Sept. 27, 1960 L. W. TAYLOR 2,953,864

REINFORCED TRIANGULAR GUIDE TRACK

Filed July 31, 1958

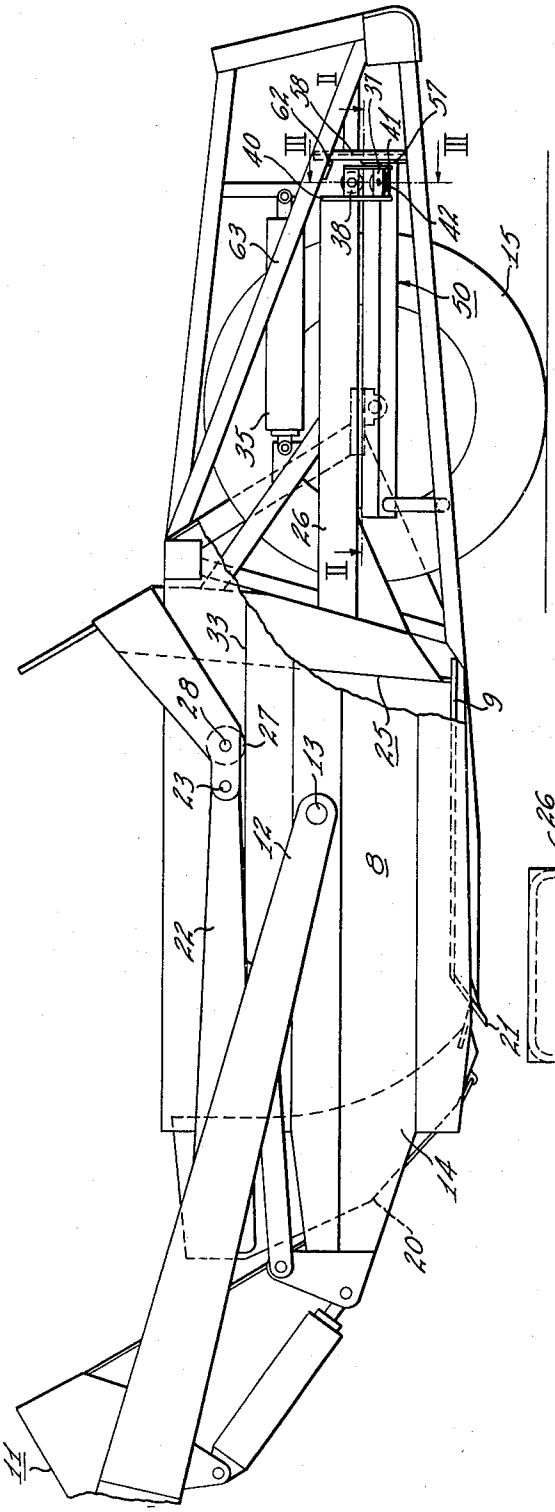


Fig. 1

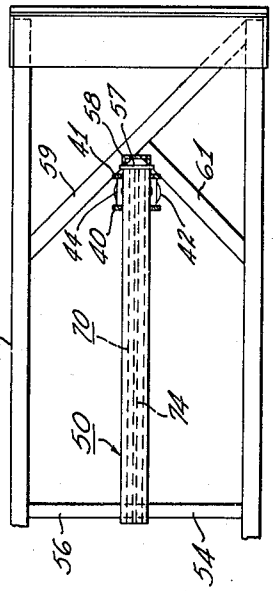


Fig. 2

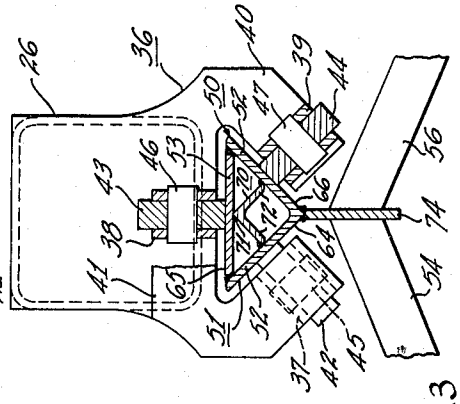


Fig. 3

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United States Patent Office 2,953,864
Patented Sept. 27, 1960

2,953,864

REINFORCED TRIANGULAR GUIDE TRACK

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Filed July 31, 1958, Ser. No. 752,212

3 Claims. (Cl. 37—129)

This invention relates to earth movers and more particularly to an earth mover having a reinforced hollow triangular section guide track.

