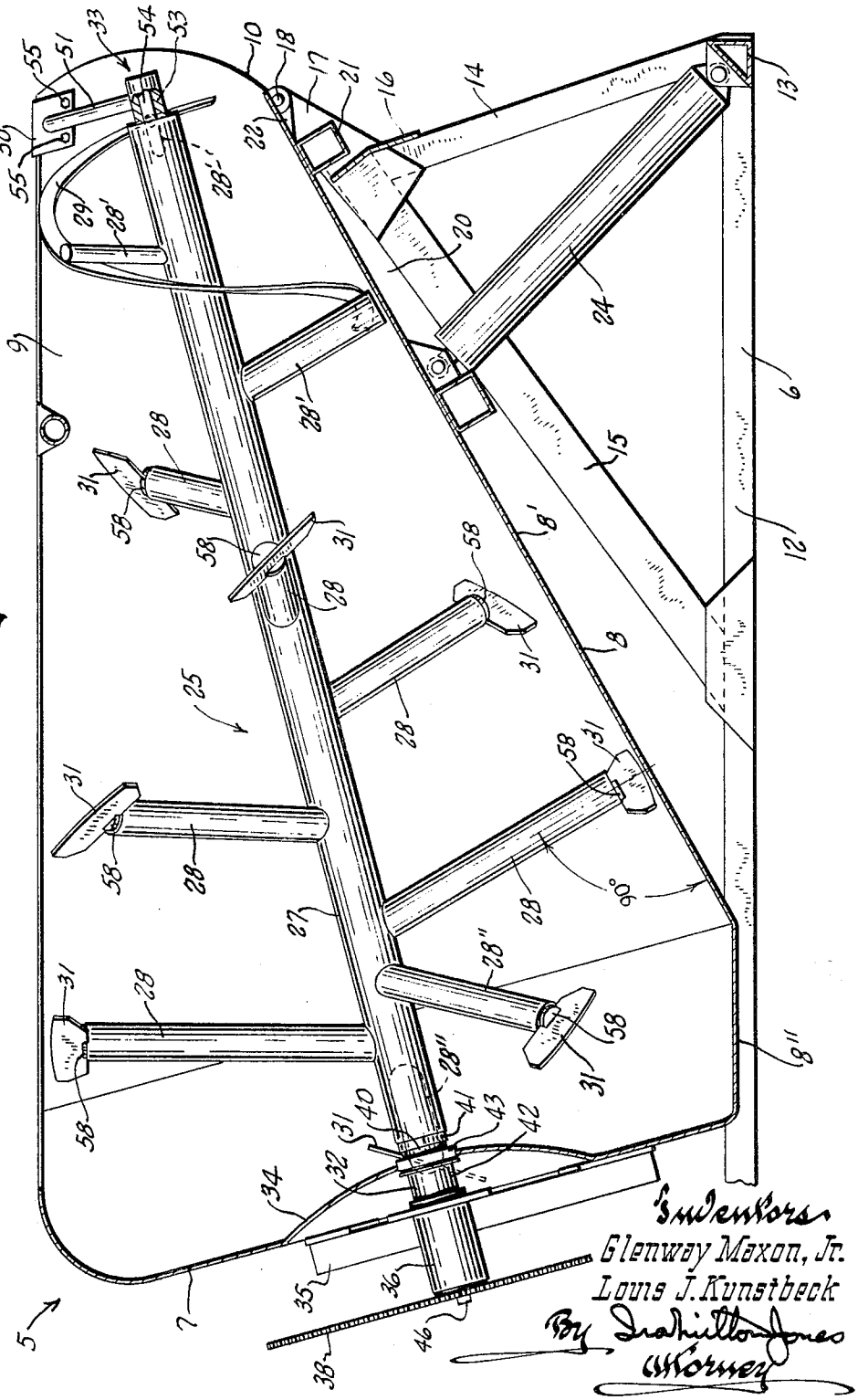
Oct. 25, 1966 G. MAXON, JR., ETAL 3,281,126

DUMP BODY FOR AGITATING AND NON-AGITATING TRANSPORT

Filed June 14, 1965 4 Sheets-Sheet 1

Fig. 1.



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DUMP BODY FOR AGITATING AND NON-AGITATING TRANSPORT

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Fig. 2.

