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J. D. FARRELL

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INCLINABLE BOOM AND BUCKET FOR CONCRETE MIXERS

Filed May 22, 1942

3 Sheets-Sheet 1

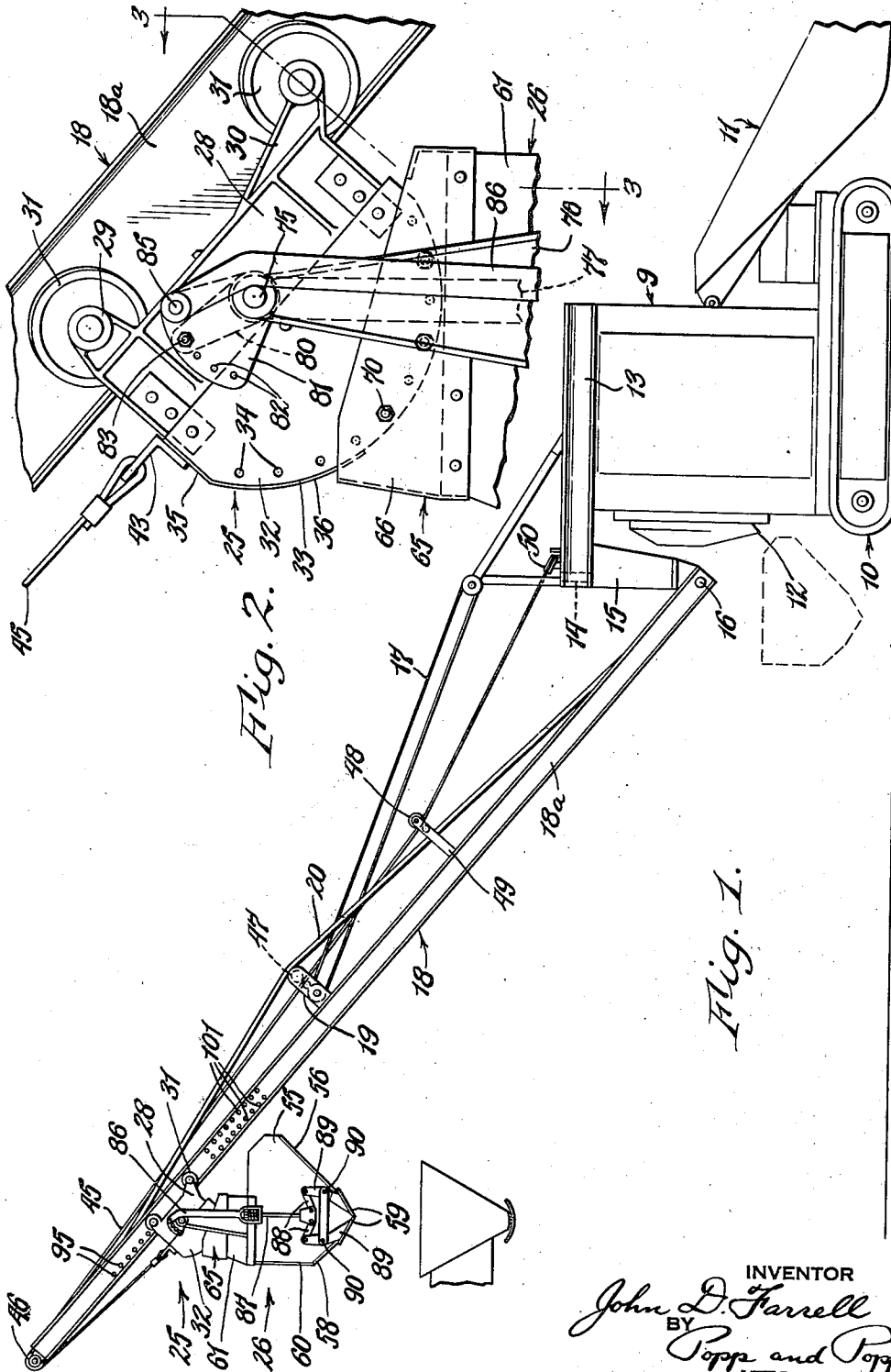


Fig. 1.

Fig. 2.

