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STIRRING DEVICE

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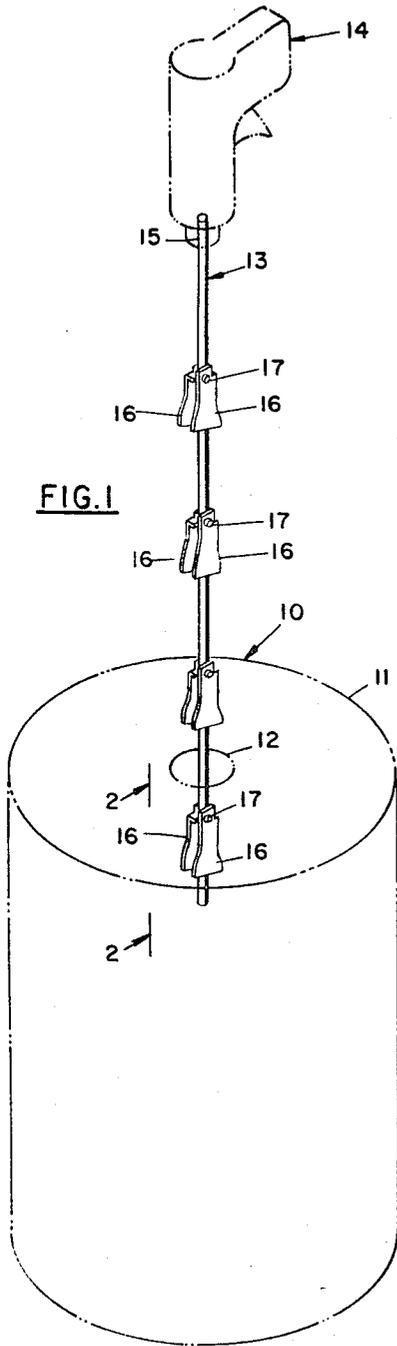


FIG. 1

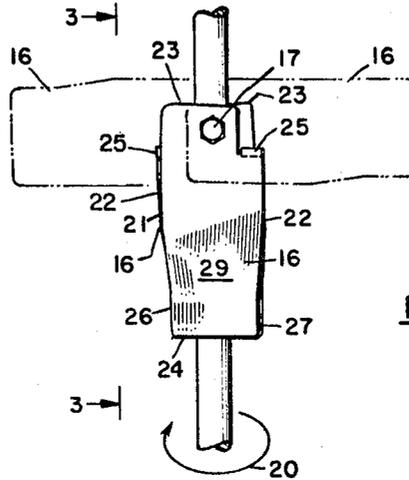


FIG. 2

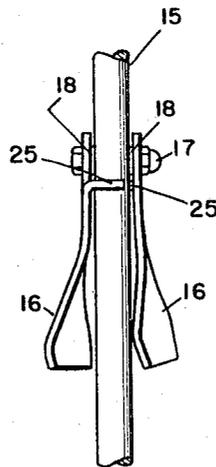


FIG. 3

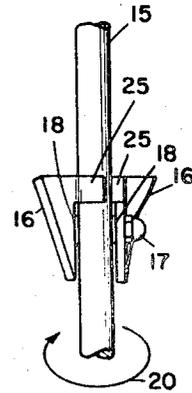


FIG. 4

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1

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STIRRING DEVICE

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2 Claims

ABSTRACT OF THE DISCLOSURE

A stirring device having a shaft to be rotated, and at least a pair of blades pivotally connected to the shaft for free swinging movement between a depending rest position longitudinally of the shaft and a radially oppositely extended operative position under centrifugal force.

This invention relates generally to stirring or mixing devices, and is especially concerned with a unique device for mixing the contents of barrels or drums.

As is well known to those versed in the art, a common construction of barrel or drum is that affording access to the interior thereof through a bung-hole, therefore requiring filling and emptying through a hose or other conduit. Heretofore, it was considered essential to obtain good mixing or stirring of the contents of such drums to remove an end thereof for the insertion therethrough of a relatively large and bulky mixing device, usually having supports adapted to rest on the lower end of the drum.

Accordingly, it is an important object of the present invention to provide a unique construction of stirring or mixing device which is capable of extension through a bung-hole of a drum, to be powered from exteriorly of the drum and produce a highly effective mixing action of the drum contents.

It is a further object of the present invention to provide a mixing or stirring device having the advantageous characteristics mentioned in the preceding paragraph, which may be powered by a portable drill or other suitably convenient drive means, and effects a unique vertical circulation of the drum contents to cure stratification thereof.

It is still a further object of the present invention to provide a mixing or stirring device of the type described which is extremely simple in construction, entirely durable throughout a long useful life, can be manufactured and sold at a reasonable price, and which is capable of use with a wide variety of liquids, as in the plastic and paint industries, and others.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIG. 1 is a top perspective view illustrating a stirring or mixing device of the present invention, a power device or drill being shown in phantom as applied to the mixing device, and illustrating the device as being inserted into a drum;

FIGURE 2 is an enlarged, partial side elevational view taken generally along the line 2—2 of FIGURE 1;

FIGURE 3 is an elevational view taken generally along the line 3—3 of FIGURE 2; and

FIGURE 4 is an elevational view similar to FIGURE

2

3, but illustrating the stirring device in an operative condition of use.