In this type of vehicle there is provided a wheel supported main earth receiving bowl substantially closed at one end by an ejector. The ejector is movable through the bowl in a forward direction to discharge earth from the bowl over a leading cutting edge and in a rearward direction to its original position at the rear end of the bowl. The ejector includes an extension having a carriage which houses three rollers. The ejector, extension and carriage move as a unit through the bowl with the three rollers housed in the carriage correspondingly positioned to operate along the three sides formed by a triangular section track. The track is positioned midway between the laterally opposite sides of the ejector and positively orients the rectilinear reciprocating movement of the ejector through the bowl.

The users of earth moving vehicles are demanding a scraper having a greater load carrying capacity so that more earth may be moved in a given period of time than heretofore experienced. The scraper industry has met this demand by increasing the overall size of the scraper, and has correspondingly been confronted with the problem of reducing the overall weight of the scraper and its total cost. From time to time the scraper industry has reduced the weight of the structural members used in the scraper and in turn reduced its cost.

Previously it had been common practice to use a solid beam as a track to guide the ejector's reciprocating movement through the bowl. This solid beam was costly to make, considerably heavy and also required a number of braces to support it. As shown in the patent to L. L. Hyler et al., U.S. 2,565,850, August 28, 1951 it was found that by using a hollow track to guide the ejector's movement through the bowl the weight of the track and number of braces could be reduced.

Although this method of using a hollow track enabled the scraper industry to reduce the weight of the scraper and its cost, a problem arose in that as the ejector forces earth from the bowl a considerable amount of weight which is directed through the rollers is placed upon the hollow track. This weight causes the sides of the hollow track to deflect as the ejector reciprocates through the bowl. These deflections of the sides of the track would cause an undesirable horizontal yaw as the ejector moved through the bowl. This condition permits some of the earth that is to be ejected from the bowl to slip between the ejector at opposite sides and the inner side wall of the bowl causing the ejector to bind and resulting in unnecessary strains to be placed upon the ejector. Also this condition of having a horizontal yaw as the ejector moves forward through the bowl allowed some of the earth to slip completely past the ejector's sides thereby resulting in an incomplete ejection of earth from the bowl.

Also as shown in the patent to L. L. Hyler et al., 2,565,850, the hollow triangular section track is supported by forward and rearward braces. Continual operation of

the ejector over the hollow track would cause the track to weaken and when the weight of the ejector and extension is located between the forward and rearward braces supporting the track, the track would tend to deflect causing the lower edge of the ejector to scrape the bottom of the bowl resulting in unnecessary wearing of parts.

Therefore it is a general object of my invention to provide a reinforced hollow triangular section track that is rigid, light in weight, economical to produce and facilitates the ejector's rectilinear movement through the bowl.

It is a further object of my invention to provide a reinforced triangular section track that positively orients the ejector's rectilinear movement through the bowl so that a complete ejection of the earth contained in the bowl will be permitted.

It is a further object of my invention to provide a triangular section track having an internal reinforcement for reinforcing the sides of the triangular section track thereby preventing any deflections of the sides of the track as the ejector reciprocates through the bowl.

It is a further object of my invention to provide a hollow triangular section track that is internally reinforced directly opposite and adjacent the path on which the rollers operate.

These and other objects and advantages of this invention will be evident when the following description is read in conjunction with the accompanying drawings, in which:

Fig. 1 is a side view of a scraper embodying the invention;

Fig. 2 is a top section view cut at line II—II of Fig. 1 embodying the invention; and

Fig. 3 is a rear section view cut at line III—III of Fig. 1 embodying the invention.

Referring to Fig. 1 this invention is embodied in a scraper unit of an earth mover which includes a main bowl frame **8**, with a bottom **9**, and a pair of support wheels **15**. A yoke **11** has a pair of side arms **12** which are pivotally connected by pivot pins **13** to side walls **14** of the bowl frame **8**. The yoke **11** of the scraper unit connects the bowl frame **8** to a suitable tractor unit, not shown.