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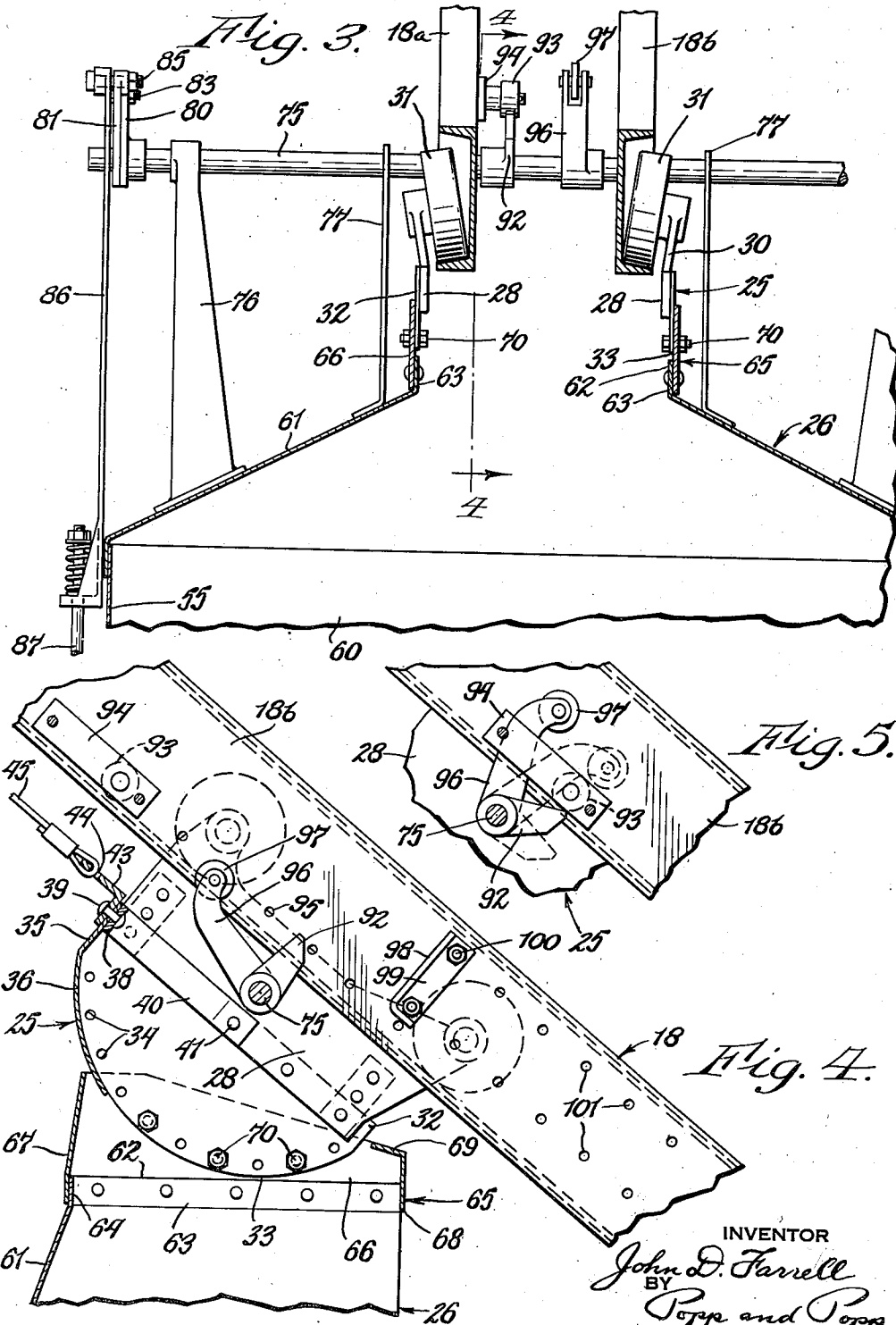
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3 Sheets-Sheet 2



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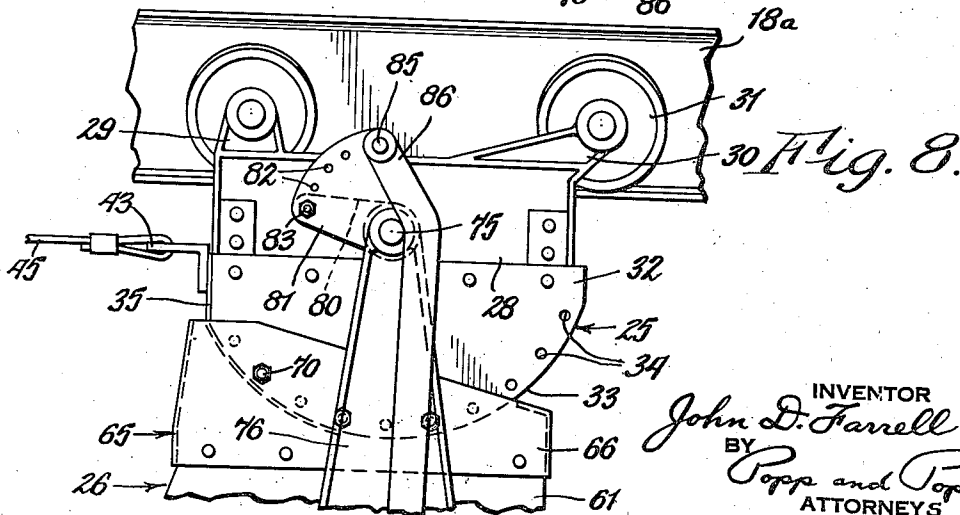
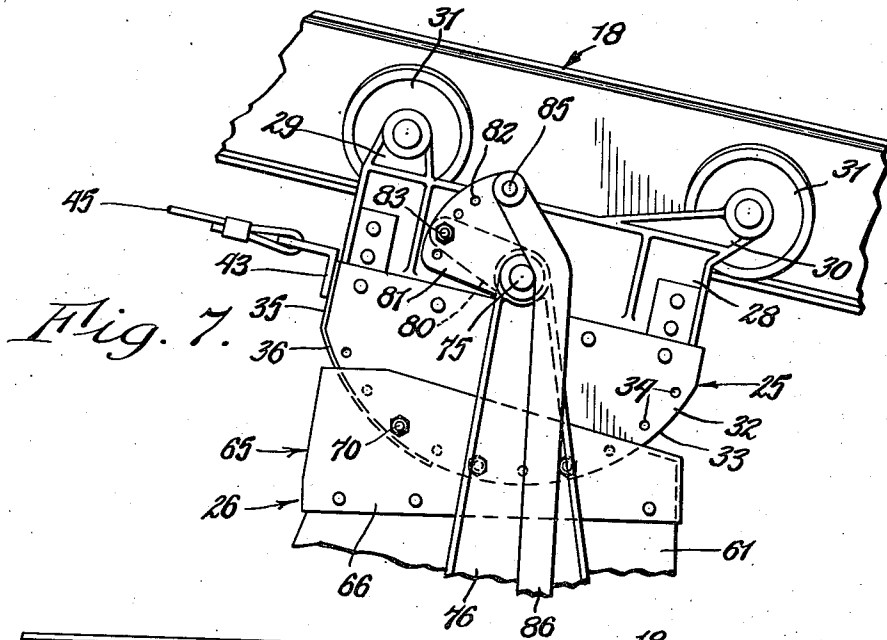
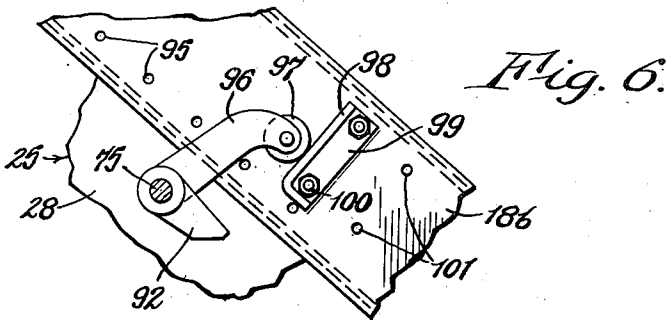
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3 Sheets-Sheet 3



