

July 17, 1934.

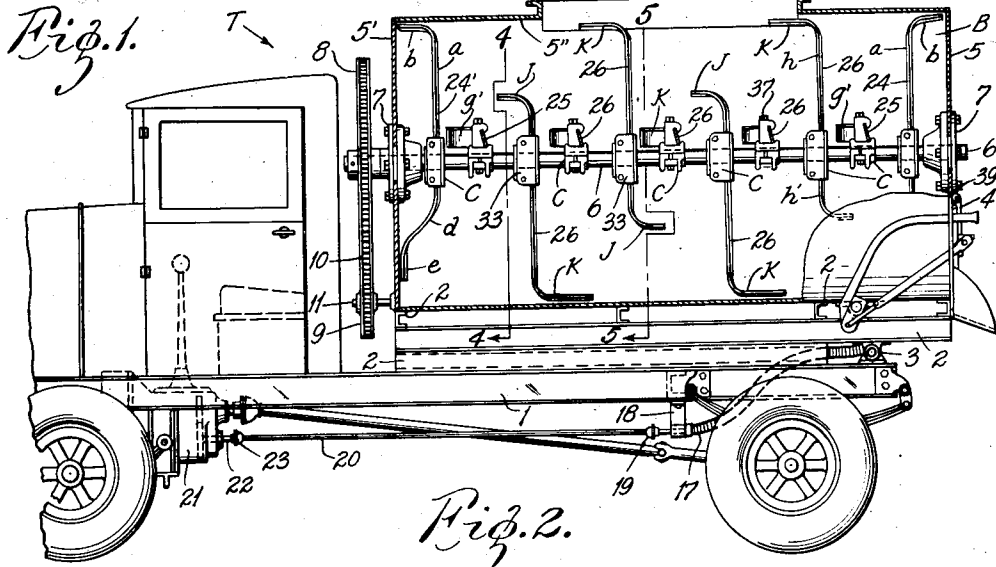
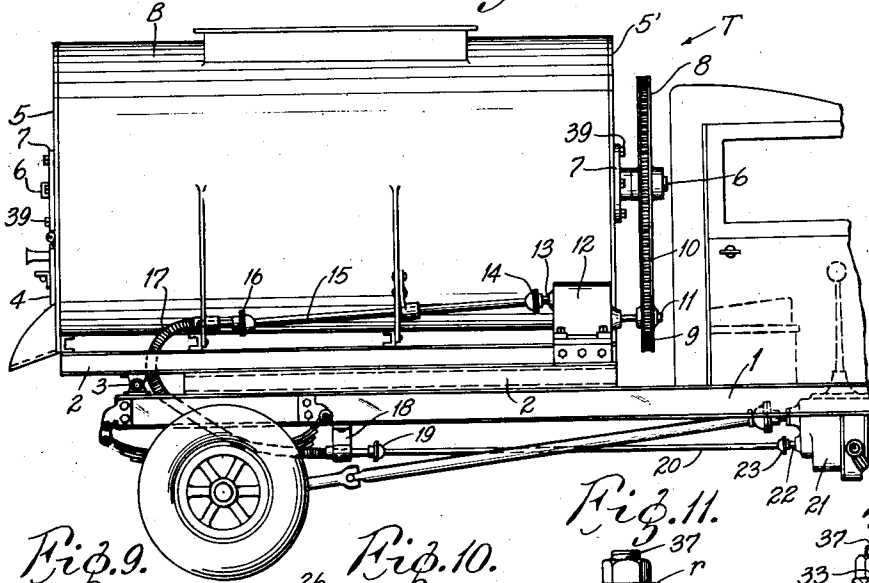
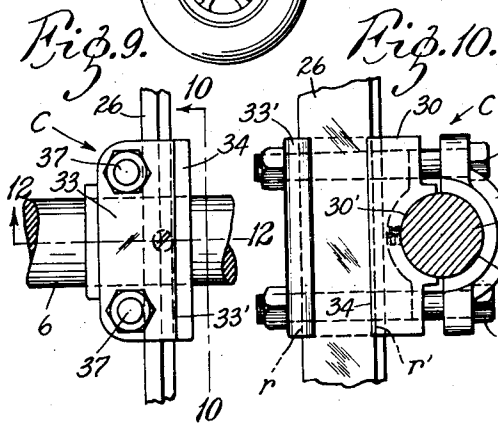
C. J. HUG

