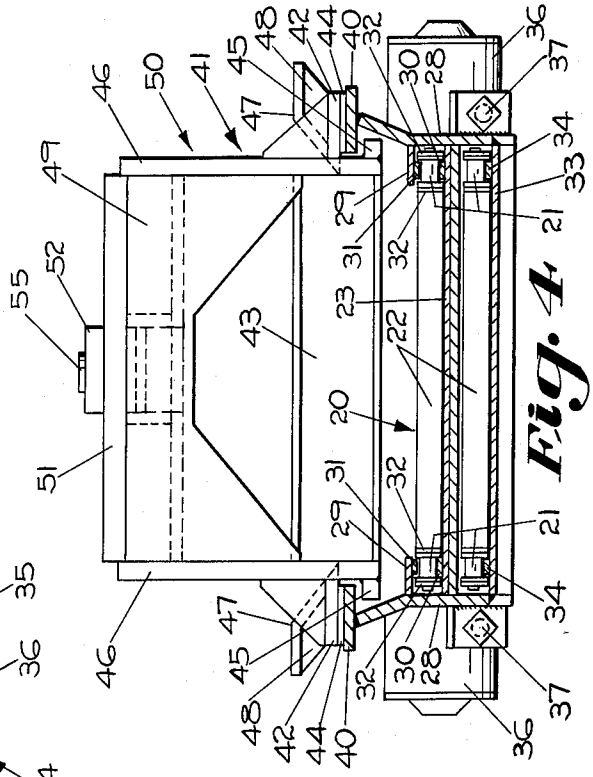


Fig. 4

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MINING APPARATUS

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1 Claim. (Cl. 198—89)

The instant invention relates to mining apparatus, and more particularly to a novel structure for connecting the discharge conveyor of a continuous mining machine to an intermediate conveyor, for discharge of the mined material from the mining machine conveyor to the intermediate conveyor, the latter removing the mined material from the mine room and delivering the material to a mother conveyor.

It is the prime object of this invention to provide an improved means for connecting the discharge conveyor of a mining machine to an intermediate conveyor for delivery of the mined material to the latter, said connecting means maintaining the mining machine discharge conveyor in position relative to the intermediate conveyor for discharge of material to the latter.

It is another object of this invention to provide improved means for connecting the discharge conveyor of a mining machine to an intermediate conveyor for delivery of the mined material to the latter, in which the connecting means permits adjustment of the position of the mining machine discharge conveyor relatively to the intermediate conveyor.

It is a further object of the instant invention to provide improved means for connecting the discharge conveyor of a mining machine to an intermediate conveyor, in which the connecting means comprises a hopper mounted on the intermediate conveyor for adjustment relatively to the intermediate conveyor in a direction longitudinally thereof.

It is still another object of the instant invention to provide improved means for connecting the discharge conveyor of a mining machine to an intermediate conveyor, in which the connecting means comprises pivot means loosely connecting the discharge conveyor to the intermediate conveyor, permitting the discharge conveyor to swing laterally relatively to the intermediate conveyor and permitting the conveyors to shift relatively to each other in accordance with the unevenness of the ground supporting surface under the mining machine and the intermediate conveyor.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claim.

In the accompanying drawings:

Fig. 1 is a side elevational view showing the mining machine discharge conveyor, the intermediate conveyor and the means connecting the conveyors;

Fig. 2 is a plan view of the apparatus shown in Fig. 1;

Fig. 3 is an elevational view partially in section showing the means connecting the mining machine discharge conveyor to the intermediate conveyor; and

Fig. 4 is a sectional view of the intermediate conveyor showing the connecting means of this invention taken on the line 4—4 in Fig. 3.

The instant invention relates to mining apparatus, and more particularly to improved means for connecting the discharge conveyor of a mining machine to an intermediate conveyor for locating the discharge conveyor in selected position with respect to the intermediate conveyor to discharge the mined material from the mining machine conveyor to the intermediate conveyor. The invention is illustrated in a preferred embodiment as applied to mining apparatus comprising a continuous mining machine which continuously advances into a mine face and removes the mined material from the mine face as it advances, the mined material being discharged from the mining machine at its rear end by a discharge conveyor. Such mining machine may be constructed in accordance with the invention of Snyder et al., Pat. No. 2,694,562, issued November 16, 1956, for Apparatus for Continuously Digging Coal.