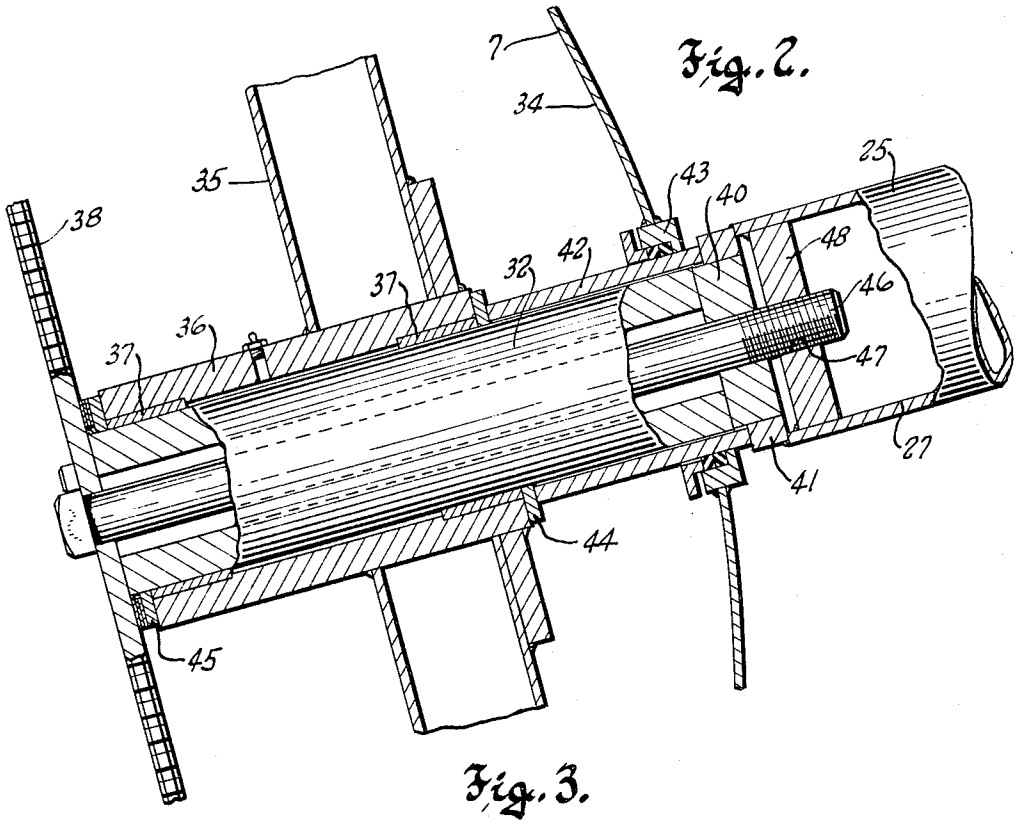
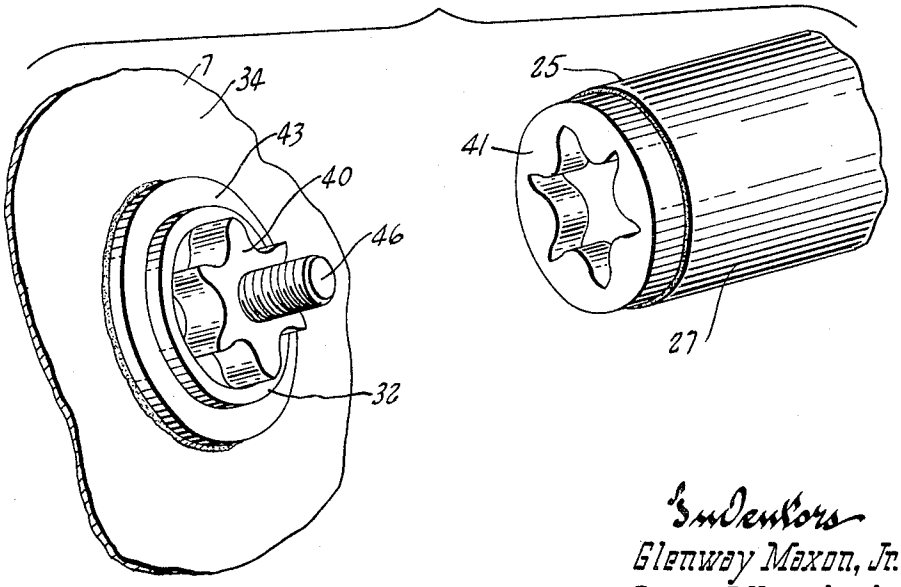


Fig. 3.



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DUMP BODY FOR AGITATING AND NON-AGITATING TRANSPORT

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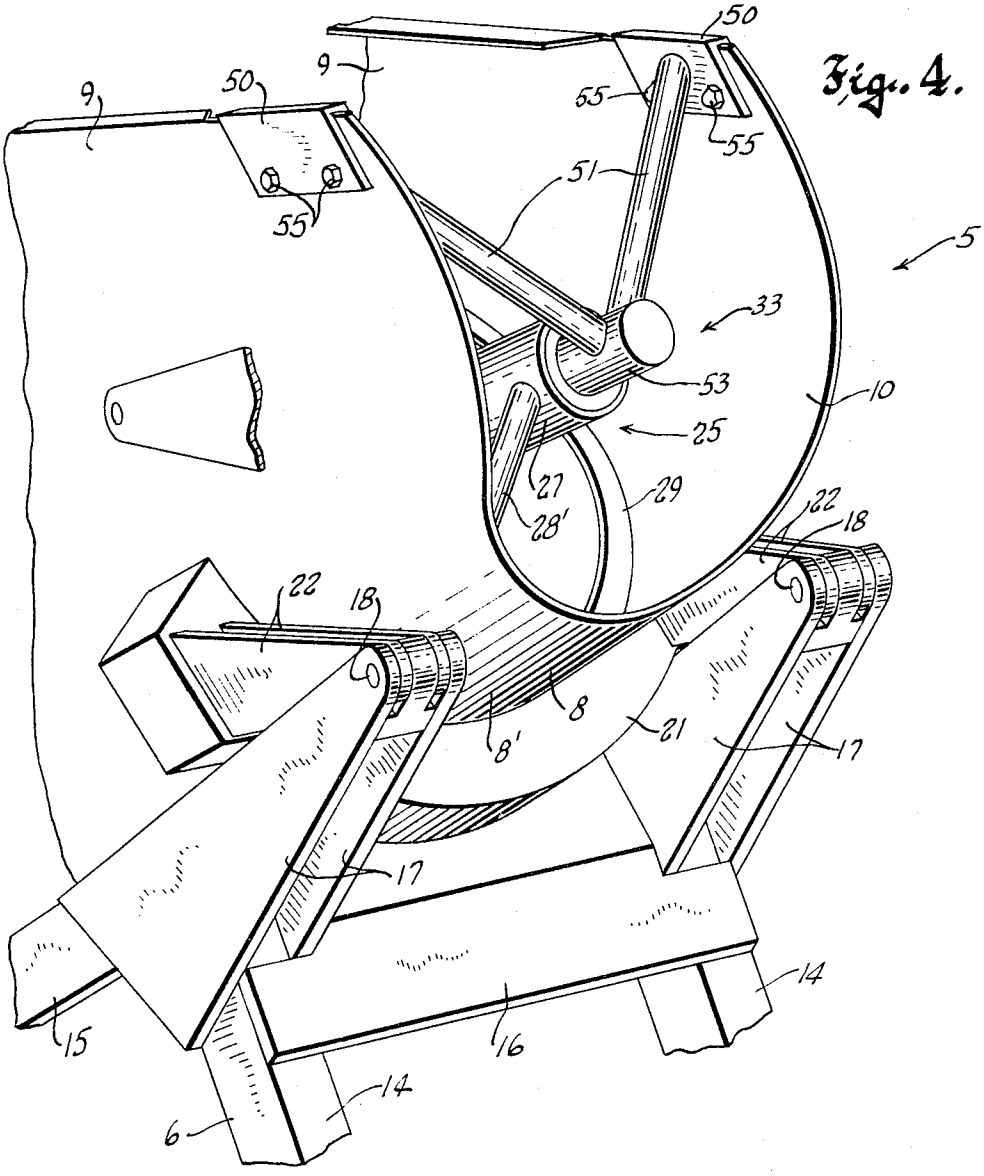
Fig. 4.