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2,321,073

INCLINABLE BOOM AND BUCKET FOR
CONCRETE MIXERS

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Application May 22, 1942, Serial No. 444,151

15 Claims. (Cl. 214—59)

This invention relates to an inclinable boom and bucket for a concrete mixer, particularly for a concrete mixer of the road paver type, the purpose of such an inclinable boom being to permit of delivering the concrete at various heights as in irregular roadwork or in the filling of elevated forms or hoppers.

In road pavers having a boom forming a track for the bucket which distributes the concrete, it is desirable to positively maintain the bucket in a level position in traveling along the boom so as to avoid the danger of having the concrete slop out of the bucket during its travel along the boom. Where an inclinable boom is provided so that the concrete can be delivered to different elevations, as in the filling of forms, or an elevated receiving hopper, it is necessary to provide means for adjusting the bucket to a level position at the selected inclination of the boom.

It is the principal object of the invention to provide, in such an inclinable boom and bucket for a concrete mixer, a simple and reliable means for adjusting the bucket relative to its carriage which traverses the boom so that the bucket can be easily set to a level position at any selected inclination of the boom.

It is another object of the present invention to provide an auxiliary support for the bucket which holds the bucket in proper position while the adjustment is being made, thereby to facilitate this adjustment.

Another object is to provide a bucket for such assembly having doors in its bottom which are positively opened and closed by trip and restoring members mounted on the outer end of the boom and adjustable lengthwise of the boom and toward and from one another so that the doors are positively closed immediately following the discharge of the concrete at the desired elevated place and so that the place of such discharge as well as the duration of such discharge can readily be regulated.

Another object of the invention is to provide an adjustment in the bucket door opening and closing mechanism which is adjusted to correspond to the selected inclination of the boom to insure the proper opening and closing of the doors and avoid dribbling of concrete from the bucket as it moves along the boom from its receiving to its discharging position and vice versa.

Another object of the invention is to provide such an inclinable boom and bucket assembly in which the adjustment of the position of the bucket and the corresponding adjustment of its

door opening and closing mechanism is effected without danger of relative misadjustment.

Another object is to provide a bucket door opening and closing mechanism which operates positively and freely to open and close the doors upon striking the corresponding abutments provided on the boom.

Another object of the invention is to provide such an adjustable inclinable boom and bucket assembly which is simple and rugged in construction and will stand up under conditions of severe and constant use without getting out of order or requiring repairs.

Another object is to so arrange the sheaves for the bucket cable that the same assist in supporting the boom and also embodies the minimum resistance to the movement of the bucket along the boom when inclined, it requiring, of course, a greater power to elevate the bucket than is required to move it along a horizontal boom.

In the accompanying drawings:

Fig. 1 is a side elevation of a concrete road paver having an inclinable boom and bucket embodying the present invention and showing the boom inclined to a high angle.

Fig. 2 is an enlarged fragmentary side elevation of the boom and bucket as shown in Fig. 1 and showing the construction of the bucket in greater detail.

Fig. 3 is a fragmentary section, through the boom and bucket, taken on line 3—3, Fig. 1.

Fig. 4 is a fragmentary vertical section, taken on line 4—4, Fig. 3.

Fig. 5 is a view similar to Fig. 4 illustrating the manner in which the doors at the bottom of the bucket are tripped during the outward movement of the bucket along the boom.

Fig. 6 is a view similar to Figs. 4 and 5 illustrating the manner in which the doors at the bottom of the bucket are closed following the discharge of concrete from the bucket.

Fig. 7 is a view similar to Fig. 4 showing the boom inclined at a lesser elevation than that illustrated in Fig. 4 and showing the corresponding adjustments made in the bucket mechanism.

Fig. 8 is a view similar to Figs. 4 and 7 but showing the boom horizontally disposed and with a corresponding adjustment made in the bucket mechanism.

