

Sept. 20, 1960

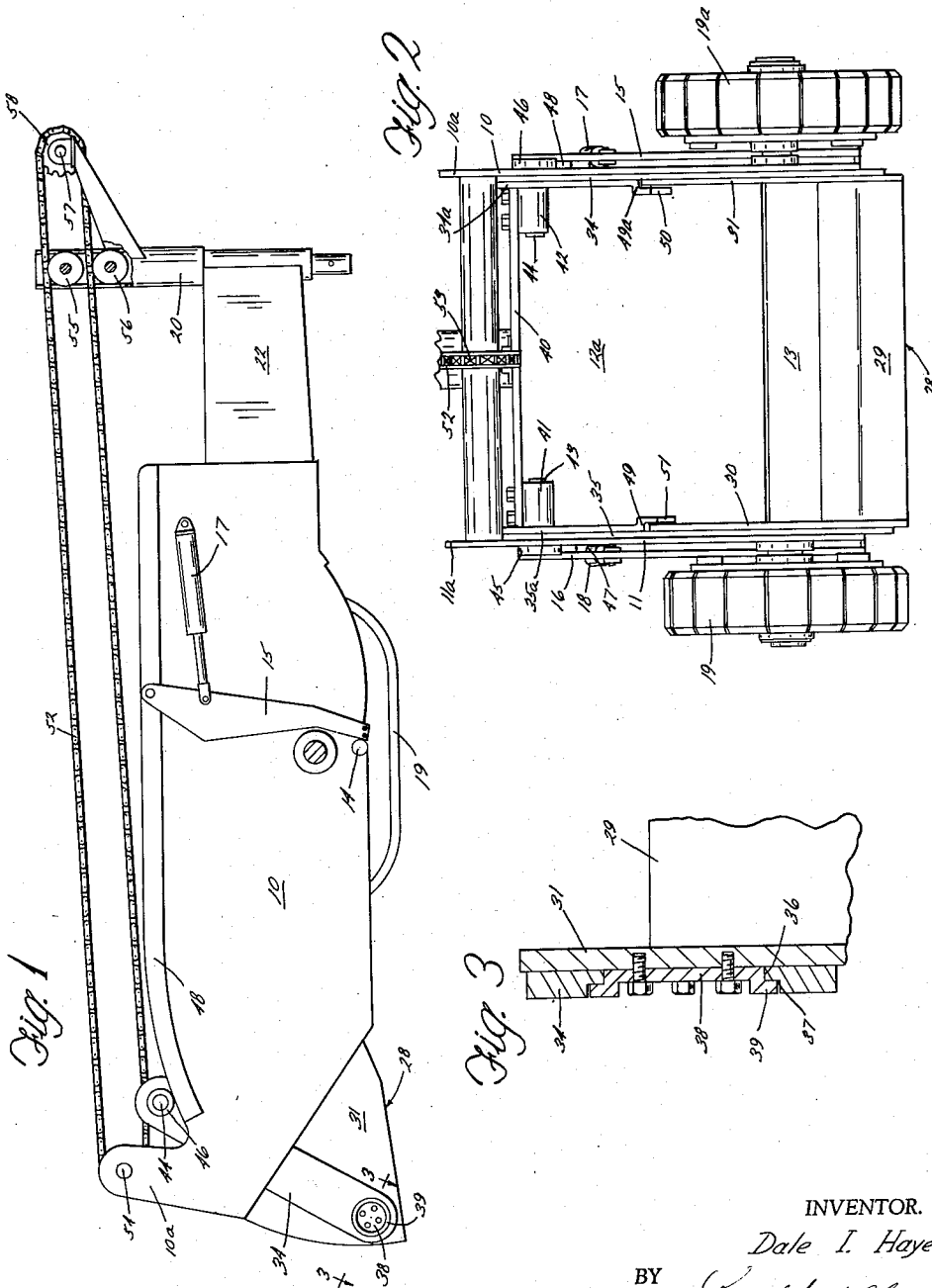
D. I. HAYES

2,953,263

SELF LOADING TRANSPORT

Filed July 21, 1958

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SELF