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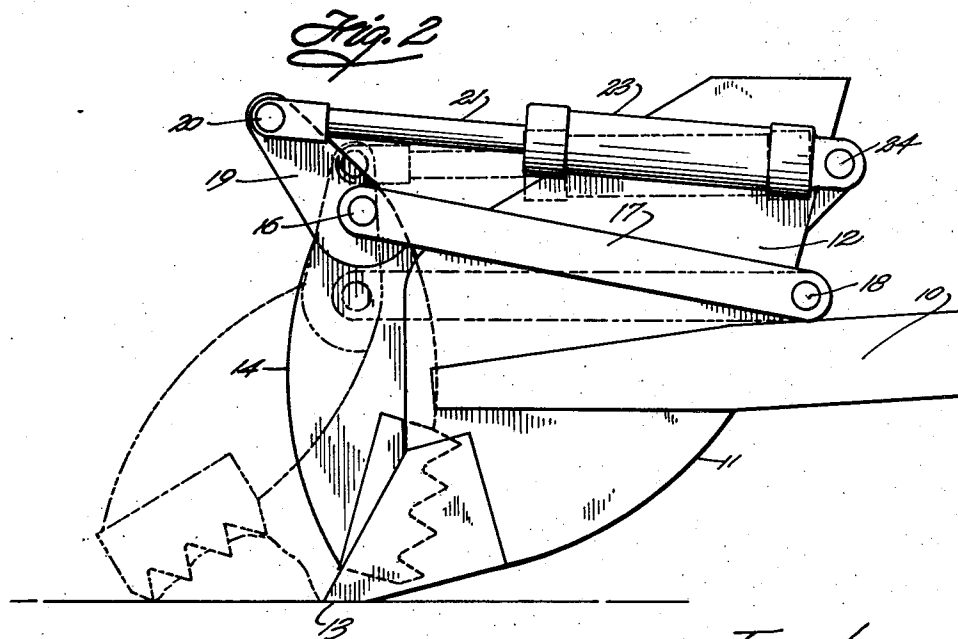
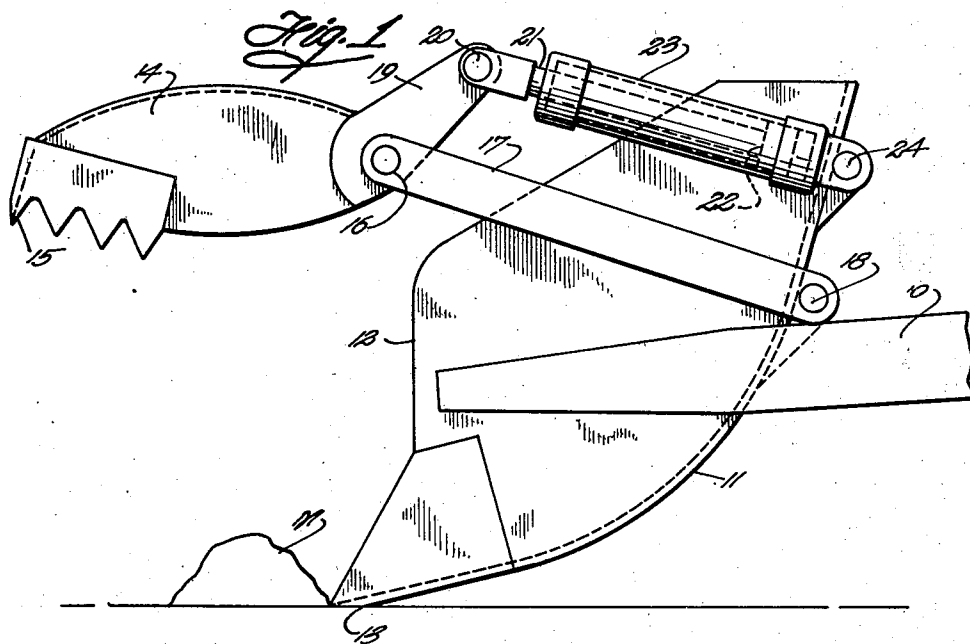
A. LANKOVSKI ET AL