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DUMP BODY FOR AGITATING AND NON-AGITATING TRANSPORT

Filed June 14, 1965 4 Sheets-Sheet 4

Fig. 5.

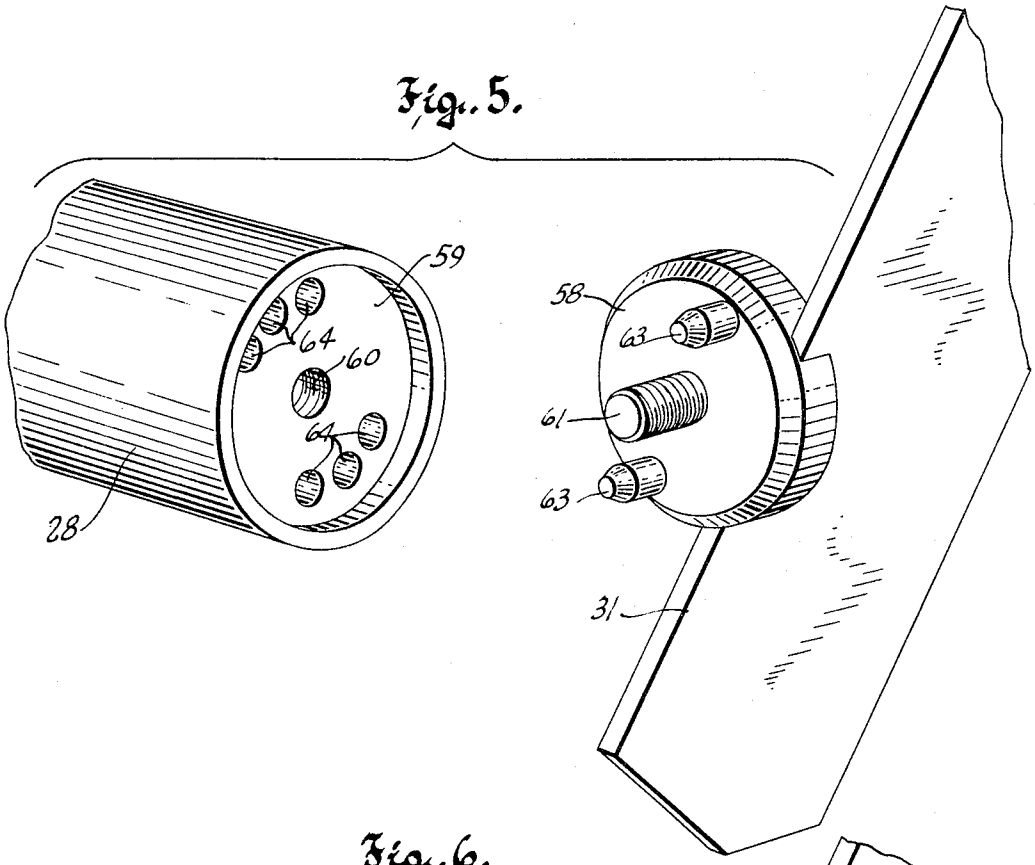
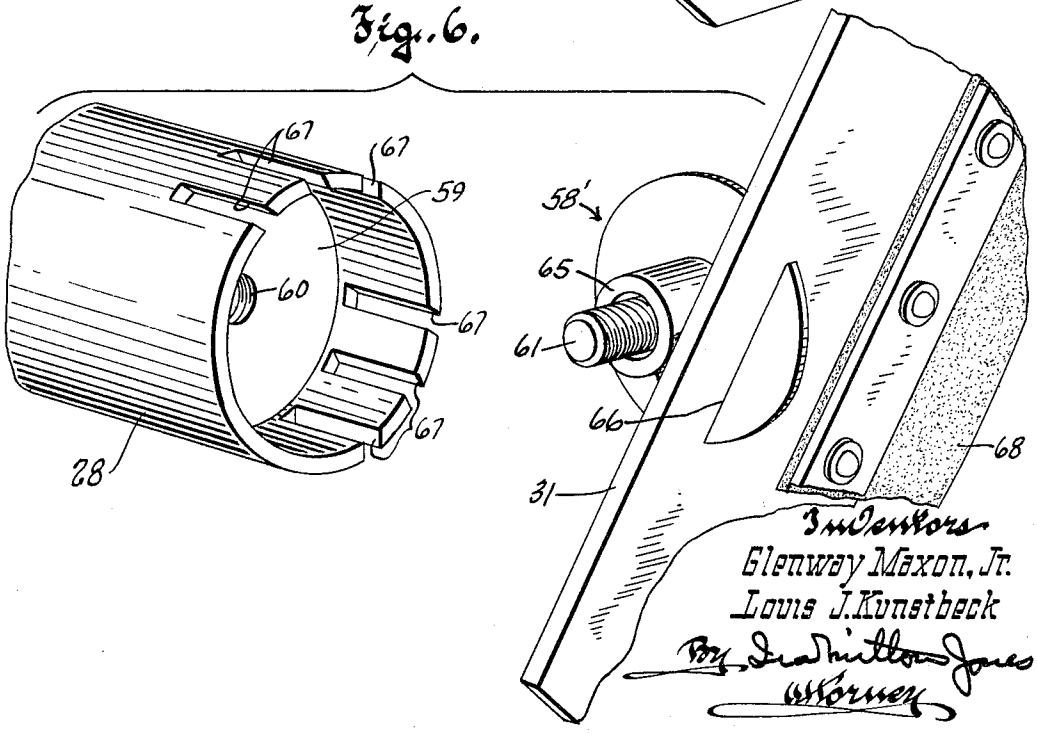