LOADING TRANSPORT

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Fig. 4

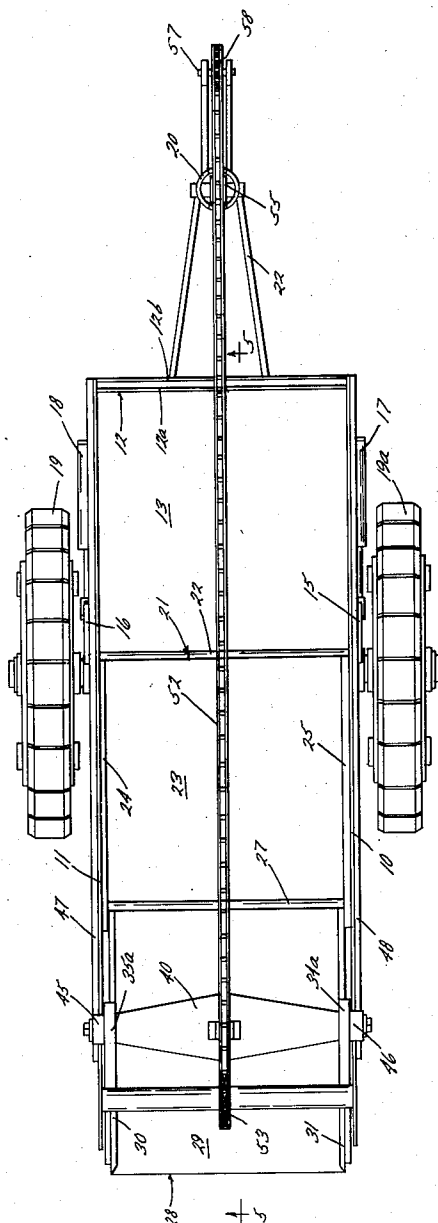
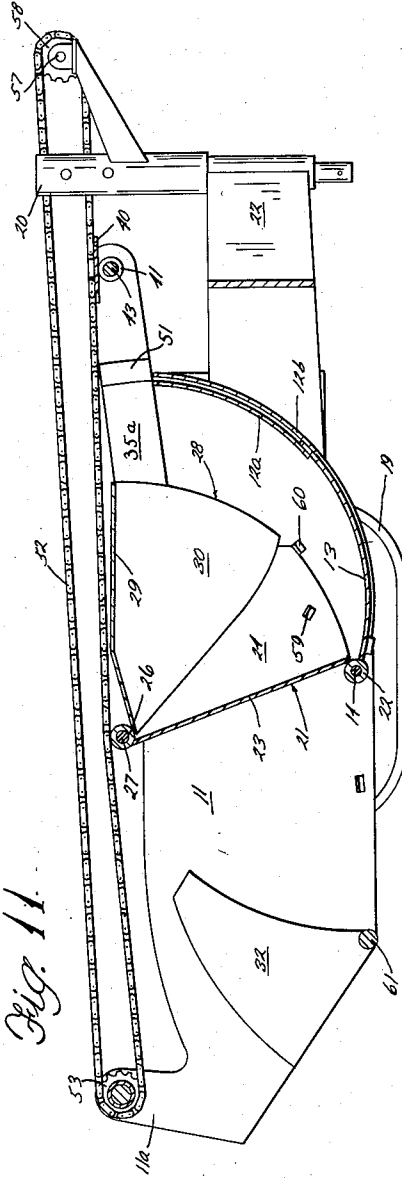


