

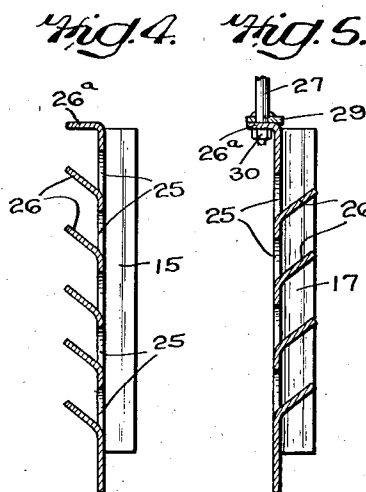
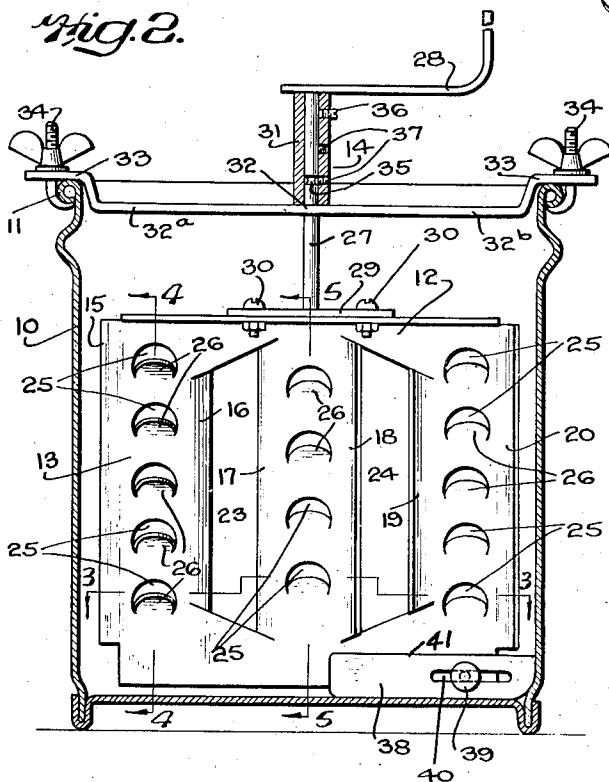
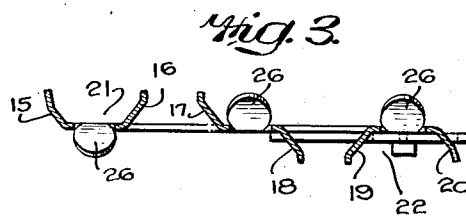
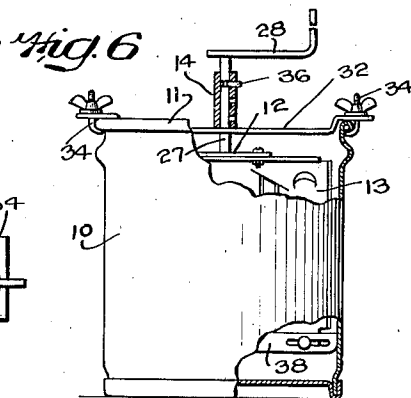
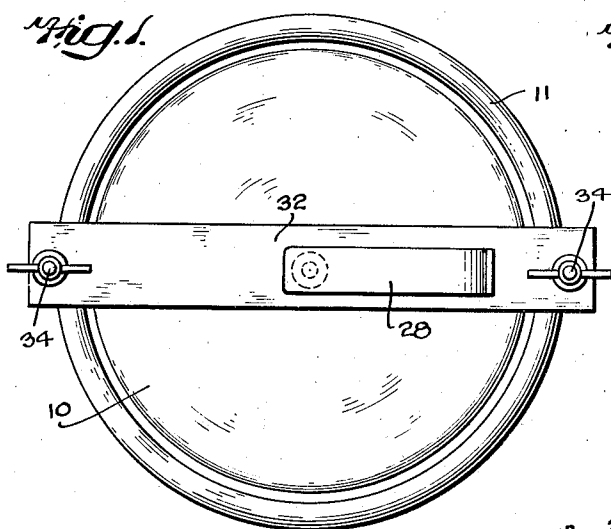
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PAINT MIXER .

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PAINT MIXER

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5 Claims. (Cl. 259-107)

This invention relates generally to agitators and more particularly to an improved construction of agitator or stirring device for use in connection with containers such as are employed in the shipment, storage and dispensation of paint and other viscous liquids, the agitator of the present invention being intended for use primarily with, although not necessarily limited to, containers of moderate size, such as those having a capacity of five gallons.

The successful handling of viscous liquids such as paints and the like, when stored in relatively large receptacles, such as five gallon receptacles, has presented serious difficulties due to the fact that as the mixture settles, a sediment is formed in the bottom of the container which must be brought back into suspension if the mixture is to serve its intended purposes in the most efficacious manner.