The boom and bucket assembly forming the subject of the present invention is illustrated as mounted on a conventional concrete mixer of the road paver type, having a frame 9 carried by crawlers 10 and having a skip 11 which can be elevated to discharge the aggregate and Portland

cement into a mixing drum, the discharge of which is indicated at 12. The skip, mixing drum and crawlers are driven by a motor (not shown) which also is employed to raise and lower the inclinable boom and to move the bucket along the boom to its discharging position. The top longitudinal frame members 13 of the frame 9 are shown as extended beyond the discharge 12 of the mixing drum and as supporting, through a vertical pivot 14, a depending saddle 15, this saddle being shown as carrying, at its lower end, a horizontal pivot 16 which carries one end of the boom 18. The boom and the frame of the paver are provided with the usual sheaves for a cable 17 leading to a power drum on the paver for elevating and lowering the boom. The provision of the vertical pivot 14 at one end of the saddle 15 and the horizontal pivot 16 at the other end of this saddle provides a universal connection between the boom and the paver frame, thus permitting the boom to be swung sidewise as well as to be moved from a horizontal to different elevated positions, the lateral movement of the boom being particularly necessary in paving roads where the concrete is being distributed in the form of a wide strip.

The boom 18 is shown as made of two side channels 18a and 18b, these channels being spaced from each other, as illustrated in Fig. 3, and suitable cross connecting members (not shown) being provided at intervals to make the boom a unitary structure. Each channel 18a, 18b of the boom is also preferably provided with an upstanding supporting post 19 which supports the center of a rod 20, each end of this rod being suitably secured to the corresponding end of the boom in any suitable manner and this rod thereby serving to brace the other boom against the load of the bucket carried thereby.

The flanges of the channels 18a, 18b project outwardly in opposing relation to one another and the lower flange of the two channels 18a, 18b form the track for a carriage 25 of the distributing bucket 26. The carriage 25 is composed of two side plates 28, each of which is preferably made in the form of a casting and has a pair of ears 29 and 30 projecting upwardly therefrom. The plates 28 are arranged outside of the channels 18a and 18b of the boom and each of the ears 29, 30 carries a roller 31 which engages and rides upon the track formed by the lower flange of the corresponding channel 18a, 18b of the boom. These channels are preferably standard structural channels and hence the rollers 31 are inclined so as to fit the inclined face of the lower flanges of these channels.

To the lower part of each of the side plates is riveted a depending side plate 32 which can be made of sheet metal and is provided with an arcuate edge 33 and with a series of marginal holes 34 conforming to this arcuate marginal edge 33. These side plates 32 are connected by a front cross plate 35, the lower portion 36 of which is curved to conform and fit against the arcuate edges 33 of the sheet metal plates 32. The cross plate 35, including its lower portion 36, can be welded to the side plates 32 to form a box-like structure at the front end of the carriage and in addition the sides of the carriage are preferably braced by a bar 38 riveted to the center of the front plate 35 as at 39 and bent to provide legs 40 extending diagonally rearward from the rivet 39 and each leg joined to the side plates 28 and 32 by a rivet 41, as best illustrated in Fig. 4.

As best shown in Fig. 4, the rivet 39 for the braces 40 also secures to the carriage 25 an L-shaped bracket 43 which projects forwardly from the carriage and is formed to provide an eye 44 in which the corresponding end of the bucket cable 45 is secured. As shown in Fig. 2, this cable passes around a sheave 46 at the extreme end of the boom and thence under a guide sheave 47 mounted on the upstanding supporting posts 19. The bucket cable 45 also passes under a guide sheave 48 carried at the upper ends of posts 49 secured to and rising from the channels of the boom 18. The post 49 is preferably located approximately two-thirds of the distance from the horizontal pivot 16 to the post 19 supporting the guide sheave 47. From the guide sheave 48 the bucket cable passes around a guide sheave 50 on the frame 9 to a power drum (not shown) of the concrete mixer.

The bucket 26 is shown as composed of side plates 55, bottom plates 56 and 58 which are welded to the side plates 55 and are spaced to form a discharge opening closed by a pair of doors 59, and a front plate 60 similarly welded to the front edges of the side plates 55. The end of the bucket 26 adjacent the concrete mixer is extended so that in the lowered position of the bucket, indicated by dotted lines in Fig. 1, the bottom plate 56 is arranged under the discharge 12 from the concrete mixer so that the charge of concrete contained in the drum of the concrete mixer is discharged into the bucket when in this lowered position. To the side and front plates 55, 60 of the bucket is welded a top plate 61, the sides of which incline inwardly and upwardly as indicated in Figs. 3 and 4 and terminate in a throat 62 composed of a front flange 64 and side flanges 63, the rear side of the top plate 61 being left open to permit ready access to the bucket for filling or cleaning the same. To this throat 62 is bolted the lower rim of a rectangular collar 65, this collar having side walls 66 which straddle and are arranged against the depending arcuate side plates 32, a front wall 67 the upper edge of which is arranged close to the curving portion 36 of the front plate of the carriage and a rear wall 68 which is extended inwardly at its upper end to brace the collar. Each of the side walls 66 of the collar 65 is provided with an arcuate series of holes which coincide in arrangement and spacing to the series of holes 34 provided in the depending arcuate side plates 32 of the carriage so that the side walls 66 of the collar 65 can be connected to these side plates 32 of the carriage by bolts 70, three of such bolts being shown. Since the bolt holes in these side walls 66 conform in spacing and arrangement to the holes 34 of the side plates 32, it will be seen that the bucket can be bolted through different groups of the holes 34 in the side plates 32 and hence that the bucket can be swung into different angular relations to the carriage 25 about the axis of the arcuate lower edges 33 of the side plates 32 and the series of holes 34.