Fig. 11



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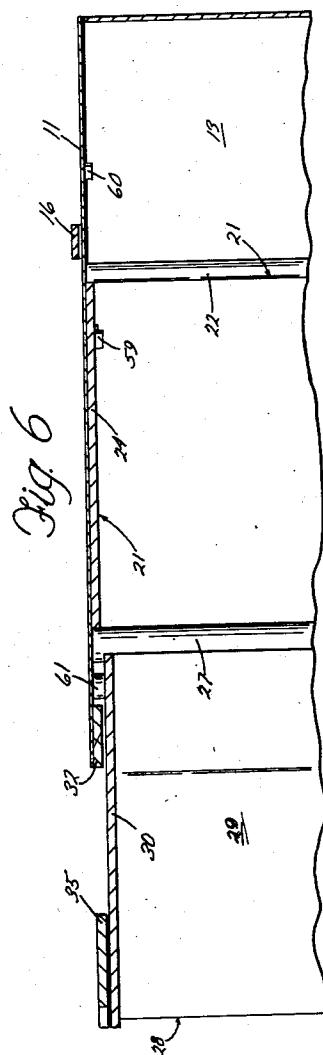
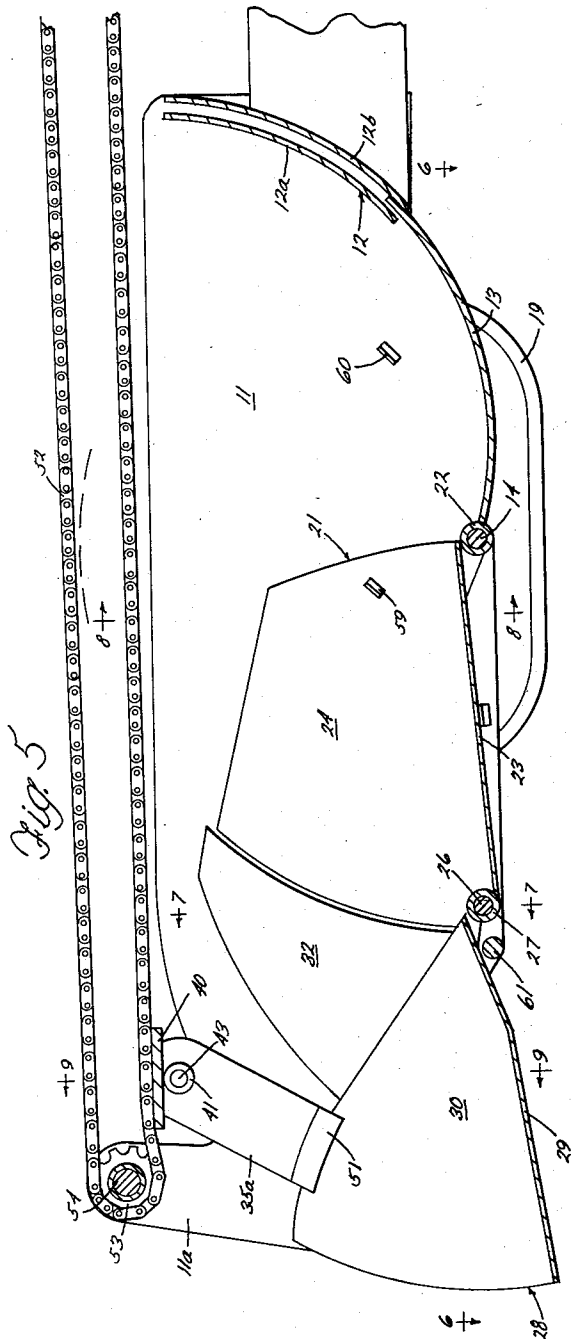
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Fig. 7