Fig. 6.



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United States Patent Office

3,281,126

Patented Oct. 25, 1966

3,281,126

DUMP BODY FOR AGITATING AND NON-AGITATING TRANSPORT

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Filed June 14, 1965, Ser. No. 463,722
12 Claims. (Cl. 259—178)

This invention relates to dump bodies for the transportation of freshly mixed concrete of different consistencies and of other pourable materials; and the invention refers more particularly to a dump body which is adapted both for the transport of concrete which must be agitated while in transit and for carrying materials which do not require agitation.

Patent No. 3,198,495 issued August 3, 1965, on the copending application of Glenway Maxon, Jr., Serial No. 168,109, filed January 23, 1962, discloses a dump body of the general type to which this invention relates and which was intended for the transportation of freshly mixed concrete that required agitation while in transit. The dump body per se of that application had a generally upright front wall and a substantially frustoconical bottom wall that merged into rearwardly converging upright side walls. The bottom and side walls terminated in an elevated discharge outlet at the rear of the body, and the body tilted to and from its discharging position about a pivot axis which was located just below the outlet. Extending lengthwise through the body was a rotatable agitator comprising a tubular shaft or stem with tubular arms projecting radially outwardly therefrom at axially spaced intervals. Each arm terminated in a paddle-like blade that was disposed obliquely to the plane of rotation of the arm.

The dump body of that copending application was particularly intended for the transportation of freshly mixed concrete which required agitation, but the agitator could not be satisfactorily used with all types of concrete. Thus, on one job the body might be used for hauling relatively wet high slump concrete, while on another job it might be used for transporting very viscous low slump concrete. If the blades on the agitator had been set at a relatively steep pitch (i.e., at a substantial inclination to the planes of their orbits), the agitator would have been satisfactory for use with high slump concrete but an excessive amount of power would have been required to drive the blades through low slump concrete. The blades were therefore set at a relatively low pitch so that low slump concrete could be agitated with reasonable power consumption, but as a result the agitator could not effect satisfactorily complete agitation of a load of high slump concrete. This compromise produced only a partial solution to the problem of providing a versatile dump body because there are situations in which the presence of an agitator in a dump body is undesirable, as for example when the body is being used for hauling sand, gravel or the like, or for short-haul transportation of freshly mixed concrete on jobs where agitation in transit is not specified. Under such circumstances the agitator represents unnecessary weight, displaces useful load, and during loading and unloading receives wear and tear which substantially shortens its useful life.

With these considerations in mind, it is a general object of the present invention to provide a very versatile dump body of the character described, completely satisfactory for the agitating transport of either high or low slump concrete and for the non-agitating transport of concrete and other materials.

Another specific object of this invention is to provide a readily removable agitator for a dump body of the character described, which agitator is co-axially supported at its front end by a drive shaft journaled in the front wall of the body and is carried at its rear end by a bearing member that is removably supported on the side walls of the body.

Still another specific object of this invention is to provide an agitator of the type comprising a stem or shaft having substantially radially outwardly projecting arms at intervals along its length, each having a paddle-like blade at its outer end, wherein each of the blades is readily adjustable to different pitch angles to accommodate different types of concrete mixes, each blade being secured to its arm by means of a single bolt that can be loosened to provide for adjustment of the blade angle and tightened to secure the blade in any one of several different positions of angular adjustment.

Another object of the present invention has to do with the angles at which the radially projecting arms of the agitator are inclined to its stem or shaft. In the agitator of the aforesaid copending application the arms were disposed in planes normal to the axis of the agitator stem, and since the axis of the stem coincided with the axis of the frustoconical bottom wall of the body, each arm was in effect inclined forwardly with respect to the bottom wall of the body. Hence, if an arm was forced rearwardly, as by the wedging action of a large rock encountered by its blade, the arm tended to flex in a direction which swung its blade closer to the frustoconical bottom wall, with the result that the blade—or material confined between the blade and the body wall—scraped and gouged the bottom wall of the body.

With this in mind it is a further object of this invention to provide an agitator comprising a shaft which extends along the axis of the frustoconical bottom wall of a dump body of the character described and a plurality of arms which extend radially from said shaft at axially spaced intervals along its length, wherein any deflection of an arm in either direction parallel to the shaft axis will cause the arm to swing away from the body bottom wall, to thus prevent any occasion for scraping or gouging of the body by the blades on the ends of the arms or by material confined between the blades and the body wall.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiments of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate several complete examples of physical embodiments of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is a view in longitudinal section of a dump body having an agitator embodying the principles of this invention;

FIGURE 2 is a fragmentary longitudinal sectional view through the dump body, on a larger scale, showing the means for rotatably driving the agitator and removably supporting the front end portion of the same;

FIGURE 3 is a disassembled perspective view of the connection between the agitator and the drive shaft;

FIGURE 4 is a rear perspective view of the dump body, showing the bearing support for the rear end portion of the agitator;

FIGURE 5 is a separated perspective view of the outer end portion of an agitator arm and its blade, showing the provision for adjustment of the blade to different angular positions; and

FIGURE 6 is a view similar to FIGURE 5 but showing a modified embodiment of the invention.