It is among the principal objects of the present invention to provide an inexpensive and yet highly efficient agitator which is adapted to be removably installed, at will, within the container without necessitating the use of any special tools or any alteration of the container structure.

A further object of the present invention is to provide an agitator of such design that it may be constructed substantially entirely of sheet metal and which, therefore, may be produced inexpensively by a simple stamping operation, the agitator as constructed in accordance with the present invention including means which operate effectively and efficiently to insure rapid and uniform dispersion of the settled sediment throughout the liquid body of the mixture.

Still another and important object of the present invention is to provide a paint mixer having an agitator element which is so constructed that it not only produces spaced concentric zones of agitation in the container within which the mixer is installed for use, but also insures effective downward boring of the agitator element into the settled sediment in the bottom of the container whereby to effectively stir and lift the same for uniform dispersion throughout the liquid body of the mixture.

Other objects and advantages of the present invention and economies effected incident to the construction and operation of the agitator constructed in accordance with and embodying the principles of the present invention will appear more fully hereinafter, it being understood that the invention consists substantially in the combination, construction, location and relative arrangement of the parts as hereinafter described, as shown in the drawings and as finally pointed out in the appended claims.

In the accompanying drawing, which is illustrative of a preferred construction, Figure 1 is a top plan view showing the agitator of the pres-

ent invention installed for use in a container for paint or the like;

Figure 2 is a vertical sectional view through the container showing the agitator element in side elevation;

Figure 3 is a transverse sectional view of the agitator element as taken on the line 3-3 of Figure 2;

Figures 4 and 5 are vertical sectional views taken respectively on the lines 4-4 and 5-5 of Figure 2; and

Figure 6 is a side elevational view of a container, partly broken away, showing the agitator element of the present invention installed in the container and the means for securing it against vertical or axial displacement during rotation thereof.

Referring now to the drawing, it will be observed that the agitator of the present invention is shown installed for use in a container 10 of the type customarily employed for paints or other such heavy bodied liquids, this type of container being generally provided with an annular lip or bead 11 at the upper edge thereof. The mixing unit or agitator of the present invention, designated generally by the reference numeral 12, essentially consists of an agitator element 13 preferably stamped out of flat sheet metal to the upper edge of which is secured, in any suitable manner, an operating handle assembly 14 for rotating the agitator element about its central vertical axis.

Referring first to the agitator element 13, it will be noted that it is generally in the form of a rectangular plate of such size as to be readily accommodated within the container 10, the transverse over-all dimension of this agitator element being only somewhat less than the diameter of the container 10, while its over-all height somewhat exceeds half the effective depth of the container. As most clearly appears in Figures 2 to 5, the plate of which the agitator element 13 is formed is so formed as to provide it with a plurality of laterally spaced vertically extending blades or vanes 15, 16, 17, 18, 19 and 20, the vanes 15 and 20 so formed along the opposite vertically extending edges of the plate being oppositely turned with respect to the flat plane of the main body of the plate. The vanes 16 and 17, which are next adjacent to the outermost vanes 15, are outwardly turned in the same direction as said vane 15, while the vanes 18 and 19, which are next adjacent the outermost vane 20, are outwardly turned in the same general direction as the latter.

By reason of this construction, the agitator element 13 is respectively provided at its opposite sides with oppositely presenting channels 21 and 22, one of these channels 21 being formed by the outwardly diverging pair of vanes 15 and 16, and the other channel 22 by the outwardly diverging pair of vanes 19 and 20. The oppositely turned

vanes 17 and 18, disposed between the oppositely presenting channels 21 and 22 and to either side of the central vertical axis of rotation of the agitator element, constitute independent stirring blades for the unit. Where the agitator element 13 is formed of a sheet metal stamping, the several blades or vanes 15, 16, 17, 18, 19 and 20 are preferably formed as integral elements by pressing them out of the normal flat plane of the sheet metal of which the agitator element is formed, thus providing a pair of vertically extending relatively large openings 23 and 24 spaced laterally to either side of the central axis of rotation of the agitator.

As is indicated most clearly in Figure 3, the agitator unit is adapted to be rotated about its central vertical axis in the clockwise direction indicated by the arrow, and it will be apparent that when the agitator unit is so rotated, the channels 21 and 22 will sweep through the outer portion of the material contained in the container 10, while the intermediate blades 17 and 18 will sweep through the central portion of the material, thereby setting up in the container concentric zones of agitation in the material undergoing agitation.