1,966,502

AGITATOR TRUCK BODY

Filed May 16, 1932

2 Sheets-Sheet 1



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AGITATOR TRUCK BODY

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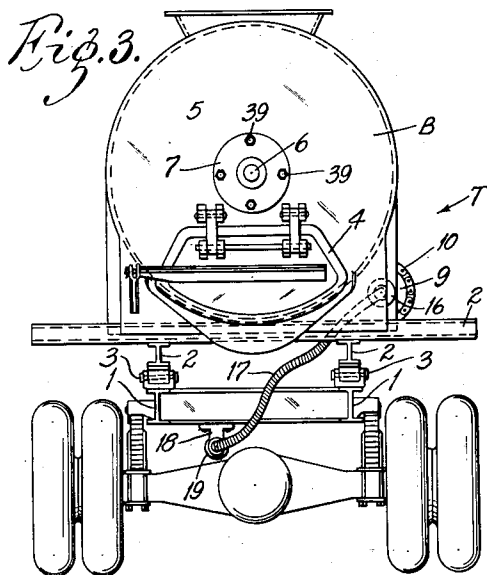
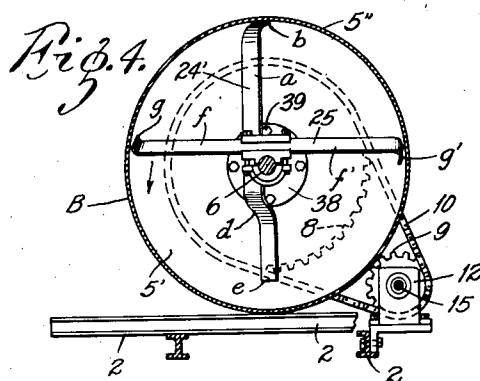
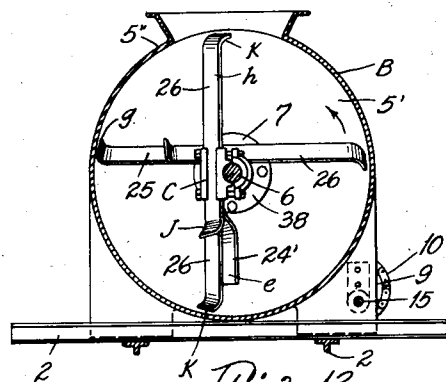
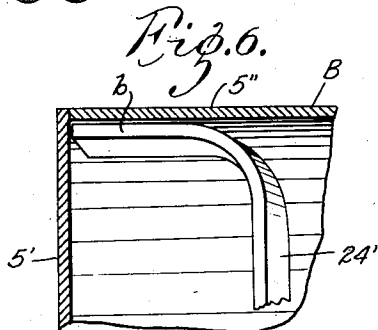
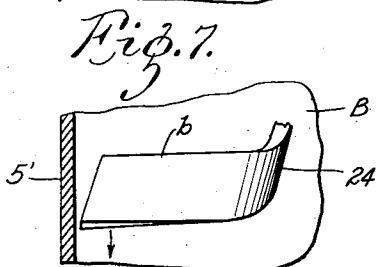
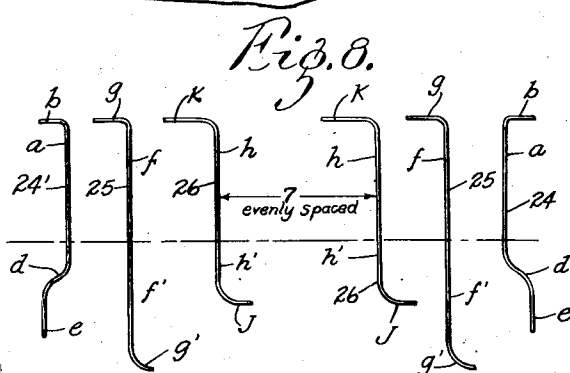
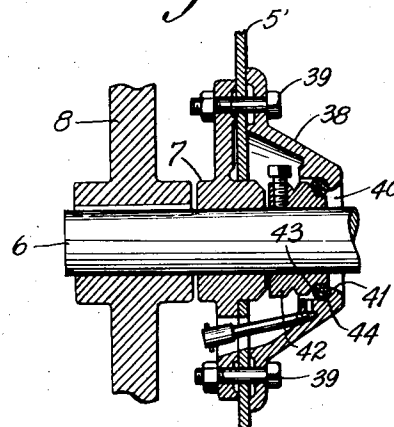


