June 8, 1926.

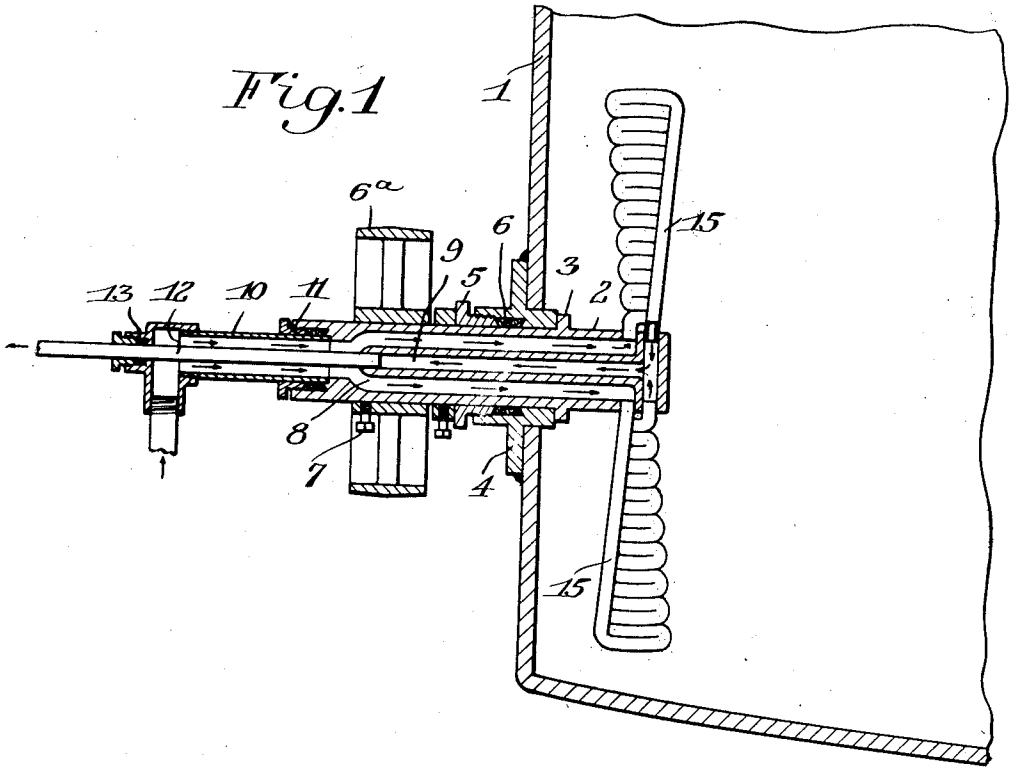
1,587,840

R. B. KILMER

IMPELLER OR AGITATOR

Filed Dec. 13, 1923

Fig. 1



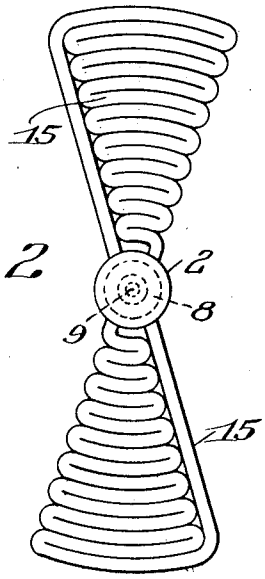
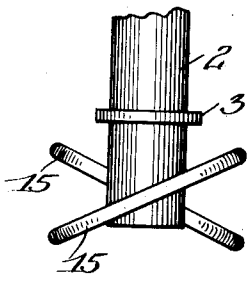


Fig. 2

Fig. 3



INVENTOR.
Ralph B. Kilmer
BY
his ATTORNEY

Patented June 8, 1926. 1,587,840

UNITED STATES PATENT OFFICE.

RALPH B. KILMER, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE PFAUDLER CO., OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

IMPELLER OR AGITATOR.

Application filed December 13, 1923. Serial No. 680,328.

My present invention relates to apparatus for stirring or agitating materials particularly liquids or semi-liquids, contained in tanks or similar containers whereby not only may the contents be agitated or stirred but may also be subjected to desired changes in temperature, as to heat or cold, and it has for its object particularly to provide such an agitator in which the heating or cooling medium may be circulated thoroughly during its movement.

In the accompanying drawings, I have shown a form of apparatus embodying one form of my invention in which

Figure 1 is a sectional view of the lower portion of the tank or container to which my agitator is applied, the hub or central portion of the agitator being shown also in longitudinal section;

Figure 2 is a front elevation of the agitator;

Figure 3 is a plan view showing the general arrangement of one form of blade.

Similar reference numerals throughout the several views indicate the same parts.

The tank 1 may be of the ordinary or any preferred construction having an aperture at the end thereof through which passes the hub 2 forming part of the agitator. This hub is preferably composed of cast metal, and of sufficient length to extend outwardly a considerable distance beyond the wall of the tank 1. It is provided with a flange 3 adapted to abut against the inner side of a casting 4 in which the hub has its bearing, said casting being provided with a gland 5 and packing 6 for making a liquid tight joint around the said hub. 6^a indicates a drive pulley for driving the agitator, secured to the outer portion of the hub in any suitable manner as, for instance, by a set screw 7. The interior of the hub is provided with two chambers or passages, one 8 constituting an inlet passage for the heating or cooling medium and the other 9, an outlet passage, although, of course, the fluid might be passed in the opposite direction as will be seen. The outer or inlet passage 8 communicates with a stationary pipe 10 surrounded by a packing gland 11 attached to the outer portion of the hub, to provide a fluid tight joint while the other passage 9 is in communication with a tube or conduit 12 also stationary, but having a relatively tight bearing in the end of the passage 9 in the hub, said tube 12 extending out through a suitable packing gland 13 to provide a fluid tight joint.