In order to facilitate this agitation and insure uniform dispersion of the solids throughout the liquid body of the mixture, the agitator element 13, in addition to the large openings 23 and 24, which are formed between the several pairs of agitator vanes or blades, is additionally provided with a series of smaller openings 25 formed in groups respectively disposed between each pair of the said blades or vanes. These smaller openings are arranged in vertically spaced relation to form a given group thereof, it being noted that one such group of vertically spaced openings 25 is provided in the base of the channel 21 formed by the pair of blades 15 and 16, the second group of these vertically spaced openings is provided in the base of the channel 22 formed by the blades 19 and 20, while the third group of vertically spaced openings is formed in the immediate region of the vertical axis of rotation of the agitator element, that is, between the intermediate pair of oppositely turned blades or vanes 17 and 18.

Preferably, these openings 25 are formed by so cutting and stamping the sheet material as to provide struck-out tabs or tongue-like elements 26 which extend angularly with respect to the plane of the main flat body portion of the agitator element. In this connection, it is important to observe that these struck-out tabs 26 are all similarly inclined upwardly and outwardly from their points of attachment to the main body of the agitator element, and that the group of tabs immediately associated with the channel 21 formed by the blades 15 and 16 project in opposite direction from the said blades, or, in other words, rearwardly of the said channel 21. Similarly, the group of tabs immediately associated with the channel 22 formed by the pair of vanes or blades 19 and 20 project in a direction oppositely from the latter or rearwardly of the channel 22. The group of tabs immediately associated with the intermediate pair of blades 17 and 18 may project in either direction or they may be dispensed with entirely, thereby leaving the central flat part of the agitator element with a plurality of unrestricted apertures of any suitable size, shape and number.

The several vanes or blades 15 to 20, extending as they do vertically of the main plate of the agitator, serve, in addition to their principal

function as means for sweeping through the mass of material to be agitated, also to reinforce and impart rigidity to the agitator element. To further strengthen and rigidify the agitator element its upper edge is laterally turned to provide a horizontally extending flange 26^a to which is secured, in any suitable manner, the operating handle assembly designated generally by the reference numeral 14. This handle assembly preferably includes a vertically extending post or shaft 27 to the upper end of which is suitably secured a crank handle 28, the lower end of the shaft 27 being rigidly secured to a flat base plate 29 which in turn is adapted to be secured, as by the bolts 30 or otherwise, to the flange 26^a of the agitator element. If desired, the lower end of the vertical shaft 27 may be directly secured, as by welding or otherwise, to the flange 26^a without the interposition of the plate 29, it being merely necessary that the shaft 27 be so located centrally of the agitator element 13 that the central vertical axis of rotation of the latter closely approximates the vertical axis of the shaft.

Fitted loosely on the shaft 27 is a bearing sleeve 31 centrally secured to a transversely extending strap member 32 to provide, in effect, a pair of oppositely extending arms 32^a and 32^b, the free ends of which are upwardly offset, as at 33, and equipped with hook-shaped bolts 34 whereby to firmly secure the opposite ends of the strap member to the annular bead or rim 11 of the container 10, as shown in Figure 3. When this strap member is properly clamped in position extending diametrically across the top of the container, the sleeve 14 carried thereby provides a substantial vertical bearing within which the shaft 27 is free to rotate and shift axially, thus permitting the agitator element 13 to be raised and lowered during rotation thereof and so making it possible to more effectively attack and stir up the solid mass settled in the bottom of the container.

Preferably, the shaft 27 is provided with an annular groove 35 into which is adapted to be projected a set screw 36 for holding the agitator element 13 fixed against axial displacement while permitting it to be freely rotated. This set screw 36 may be projected through one or the other of several vertically spaced threaded holes 37 tapped transversely through the wall of the sleeve 31 so as to secure the agitator for rotation at various adjusted elevations, as, for example, in Figure 6, wherein the agitator is shown supported for rotation in its uppermost elevated position.

If desired, the agitator 13 may be provided with an auxiliary stirrer blade 38 which is loosely secured to the bottom thereof by a headed pin 39, the blade 38 being longitudinally slotted, as at 40, to permit it to be extended laterally to one side of the agitator for effectively sweeping through the chime corners of the container and stirring up such settled pigment as might otherwise remain embedded therein. Also, this auxiliary blade 38 serves as a means for increasing the effectiveness of the agitator unit when used in over-size containers. It will be noted that the auxiliary blade is loosely held in a generally horizontal position, as shown in Figure 3, by virtue of the engagement of the upper edge 41 thereof by the lower ends of the blades or vanes 18 and 20 which project across the plane of the blade 38.