In accordance with the usual practice in mining with a continuous mining machine, an intermediate conveyor receives the material which is discharged by the mining machine, this intermediate conveyor extending into the mine room for the reception of the mined material directly from the mining machine. The intermediate conveyor delivers the mined material to a mother conveyor which is located in one of the main passageways of the mine. The intermediate conveyor in the illustrated embodiment of the invention comprises a plurality of individual conveyor cars which are hitched to each other in a train, and may be constructed in accordance with the invention of Moon, Pat. No. 2,799,386, issued July 16, 1957, for Self-Contained Mobile Power Driven Conveyor System. The instant invention provides novel means for connecting the discharge conveyor of the mining machine to the intermediate conveyor for maintaining the mining machine conveyor in selected position with respect to the intermediate conveyor for discharge of the mined material to the intermediate conveyor.

Referring to the drawings, there is illustrated therein the discharge boom **10** of a continuous mining machine, which comprises a conveyor **11** of an endless type which is trained about a tail pulley **12**. The conveyor **11** includes a plurality of laterally extending flights **13** extending between endless chains disposed at either side of the discharge boom **10** and trained about the tail pulley **12**. The laterally extending flights **13** sweep the mined material over the conveyor bed **14** and discharge the material over the tail pulley **12**.

An intermediate conveyor **17** is disposed behind the discharge boom **10** of the continuous mining machine. The intermediate conveyor **17** comprises a plurality of individual cars **18**, **18'**, each of which is a self-contained conveyor with its own power unit. Each conveyor car **18** is supported upon pairs of wheels **19**, one of which pairs of wheels **19** is power driven for propulsion of the conveyor car. There is additionally provided steering means for the pairs of wheels whereby the intermediate conveyor **17** may follow the continuous mining machine **10** along a curved path.

Each conveyor car **18** includes an endless conveyor **20**, comprising laterally spaced endless chains **21**, between which there extend transverse flights **22** secured to the opposite chains **21**. The flights **22** are dragged along the conveyor bed **23** by the chains **21**, and thereby sweep the mined material over the conveyor bed **23** in moving the material from the receiving end **24** of the conveyor car **18** to the discharge end **25** thereof. The discharge end **25** of the conveyor car **18** is elevated above the receiving end **24'** of the next adjacent conveyor car **18'**, and the adjacent conveyor cars **18**, **18'** are so disposed that the discharge end **25** of the conveyor car **18** overlaps the receiving end **24'** of the conveyor car **18'**, whereby the mined material will be discharged from the one conveyor

car 18 to the next adjacent conveyor car 18'. The mined material is conveyed along the other cars of the intermediate conveyor 17 in a similar manner, until it is discharged by the last car of the conveyor 17 to the mother conveyor, which is usually located in one of the main passageways of the mine.

The conveyor car 18 comprises upright side plates 28 disposed one at either side of the conveyor car 18. The bed 23 of the conveyor 20 extends laterally between the side plates 28 and is secured thereto, as by welding. Above the bed 23, at each side of the conveyor 20, there are provided cover plates 29 which overlie the chains 21 and are secured to the side plates 28. At each side of the conveyor 20 there is provided a longitudinally extending guide 30, secured to the bed 23, and a longitudinally extending guide 31 secured to the underside of the cover plates 29, which fit between the side bars 32 of the chains 21, and serve to guide the chains 21 longitudinally of the conveyor car 18. A bed plate 33 is secured between the side plates 28 at the bottom thereof and provides a support for the return flight of the conveyor 20. The bed plate 33 includes a guide 34 at either side thereof, which fits between the side bars 32 of the chain 21, and thereby guides the return flight of the conveyor 20 in its return run. At the receiving end 24 of the conveyor car 18 the endless conveyor 20 is trained about an end pulley 35. The end pulley 35 is mounted in blocks 36, which are slidably supported on the side plates 28 and may be adjusted relatively thereto by screws 37 for adjustment of the tension in the chains 21 of the conveyor 20.

The portion of the side plates 28 above the cover plates 29 is flared outwardly, and has secured to the tops thereof longitudinally extending tracks 40 which are formed of horizontally disposed plates. The tracks 40 are secured to the tops of the side plates 28 in any suitable manner, as by welding. The tracks 40 are adapted to slidably support the connecting means 41, which joins the discharge boom 10 of the mining machine to the intermediate conveyor 17.

The connecting means 41 comprises a frame formed of horizontal supporting plates 42 disposed one at either side thereof and connected at one end by a transverse channel member 43. Each plate 42 has secured to the underside thereof a pair of shoes 44, disposed one at each end of the plate 42. The shoes are seated on the tracks 40 and thereby slidably support the connecting means 41 on the tracks 40. The frame of the connecting means 41 additionally comprises guide elements 45 which are disposed below the plate members 42, and underlie the tracks 40 to maintain the connecting means 41 in assembly on the conveyor car 18. The guide elements 45 are secured to the transverse channel member 43 below the plate members 42. The ends of the plate members 42 and the guide elements 45 opposite the transverse channel member 43 are secured to upright side members 46.