The side plates 28, 28 carry a cross shaft 75, this cross shaft being journaled in bearings provided in these side plates 28 and the axis of these bearings and the cross shaft 75 being concentric with the arcuate edge 33 of the side plates 32 and also with the arcuate series of holes 34 provided along this edge. This cross shaft 75 extends beyond the sides of the bucket 26 and to support each end a standard 76 is mounted on the corresponding side of the top plate 61 and is provided with a bearing at its upper end in which

the shaft is journaled. These standards are for the purpose of supporting the extremities of the shaft and are not suitable for use for supporting the bucket 26 when the adjusting bolts 70 are removed inasmuch as they connect with the opposite extremities of the shaft 75. To prevent the bucket 26 from falling when these adjusting bolts 70 are so removed in adjusting the bucket to a different angularity, hanger straps 77 are welded to the top plate of the bucket immediately adjacent the collar 65, these hanger straps 77 being provided with holes through which the shaft 75 passes. It will be seen that when the bolts 70 are removed the bucket hangs from the shaft 75 through the medium of the straps 77, thereby to prevent the bucket from falling in effecting the leveling of the bucket.

To each extremity of the cross shaft 75 is secured a crank arm 80 and adjacent each of the crank arms 80 a segmental plate 81 is loosely mounted on the cross shaft 75, this segmental plate having a series of openings 82 which are concentric with the axis of the cross shaft 75 and are also arranged to register with an opening in the crank arm 80 so that the crank arm can be connected by a bolt 83 with the segmental plate 81 through any one of the openings 82. To the upper outer extremity of the segmental plate 81 is pivoted, as indicated at 85, the upper end of a link 86, this link being bent so that when the parts are in the position shown, the link bears against the side of the cross shaft 75. The lower end of each link 86, as shown in Fig. 1, has a spring connection with a rod 87 which in turn is pivotally connected to the inner ends of a pair of toggle links 88, the outer ends of these toggle links connecting with an arm 89 secured to and projecting upwardly from each door 59, each of these arms 89 being in turn pivoted to the corresponding side plate 55 of the bucket 26 at 90.

With such toggle linkage mechanisms at each side of the bucket connected to the cross shaft 75 through the medium of the link 86, segmental plate 81 and crank arm 80, as shown, it will be seen that when the cross shaft 75 is rotated clockwise from the positions as viewed in Figs. 2, 7 and 8, the pivot pin 85 at the upper end of the link 86 passes to the right beyond the dead center line of the cross shaft 75 and hence permits the link 86 to drop. This contracts the toggle links 88, thereby to swing the upper ends of the arms 89 inwardly about the pivots 90 and since these arms are fast to the doors 59 closing the bottom of the bucket, these doors are swung outwardly into an open position so as to permit the contents of the bucket to be discharged. Conversely, when the cross shaft 75 is rotated counterclockwise, as viewed in Figs. 2, 7 and 8, back to the position shown in these figures, each of the pivot pins 85 passes to the left of the dead center line of the cross shaft 75 and its link 86 engages the corresponding side of the cross shaft 75. In so rotating, the link 86 is raised thereby to lift and expand the toggle links 88 and force the doors 59 to swing about the pivots 90 to the closed position shown. The engagement of each link 86 with the cross shaft 75 serves to lock the doors in this closed position.

For the purpose of automatically opening the doors 59 of the bucket at any desired position on the boom 18, a trip mechanism is provided which rotates the cross shaft 75 in a clockwise direction as viewed in the drawings, this trip mechanism being preferably constructed as follows:

A trip arm 92 is fast to the cross shaft 75 and

extends into the space between the two channels 18a and 18b of the boom 18. This trip arm is arranged adjacent the channel 18a and in the outward movement of the bucket carriage 25 along the boom engages a trip roller 93 mounted on a plate 94 which is in turn removably secured to the inner face of the channel 18a through bolt holes 95. These bolt holes, as best shown in Fig. 1, are provided in a series along the channel 18a so that the plate 94 and its roller can be moved to different positions along the boom thereby to determine the position of the bucket along the boom at which its doors are opened. It will be seen that when the trip arm 92 engages the trip roller 93, the continued outward movement of the bucket carriage 25 causes this trip arm to swing clockwise, thereby to impart a clockwise rotation to the cross shaft 75 and carry the pivot pin 85 to the right of the dead center line of the cross shaft 75, as viewed in Figs. 2, 7 and 8 and permit the doors 59 to open, as previously described.

During the initial part of the return movement of the bucket carriage 25 along the boom 18, the doors 59 are restored to their closed position so as to avoid the dribbling of concrete from the bucket during such return movement and to permit of immediately refilling the bucket on reaching the dotted line position shown in Fig. 1. For this purpose a door closing arm 96 is fast to the cross shaft 75 and projects upwardly into the space between the channels 18a and 18b of the boom 18. This door closing arm 96 is arranged adjacent the channel 18b and at its upper end is provided with a roller 97 which is adapted to engage the L-shaped projection 98 of a plate 99 secured to the inner side of the channel 18b by bolts 100. These bolts 100 are secured through any pair of two series of bolt holes 101, the series of bolt holes 101 extending lengthwise of the boom so that the plate 99 can be secured in any desired position along the boom and effect a corresponding adjustment of the place at which the doors 59 of the bucket 26 are closed.