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SCOOP CONSTRUCTION FOR SELF-LOADING TRUCKS

Filed June 25, 1946

2 Sheets-Sheet 1



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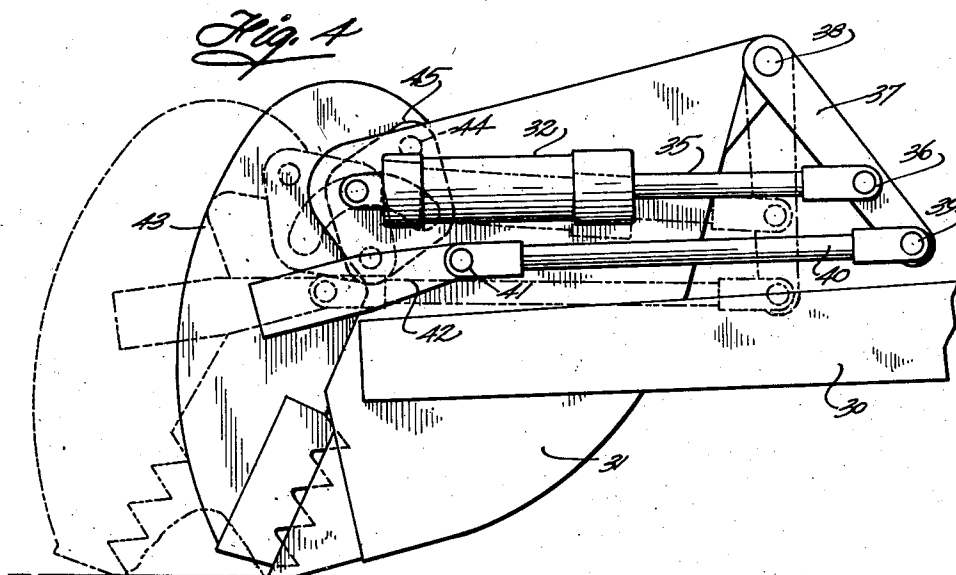
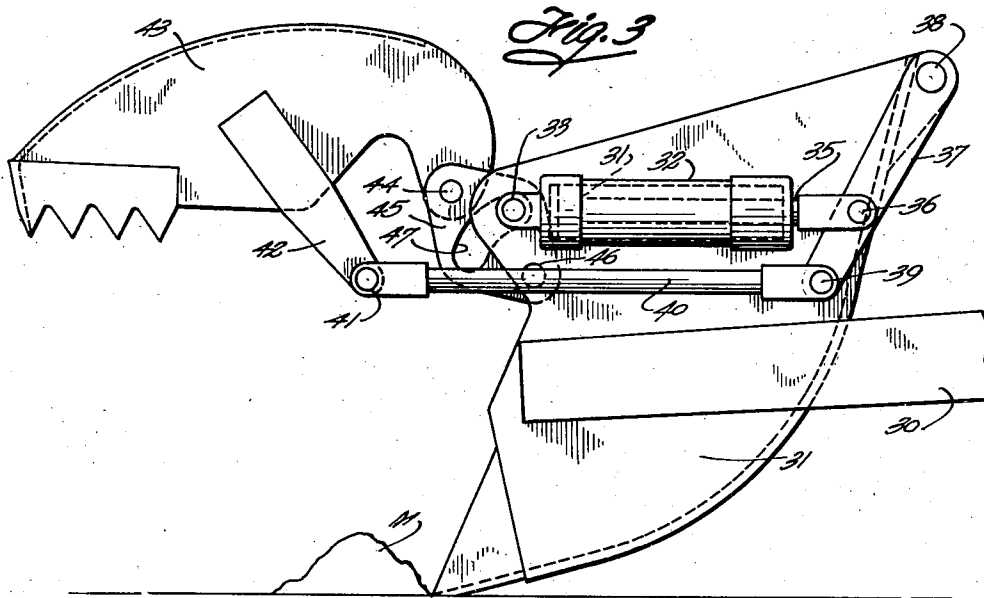
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SCOOP CONSTRUCTION FOR SELF-LOADING TRUCKS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SCOOP CONSTRUCTION FOR SELF-LOADING TRUCKS