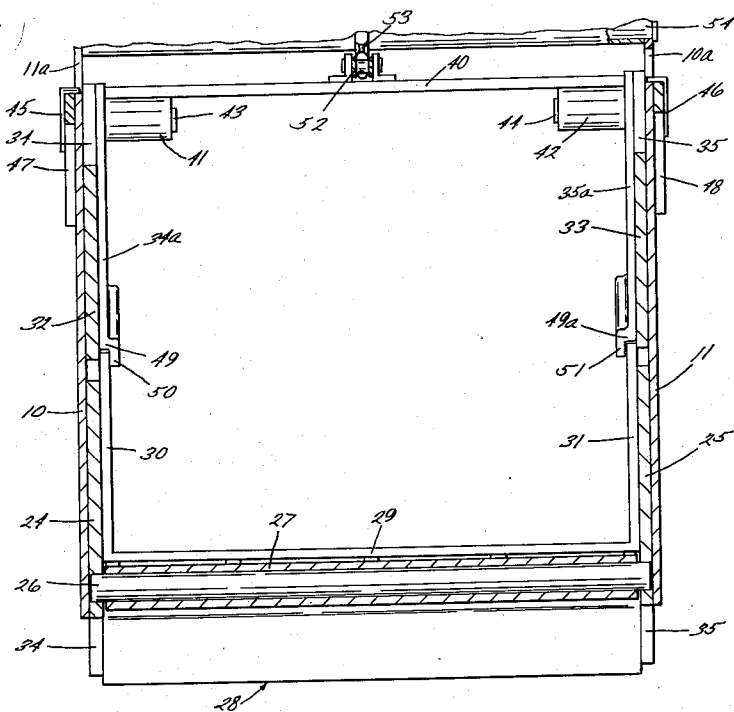
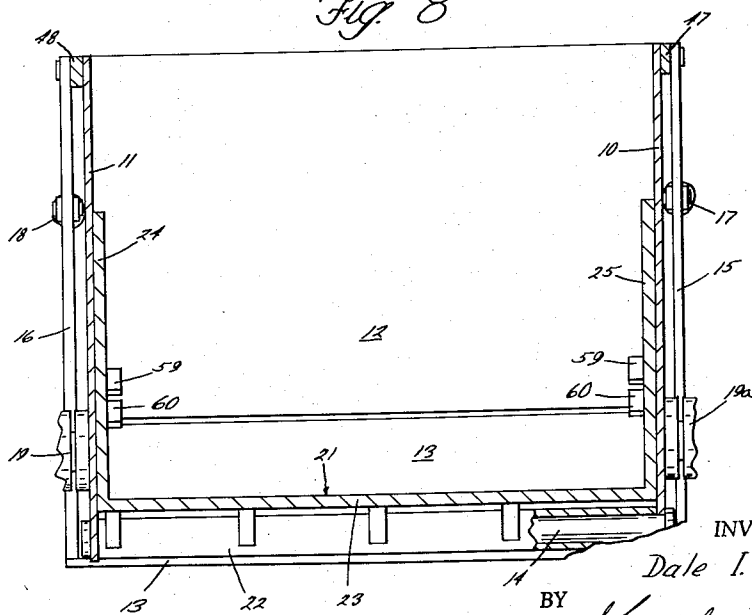