Referring now to the accompanying drawings, the numeral 5 designates generally a dump body supported upon a frame 6 which is in turn adapted to be mounted on the chassis (not shown) of a truck or other vehicle.

The body has a generally upright wall 7 at its front end and has a frustoconical bottom wall 8 which slopes and tapers generally upwardly and rearwardly from the front wall 7 and merges into upright rearwardly convergent side walls 9. In the particular body construction shown in the drawings the main portion 8' of the bottom wall tapers rearwardly, but there is a short frustoconical portion 8'' of the bottom wall at the front of the body which tapers forwardly and which is coaxial with the rear wall portion 8'. The upper edges of the front wall 7 and side walls 9 lie in a common horizontal plane when the body is in its transit position, and the front wall is inclined slightly forwardly and upwardly so as to be normal to the rearwardly and upwardly inclined axis of the frustoconical bottom wall. The rear edges of the side walls and of the bottom wall define a discharge opening 10 which can be closed by a suitable gate (not shown) that is adapted to be edgewise raised to a dumping position and lowered to a transit position.

The frame 6 upon which the body 5 is supported comprises a pair of fore-and-aft extending horizontal sills 12 connected by cross-members 13, an upright 14 on the rear end of each sill, and a diagonal brace member 15 connected between the medial portion of each sill and the top of its upright. Transverse bracing, preferably in the form of a plate 16, connects the two uprights 14. Thus the frame can be regarded as comprising a pair of connected A-frames, located at opposite sides of the body near the rear thereof, and each consisting of the rear portion of a sill 12 together with the upright 14 and the diagonal 15 thereon.

To the apex of each A-frame there is fixed a pair of flatwise parallel rearwardly and upwardly projecting arms 17 which carry a pivot support defined by a pin 18. The two pins, which are located somewhat outboard of the sides of the body, are disposed on a common axis which passes directly adjacent to the underside of the body and to the bottom edge of the discharge opening 10. Mounted on the upwardly and rearwardly sloping bottom wall of the body to reinforce the same is a rigid keel structure which comprises a pair of elongated beam-like members 20 that extend forwardly along the bottom wall, near its junction with the side walls, from a yoke 21 that transversely embraces the rear portion of the bottom wall near the discharge opening 10. The yoke 21, however, is spaced a distance forwardly of the lower edge of the discharge opening and constitutes the rearmost portion of the keel.

At its opposite ends the yoke 21 has bearing members 22 fixed thereto which project rearwardly to be embraced by the pairs of arms 17 on the A-frames and to receive the pivot pins in suitable apertures in their rear ends. Consequently the bearing members 22 and the pivot pins 18 cooperate to provide substantially widely spaced outboard bearings by which the body is supported for tilting motion about a transverse axis directly adjacent to its rear extremity and to its under side.

The body is raised to its discharge position and controlledly lowerd to its transit position by means of a pair of hydraulic lift cylinders 24 which are connected between the beam-like members 20 and the rear ends of the sills 12.

The above described structure of the body and its frame is quite similar to that disclosed in my aforesaid copending application, to which reference may be made for further details. The dump body of the present invention has a rotatable agitator 25 therein which is generally similar to that disclosed in said copending application but which is readily removable to adapt the body for non-agitating

transport of various materials and which, furthermore, is adjustable to accommodate different types of concrete.

The agitator 25 comprises, in general, an elongated stem or shaft 27 which extends through the body on the axis of its frustoconical bottom wall, and a plurality of arms 28 which project substantially radially from the stem 27 at axially spaced intervals therealong. Adjacent arms 28 along the shaft 27 are disposed at obtuse angles to one another such that as the agitator rotates not more than two of the arms will be entering the concrete in the body at any one instant, to thus maintain a substantially constant torsional load on a coaxial drive shaft 32 (see FIGURE 2) at the front of the body by which the agitator is driven.

The three rearmost arms on the agitator, designated by 28', cooperate to support a continuous spiral shaped blade 29, which is permanently affixed to said arms and which serves to assist discharge of the contents of the body through the discharge outlet. The remaining arms have at their extremities paddle-like blades 31, each of which projects laterally a substantial distance to opposite sides of its arm and has its opposite flat faces substantially parallel to the axis of its arm.

It is a feature of the agitator of the present invention that (with exceptions described hereafter) each of its arms 28 is inclined rearwardly with respect to the agitator shaft 27, so that at all points in the lower portion of its orbit the arm is disposed normal to the frustoconical bottom wall surface. This relationship is best seen in FIGURE 1 with respect to the fourth arm from the front of the shaft, inasmuch as the agitator is shown in its rotational position at which said fourth arm extends downwardly and is disposed in a vertical plane through the shaft axis. The exceptions are the arms 28'', which in this case are the first and third from the front of the shaft 27, the blades of which sweep the short front portion 8'' of the bottom wall; and those arms are forwardly inclined relative to the shaft so as to be disposed normal to said front frustoconical wall portion at all points around the lower portion of their orbits. Hence, without exception, each arm is disposed at such an angle to the agitator shaft 27 that the arm is normal to the surface of the frustoconical bottom wall portion that it sweeps.

It will be apparent that with the arms inclined to the agitator stem as described, any deflection of an arm either rearwardly or forwardly will cause its blade 31 to have a component of motion that carries it away from its adjacent frustoconical wall surface, thus substantially eliminating chances for the body to be gouged or scraped by deflected blades or by rocks or the like confined between a blade and the body bottom wall.

To provide for ready removal of the agitator of the present invention, it has at its front end a telescoping splined connection with the drive shaft 32 and has its rear end journaled in the bearing structure 33 that is readily removably carried by the body side walls 9 near their rear ends.