The agitating or stirring blade or blades attached to the inner end of the rotary hub are in the present instance each formed of a single piece of tubing 15 one end of which is connected with the inlet passage 8 in the hub and the other with the outlet passage thereof, the portion intermediate the ends being bent back and forth upon itself with the sides of the convolutions or bends in contact, and these adjacent sides are preferably secured as, for instance, by welding or brazing so that the agitator blades thus formed will as a whole extend in substantially the same plane and form a practically solid surface to thrust or move the contents of the receptacle when the agitator is rotated. The exact shape or the direction of the surface formed by the abutting convolutions is not material so long as the agitator blade is of such shape that it will effectually move or agitate the contents of the tank. In the present embodiment the agitators or stirring blades are shown as extending outwardly from the hub and turned at an angle to the axis thereof, and they may well be curved after the manner of the blades of a screw propeller, or if desired they could be arranged with their surfaces extending in a plane parallel with that of the axis of the hub so as to constitute merely a form of paddle serving to beat or agitate the contents in a direction transverse to the axis of the hub.

While I prefer to employ a single section of pipe for each of the blades as shown, with the adjacent edges of the bends connected, it is obvious that other constructions could be devised without departing from the spirit of my invention.

The principal object of the construction employed is to provide an efficient agitator or stirring member of this general type in which the heating or cooling medium can be definitely and positively circulated in contact with the whole of the inner surface thereof, and that there will be no pockets or recesses formed in which the heating or cooling medium can collect but the thermal condition of the medium circulating in the agitator will be imparted to the contents of the tank, which is at the same time circulated by the rotation of the hub in the manner described.

I claim as my invention:

1. A rotary impeller or stirrer comprising a hub having adjacent inlet and outlet fluid passages therein and a stirring blade extending outwardly from said hub having a continuous fluid passage throughout its whole effective operative face, the ends of which are connected to the passages in the adjacent hub.

2. A rotary impeller or stirrer comprising a hub having inlet and outlet fluid passages therein and a stirring blade extending laterally of the axis of the hub having a tortuous fluid passage coextensive with the operating surface and connected at its respective ends to the inlet and outlet passages at adjacent points upon the hub.

3. A rotary impeller or stirrer comprising a hub having fluid inlet and outlet passages therein and a stirring blade formed of a tortuous tubular conduit with adjacent surfaces of the bends therein connected to form a substantially continuous flat surface, the ends of said conduit being connected to respectively the inlet and outlet passages in the hub.

4. A rotary impeller or stirrer comprising a hub having fluid inlet and outlet passages therein and a continuous tubular conduit connected at its respective ends to said passages, the portion of the conduit intermediate said ends extending back and forth in substantially the same plane with the edges of the adjacent portions in contact to form an impelling surface.

5. A rotary impeller or stirrer comprising a hub having fluid inlet and outlet passages therein and a continuous tube connected at its ends to the respective passages in the hub and having its intermediate portion extended back and forth in substantially the same plane with the adjacent edges between the bends connected to form a substantially continuous impelling surface.

6. A rotary impeller or stirrer comprising a hub having fluid inlet and outlet passages therein, and a stirring blade formed of a continuous tube connected at its ends to the respective passages in the hub and its intermediate portion returned upon itself in substantially a single plane extending at an angle to the axis of the hub, the adjacent edges of tube being connected to form a substantially continuous impelling blade.

7. The combination with a container having an aperture in a wall thereof, of a hub extending through the aperture and having fluid inlet and outlet passages leading to the exterior of the container, an impelling blade on the hub composed of a continuous tube connected at its respective ends to the passages in the hub and bent back and forth in a single plane extending at an angle to the axis of the hub with the adjacent edges of the tube connected to form a substantially continuous impelling blade.

8. A rotary impeller or stirrer comprising a hub having inlet and outlet fluid passages therein and a plurality of radially extending vanes thereon, each vane composed of a tubular conduit bent back and forth upon itself, the adjacent edges of the conduit composing each vane being connected to form substantially continuous impelling surfaces and the respective ends of said conduits being in communication respectively with the inlet and outlet passages in the hub.

9. A rotary impeller comprising a hub and tubing shaped to form a substantially flat blade connected with the hub and extending in a plane intersecting the axis thereof.

10. A rotary impeller comprising a hub and oppositely inclined blades thereon formed of coiled tubing, the impellers each being disposed substantially in a plane intersecting the axis of the hub.

11. A rotary impeller comprising a hub and a blade thereon constructed of tubing bent to form a series of coils superimposed one upon another substantially in a plane intersecting the axis of the hub.

12. A rotary impeller comprising a hub having separate fluid inlet and outlet passages extending longitudinally thereof and a blade thereon having a circuitous fluid circulating passage therethrough communicating with said inlet and outlet passages, said blade being substantially flat and extending in a plane intersecting the axis of the hub.

13. A rotary impeller comprising a hub having adjacent inlet and outlet passages and a substantially flat blade upon the hub having a circuitous passage therethrough, the extremities of which are connected with said inlet and outlet passages.

14. A rotary impeller comprising a hub having separate fluid inlet and outlet passages and a substantially flat blade thereon including oppositely arranged sections provided with a circuitous passage for the circulation of a fluid therethrough the inlet and outlet ends of the last mentioned passage communicating respectively with the inlet and outlet passages of the hub.

15. A rotary impeller comprising a hub having adjacent fluid inlet and outlet passages therein and a substantially flat blade upon the hub including oppositely disposed hollow sections in communication with said passages and through which fluid is adapted to circulate during rotation of the impeller.

RALPH B. KILMER.