Fig. 8



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2,953,263

SELF LOADING TRANSPORT

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Fig. 9

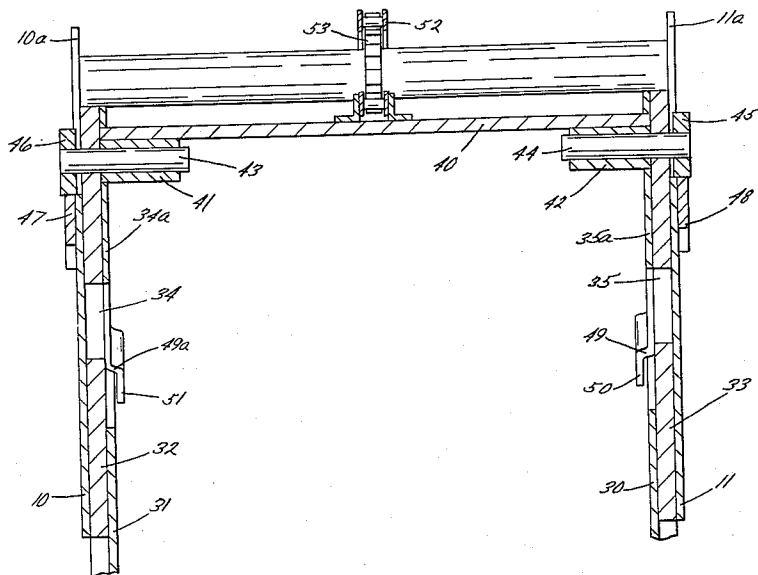
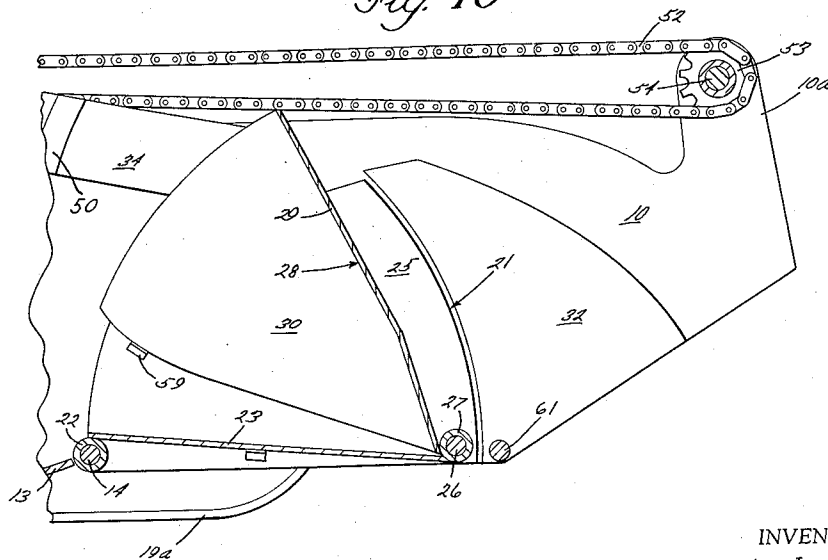


Fig. 10



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2,953,263

SELF LOADING TRANSPORT

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Filed July 21, 1958, Ser. No. 749,826

8 Claims. (Cl. 214—78)

My invention relates to self loading transports which are particularly adapted to pick up and transport loose aggregates wherein the overhead room is limited, as in the case of a tunnel. Self loading transports of the general character of the present invention are illustrated in my prior Patents No. 2,518,471 and No. 2,743,828. It is the principal purpose of this invention to provide a self loading transport of this nature wherein the bucket which gathers the aggregate and the intermediate trough which receives the aggregate from the bucket are so combined with the side walls of the vehicle body so that the bucket can be folded rearwardly about its pivot on the intermediate fold back trough until it is substantially inverted, and then utilized to fold the trough itself rearwardly in such a fashion that the overall height necessary in which to accomplish the folding is kept within the confines of the fore and aft length of the trough itself, and the accompanying pivots by which it is connected to the vehicle body and to the bucket.

In self loading transports of this character the practical advantage is obtained by virtue of the fact that the load of loose aggregate is crowded rearwardly from the time it is received in the bucket by the shovel action of the bucket until it is loaded in the vehicle body. According to the present invention, this crowding action is attained in such a way that the overall height needed to swing the bucket and the intermediate fold back trough is kept very low when compared to the overall length of the bucket and the intermediate fold back trough which picks up the load. In carrying out the invention I utilize the side walls of the vehicle body to support the front cross tie and to provide top rails or guides for a bail, consisting of two arms pivoted to the lower front end of the bucket and a cross member, the bail having flanged rollers that ride on the top edges of the vehicle side walls in guiding the fold back elements throughout their crowding movement that carries the loose aggregate back into the vehicle body.

The nature and advantages of my invention will appear more fully from the following description and the accompanying drawings. It should be understood, however, that the drawings and description are intended to be illustrative of a preferred embodiment of the invention and are not intended to limit the invention except insofar as it is limited by the claims.

In the drawings:

Figure 1 is a side view of a self loading transport embodying my invention;

Figure 2 is a front view of the machine;

Figure 3 is an enlarged fragmentary cross section taken on the line 3—3 of Figure 1;

Figure 4 is a plan view of the machine;

Figure 5 is an enlarged sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a sectional view taken on the line 6—6 of Figure 5;

Figure 7 is an enlarged sectional view taken on the line 7—7 of Figure 5;

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Figure 8 is an enlarged sectional view taken on the line 8—8 of Figure 5;

Figure 9 is an enlarged sectional view taken on the line 9—9 of Figure 5;

Figure 10 is a fragmentary sectional view taken lengthwise through the machine showing the bucket folded back to its limiting position with respect to the intermediate fold back trough;

Figure 11 is a view similar to Figure 10 but showing the parts folded to the ultimate limit wherein the intermediate fold back trough has its bottom moved to an upright position.