Fig. 5.



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UNITED STATES PATENT OFFICE

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AGITATOR TRUCK BODY

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Application May 16, 1932, Serial No. 611,604

1 Claim. (Cl. 83—73)

My invention has relation to improvements in agitator truck bodies, primarily adapted for use in hauling concrete from a central mixing plant to the various jobs on which it is to be used.

It is a matter of common knowledge among those engaged in concrete work that when mixed concrete is hauled in an ordinary truck body there is a tendency for the water and the cement to segregate from the coarse aggregate, which sinks to the bottom and adheres to the wall of the truck body. This, of course, is not only detrimental to the mixture, but makes the unloading operation difficult because of the fact that the adhering cement must be scraped from the surface of the body.

It is thus the object of the present invention to provide means for maintaining the mixed concrete in a state of mild agitation while being transported in a truck body so that the ingredients of the concrete will be as thoroughly mixed when the concrete arrives on the job as when it was placed into the truck. A further object of the invention is to provide a series of agitators, which also embody the function of scrapers to prevent the cement from adhering to the inner surface of the truck body, said scrapers being resiliently mounted so that they will yield if any pieces of aggregate become wedged between them and the body of the truck, instead of crushing the aggregate. It is also the object of the invention to provide agitators of varying lengths so that their stirring effect will be distributed entirely throughout the mass of concrete in the truck body. The stirring action is further increased by giving the agitator arms a definite pitch so that they will have a certain lifting effect on the contents of the truck, thus providing effective agitation with a comparatively slow motion.

A further object of the invention is to obtain the desired results by a construction that is both simple and rugged, to which end the agitators comprise bars of spring steel, each of which is clamped to the agitator shaft at an intermediate point to provide a long and a short agitator arm. It is a further object of the invention to mount the agitators on a shaft supported in the truck body and provide the shaft bearings with an effective packing to prevent leakage of the water from the truck. A further object is to provide a tail gate at the discharge end of the truck that is operated by a series of levers so that it may be held in open position to any extent desired. These, as well as other advantages of the invention, will be better apparent from a detailed description of

the invention in connection with the accompanying drawings, in which:

Figure 1 is a combined side elevation and vertical longitudinal section of a truck equipped with my improved agitator body; Fig. 2 is a side elevation of the truck looking at the side opposite to that shown in Fig. 1; Fig. 3 is an end elevation of the truck equipped with my improved agitator body; Fig. 4 is a vertical cross-section through the truck body taken on a plane indicated by the line 4—4 of Fig. 1; Fig. 5 is a vertical cross-section through the truck body taken on a plane indicated by the line 5—5 of Fig. 1; Fig. 6 is a fragment of the truck body and end agitator arm (on an enlarged scale) showing how said agitator also operates as a scraper to keep the corner of the truck body free from accumulations; Fig. 7 is a view looking at the end of the agitator arm shown in Fig. 6; Fig. 8 is a diagrammatic view showing the arrangement of the agitator arms within the truck body; Fig. 9 is a detail view showing the clamp which holds the agitator arm to the shaft; Fig. 10 is a sectional detail taken on the line 10—10 of Fig. 9; Fig. 11 is an end view of the clamp for holding the agitator arm, said arm being shown in section; Fig. 12 is a middle cross-section through the clamp taken on the line 12—12 of Fig. 9, the shaft remaining in elevation; and Fig. 13 is a cross-section taken on a medial plane through the shaft bearing and packing secured to the end wall of the truck body.