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7 Claims. (Cl. 214-145)

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This invention relates to a scoop construction for self-loading trucks and the like.

In our co-pending application Serial No. 637,872, filed December 29, 1945, now Patent No. 2,457,039 granted December 21, 1948, we have disclosed a self-loading truck wherein arms are pivotally mounted on the sides of the truck adapted to assume a position extending forwardly beyond the forward end of the truck and which have a scoop mounted therebetween. This scoop may be driven into a pile of material to be loaded into the truck by moving the truck forwardly while the arms are in this position. When the scoop has been loaded with the material the arms are caused to swing upwardly and rearwardly over the cab of the truck carrying the loaded scoop into a position in which it can dump its load into the truck body. In the application above referred to the scoop is provided with a hydraulically actuated closure pivotally mounted on the scoop and adapted to be hydraulically swung into closed position closing the forward side of the scoop.

When the closure is pivotally mounted directly on stationary pivots on the scoop body it may function adequately where there is a considerable pile of material to be loaded into the truck. If the pile of material is large and relatively heavy the scoop may be driven into the pile by the truck and the closure forcibly closed. The pile does not skid or slide on its supporting surface and the closure on closing may be caused to bite into the pile and to force it into the scoop. However, when the pile of material to be loaded is relatively small and is comparatively light in weight on driving the scoop against the pile it frequently occurs that the pile is merely pushed forwardly by the scoop without entering it and on swinging the closure to closed position the closure passes through an arc above the small pile and cannot function to sweep it into the scoop.

An object of the present invention is to provide an improved closure construction for scoops of this character which is so designed that the closure may descend and engage the ground at a point in advance of the forward end of the scoop and then be caused to slide rearwardly over the ground into scoop closing position so as to sweep such small piles into the scoop, thus enabling the complete removal and loading of any material that is to be loaded.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out

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in the appended claims, reference is made to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a view in side elevation of one form of the improved scoop and its closure construction illustrating the closure in its fully opened position.

Fig. 2 is a view in side elevation of the form of construction illustrated in Fig. 1 illustrating the closure in fully closed position in full lines and in partially closed position wherein it is about to sweep material into the scoop in dotted lines;

Fig. 3 is a view in side elevation of an alternative form of construction embodying the present invention illustrating the closure in fully opened position; and

Fig. 4 is a view in side elevation of the construction illustrated in Fig. 3 showing the closure in partially closed position in dotted lines preparatory to sweeping material into the scoop and illustrating the position assumed by the closure in fully closed position.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, 10 indicates one of a pair of parallel arms that are pivotally mounted on the sides of a self-loading truck of the type disclosed in our co-pending application above referred to. It will be understood, however, that the present invention is in no way restricted to a self-loading truck of the design or embodying the invention of the disclosure made in our co-pending application but may be employed wherever there is a scoop adapted to be loaded with a pile of material positioned on the ground or other supporting surface. Between the arms 10 there is mounted a scoop having a curved bottom 11 and sides 12. The forward edge 13 of the bottom 11 may or may not be toothed and is adapted to engage the ground surface adjacent a pile of material M that is to be loaded. The closure 14 which may be of any preferred or conventional design is adapted to close the forward side of the scoop to retain the material therein. This closure is preferably but not necessarily equipped with teeth 15. It is pivotally mounted as at 16 upon the forward ends of links 17 arranged adjacent the sides 12 of the scoop and these links in turn are pivoted as at 18 near the back of the scoop. The closure 14 is provided at its sides with crank arms 19 that are pivotally connected at their upper ends as at 20 to the piston rods 21 which are receivable with hydraulic cylinders 23. Hydraulic pressure can be supplied to and with-

