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CONCRETE MIXER WITH LIFTING AND TILTING MECHANISM

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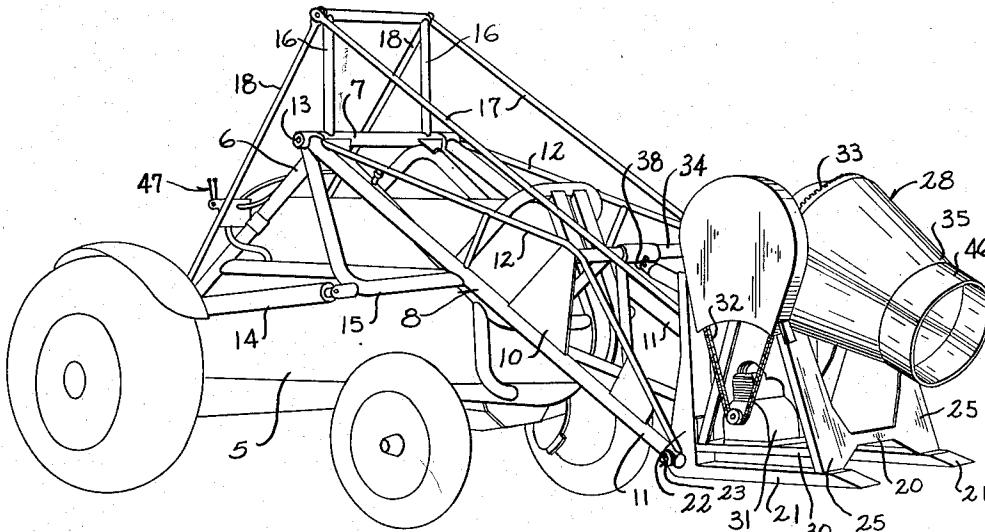


Fig. 1

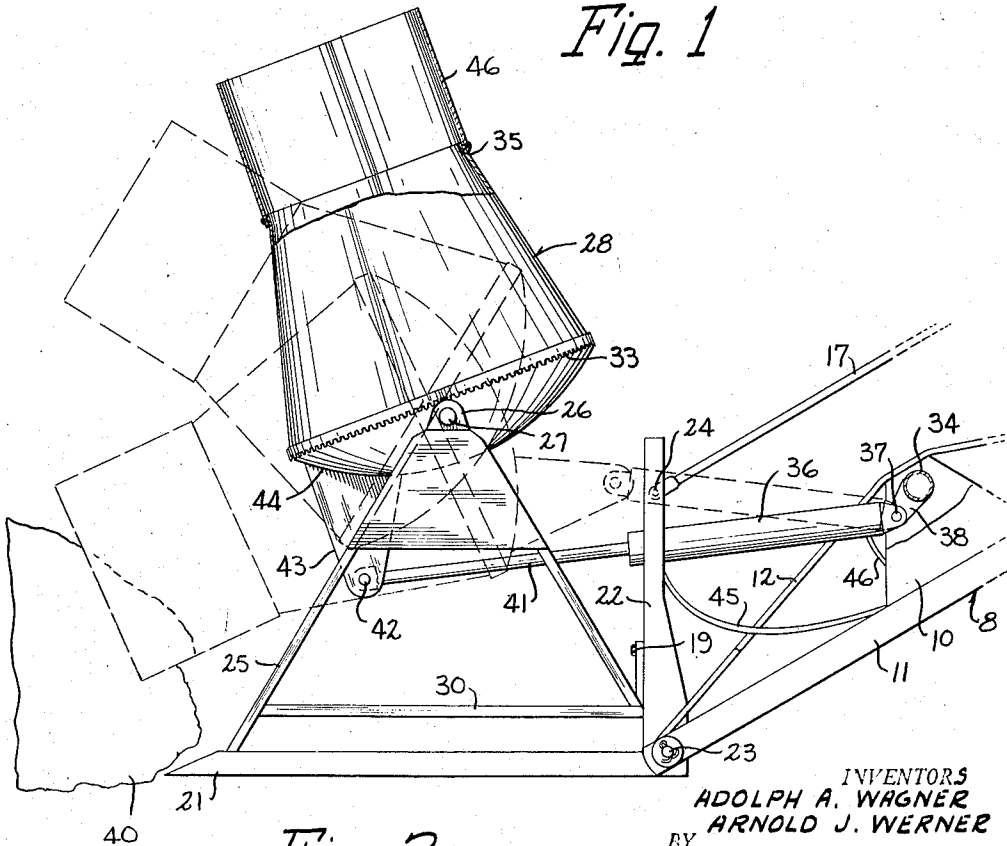


Fig. 2

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CONCRETE MIXER WITH LIFTING AND
TILTING MECHANISM

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9 Claims. (Cl. 259-160)

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This invention relates to a concrete mixer attachment for tractors, and particularly to those tractors equipped with pivotal dipper sticks of the type described in our co-pending application Serial No. 148,961, filed March 10, 1950, and entitled "Hydraulic Front End Power Lift Attachment for Tractors."