More specifically, the front wall of the body has a dome-like or bowl shaped central portion 34 that is forwardly concave and has its axis coincident with the axes of the frustoconical bottom walls. The front wall is reinforced by an X-shaped brace 35 on its forward surface that bridges the concavity in the bowl-shaped central portion. At the intersection of its arms the reinforcement 35 carries a tubular front bearing retainer 36 which has its axis aligned with that of the conical bottom wall 8 of the body and which is permanently affixed to the reinforcing structure 35, as by welding. The drive shaft 32 is rotatably and axially slideably received in tubular bearings 37 (see FIGURE 2) that are fitted into the end portions of the front bearing retainer 36, and the drive shaft projects a short distance forwardly from the bearing retainer and a substantial distance behind it to extend through the dome-like central portion of the front wall. Coaxially secured to the front end of the drive

shaft, as by welding, is a sprocket **38** that is connectable through a suitable chain drive (not shown) or the like with a power source such as a hydraulic motor (not shown) to provide for rotatably driving the agitator. To the rear end of the drive shaft there is affixed a star-shaped male spline element **40** that is telescopingly receivable in a female spline element **41** secured on the front end of the agitator shaft, the female spline element, of course having a star-shaped internal configuration that mates with the male spline element.

Between the female spline element **41** and the bearing retainer **36** there extends a tubular collar **42** which surrounds the rear portion of the drive shaft and which is in turn surrounded by a sealing ring or gland **43** that is coaxially secured to the dome-shaped central portion **34** of the front wall. A washer-like thrust bearing **44** is interposed between the collar **42** and the bearing retainer **36**, and another similar bearing **45** is interposed between the sprocket **38** and the front end of the bearing retainer **36**. The agitator stem **27** and drive shaft **32** are held against axial separation by means of a single large bolt **46** which extends through coaxial holes in the sprocket **38** and the male spline element **40** and which has its inner end received in a threaded coaxial hole **47** in a disc-like plug **48** that is welded into the front end of the agitator stem, axially inwardly of the female spline element **41**.

It will be apparent that when the bolt **46** is tightened, the drive shaft **32** and agitator are not only held against axial separation but are also confined against axial displacement relative to the body by the cooperation of the collar **42** and sprocket **38** with the bearing retainer **36**. It will also be evident that when the bolt **46** is removed, the drive shaft can be withdrawn axially forwardly out of the bearing retainer **36** and out of telescoping splined engagement with the agitator stem **27** to permit removal of the agitator from the body. With the agitator and drive shaft removed from the body, the collar **42** can be withdrawn axially rearwardly out of the gland **43** and a suitable plug (not shown) can of course be inserted into the gland to seal the front wall of the body. If it is desired to leave the drive shaft in place, the plug could obviously be formed as a suitable cap-like member that could be held in place over the rear end of the collar **42** by the bolt **46**; but in most cases removal of the drive shaft will be desirable when the agitator is taken out of the body, to obtain the advantage of further elimination of the weight of the drive shaft, the sprocket, the drive chain connected with the sprocket, and possibly the hydraulic motor or other drive means for the sprocket.

The rear bearing structure **33**, which supportingly journals the rear end portion of the agitator stem, comprises a pair of inverted U-shaped brackets **50**, each adapted to straddle a side wall of the body near the discharge outlet, and a rigid arm **51** extending obliquely downwardly into the body from the inner leg of each bracket. The two arms **51**, which may be formed of tubular material and secured to the bracket **50** as by welding, converge inwardly and downwardly and cooperate in supporting a rear bearing **53** at their inner ends. Projecting rearwardly from the rear end of the tubular agitator stem **27** is a coaxial journal portion **54**, which is received in the rear bearing **53**. If desired, the rear bearing can be of the self aligning type; and in that event the agitator can be removed from the body without removal of the rear bearing support structure, by removing the bolt **46**, drawing the drive shaft **32** forwardly out of telescoping engagement with the agitator stem, and then lifting the front end portion of the agitator and drawing its journal portion **54** axially forwardly out of the rear bearing.

Preferably, however, the rear bearing support structure **33** is also removed when the agitator is taken out of the body. Even though the structure **33** has been found not to produce any appreciable interference with flow of materials out of the discharge outlet when it is left in place, its removal when it is not needed is desirable in order to save

weight and space and eliminate wear and tear on it. To this end each of the inverted U-shaped brackets **50** has a pair of aligned holes in its opposite legs, which register with holes in the body side wall, to receive bolts **55** by which the bracket is fastened to the body. Hence removal of the rear bearing structure can be effected by simply removing the four bolts **55** and lifting the bearing structure off of the body.

As shown in FIGURE 5, each of the paddle-like blades **31** is secured, as by welding, to a disc-like blade holder **58** that is telescopingly receivable in the end portion of an arm **28**, the blade of course being so disposed on the blade holder that its opposite faces are substantially parallel to the blade holder axis and so that its major width extends transversely to said axis. Near the outer end of each arm **28**, but spaced inwardly therefrom, there is secured a disc-like plug **59** having a coaxial threaded hole **60** therein. A bolt **61** extending through a coaxial hole in the blade holder **58**, is received in the threaded hole **60** to fasten the blade holder onto the end of the arm. It will be noted that the blade is so attached to the blade holder that the blade extends across the blade holder at one side of the axis of the latter so as to clear the head of the bolt **61**. As will also be evident from FIGURE 5, the fixed plug **59** is spaced inwardly from the end of the arm **28** by a small enough distance so that the disc-like blade holder can flatwise engage the outer face of said plug when the bolt **61** is tightened.