drawn from each end of each cylinder to actuate the pistons 22 in unison and thus apply opening or closing forces to the crank arms 19. The cylinders 23 are pivotally mounted as at 24 on the back of the scoop and the fluid pressure supplied to the cylinders may be supplied and withdrawn in any suitable manner such as by tubing, not shown.

As the cylinders 23 are disposed above and may assume positions approximately parallel to the links 17 it will be observed that when fluid pressure is effective to urge the pistons 22 toward the right that the closure 14 is swung in a clockwise direction about its pivots 16 and the links 17 swing upwardly about their pivots 18 thus swinging the pivots 16 upwardly while the closure pivots relatively thereto. The closure may thus assume a fully opened position as illustrated in Fig. 1. If there is a very large pile of material M in front of the scoop the scoop may be driven into the pile without causing it to slide on the ground and as the pistons 22 are moved hydraulically from right to left a combination of movements occurs. The links 17 tend to swing downwardly about their pivots 18 and the closure 14 tends to swing downwardly about its pivots 16. This continues until the closure 14 engages a high pile of material at which time further descent of the links 17 automatically discontinues and the effect of the forces exerted by the pistons is largely devoted to turning the closure about the pivots 16 until the closure swings into engagement with the forward side of the scoop. However, if the pile of material M forwardly of the scoop is very small and tends to slide over the ground when positioned by the scoop the movement of the pistons 11 from right to left is largely effective to allow the links 17 to swing downwardly about the pivots 18 for a considerable distance or into a position somewhat as illustrated in dotted lines on Fig. 2 before the closure 14 turns about its pivots 16 to any great extent. The closure consequently will engage the ground surface on the forward side of the scoop and as the pistons 22 continue to move from right to left they are thereafter effective to swing the closure about the pivots 16. As the closure swings about these pivots it scrapes the ground surface sweeping the material M into the scoop and as it moves from the inclined dotted line position shown in Fig. 2 to the substantially vertical position shown in full lines the links 17 swing upwardly to accommodate this movement. In this manner even a small slidable pile of material can be completely cleaned from the ground and swept into the scoop to be lifted thereby and dumped into the body of the truck. When the pistons are forced from left to right as viewed in Fig. 1 this does not involve a reverse scraping action of the closure 14 in opening the scoop. Instead the scoop closure 14 merely starts swinging about the pivots 16 in a clockwise direction during the ascending movements of the links 17. In this manner it will be appreciated that the closure is caused to in effect reach out forwardly of the scoop and to scrape or sweep material into the scoop when the material is in a small pile forwardly of the scoop.

In Figs. 3 and 4 there is disclosed an alternative form of construction wherein the arms are indicated at 30 between which the scoop 31 is rigidly mounted. Hydraulic cylinders 32 are pivotally mounted as at 33 on stationary pivots on the sides of the scoop. Their pistons 34 have their piston rods 35 pivotally connected as at 36 to arms

or links 37 that are pivoted to the scoop as at 38 near the top thereof. The lower ends of these arms or links are pivotally connected as at 39 to links 40 that extend forwardly adjacent the sides of the scoop and which are connected by pivotal connections 41 to crank arms 42 on the scoop closure 43. The scoop closure is pivotally connected as at 44 to slotted links 45 that are pivoted to the sides of the scoop as at 46. The slots 47 in the links accommodate the pivots 33 so that the links 45 may freely swing between limits about their pivots 46 relatively to the scoop 31.