It is a principal object of the invention to provide a concrete mixing attachment which is interchangeable with other apparatus of the type disclosed in the aforementioned patent application, and which may be interconnected with the hydraulic motor of the dipper stick in such a way that the concrete mixer may be pivoted by the motor between mixing and mix discharge position.

Another object of the invention is to provide the mixer attachment with an elongated spout which is useful for loading the mixer and delivering the mix. After the aggregate is properly mixed, the hydraulic motor is used to freely pivot the concrete mixer to a mix depositing position in which the mixed load will be delivered to a selected area well past the platform on which the mixer is mounted. The spout also serves as a loading chute to permit the tractor to drive the spout into a mound of unmixed aggregate to force the aggregate into the mixer prior to mixing. Accordingly, all mixer loading and discharging operations are powered by the tractor at the control of the tractor operator and without the intervention of others.

Other objects and advantages of the invention will be more apparent from an examination of the following disclosure.

In the drawings:

Fig. 1 is a perspective view of apparatus embodying the invention.

Fig. 2 is a side elevational view on an enlarged scale of the mixer attachment and portions of the associated apparatus shown in Fig. 1.

As more fully described in our aforesaid co-pending application, a tractor 5 may be provided with a main or base frame 6 which has a transverse bearing tube 7 upon which a dipper stick, indicated generally as a tubular fabricated framework at 8, is pivotally mounted. The dipper stick comprises spaced cantilever arms 11 each provided with a suitable tension rod 12 and upstanding central strut 10. The rear ends of the levers 11 are pivoted on the bearing tube 7 by means of a transverse rock shaft 13 which mutually engages the bearing tube 7 of the main frame 6 and the socketed ends of the levers 11. The dipper stick is powered in its swingable

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movement on rock shaft 13 by dual hydraulic motors 14, which are pivotally connected with the respective underslung dipper stick elbows 15 at each side of the tractor.

The base frame 6 is further provided with an upstanding mast 16 mounted vertically on the bearing tube 7. Parallelogram arms 17 are pivotally mounted to the mast and extend forwardly to a connection with the platform standards 22 as hereinafter described. The mast is braced in upstanding position by the rearwardly extending braces 18 which have terminal connections with the base frame.

To the front, elevatable end of the dipper stick arms 11 is pivoted a platform comprising, in the preferred embodiment, forwardly extending forks 21 and upright rear members or standards 22. The pivotal connection of the platform to the dipper stick comprises removable pins 23 which engage the platform near the junction of the fork members 21 and upstanding members 22. The parallelogram arms or rods 17 are pivotally connected to the standards at 24, near their respective upper ends, and extend substantially parallel to the dipper stick arms 11. Accordingly, the resultant parallelogram action will assure that the platform fork members 21 remain horizontal in all positions of dipper stick and platform elevation.

The concrete mixer attachment comprises spaced A-frame members 25 which are securely mounted on the platform forks upon their rear legs by means of bolts 19 which engage the standards 22. The front legs of the A-frames 25 rest on the spaced forks 21, and are interconnected by the tie bar 20 which laterally braces the A-frames. The respective A-frames are provided at their apices with bearing brackets 26 in which are journaled axially aligned stub shafts 27 which rockably support a rotary concrete mixer hopper, indicated generally as 28.

The concrete mixer 28 rotates on an axis transverse to its rockable axis on stub shafts 27 and is driven by engine 31. Engine 31 is mounted on the cross members 30 of the A-frames and is connected through chain drive 32 to the annular or ring gear 33 on the rotary part of the mixer. Engine 31 rotates the mixer on an axis transversely related to the rockable axis upon which the mixer pivots between extreme positions, such as a mixing position, shown in Fig. 2, and a mix discharge position, shown in Fig. 1.

As more fully pointed out in the aforesaid co-pending application, dipper stick 8 is provided with a hydraulic motor 35. The hydraulic mo-

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tor 35 is pivotally mounted on pin 37 to a bracket 38 on cross connection 34 which spans the dipper stick arms and is supported upon the struts 10. Hydraulic motor 36 is provided with an extensible operating member or piston rod 41 which extends to a pivotal connection through pin 42 with a crank arm 43 rigidly connected by means of welding or the like at 44 to the non-rotary part of the concrete mixer 28.

Hydraulic motor 36 is powered from the hydraulic system of the tractor through the hydraulic fluid lines 45 and 46 which extend along the dipper stick to a valve control indicated generally as 47. Valve 47 is disposed within the reach of the tractor operator and provides a remote control by means of which the concrete mixer may be tilted on its horizontal axis 27 between loading, mixing, transporting and discharge position. The range of concrete mixer pivotal movement is illustrated by the full and dotted line positions of the mixer shown in Fig. 2. During pivotal movement of the mixer the hydraulic motor 36 will also change position on its respective pivots 37 and 42 to accommodate mixer movement, as best shown in the full and dotted lines in Fig. 2.