To hold the blade in any desired position of rotational adjustment about the bolt **61**, the blade holder is provided with a pair of diametrically opposite axially projecting pins **63** that are receivable in pairs of circumferentially spaced holes **64** in the plug **59**. Adjustment of the blade angle is readily accomplished by loosening the bolt **61** until the blade holder can be drawn axially outwardly far enough to disengage the pins **63** from the holes **64** in which they are seated, rotating the blade about the bolt to bring the pins into alignment with a new set of holes, and then retightening the bolt. For viscous low slump concrete each blade will normally be set for a substantially flat pitch, that is, its faces will be nearly parallel to the plane of its orbit; and it will be adjusted to higher pitch angles for high slump concrete.

In the embodiment of the invention illustrated in FIGURE 6 each blade holder **58'** comprises a disc-like member that is receivable in the outer end portion of an arm **28** and which has an inwardly projecting coaxial boss portion **65**. A bolt **61**, extending coaxially through the blade holder **58'** and received in a threaded hole **60** in a plug **59** fixed in the arm, secures the blade holder in the end portion of the arm.

The blade holder and blade are secured together, as by welding, with an edge portion of the disc-shaped blade holder projecting, as at **66**, through a slot in the blade that is parallel to and near the axially inner edge thereof. Hence a marginal edge portion of the blade projects axially inwardly of the blade holder, to be received in axially outwardly opening slots **67** in the end portion of the arm by which the blade holder and blade are confined against rotation about the bolt **61**. Several pairs of slots **67** are provided in each arm to define different angular positions of its blade.

As shown in FIGURE 6, the outer marginal edge portion of each blade can comprise a wiping strip **68** of rubber or similar resiliently flexible material, which can have wiping contact with the body wall to dislodge any sticky concrete that might adhere thereto but which can be readily deflected by large stones and the like to avoid damage to the body wall and to the agitator.

Since a vehicle which incorporates a dump body like that of the present invention is normally used for transporting a single type of material during some substantial period of time before being transferred to hauling some other type of material, the relatively small amount of effort required to remove or install the agitator

in the body of this invention, or to change the angle of the paddle-like blades on the agitator, is usually well worthwhile.

From the foregoing description taken together with the accompanying drawings it will be apparent that this invention provides a very versatile vehicle dump body that is well suited for either agitating or non-agitating transport of all sorts of pourable materials and which, when adapted for agitating transport of concrete, is adjustable to accommodate concrete of any of a wide range of consistencies.

What is claimed as our invention is:

1. In a vehicle body having a substantially upright front wall, upright side walls which extend generally rearwardly from the front wall and converge toward a discharge outlet at the rear of the body, and a bottom wall extending from one side wall to the other and from the front wall to the discharge outlet and which is curved about an axis that extends lengthwise through the body:

A. front bearing means carried by the front wall and having its axis substantially coinciding with said axis of the bottom wall;

B. a drive shaft rotatably journaled in said front bearing means, said drive shaft having a front end portion which projects forwardly from the front wall;

C. transmission means connected with the projecting front end portion of said drive shaft for imparting rotation thereto;

D. an elongated agitator stem in the body;

E. means readily removably supporting the agitator for rotation in the body comprising

(1) cooperating means on the front wall of the body and on the front end portion of the agitator stem for rotatably supporting the latter coaxially with the drive shaft, and

(2) rear bearing means carried by the body, near the discharge outlet, by which the rear end portion of the agitator stem is supported for rotation;

F. coupling means providing an axially separable driving connection between the drive shaft and the front end portion of the agitator stem;

G. a plurality of arms projecting substantially radially outwardly from the agitator stem at axially spaced intervals along the same;

H. a paddle-like blade for each of said arms; and

I. means securing the blades to their arms with the surfaces of each blade substantially parallel to the axis of its arm.

2. The vehicle body of claim 1 wherein said bottom wall has a conical portion which converges toward said discharge outlet, and wherein the agitator shaft axis coincides with the axis of said bottom wall, further characterized by:

each of said arms being rearwardly inclined with respect to the agitator shaft at an angle such as to be normal to the surface of said bottom wall portion at all points around the lower portion of the orbit of the arm.

3. The vehicle body of claim 1 wherein said last named means comprises:

cooperating means on each blade and on its arm for readily detachably securing the blade to the arm in each of a number of different positions of rotation of the blade about the axis of the arm.

4. The vehicle body of claim 3 wherein said cooperating means on each blade and its arm comprises:

A. a blade holder to which the blade is affixed and which is telescopingly engageable with the outer end portion of the arm, said blade holder having a coaxial hole therethrough;

B. means fixed on the outer end portion of the arm defining a threaded coaxial hole;

C. a bolt extending through said hole in the blade holder and received in said threaded hole to secure the blade holder to the arm in any angular position of the blade; and

D. cooperating means on the blade holder and on the arm for holding the blade in each of a plurality of different positions of angular adjustment of the blade.

5. The vehicle body of claim 1, wherein said coupling means comprises:

A. cooperating axially disengageable male and female spline elements one of said elements being on the front end portion of the agitator stem and the other being on the rear portion of the drive shaft;

B. means fixed on the front end portion of the agitator stem defining a threaded coaxial hole; and

C. a bolt extending through a coaxial bore in the drive shaft from the front thereof and received in said threaded hole to confine the agitator stem and the drive shaft against axial separation, so that the front bearing means and the drive shaft cooperate with the spline element on the agitator stem to provide said means by which the front end portion of the agitator stem is rotatably supported.

6. The vehicle body of claim 1 wherein the drive shaft is axially slidable forwardly out of the front bearing means, further characterized by:

a collar slidably received on the rear end portion of the drive shaft, behind the front bearing means, and confined against rearward axial displacement off of the drive shaft by said coupling means, said collar being confined by said front bearing means against forward axial displacement.