It will be seen that when the trip arm 92 engages the trip roller 93 to open the bucket doors, the door closing arm 96 is swung to an upright position and in position to engage the L-shaped projection 98 of the plate 99. When its roller 97 so engages this plate during the return movement of the bucket carriage 25, the arm 96 is swung counterclockwise until its roller passes under the L-shaped projection 98. This counterclockwise movement of the door closing arm effects a corresponding movement of the cross shaft 75, thereby to swing the pivot pin 85 upwardly and to the left of the dead center line of the shaft 75, as viewed in Figs. 2, 7 and 8. A corresponding upward movement of the links 86 causes the doors 59 to be drawn to a closed position and this link is brought into locking engagement with the cross shaft 75 so as to hold the doors 59 closed until they are again released by the trip arm 92.

Assuming that the boom has been elevated through the cable 17 to the high elevation illustrated in Figs 1-6 and with the parts of the bucket and its carriage adjusted as shown, when the operator draws in the bucket cable 45 the filled bucket is moved from the dotted line position illustrated in Fig. 1 toward the upper end of the boom, the rollers 31 of the carriage riding along the lower flanges of the two channels 18a and 18b which form the boom. The outward

and upward movement of the bucket continues

until the trip arm 92 strikes the roller 93 on the boom channel 18a as illustrated in Fig. 5. This engagement swings the trip arm from the position shown in Fig. 4 to the position shown in Fig. 5 and hence rotates the shaft 75 clockwise as viewed in these figures. The clockwise rotation of this shaft causes a corresponding rotation of each of its crank arms 80 and the segmental plates 81 and moves each pivot 85 to the right of the dead center line of the shaft 75, as viewed in Fig. 2. When each of these pivots 85 passes beyond this dead center line the links 86 drop thereby to draw in the toggle links 88 and the upper ends of the arms 89, as viewed in Fig. 1. Since the arms 89 are pivoted at 90, this movement of these arms swings the doors 59 downwardly and outwardly so as to open them and permit the concrete to flow out of the bucket.

After the bucket has been so emptied the operator pays out the bucket cable 45 so as to permit the bucket to slide down the inclined boom.

The clockwise rotation of the shaft on being tripped, as above described, swings the cable closing arm 96 on this shaft to the position shown in Fig. 6. Hence when the operator pays out the cable 45 to return the bucket to the dotted line filling position shown in Fig. 1, the roller 97 of this arm is in position to engage the L-shaped extension 98 of the plate 99 on the channel 18b. When this engagement takes place, the movement of the door closing arm 96 is arrested and hence this arm, together with the cross shaft 75, is rotated in a counterclockwise direction, as viewed in Fig. 6, until the roller 97 passes under the L-shaped extension 98. This counterclockwise rotation swings the crank arms 80 and the segmental plates 81 attached thereto in a similar direction until the pivots 85 pass to the left of the dead center line of the shaft 75, as viewed in Fig. 2, so that the link 86 is brought into engagement with the shaft 75. This counterclockwise movement of the pivots 85 raises the link 86 so as to close the bucket doors 59 through the toggle links 88. The bucket therefore continues in its downward movement with its doors closed so that very little concrete will dribble from the bucket while it is returning to the dotted line filling position illustrated in Fig. 1.

The plate 94 carrying the bucket trip roller 93 can be adjusted along the outer end of the boom through the medium of the series of bolt holes 95 and similarly the plate 99 carrying the L-shaped cam extension 98 can be adjusted along the boom through the medium of a series of bolt holes 101. The bucket can therefore be made to open at any desired point along the end of the boom and can also similarly be made to close at any desired point at the end of the boom and the interval between the opening and closing can similarly be adjusted.

Assuming that it is desired to adjust the boom to the lower inclination illustrated in Fig. 7, it is desirable that the bucket 26 be brought to a level position to avoid concrete slopping out of the bucket. To level the bucket, the operator removes the bolts 70 thereby to release the bucket from the carriage. At the same time the bucket will not drop because during this adjustment the bucket is supported by the hanger straps 77 from the cross shaft 75, as viewed in Fig. 3. In this connection the standards 76 are designed to support the ends of the shaft 75 and cannot be used as hangers inasmuch as they are located at

the ends of the shaft 75 and would bend the shaft if they were so used.

The operator then swings the bucket 26 to a leveled position and reinserts the bolts 70 through the registering bolt holes of the arcuate plates 32 and the collar 65 of the bucket. Upon tightening these bolts 70 the bucket will move along the boom in a level position at the newly selected inclination of the boom. At the same time it will be seen that the swinging of the bucket 26 about the shaft 75 to the newly selected position disturbs the door trip and closing mechanism. Thus, swinging the bucket clockwise, as assumed, effects a similar clockwise movement of the arcuate plate 81, crank arm 80 and shaft 75. This clockwise movement of the shaft 75 causes a corresponding upward movement of the door closing arm 96 and downward movement of the trip arm 92, as viewed in Fig. 4. Therefore, with a sufficient readjustment of the level of the bucket, the trip arm would be moved to a position where it would not engage the roller 93 sufficiently to open the bucket doors and similarly the door closing arm would be moved to a position where, upon engaging the L-shaped extension 98, it would attempt to rotate the shaft 75 counterclockwise beyond that permitted by the engagement of the links 86 with this cross shaft. To restore the door opening and closing mechanism to an operative condition after the bucket has been leveled, the operator removes the bolt 83 and selects one of the other bolt holes 82 so that in the newly selected inclination of the bucket the trip 92 and door closing arm 96 are restored to the position shown in Fig. 4 with reference to the roller 93 and L-shaped cam 98, respectively. As shown in Fig. 2, in the maximum inclined position of the boom 18 the bolt 83 occupies the uppermost hole 82 of the segmental plate 81. In the horizontal position of the boom 18, as shown in Fig. 8, this bolt occupies the lowermost hole 82 of the segmental plate 81 and in an intermediate position, as illustrated in Fig. 7, the bolt 83 occupies an intermediate hole 82 of the segmental plate 81.