An apron **20** includes a pair of rearwardly extending arms **22** which are pivotally connected to an ejector **25** by pins **23**. The apron operates to and from a lower position adjacent a leading cutting edge **21** wherein it closes the otherwise open forward end of the bowl frame **8**, to a partly opened position for allowing earth to fill the bowl when the bowl is in the loading position and thence to an upper position away from the leading cutting edge **21** wherein the bowl is completely open at the forward end.

The ejector **25**, which includes a rearward extension **26**, is movable between a rearward loading position wherein it constitutes a wall closing the otherwise open end of the bowl and a forward position adjacent to the leading cutting edge **21**. The ejector is connected to and supported by a pair of side supporting rollers **27** by pivot pins **28**. The rollers **27** operate along tracks **33** which are integral with side walls **14**, respectively. The fore and aft movement of the ejector is established by a double acting hydraulic ram **35** which is pivotally connected at its opposite ends to the ejector and bowl frame, respectively.

Referring also to Fig. 3, the rearward extension **26** of the ejector **25** includes a carriage **36**. The carriage **36** is fabricated by welding pairs of rectangular shaped roller supports **37**, **38** and **39**, respectively, to a vertically disposed front member **40** and a rear member **41**. The carriage includes three rollers **42**, **43** and **44** housed between supports **37**, **38** and **39**, respectively, which are

carried on the supports by pivot pins 45, 46 and 47, respectively.

To positively orient the ejector's reciprocating movement through the bowl a hollow triangular section track 50 is provided. The track 50 is formed by an angle member 51 having a pair of flanges 52 that are joined substantially at right angles to one another and a rectangular shaped plate member 53 which is welded at its opposite sides to the flanges 52. Member 51 may be a length of angle iron or may be fabricated from separate plates.

Referring also to Fig. 2 the track 50 is supported at its forward end by a pair of forward braces 54 and 56 extending from the bowl frame 8. The rear end of the track 50 is secured to a plate member 57 which in turn is secured as by welding to a channel member 58 welded at its lower end to braces 59, 61 and at its upper end to a transverse bowl frame member 62 having its opposite ends connected to bowl frame members 63. The triangular track 50 forms three sides 64, 65 and 66 on which rollers 42, 43 and 44 operate, respectively. The ejector 25, extension 26 and carriage 36 operate as a unit as the ejector moves through the bowl.

To reinforce the hollow triangular section track, thereby preventing excessive deflections in the sides of the track an angle member 70 is welded therein. The angle member 70 extends the length of the track and includes an apex or heel 71 and a pair of flanges 72 extending at substantially right angles to one another. The flanges 72 of angle member 70, respectively, are welded midway between the opposite ends of the inner sides of the track and opposite the path on which the rollers operate. The angle bar 70 also increases the rigidity of the track so that when the weight of the ejector and extension is located between the forward braces 54, 56 and the channel member 58, the bottom edge of the ejector will remain flush with the bottom of the bowl.

A side of a plate member 74 is welded to the outside of the triangular track 50 along the heel or apex of angle member 51. As shown in Fig. 3, the track is positioned so that the apex of the triangular track 50 having the plate member 74 connected thereto is pointing downward.

When the bowl has been completely filled with earth and is ready for unloading, the hydraulic ram 35 is expanded thereby moving the ejector forward through the bowl. The ejector moves forward on side support rollers 27 which operate along tracks 33 and on rollers 42, 43 and 44 which operate along the sides of triangular section track 50. The internally welded angle member 70 which may also be a length of angle iron prevents excessive deflection in the sides of the track caused by the weight of the ejector imposed thereon. This internal support eliminates the undesirable horizontal yaw or horizontal turning of the ejector, heretofore found as the ejector moved through the bowl which permitted earth to slip between the laterally opposite sides of the ejector and the inside wall of the bowl causing the ejector to bind and resulting in unnecessary strains to be placed upon the ejector. Also this condition of having a horizontal yaw as the ejector moves forward through the bowl enables some of the earth which is to be ejected from the bowl to slip completely past the ejector's sides falling back into the bowl. Therefore the reinforced hollow triangular section track provides a positive orientation of the ejector's rectilinear reciprocating movement through the bowl thereby permitting a complete ejection of earth from the bowl.