A hopper is formed on the connecting means 41 by flared side elements 47, one at each side of the connecting means 41. Each side element 47 is secured to a side plate 42 and overlies the latter. A plurality of gussets 48 are disposed between each side element 47 and each side plate 42 for supporting the side elements 47. The side elements 47, as best seen in Fig. 4, are flared outwardly forming a hopper therebetween, whereby the material discharging from the boom 10 onto the receiving end 24 of the conveyor car 18 will be directed inwardly towards the center thereof onto the conveyor 20.

Between the upright side members 46 there are secured a pair of spaced laterally extending plates 49 which have an arch configuration. The upright members 46 and the lateral plates 49 together form an upright post 50 at the end of the connecting means 41. A substantially horizontally disposed arm 51 is secured to the top of the post 50 and is centrally disposed above the conveyor 20. The arm 51 extends from the post 50 towards the discharge boom 10 of the mining machine. At the end of the arm 51 there is secured a clevis 52 to which the discharge boom 10 of the mining machine is adapted to be secured on a vertical axis.

The discharge boom 10 of the mining machine has secured thereto, as by welding, a tongue 53 which extends towards the clevis 52 and is received therein. The tongue 53 is in the form of a yoke, as best seen in Fig. 2, leaving an open space 54 between the end of the discharge boom 10 and the tongue 53 through which the mined material can be discharged by the conveyor 11 of the mining machine. The clevis 52 includes a pivot pin 55 which is received in an oversized hole 56 formed at the end of the tongue 53. It is seen in Fig. 3 that the clevis 52 is substantially larger than the tongue 53, whereby there is a loose fit of the tongue 53 in the clevis 52, as well as on the pin 55. It is found that the ground surface in the mine room may be uneven, which will cause shifting of the mining machine relatively to the intermediate conveyor, and the loose fit of the tongue 53 in the clevis 52 and on the pin 55 permits such relative shifting movement of the mining machine conveyor with respect to the intermediate conveyor.

As previously described, the connecting means 41 is slidably supported on the intermediate conveyor and this permits relative movement of the mining machine and the intermediate conveyor, as may occur during the mining operation. At the end of each track 40 nearest the mining machine, there is secured a stop pin 57 which limits the movement of the connecting means 41 towards the mining machine and prevents the connecting means 41 from riding off the end of the tracks 40. The tongue 53 being secured to the connecting means 41 by the pivot pin 55 permits swinging movement in a lateral direction of the mining machine discharge boom 10 and conveyor 11 with respect to the intermediate conveyor 17. The tongue 53 is of such length that in all lateral positions of the mining machine discharge boom 10, the conveyor 11 thereof will be so located that the mined material will be discharged within the area of the hopper formed by the flared side elements 47.

In accordance with this invention there is provided a novel means for connecting the discharge conveyor of a mining machine to an intermediate conveyor, whereby the respective conveyors may swing relatively to each other in a lateral direction in accordance with the direction of progress of the mining operation. The connecting means for joining the mining machine conveyor to the intermediate conveyor is slidably mounted on the intermediate conveyor to permit movement of the conveyors with respect to each other, and there is further provided a loose connection which permits shifting of the mining machine with respect to the intermediate conveyor as may be occasioned by unevenness of the ground supporting surface.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of the invention as defined by the claim hereto appended, and applicant therefore wishes not to be restricted to the precise construction herein disclosed.

Having thus described and shown an embodiment of the invention, what is desired to secure by Letters Patent of the United States is:

Mining apparatus comprising a first conveyor for discharging mined material, a second conveyor adapted to receive mined material discharged by the first conveyor, means for connecting the first conveyor to the second conveyor and for locating the discharge end of the first conveyor in overlapping relation to the receiving end of the second conveyor, said connecting means including a hopper for guiding the discharge of material from the first conveyor to the second conveyor, said second conveyor including tracks extending longitudinally thereof and providing support for said connecting means, said connecting means also including elements overlying said tracks in the area of the hopper and shoes interposed between said

overlying elements and the tracks seating the connecting means on the tracks and slidably supporting the connecting means on the second conveyor for movement of the connecting means relatively to the second conveyor in a direction longitudinally thereof, said connecting means further including guide elements secured below said tracks thereby to maintain said connecting means in assembly on said second conveyor, and means linking the first conveyor to the connecting means.

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