Referring now more particularly to the drawings, and specifically to FIGURE 1 thereof, a drum is there generally designated 10, being of cylindrical formation and shown in an upright condition, as provided in its upper end 11 with a bung-hole 12. A stirring device of the present invention is generally designated 13, and has a drill 14 connected on its upper end, the lower end being inserted downward into the drum 10 through the bung-hole 12.

The stirring device 13 includes an elongate shaft or rod 15, being disposed generally vertically in the drawings, and having its upper end engaged in a chuck of drill 14. At a plurality of vertically spaced locations along the shaft or rod 15 there are provided pairs of blades 16, each adjacent pair of blades 16 being pivotally connected to the shaft 15, as by a pivot pin 17, for free swinging movement of the blades about the connecting pivot.

The shaft 15 and blades 16 are best seen in FIGURES 2 and 3. It will there be observed that each blade 16 is of an elongate configuration, being shown in the illustrated embodiment as generally rectangular. The pivot 17 extends transversely or diametrically through the shaft 15, and projects on opposite sides thereof. The projecting ends of the pivot 17 each extend through a respective blade 16, adjacent to one end of the blade, to mount the blades for free rotative movement about the pivot. Advantageously, there may be circumposed about the pivot 17, between the shaft 15 and each blade 16, a spacer or washer 18. Also, the distal ends of the pivot 17 may be enlarged to retain the blades on the pivot.

By the elongate configuration of each blade 16, and the location of the pivot 17 through each blade adjacent to an end thereof, the blades 16 will depend gravitationally from their respective pivots in a generally vertically disposed rest position, as shown in solid lines in FIGURES 2 and 3.

The direction of shaft rotation is illustrated by the arrow 20, as being clockwise when viewed from above. Thus, the longitudinal edge 21 of the blade 16 may be considered as a leading edge from the rest position, while the longitudinal edge 22 may be considered as a trailing edge. The upper transverse edge 23 may be considered as an inner edge, while the lower transverse edge 24 may be considered as an outer edge, both with reference to the pivot 17. An upper portion 25 of the blade 16, at a corner thereof adjacent to longitudinal edge 22 may be bent or turned, generally normal to the blade in the direction toward shaft 15. As the blades 16 of each adjacent pair are disposed in generally parallel, facing planes spaced on opposite sides of the shaft 15, the inturned portions 25 are also located on opposite sides of the shaft.

The lower or outer region of each blade 16 is twisted, generally in the form of a helix, with the outer portion of side edge 21 extending slightly inward, as at 26, and the outer portion of side edge 22 extending outward, as at 27.

Upon axial rotation of shaft 15 in the direction of arrow 20, the blades 16 are initially swung, as by inertia, slightly counterclockwise about their pivots, and then by centrifugal force acting on the blades upward to a transverse position shown in phantom in FIGURE 2.

This operative condition is shown in solid lines in FIGURE 4. It will there be apparent that the inturned portions or lugs 25 of the blades 16 are in limiting abutting engagement with opposite sides of the shaft 15, to limit the upward swinging movement of the blades to an operative position extending transversely from and generally normal to the shaft 15. It will also be apparent

3

that the outer faces 29 of the blades 16 have their radially outer portions facing obliquely downward for downward impelling action against the ambient medium. Thus, the ambient medium, say the liquid in a drum, is impelled downward in the region of the stirrer 13, and returns upward at locations remote from the stirrer, for a vertical pattern of circulation, resulting in highly effective mixing action.

Upon cessation of shaft rotation, the blades 16 gravitationally return to their depending condition of FIGURE 3, and may, in such condition, be withdrawn upwardly through the bunghole 12.

From the foregoing, it is seen that the present invention provides a stirring or mixing device which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In a stirring device, the combination comprising a shaft having an upper end adapted for connection to a rotary driver, at least a pair of blades pivotally connected to said shaft on opposite sides thereof for free swinging movement between a rest position depending longitudinally of said shaft spaced above the lower end thereof and an operative position centrifugally extended in opposite directions transversely of said shaft, said shaft being rotatable in a container with its lower end engaging the bottom of the container to mix the contents

4

of the container, said blades being disposed in generally parallel planes on opposite sides of said shaft and swingable in said planes between said rest and operative positions, and limit lugs on said blades transverse of the planes of said blades and movable therewith into abutting engagement with opposite sides of said shaft to limit swinging blade movement to their operative positions, said blades being configured to impel downwardly when in their operative positions, and said lugs being located to resist upward blade movement.

2. A stirring device according to claim 1, said blades being of a width approximating their spacing, to facilitate insertion through a bunghole with the blades in their rest position.

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