To provide for the most effective use of the mixer, its throat 35 is elongated by a tubular pick up and delivery spout 46 so that in mixer loading and discharge positions it extends past the ends of the forks 21. By reason of this elongation the mixer can be tilted to lowermost position to discharge its mixed contents free and clear of the outer ends of the forks 21 and to properly deposit the mix at the local area where it is needed. The provision of the spout 46 further permits the tractor to drive the spout into a mound of unmixed aggregate, indicated diagrammatically as 40, to load the mixer. In this manner, the loading and unloading of the mixer may be powered solely by the tractor as controlled by the tractor operator, no other personnel being needed to load the mixer or to deposit the mixed concrete. The tractor may move from a loading station to the area where the concrete is needed, mixing taking place en route.

From the foregoing description, taken in connection with the accompanying drawings, it is seen that a concrete mixer attachment has been provided which may be simply and interchangeably mounted upon the dipper stick equipment of a tractor. The hydraulic motor on the dipper stick may be connected to the mixer whereby the mixer may be power tilted through loading, mixing, and depositing positions solely at the control of the tractor operator. While the mixer hopper may be loaded manually in lowered position, and then the entire mixer bodily elevated by the operator to discharge the mix wherever desired, the novel mounting of the entire mixer on the dipper stick platform, and the provisions for the loading spout makes it possible for the operator to load the hopper by using the forward motion of the tractor to drive the spout into a mound of dry aggregate.

While the mixer attachment has been described with particular reference to a concrete mixer, it is evident that the use of the mixer is not thus limited, since it may also be adapted to other mixing purposes.

We claim:

1. In a device of the character described, and including a tractor provided with a dipper stick pivotally mounted on the tractor, said dipper stick being provided with a hydraulic motor at

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its front end and means under control of the tractor operator for the control of said motor, a mixer attachment comprising a mounting frame having connections for attaching the frame to the front end of the dipper stick, a mixer, said frame being provided with a horizontal pivot upon which the mixer is mounted to pivot between mixing and discharge positions, said mixer further comprising a connection to which the hydraulic motor may be attached whereby pivotal movement of the mixer on its pivot between mixing and discharge positions, at the control of said operator, is powered by said motor, said mixer being movable on said dipper stick to a plurality of elevated positions within the range of dipper stick pivotal movement.

2. The device of claim 1 wherein the attachment further comprises a power source for the mixer, said mixer being mounted on the horizontal pivot to rotate on an axis transverse to the horizontal axis, said power source being supported by the mounting frame and having driving connections to the mixer.

3. The device of claim 1 wherein the connection from the hydraulic motor to the mixer comprises a crank on the mixer, said motor having pivotal connections both to the crank and the dipper stick to articulate freely on both said connections, said motor constituting a link of adjustable length between the mixer and the dipper stick.

4. The device of claim 1 wherein the mixer is provided with an elongated throat extending past the mounting frame when the rotary axis of the mixer is horizontal whereby the mixer may load and deposit mix with respect to positions beyond the end of the frame.

5. The device of claim 4 wherein the throat comprises an annular spout separately applicable to the mixer throat.

6. In a device of the character described, the combination with a tractor dipper stick having a pivotal mounting upon which the dipper stick is swingable respecting the tractor, said tractor being further provided with an upstanding mast and with parallelogram arms pivotally connected to the mast, said dipper stick being provided at its free end with a platform having an upstanding portion pivotally connected both to the dipper stick and to the parallelogram arms whereby swinging movement of the dipper stick upon its pivotal mounting will cause the platform to remain level in all positions of dipper stick movement, and a mixer pivotally mounted on said platform, said dipper stick being provided with a hydraulic motor, means under control of the tractor operator for operation of said motor, and a connection from the motor to the said mixer, said motor and connection constituting an adjustable link between the dipper stick and the mixer whereby the position of the mixer on its pivot is determined by the adjustment of said link and the mixer may be pivoted under the control of the tractor operator between a mixing position and a discharge position, said mixer being movable with said platform to all pivotal positions of the dipper stick.

7. The device of claim 6 wherein the said platform comprises laterally spaced forks, said mixer being further provided with correspondingly laterally spaced A-frame mountings respectively connected to the platform, and a tie bar between said A-frames to laterally brace said frames.

8. An attachment for a powered vehicle having an elevatable dipper stick provided with a

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levelized platform support, said attachment comprising a tiltable mixer, means for connecting said mixer to said support and a motor having extensible parts constituting an adjustable link between the dipper stick and the mixer, and means for actuating said motor whereby to tilt the mixer to and from a mixing position and a lowered discharge position.

9. The mixer and motor connection of claim 8 wherein the mixer has a spout extending beyond the platform whereby in a lower tilted position of the mixer a forward movement of the vehicle may cause the spout to scoop mix aggregate into the mixer.

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