Referring now in detail to the drawings, the self loading transport which embodies my invention consists of a vehicle body having side walls 10 and 11 and a rear wall 12. The body also has a dump gate 13 which is adapted to swing between the inner and outer wall sections 12a and 12b of the rear wall. Forwardly of the dump gate 13 a cross tie 14 connects the side walls 10 and 11 at the bottom thereof. The dump gate 13 is moved between a position adjacent the cross tie 14 and a rear position where it telescopes with the rear wall by arms 15 and 16 that are pivoted to the side walls 10 and 11 and operated by suitable jacks 17 and 18. For supporting the body, I have illustrated crawler type supports 19 and 19a connected to the side walls 10 and 11 and a rear pedestal 20 which is mounted by a frame 22 that extends rearwardly from the rear wall 12. The pedestal 20 may be supported as illustrated in my prior patents by a powered vehicle which serves also to furnish the motive power needed for the operation of the fold back elements. The present invention, however, is not limited to or particularly concerned with the manner of supporting and moving the vehicle body. Self powered supporting members 19 and 19a and a like rear member supporting the pedestal might be used without the necessity of having a separate vehicle.

The side walls 10 and 11 extend forward beyond the cross tie 14. An intermediate fold back trough 21 is pivoted on the cross tie 14. A sleeve 22 is provided at the lower rear corner of the trough 21 and this sleeve surrounds the cross tie 14 to provide the pivot. The trough 21 has a bottom wall 23 and two side walls 24 and 25 which are juxtaposed to the side walls 10 and 11 of the vehicle body.

The trough 21 at its forward end carries a cross shaft 26 on which a sleeve 27 is journaled. The sleeve 27 is fixed to the lower rear corner of the bucket 28 which picks up the loose aggregate. The bucket 28 has a bottom wall 29 and upstanding side walls 30 and 31 which are spaced apart the correct amount to fit closely between the side walls 24 and 25 of the trough 21. The side walls 10 and 11 forwardly of the trough 21 have liner plates 32 and 33 of the same thickness approximately as the side walls 24 and 25 of the trough and these liners serve as guides for the side walls 30 and 31 of the bucket 28.

The bucket 28 is swung about its pivot on the cross shaft 26 by a bail which is composed of two arms 34 and 35. These arms are pivoted to the bucket on the outside of the walls 30 and 31 in the manner illustrated in Figure 3 of the drawings. In this figure the arm 34 is shown as pivoted to the side wall 30 of the bucket by being provided with an aperture 36 and a ledge 37 around the aperture. A circular plate 38 is bolted to the side wall 30 of the bucket 28 and has a flange 39 which overlies the ledge 37. The bail further comprises a cross member 40 which is provided with two bearings 41 and 42 pivotally receiving stub shafts 43 and 44 which are mounted on the upper ends of the arms 34 and 35. The stub shafts 43 and 44 are extended through the arms 34

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and 35 and on their outer ends they mount wheels 45 and 46. These wheels ride on the top edges of the side walls 10 and 11 of the vehicle body, the side walls 10 and 11 being reinforced by bars 47 and 48 to provide adequate bearing surface for the wheels 45 and 46. The arms 34 and 35 are provided with means to engage the inner faces of the side walls 30 and 31 of the bucket 28 at the top edge thereof for the purpose of strengthening the side walls against inwardly directed forces that might bend them. This is done by providing recesses 49 and 49a in the arms with overhanging lips 50 and 51 to receive the top edges of the side walls 30 and 31. The parts of the arms 34 and 35 that form the lips 50 and 51 are bars 34a and 35a which provide additional reinforcement of the arms 34 and 35. It will be noted from Figure 5 of the drawings that the top edges of the walls 30 and 31 of the bucket 28 are curved about the center of the pivot of the arms to the bucket throughout the area of their engagement of their top edges in the recesses 49 and 49a.