In this form of construction likewise when the pistons 34 are hydraulically forced from right to left as viewed in Fig. 4 the arms 37 are forced to swing forwardly pushing the links 40 forwardly and causing the closure 43 to swing upwardly and outwardly about its movable pivots 44 on the movable links 45 which swing about their pivots 46. As the pistons 34 move from left to right as viewed in Fig. 3 the arms 37 are swung rearwardly causing the links 40 to allow the closure 43 to descend swinging about the pivots 44 as a center. Unless the movement of the closure 43 is restrained by engaging with a large pile of material it will continue such swinging movement until it occupies a position illustrated in dotted lines on Fig. 4 engaging the ground surface a considerable distance forwardly of the forward end of the scoop and forwardly of the small pile of material M. Continued movement of the pistons 34 from left to right draws the closure rearwardly from the dotted line position shown in Fig. 4 to the full line position shown therein and during such movement the links 45 swing about their pivots 46 to accommodate such movement of the closure. During such movement the closure sweeps or scrapes the material M into the scoop.

From the above described construction it will be appreciated that an improved scoop closure construction is provided which is so designed as to cause the closure to reach out and descend into engagement with the ground at a point well in advance of the scoop and that as it completes its closing movement it effectively sweeps or scrapes material to be loaded into the scoop finally reaching a scoop closing position. In this manner even small piles of material and piles which would be disposed to slide over the ground surface in advance of the scoop can be effectively loaded therein.

Various changes may be made in the details of construction without departing from the spirit and scope of the invention as defined by the appended claims.

We claim:

1. In combination with a scoop, a closure for the forward end of the scoop, means providing a pivot for the closure which pivot is movable relatively to the scoop, and means for swinging the closure relatively to the pivot to open and close the forward end of the scoop whereby the closure may descend into engagement with a ground surface on which the scoop is positioned and cause to engage the ground in advance of the forward end of the scoop and then be drawn into scoop closing position and in so doing to scrape material on the ground in advance of the scoop into the scoop.

2. In combination with a scoop, links pivotally mounted upon the scoop, a closure for the forward end of the scoop pivotally mounted upon said links, and means for urging the closure toward and away from the entrance to the scoop pivotally mounted upon the scoop.

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3. In combination with a scoop, a closure for the scoop, means providing movable pivots on the scoop, said closure being mounted for swinging movements relative to said pivots, and means for swinging the scoop relative to said pivots and causing the pivots to move relatively to the scoop.

4. In combination with a scoop, links pivotally connected to the scoop, a closure for the scoop pivotally connected to said links, and means for swinging the closure relative to said links whereby the closure may be lowered to engage the ground in advance of the scoop and drawn into scoop closing position while sweeping over the ground in advance of the scoop.

5. In combination with a scoop, a pair of links pivotally mounted upon the scoop, a closure for the forward end of the scoop pivotally mounted upon said links, said closure having crank arms secured thereto and extending upwardly from said links and for hydraulically operable means pivotally mounted upon the scoop and pivotally connected to said crank arms for swinging the closure relatively to said links.

6. In combination with a scoop, a pair of arms pivotally mounted upon the scoop, a pair of links pivotally mounted upon the scoop, a closure pivotally mounted upon said links adapted to close the forward end of the scoop, crank arms secured to the closure, links pivotally connected to said arms and crank arms, and hydraulically operable means pivotally connected to the scoop and to

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said arms for forcibly swinging the arms and thus causing the closure to swing relatively to said links.

7. In combination with a scoop, a pair of links pivotally mounted upon the scoop, a closure for the forward end of the scoop pivotally mounted upon said links, and hydraulic means pivotally mounted upon the scoop and pivotally connected to the closure and so arranged that when the closure is opened from the scoop the links will be caused to swing upwardly with relation to the scoop and when the closure is allowed to swing toward the scoop the links will be allowed to descend to deposit the closure on the surface of the ground in advance of the scoop and then be drawn into scoop-closing position and in so doing to scrap material on the ground in advance of the scoop into the scoop.

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