Referring to the drawings, T represents a truck, the chassis of which is provided with the customary frame members 1, 1 on which are disposed a series of sills 2, 2 for supporting the truck body B when the same is in its normal position for transporting a load. The body B is also supported by suitable bracket and pin connections 3, 3 whereby it may be tilted to facilitate the dumping of the load through the tail gate 4 arranged on the rear wall 5 of said body. This arrangement for tilting the truck body is old in the art and requires no specific explanation. The invention herein is concerned particularly with the means for agitating the truck body contents, ordinarily concrete, together with the mechanism for operating said agitating means.

The agitator includes a shaft 6 mounted in bearings 7, 7 secured on the outside of end walls 5, 5 of the truck body. The forward end of shaft 6 carries a sprocket wheel 8 adapted to be driven by a sprocket pinion 9 through the medium of a sprocket chain 10. The sprocket pinion 9 is suitably fixed on a stub shaft 11 which forms a part of

the reducing gear set housed in the casing 12 and is not shown in detail as such gear sets are old in the art and can be purchased on the open market. There is a second shaft 13 projecting from the casing 12 connected by means of a universal joint 14 to a shaft 15 mounted on the side of the truck body B (Fig. 2). The shaft 15 is also connected by means of a universal joint 16 to a flexible shaft 17 which bends downwardly past the pivotal axis of the truck body underneath the truck chassis where it is supported by means of a bracket 18. The flexible shaft 17 is connected adjacent to bracket 18 by means of a universal joint 19 to a shaft 20 which extends forwardly to the transmission case 21, from which a stub shaft 22 projects for connection with the shaft 20 through a universal joint 23. The driving of auxiliary machinery from the truck transmission is old and is not claimed herein per se, nor illustrated in detail, but the utilizing of a flexible element in the drive shaft in a tilting truck body is believed to be new.

There are a plurality (in the present instance 11) of agitator bars 24, 25, 26 and 24' mounted rigidly on the shaft 6 by means of clamps C. Each agitator bar, it will be observed, is secured in a clamp C intermediate its ends so that each bar in effect constitutes two agitator arms, one of which is longer than the other. Thus the end bars 24 and 24', which are identical except that they are right and left respectively, each comprise a long agitator arm *a* having a substantially horizontal component *b* bent at right angles to the component *a* and of a length so that the end of component *b* will operate in the corner between end wall 5 or 5' and cylindrical wall 5'' of the body B and serve the function of a scraper to prevent accumulations of concrete in this corner. The short arm *d* of each of the bars 24, 24' is bent in the shape of a comparatively flat ogee curve so that a scraping component *e* is provided which operates in close proximity to the truck body end wall and serves to scrape any accumulations of concrete adhering to this wall. Adjacent to the bars 24 and 24', which, as we have seen, serve as scrapers as well as agitators, are bars 25, 25 identical in shape and each having both agitator arms *f* and *f'* of the same length, although the extremity of arm *f* terminates in a horizontal component *g* considerably longer than the horizontal component *g'* terminating the arm *f'*. It will also be observed (Fig. 8) that the curvature of the arc connecting horizontal component *g* with arm *f* is not as sharp as the curvature of the arc connecting horizontal component *g'* with the arm *f'*. The reason for this is that the component *g* operates in close proximity to the cylindrical wall of the truck body and serves the purpose of a scraper to remove adhering concrete therefrom, while the component *g'* serves merely as an agitator and does not perform any scraping function. In fact, all of the bars except those operating in proximity to the end walls of the truck body have one arm which serves as a scraper and an agitator, while the opposite arm (the shorter of the two) serves only as an agitator. The intermediate bars 26 (of which there are 7) are all identical, each having a long arm *h* and a short arm *h'*, the short arm terminating in a curved component *j* to serve the function of an agitator and the long arm terminating in a horizontal component *k* operating in proximity to the cylindrical wall of the body B in serving as a scraper therefor as well as an agitator.