The arms 34 and 35 and the cross member 40 constitute a bail which can be pulled rearwardly with the wheels 45 and 46 riding on the tops of the side walls 10 and 11 to lift the bucket 28 from its loading position as illustrated in Figure 5 rearwardly to the position shown in Figure 10, where the bucket is inverted to the final position shown in Figure 11 where the intermediate fold back trough 21 has been tipped up to crowd the load into the back portion of the vehicle body. This movement is accomplished by attaching a flexible endless member 52 to the cross member 40. This flexible endless member 52 is mounted at its forward end on a guide 53 which is journaled for rotation on a cross tie 54 that connects the side walls 10 and 11 at their forward ends. The side walls have upstanding portions 10a and 11a at their forward ends which serve to mount the cross tie 54 high enough for connection of the member 52 to the cross member 40. These portions 10a and 11a also form stops limiting the forward movement of the wheels 45 and 46 and the arms 34 and 35 carried by the wheels. The endless member 52 extends lengthwise over the vehicle body through a pair of guides 55 and 56 which are provided on the pedestal 20 to a powered shaft 57 which has a drive sprocket 58 thereon to drive the endless member 52. By moving the lower flight of the endless member 52 to the right as shown in Figure 1, the bail is caused to lift the bucket 28 and fold it over the intermediate fold back trough 21 and finally to utilize the bucket as a link to lift the front end of the intermediate fold back trough. To bring the parts back to loading position as shown in Figure 5, the endless member 52 is reversed and moved to the left. The arms 34 and 35 will then push the bucket and the intermediate fold back trough back to the position shown in Figure 5.

The matter of supplying power to the drive sprocket 58 is one of choice so no particular drive mechanism has been shown for driving the sprocket. The drive of the sprocket 58 must be reversible so that the endless flexible drive member 52 can be made to move in both directions. Preferably a roller chain is used for the member 52.

It will be noted that stops 59 are provided inside the fold back trough 21 to serve as limits to the amount that the bucket 28 can be folded. When the side walls 30 and 31 of the bucket 28 engage the stops 59, the bucket 28 then serves to communicate the pull of the bail to the intermediate fold back trough 21 to fold it over. The degree of folding of the intermediate fold back 21 is also limited by stops 60 which are mounted inside the side walls 10 and 11 to engage the rear edges of the side walls 24 and 25 of the intermediate fold back trough.

In order to further strengthen the assembly at the forward end I have illustrated a cross tie 61 between the side walls 10 and 11 directly in front of the front edge of the intermediate fold back trough 21. Should additional cross tie strength be found necessary there is ample

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space below the bottom 23 of the trough 21 for another cross tie. An overhead cross tie of course, can be used above the chain 52 and extending down to the side walls 10 and 11. The maximum height reached by the folding parts 21 and 28 is illustrated by the broken line of Figure 5 and by the position of the parts as shown in Figure 11.

It is believed to be evident from the foregoing description that I have provided a self loading transport wherein the capacity for receiving a load of loose material is quite ample and the overall height of the machine is kept quite low. The machine when constructed can have a very low swing such as 5 feet or less. The advantages of this low clearance are obvious when one considers the utility of the machine in underground work. This low clearance and the crowding ability of the machine, that is, its ability to work the load back into the body from the front end of the bucket and its ability to eject the load through the dump opening, is particularly important. The overall length of the side walls 10 and 11 provides ample storage and since the forward and rearward swinging movement of the bucket 28 and the intermediate fold back trough 21 are powered movements, the filling of the machine and the discharge of its load are both under full control of the operator and are accomplished with a minimum power requirement due to the small amount of lifting of the load that is required.