From the foregoing it will be seen that the inclinable boom and bucket assembly forming the subject of the present invention provides a very simple means for leveling the bucket relative to its carriage as the boom is moved to different selected inclinations. It will further be seen that in such adjustment, the weight of the bucket is adequately supported on the cross shaft 75 so that swinging the bucket to the newly selected level and bolting it to the carriage in the new relation can be effected expeditiously. Further, it will be seen that the door opening and closing mechanism can readily be adjusted to function properly in the readjusted relation between the bucket of this carriage by the simple expedient of adjusting the bolts 83 along the holes 82, these holes being, of course, selected to correspond to the arcuate series of holes in the arcuate plates 32. The provision of the adjustment holes 95 and 101 along the boom for the trip roller 93 and door closing cam 98 further permits of adjusting the discharge and closing of the bucket at any place along the outer end of the boom and extending the boom cable directly from the mixer frame to the sheaves 47 and 48 near the center of the boom serves not only to avoid a sharp bend in the cable with attendant power loss, but also serves to in part support the weight of the boom by the bucket cable, particularly when the heavy

load of concrete in the bucket is being elevated to the outer end of the boom.

I claim as my invention:

1. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a depending arcuate member extending lengthwise of said boom, said arcuate member being concentric with a horizontal axis extending centrally through said carriage and transversely of said boom, a bucket adapted to receive the material to be distributed from said paver, means for pivotally supporting said bucket on said carriage concentric with said axis, and means for securing said bucket to said arcuate member at different positions along the arc thereof thereby permitting said bucket to be leveled upon moving said boom to different inclinations.

2. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a depending member extending lengthwise of said boom, said depending member being formed to provide an arcuate series of transverse holes having a common axis extending horizontally and transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and provided with holes adapted to register with selected holes of said arcuate series of holes, means for pivotally supporting said bucket on said carriage concentric with said axis, and removable fastening members adapted to be inserted in the holes of said depending member and bucket to fix said bucket in a level position with different inclinations of said boom.

3. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a depending member extending lengthwise of said boom, said depending member being formed to provide an arcuate series of transverse holes having a common axis extending horizontally and transversely of said boom and said common axis extending through said carriage, a bucket adapted to receive the material to be distributed from said paver and provided with holes adapted to register with selected holes of said arcuate series of holes, means for pivotally supporting said bucket on said carriage concentric with said axis, and removable fastening members adapted to be inserted in the holes of said depending member and bucket to fix said bucket in a level position with different inclinations of said boom.

4. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a pair of spaced, depending, vertical side plates extending lengthwise of said boom, each

of said side plates being formed to provide an arcuate series of transverse holes and the series of holes of the two plates having a common axis extending horizontally and transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having vertical side walls the upper parts of which fit against said side plates and are provided with holes adapted to register with selected holes of said arcuate series of holes, means for pivotally supporting said bucket on said carriage concentric with said axis, and removable fastening members adapted to be inserted in the holes of said bucket walls and said side plates to fix said bucket in a level position with different inclinations of said boom.

5. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a pair of spaced, depending, vertical side plates extending lengthwise of said boom, each of said side plates being formed to provide an arcuate series of transverse holes and the series of holes of the two plates having a common axis extending horizontally and transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a top provided with a contracted upwardly extending neck, means for pivotally supporting said bucket on said carriage concentric with said axis, a collar secured to said neck and having vertical side walls which fit against said side plates and are provided with holes adapted to register with selected holes of said arcuate series of holes, and removable fastening members adapted to be inserted in the holes of said side walls and said side plates to fix said bucket in a level position with different inclinations of said boom.

6. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a depending member extending lengthwise of said boom, said depending member being formed to provide an arcuate series of transverse holes having a common axis extending horizontally and transversely of said boom and said common axis extending through said carriage, a bucket adapted to receive the material to be distributed from said paver and provided with holes adapted to register with selected holes of said arcuate series of holes, means for pivotally supporting said bucket on said carriage concentric with said axis, removable fastening members adapted to be inserted in the holes of said depending member and bucket to fix said bucket in a level position with different inclinations of said boom and means pivotally secured to said carriage substantially coaxial with said common axis and connected with said bucket to support said bucket when said fastening members are removed from said holes.

7. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being

formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and carrying a centrally disposed, horizontal cross shaft extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver, a hanger having its upper end carried by said cross shaft and rotatable about the axis of said cross shaft and secured to said bucket at its lower end and means for securing said bucket to said carriage at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations.

8. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having spaced, depending, vertical side walls extending lengthwise of said boom, a horizontal cross shaft mounted centrally in said side walls to extend transversely of said boom, each of said side walls being formed to provide an arcuate series of transverse holes and the series of holes of the two side walls having a common axis substantially coincident with the axis of said cross shaft, a bucket adapted to receive the material to be distributed from said paver and having vertical side walls the upper parts of which fit against said side walls of said carriage and are provided with holes adapted to register with selected holes of said arcuate series of holes, a pair of hangers carried by said cross shaft adjacent the side walls of said carriage and rotatable about the axis thereof and said hangers being secured at their lower ends to said bucket, and removable fastening members adapted to be inserted in the holes of said walls of said bucket and carriage to fix said bucket in a level position with different inclinations of said boom.

9. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track, a horizontal cross shaft journaled in said carriage and extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a bottom opening, a door for said opening, means operatively connecting said door and cross shaft for opening said door when said shaft is rotated in one direction, means for securing said bucket to said carriage at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations, a trip arm fast to said cross shaft adjacent said boom, and abutment means on said boom in the path of said trip arm and engaging said trip arm during the outward movement of said carriage from said paver along said boom to turn said cross shaft in said one direction to open said bucket door.

10. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise

thereof, a carriage having rollers riding on said track, a horizontal cross shaft journaled in said carriage and extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a bottom opening, a door for said opening, means operatively connecting said door and cross shaft for opening said door when said shaft is rotated in one direction, means for securing said bucket to said carriage at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations, a trip arm fast to said cross shaft adjacent said boom, abutment means on said boom in the path of said trip arm and engaging said trip arm during the outward movement of said carriage from said paver along said boom to turn said cross shaft in said one direction to open said bucket door, and means for adjustably moving said abutment means lengthwise of said boom.

11. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track, a horizontal cross shaft journaled in said carriage and extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a bottom opening, a door for said opening, means operatively connecting said door and cross shaft for closing said door when said shaft is rotated in one direction, means for securing said bucket to said carriage at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations, a door closer arm fast to said cross shaft adjacent said boom, and abutment means on said boom in the path of said door closer arm and engaging said door closer arm during the inward movement of said carriage toward said paver along said boom to turn said cross shaft in said one direction to close said bucket door.

12. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track, a horizontal cross shaft journaled in said carriage and extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a bottom opening, a door for said opening, means operatively connecting said door and cross shaft for closing said door when said shaft is rotated in one direction, means for securing said bucket to said carriage at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations, a door closer arm fast to said cross shaft adjacent said boom, abutment means on said boom in the path of said door closer arm and engaging said door closer arm during the inward movement of said carriage toward said paver along said boom to turn said cross shaft in said one direction to close said bucket door, and means for adjustably moving said abutment means lengthwise of said boom.

13. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track, a horizontal cross shaft journaled in said carriage and extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a bottom opening, a door for said opening, a depending link arranged alongside said bucket, means operatively connecting the lower end of said link to said door to open and close said door in response to the vertical movement of said link, a crank arm fast to said cross shaft, a pivot pin connecting the upper end of said link to said crank arm, means for securing said bucket at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations, a second arm fast to said cross shaft adjacent said boom, abutment means on said boom in the path of said second arm and engaging said second arm during the movement of said carriage along said boom to turn said cross shaft, and means for adjusting the said pivot pin to different radial positions relative to the axis of said cross shaft to obtain proper engagement of said second arm with said abutment in all leveled positions of said bucket.

14. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track, a horizontal cross shaft journaled in said carriage and extending transversely of said boom, a bucket adapted to receive the material to be distributed from said paver and having a bottom opening, a door for said opening, a depending link arranged alongside said bucket, means operatively connecting the lower end of said link to said door to open and close said door in response to the vertical movement of said link, a crank arm fast to said cross shaft, a pivot pin connecting the upper end of said link to said crank arm, means for securing said bucket at different radial positions relative to the axis of said cross shaft thereby permitting said bucket to be leveled upon moving said boom to different inclinations, a second arm fast to said cross shaft adjacent said boom, abutment means on said boom in the path of said second arm and engaging said second arm during the movement of said carriage along said boom to turn said cross shaft, and means for adjusting the said

pivot pin to different radial positions relative to the axis of said cross shaft to obtain proper engagement of said second arm with said abutment in all leveled positions of said bucket and comprising a plate loosely mounted on said cross shaft adjacent said crank arm and link and carrying said pivot pin, said plate being provided with an arcuate series of holes arranged concentric with said cross shaft and a fastening member securing said crank arm to said plate through one of said arcuate series of holes selected in accordance with the relative position of said boom and bucket.

15. An inclinable boom and bucket assembly for concrete pavers and the like, comprising a boom having one end adapted to be pivotally secured to said paver to permit it to be raised and lowered to different inclinations and being formed to provide a track extending lengthwise thereof, a carriage having rollers riding on said track and having a pair of spaced, depending, vertical side walls extending lengthwise of said boom, a horizontal cross shaft journaled in said side walls to extend transversely of said boom, each of said side walls being formed to provide an arcuate series of transverse holes and the series of holes of the two side walls having a common axis substantially coincident with the axis of said cross shaft, a relatively wide bucket adapted to receive the material to be distributed from said paver and having a discharge opening in its bottom, a door pivotally mounted on said bucket to open and close said opening, said bucket having a top provided with a contracted upwardly extending neck having vertical side walls which fit against the side walls of said carriage and are provided with holes adapted to register with selected holes of said arcuate series of holes, removable fastening members adapted to be inserted in the holes of said side walls of said neck and carriage to fit said bucket in a level position with different inclinations of said boom, standards secured to the top of said bucket and having bearings in which the outer ends of said cross shaft are journaled, a pair of hangers rotatably mounted on said cross shaft adjacent the side walls of said carriage and said hangers being secured at their lower ends to said top of said bucket to support said bucket when said fastening members are removed, means operatively connecting each end of said cross shaft with the corresponding end of said door for opening and closing said door upon rotating said cross shaft in opposite directions, and cooperating means carried by said boom and cross shaft for rotating said cross shaft in at least one direction in response to the movement of said carriage along said boom.

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