7. The vehicle body of claim 1 wherein said rear bearing means comprises:

A. a pair of inverted U-shaped brackets, each removably straddling an upper edge portion of a body side wall near the discharge outlet;

B. a supporting arm extending inwardly with respect to the body from each of said brackets;

C. a bearing member conjointly carried by said supporting arms at the inner ends thereof; and

D. detachable securement means extending through each body side wall and the legs of the bracket straddling the same for holding the brackets against displacement relative to the body.

8. In a vehicle dump body having a substantially upright front wall, and side and convex bottom walls which extend generally rearwardly from the front wall and have portions that converge upwardly and rearwardly toward a discharge outlet at the rear of the body, means adapting the dump body for agitating transport of materials of different viscosities and for non-agitating transport of flowable materials, said means comprising:

A. a drive shaft rotatably journaled in the front wall of the body and projecting forwardly and rearwardly therefrom;

B. means on the front end portion of said drive shaft for connecting the same with a power source;

C. rear bearing support means comprising

(1) a pair of brackets, each adapted to be received on and detachably secured to a side wall near the discharge outlet,

(2) an arm extending laterally inwardly from each of said brackets, and

(3) a rear bearing member secured to said arms at their inner ends to be supported by them between the side walls and near the discharge outlet;

D. an elongated agitator stem having a rear end portion which is journaled in the rear bearing member and which is long enough to extend forwardly therefrom to said drive shaft;

E. cooperating means on the front end portion of the agitator stem and on the projecting rear end portion of the drive shaft providing a telescopingly engageable coaxial splined connection between them by which the front end portion of the stem is sup-

ported and by which rotation of the drive shaft is transmitted thereto;

F. a plurality of elongated tubular arms secured to said stem at axially spaced intervals therealong and projecting substantially radically outwardly therefrom;

G. a plug nonrotatably secured in each of said arms near to but spaced inwardly from the outer end thereof and in which there is a threaded coaxial hole;

H. a plug-like blade holder receivable in the outer end portion of each of said arms, axially outwardly of the plug, in different positions of rotation about the axis of the arm and having a coaxial hole therethrough;

I. a blade anchored to each blade holder with its faces substantially parallel to the axis thereof;

J. a bolt extending through each blade holder and into said threaded hole in the plug to secure the blade holder to the arm in any position of rotation in which the blade holder may be set; and

K. cooperating means respectively fixed on each arm and on its blade holder, engageable upon axial insertion of the blade holder into the end portion of the arm, for confining the blade holder against rotation about the axis of the arm.

9. In a vehicle body having a substantially upright front wall, side walls which extend generally rearwardly from the front wall and converge toward a discharge outlet at the rear end of the body, a bottom wall which extends from one side wall to the other and from the front wall to the discharge outlet and which is curved about an axis that extends lengthwise through the body between the side walls, and a rotatable agitator comprising a shaft which extends along said axis and a plurality of axially spaced bladed arms projecting substantially radially from said shaft, means readily removably mounting the agitator in the body, said last named means comprising:

A. a drive shaft;

B. bearing means carried by the front wall of the body and in which said drive shaft is rotatably journaled with its axis coinciding with said axis about which the bottom wall is curved;

C. means on the front end portion of the drive shaft for drivingly connecting the same with a power source;

D. telescoping spline means on the rear end portion of the drive shaft and on the front end portion of the agitator shaft providing an axially separable driving connection between them;

E. rear bearing support means comprising

(1) a pair of brackets, each having a first portion adapted to rest upon the top edge of a side wall near the discharge outlet and another portion which projects downwardly from said first portion and overlies one face of the side wall,

(2) an arm extending laterally inwardly from each of said brackets, and

(3) a rear bearing member carried by said arms at their inner ends and in which the rear end portion of the agitator shaft is supportingly journaled; and

F. removable securement means extending through said downwardly projecting portion of each bracket and its adjacent side wall to detachably secure the rear bearing support means to the body.

10. In an agitator for a vehicle dump body of the

type in which freshly mixed concrete or the like is transported, and which agitator comprises an elongated rotatably driven shaft extending through the body and a plurality of tubular arms projecting radially outwardly from said shaft at axially spaced intervals, adjustable blade means on each of said arms comprising:

A. a plug member fixed in each arm near to but spaced inwardly from the outer end of the arm, said plug member having a coaxial threaded hole therein;

B. a blade holder receivable in the outer end portion of the arm, outwardly of said plug member, said blade holder having a coaxial hole therethrough;

C. a substantially flat blade secured to said blade holder and projecting outwardly therefrom with its surfaces substantially parallel to the axis of the blade holder;

D. a bolt extending through said hole in the blade holder and received in said threaded hole in the plug member to secure the blade holder to the arm in any desired position of angular adjustment of the blade about the axis of the arm; and

E. cooperating means on the blade holder and on the arm for confining the blade holder against angular displacement out of any one of a plurality of positions of angular adjustment of the blade about the axis of the arm.

11. The agitator of claim **10** wherein said plug member has a plurality of circumferentially spaced axially extending holes therein at uniform distances from its axis, and wherein said means for confining the blade against angular displacement comprises:

an eccentric pin on the blade holder that is axially engageable in each of said holes.

12. In an agitator for a vehicle dump body of the type in which freshly mixed concrete or the like is transported, and which agitator comprises an elongated rotatably driven shaft extending through the body and a plurality of elongated arms projecting substantially radially outwardly from said shaft at axially spaced intervals, adjustable blade means on each arm comprising:

A. a blade holder engageable with the outer end portion of each arm;

B. a substantially flat blade secured to said blade holder and projecting outwardly therefrom with its surfaces substantially parallel to the axis of the blade holder;

C. coaxial detachable securement means cooperating with the arm and the blade holder to removably mount the latter coaxially on the outer end portion of the arm for rotation about the axis of the arm to different positions of angular adjustment of the blade; and

D. cooperating means on the blade holder and on the arm for confining the blade holder against angular displacement out of any one of a plurality of positions of angular adjustment of the blade.

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