Having thus described my invention, I claim:

1. In a self loading transport including a load receiving body having upstanding spaced apart side walls and a bottom and rear wall provided with a dump opening and a closure therefor, said transport having a U-shaped trough pivoted at its lower rear edge to said body in front of said opening and rotatable about its pivot from a horizontal load receiving position upwardly and rearwardly between said side walls to crowd material thereon into the body, said transport also having a trough like bucket between the side walls of the body extending forwardly from the trough and pivoted at its lower rear edge to the trough and rotatable from a horizontal, load receiving position upwardly and rearwardly between the side walls of the trough to crowd material thereon into the trough, the improvement comprising arms pivoted to the bucket adjacent to its lower front edge and extended upwardly inside the side walls of the body, and supported at their upper ends on said side walls for movement lengthwise of said side walls and means operatively connected to said arms adapted to effect said movement of said arms whereby to turn said bucket on its pivot from load receiving position to an inverted position above the trough and to turn the trough from its load receiving position upwardly and rearwardly about its pivot.

2. The improvement defined in claim 1 wherein the arms are supported on said body side walls by wheels on the arms riding on the side walls.

3. The improvement defined in claim 1 wherein the means adapted to effect movement of said arms comprises a flexible member supported on said body and connected to said arms and means to move the flexible member lengthwise of the body side walls in both directions.

4. The improvement defined in claim 1 wherein the arms are supported on said body side walls by wheels on the arms riding on the side walls and said arms are connected to each other by a cross member to which said means is connected.

5. The improvement defined in claim 1 wherein the body side walls have stops at their forward ends limiting forward movement of the arms and a cross tie connects said body side walls at their forward ends.

6. The improvement defined in claim 1 wherein the arms have recesses slidably receiving the upper side edges of the bucket when the bucket is in load receiving position.

7. A self loading transport for the purposes described comprising a vehicle body having spaced apart upright side walls, a rear wall connecting said side walls, a trough spaced forwardly from said rear wall and comprising

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trough side walls in juxtaposition to said side walls, and a trough bottom wall connecting the trough side walls, the trough being pivotally supported at its lower rear corner on the vehicle side walls, a bottom closure for the side walls between the rear wall and the trough, a trough like bucket having side walls movable between the trough side walls and a bucket bottom wall and being open at the rear for passage of material into the trough, the bucket being pivoted at its lower rear corner on the lower front portion of the trough to swing into and out of the trough, bucket lifting arms pivoted to the bucket side walls adjacent to the lower front corners thereof and extending inside the vehicle side walls to the top thereof and having supports riding on the top edges of said vehicle side walls, a cross member connecting the top portions of said arms, the vehicle side walls having a cross tie therebetween in front of the cross member, and means operatively connected to the cross member adapted to move the cross member lengthwise of the side walls to lift the bucket about its pivot on the trough and move it rearwardly to swing the trough rearwardly about its pivot to the side walls.

8. A self loading transport for the purposes described comprising a vehicle body having spaced apart upright side walls, a rear wall connecting said side walls, a trough spaced forwardly from said rear wall and comprising trough side walls in juxtaposition to said side walls, and a trough bottom wall connecting the trough side walls,

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the trough being pivotally supported at its lower rear corner on the vehicle side walls, a bottom closure for the side walls between the rear wall and the trough, a trough like bucket having side walls movable between the trough side walls and a bucket bottom wall and being open at the rear for passage of material into the trough, the bucket being pivoted at its lower corner on the lower front portion of the trough to swing into and out of the trough, bucket lifting arms pivoted to the bucket side walls adjacent to the lower front corners thereof and extending inside the vehicle side walls to the top thereof and having supports riding on the top edges of said vehicle side walls, a cross member connecting the top portions of said arms, the vehicle side walls having a cross tie therebetween in front of the cross member, and means operatively connected to the cross member adapted to move the cross member lengthwise of the side walls to lift the bucket about its pivot on the trough and move it rearwardly to swing the trough rearwardly about its pivot to the side walls comprising a flexible endless drive member fixed to said cross member, a support for the drive member on the cross tie, another support for the drive member on the rear end of the vehicle body and power means to move the drive member to and fro.

References Cited in the file of this patent

UNITED STATES PATENTS

2,518,471 Hayes ----- Aug. 15, 1940