Heretofore when the ejector has moved forward halfway through the bowl, and/or the weight of the ejector on the track is located between the structural supports of the track, the track would tend to deflect causing the ejector to pivot about pin 28 thereby scraping the bottom of the bowl. This would result in unnecessary wearing of parts. The angle member 70 increases the rigidity of the track which prevents any appreciable deflection in the track so that the lower edge of the ejector is maintained flush with the bottom of the bowl. Thus the ejector continues to move forward through the bowl without scraping the bottom of the bowl and continues its forward movement until it reaches the leading cutting edge 21 wherein all of the earth which was contained in the bowl is completely ejected.

To return the ejector to its original position the ram is contracted and the ejector retraces its forward movement to its original rearward position closing the bowl.

In accordance with my invention a hollow triangular section track is fabricated out of standard structural materials and is internally reinforced by an angle member for preventing excessive deflections in the track and its sides when the weight of the ejector is imposed thereon.

Thus, this reinforcement of the track eliminates the undesirable horizontal yaw which prevented a complete ejection of earth from the bowl, and positively orients and maintains the edge of the ejector flush with the bottom of the bowl so that the edge of the ejector will not scrape the bottom of the bowl and cause unnecessary wearing of parts.

Therefore, this reinforced track gives the scraper industry a light weight, rigid, uncluttered, economically produced triangular track which does not interfere with the reciprocating movement of the ejector, and allows a complete and positive ejection of earth from the bowl.

While only one particular embodiment of the applicant's invention has been described herein, it should be understood that the applicant's invention is not to be restricted thereto in that it is intended to cover all modifications of the invention which would be apparent to one skilled in the art and that come within the scope of the appended claims.

What is claimed is:

1. In combination with an earth mover of the type including a bowl and an ejector, a means for mounting said ejector assembly in said bowl for rectilinear reciprocating movement comprising: a longitudinally extending angle section member forming two adjoining sides of a triangular track; a plate coextensive with said angle member and fixedly connected to said two sides to form the third side of said triangular track; a second angle section member coextensive with and fixedly connected within said track so that three longitudinal edges of said second angle member respectively abut the inner faces of said three sides of the track; support means for fixedly connecting said track to said bowl; and a support carriage connected to said ejector assembly and having three guide rollers respectively mounted thereon for complementary rolling contact with the outer faces of the three sides of said track, the path of rolling contact following along the edges of said second angle section member.

2. In combination with an earth mover of the type including a bowl and an ejector, a means for mounting said ejector assembly in said bowl for rectilinear reciprocating movement comprising: a longitudinally extending angle section member forming two adjoining sides of a triangular track; a longitudinal plate coextensive with said angle member and having opposite edges fixedly connected to the outer edges of said two sides thereby forming the third side of said triangular track, said triangular track being oriented so that one of the sides is disposed in a generally horizontal plane; a second angle section member coextensive with and fixedly connected within said track so that the three longitudinal edges of said second angle member respectively abut the inner faces of said three sides; support means for fixedly connecting said track to said bowl, said means including a second plate member being disposed in a vertical plane having one edge coextensive with and connected on the outside of the track along the edge subtended by said one side; and a support carriage connected to said ejector assembly and having three guide rollers respectively mounted there-

on for complementary rolling contact with the outer faces of the three sides of said track, the path of said rolling contact following along the abutting edges of said second angle section member.

3. In combination with an earth mover of the type including a bowl and an ejector, a means for mounting said ejector assembly in said bowl for rectilinear reciprocating movement comprising: a first length of angle iron forming two adjoining lower sides of a triangular track; a longitudinal plate coextensive with said angle iron being disposed in a horizontal plane and having opposite edges welded to the outer edges of said two sides thereby forming the third and upper side of said triangular track, a second length of angle iron coextensive with the track, the sides of said second angle iron being disposed perpendicular and welded at their outer edges to the sides of said first angle iron with the heel of said second angle

iron abutting the inner face of said plate; support means for fixedly connecting said track to said bowl, said means including a second plate being disposed in a vertical plane and having one edge coextensive with and welded to the outside of the track along the heel of said first angle iron; and a support carriage connected to said ejector assembly and having three guide rollers respectively mounted thereon for complementary rolling contact with the outer faces of the three sides of said track, the path of rolling contact following along the abutting edges and heel of said second angle iron.

References Cited in the file of this patent

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