From the foregoing description it can be readily

seen that the arrangement and lengths of the agitator arms is such that in addition to serving to agitate and stir the contents of the tank body they also serve to scrape the inner surface of said tank body so as to prevent accumulations of cement on both the end walls and the cylindrical wall thereof. In order that the function of the arms 24, 25 and 26 as agitators may be carried out with maximum efficiency it will be observed that the bars are all secured in the clamp C so that they are inclined or pitched with respect to the longitudinal axis of shaft 6. That is, they do not lie in planes at right angles to the shaft but they lie in planes making an angle with the shaft of less than 90 degrees. This is readily apparent from an inspection of Figs. 9 to 12 inclusive wherein the clamp C securing the bars is shown in detail. This clamp comprises members 30 and 31 provided respectively with semi-circular seats 30', 31' for encircling shaft 6, the member 30 together with a holding member 32 serving to clamp the bars 24, 25 or 26, as the case may be. The lateral component 33 of member 32 is provided with a flange 33' and the clamp member 30 is provided with a flange 34 offset from the flange 33', which flanges together with inclined edges 35, 35' of the ends 36, 36' of the holding member determine the angularity of the bar 24 (25 or 26) as said bar is held in recesses *r*, *r'* formed between flanges 33', 34 and inclined edge 35 by means of bolts 37, 37 which maintain all of the clamp elements and the bar securely fixed to the shaft 6, as shown in Figs. 9 to 12 inclusive.

In order that there may be no leakage of the liquid from the tank body B through the end wall openings for the shaft 6, I provide a packing housing 38 on the inner surfaces of the end walls 5, 5', said housings being secured by means of bolts 39 which also hold the bearings 7, 7 in place. This housing 38 is more or less in the shape of a hollow cone having a central opening 40 to accommodate the shaft 6, the inner edge of said opening 40 being provided with a flange 41. A gland 42 is set-screwed or otherwise secured to the shaft 6 and projects partly into the opening 40 of the conical housing 38. A beveled shoulder 43 is provided on the inner end of gland 42 between which and flange 41 suitable packing material 44 is tightly wedged. The packing 44 prevents the leakage of liquid through the opening 40 past the shaft bearing and the pressure of the material within the tank body serves only to wedge the packing more tightly against the shoulder 43 (Fig. 13). Thus there is no opportunity for leakage from the tank through or past the shaft bearings.

The operation of my improved agitator truck body is obvious from the foregoing description. When the truck engine is running the shaft 6 will be slowly rotated by virtue of its connection with the truck transmission and carry around with it in its rotation the bars 24, 24', 25 and 26. The agitator arms will stir the truck contents and agitate the same continually so that the heavier ingredients of concrete will not settle to the bottom of the tank body. In addition to agitating the concrete the arms terminating in the scraper elements, as above described, will prevent any accumulations of concrete or cement on the truck walls as the scraper elements travel in close proximity (about $\frac{1}{2}$ "') to the walls. Should any of the pieces of aggregate, such as rock or gravel, become wedged between the scraper elements and the tank walls during the operation of the scrapers the agitator arms will yield owing

to their inherent springiness and quickly release such wedged pieces of aggregate without grinding the same. It will also be observed that the lagging edge of the scraper element has a greater amount of clearance than the leading edge which also facilitates the release of any pieces of aggregate that may become wedged between the scraper element and the tank wall. Thus my improved agitator serves not only to keep the concrete in a thoroughly mixed condition as the same is transported, but also serves to keep the inner surface of the tank clean so that when the tank contents are finally dumped on the job all the contents thereof will be discharged without

the necessity of hand labor for scraping the walls of the tank clean as is now commonly done.

Having described my invention I claim:

In a tank body for motor trucks, an agitator comprising a shaft, means for rotating said shaft, and a flexible agitator arm fixed to said shaft and pitched at an angle with respect to the plane of rotation of said arm, a laterally extending scraper component on one end of said arm disposed in close proximity to the side wall of the tank body, and an offset portion at the other end of said arm forming a second scraper element disposed in close proximity to the end wall of said tank body.

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