In the operation of the agitator, after the same has been secured to the container as shown and described, and the set screw 36 withdrawn so as

to permit the shaft 27 to freely shift axially within its bearing sleeve 31, the agitator element 13 is lowered into the material to be mixed so that its lower edge rests upon or is disposed somewhat beneath the surface of the solid material settled in the bottom of the container. Thereupon, upon rotation of the operating handle 28, the agitator element 13 is caused to rotate and so gradually scrapes away and stirs up the settled sediment and starts it back into suspension. Preferably, when it is intended to initially attack the sedimentation in the bottom of the container, the operator bears down upon the handle simultaneously as he effects rotation of the agitator about its central axis of rotation, thereby exerting a downward cutting pressure which acts to quickly and expeditiously attack and disperse the sediment settled in the bottom of the drum. As this solid material is loosened by the cutting action of the several vertically extending blades or vanes of the agitator element 13, it is caused to rise in the container by the swirling action of the agitator element and is forced through and so dispersed by the various openings 23, 24 and 25 formed in the latter. The several inclined tabs or tongue-like elements 26 greatly facilitate this dispersion of the solid materials throughout the liquid body of the mixture and, due to their inclination, serve as miniature propeller elements to propel the mass upwardly as the agitator is rotated about its central axis of rotation. At the same time, these inclined tabs 26, particularly those immediately associated with the outer channels 21 and 22 provide thrust surfaces against which the mass of the material being agitated reacts to force the agitator downwardly toward the bottom of the container as it is rotated by the handle 28. In this manner, the agitator, during rotation thereof, is caused to be forced gradually downwardly into the settled pigment from the top to the bottom thereof, in consequence of which the settled solid content of the material is rapidly and effectively dispersed to render the mixture suitable for use.

While in its preferred construction, the agitator of the present invention is constructed of sheet metal, it will be understood that it is not intended to limit it to such construction and that it may well be made and formed of other suitable materials, such as various plastics which lend themselves readily to molding operations by which the agitator element 13 may be molded of such plastics as a unit. Also, the several vertically extending blades or vanes and the several vertically spaced tabs or tongue-like elements necessarily do not have to be formed as integral elements of the main plate, but instead may be separately formed and secured thereto to provide an agitator having all of the operating characteristics of the integrally formed unit. Accordingly, it will be understood that the agitator of the present invention is susceptible of being modified in various respects without departing from the general principles or real spirit of the invention and it is accordingly intended to claim the same broadly as well as specifically as indicated by the appended claims.

What is claimed as new and useful is:

1. An agitator adapted to be removably inserted within a container for paint or the like comprising a substantially flat main body member adapted for rotation about a vertical axis lying in the plane of said member and located centrally between its opposite side edges, said body member

being provided with a pair of oppositely presenting channels respectively constituting the opposite side marginal portions of the agitator, the side walls of each channel being struck out of the main body member to provide a plurality of laterally spaced sections respectively constituting the basal walls of said channels, said basal walls of the channels being each provided with a series of vertically spaced restricted apertures.

2. In an agitator of the character defined in claim 1 wherein the said vertically spaced apertures each have associated therewith a tab projecting from the said basal wall portion of the channel and rearwardly thereof.

3. An agitator adapted to be removably inserted within a container for paint or other such material to be agitated comprising a substantially flat main body member adapted for rotation about a vertical axis lying approximately in the plane of said body member, said body member being provided with a pair of integral flanges projecting outwardly of the flat plane of said body member to form a vertically disposed channel presenting generally in the direction of rotation of the agitator, the base portion of said channel being provided with a series of vertically spaced apertures through which the material, swept into the channel upon rotation of the agitator, is discharged.

4. An agitator adapted to be removably inserted within a container for paint or other such material to be agitated comprising a substantially flat main body member adapted for rotation about a vertical axis lying approximately in the plane of said body member, said body member being provided with a pair of flanges projecting outwardly of the flat plane of said body member to form a vertically disposed channel presenting generally in the direction of rotation of the agitator and having a base wall portion interconnecting said flanges and disposed in the plane of said main body member, the base portion of said channel being provided with a series of vertically spaced apertures through which the material, swept into the channel upon rotation of the agitator, is discharged, and means operatively associated with each of said apertures for imparting an upwardly directed thrust to the material discharged through said apertures.

5. An agitator adapted to be removably inserted within a container for paint or the like comprising a substantially flat main body member adapted for rotation about a vertical axis lying in the plane of said member and located centrally between its opposite edges, said body member being provided with a pair of oppositely presenting channels respectively constituting the opposite side marginal portions of the agitator and with a pair of reversely projecting flanges located between said channels and respectively disposed to either side of the axis of rotation of the agitator, the flange immediately adjacent each channel presenting in the same direction as the mouth of said channel and being separated therefrom by an opening formed in the main body member of the agitator, the side walls of said channels and the reversely projecting flanges aforesaid being all struck out of the main body member of the agitator, and the basal wall portions of each of said oppositely presenting channels and the portion of the body member disposed between said reversely projecting flanges being each provided with a series of vertically spaced apertures.

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