F. TYSON.

MIXING APPARATUS.

APPLICATION FILED JULY 7, 1911.

1,181,973. Patented May 2, 1916.

Fig. 1.

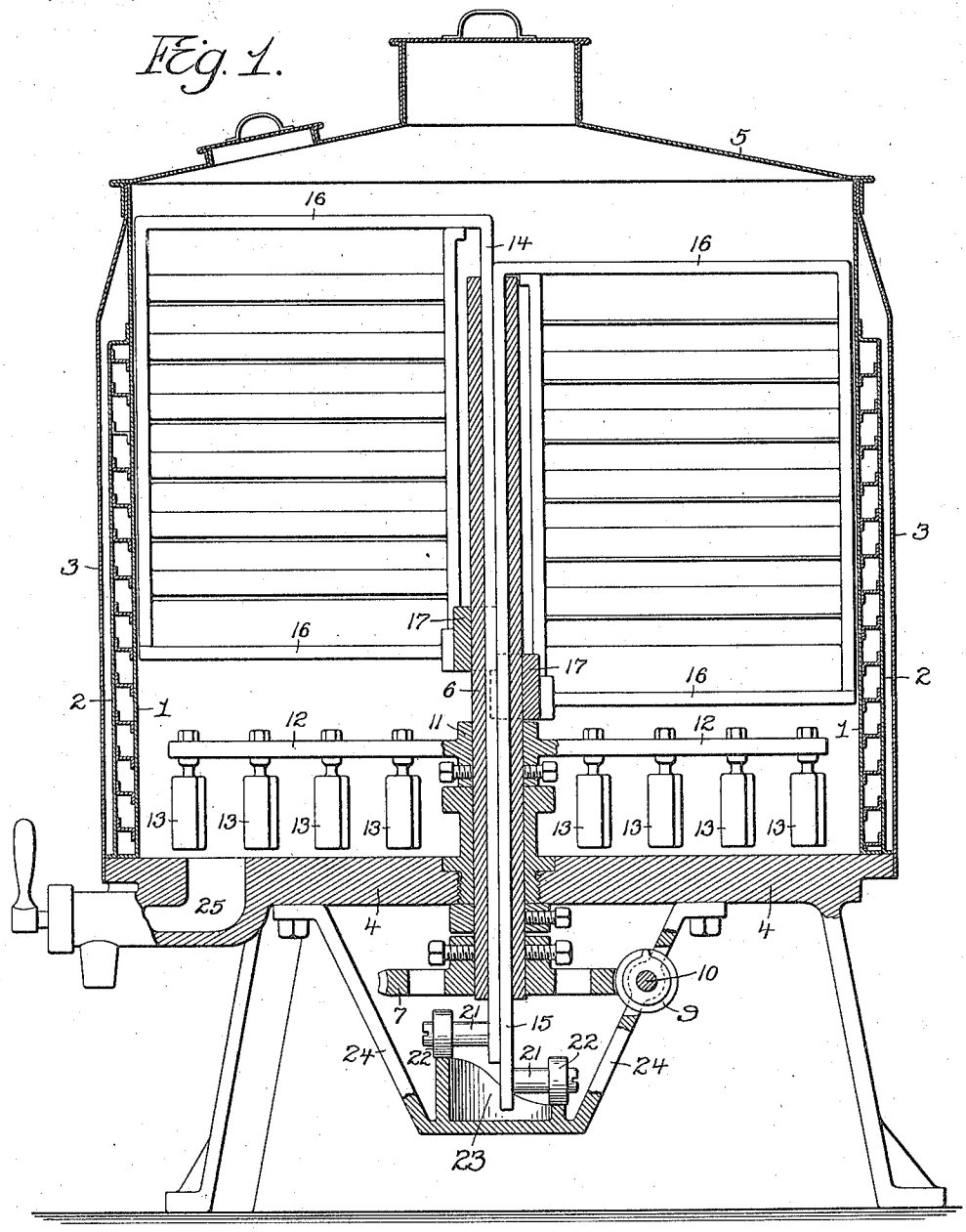
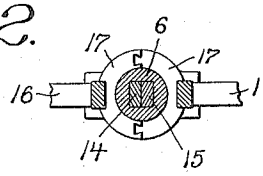


Fig. 2.



WITNESSES

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MIXING APPARATUS.

1,181,973. Specification of Letters Patent. Patented May 2, 1916.

Application filed July 7, 1911. Serial No. 637,384.

To all whom it may concern:

Be it known that I, FRANK TYSON, a citizen of the United States, and a resident of Canton, Ohio, have invented certain Improvements in Mixing Apparatus, of which the following is a specification.

The object of my invention is to construct a machine for mixing fluid bodies or for dissolving solid matters in such fluid bodies as to insure effective agitation of all portions of the mass and consequent thorough admixture of all of the component parts of the mass. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical sectional view of a mixing machine constructed in accordance with my invention, and Fig. 2 is a horizontal section of part of the machine on a larger scale than Fig. 1.

The mixing vessel has a triple wall, 1, 2, 3, a bottom 4 secured thereto and a cap or cover 5 removable therefrom for the insertion of the batch of material which is to be mixed, the space between the members 1 and 2 of the triple wall being intended for receiving a heating or cooling agent and the space between the members 2 and 3 of the triple wall being intended for the reception of a non-conducting medium to prevent loss of heat when a heating agent is employed or absorption of heat when a cooling agent is used.

To a suitable bearing on the bottom of the vessel is adapted a central rotating shaft 6 which is provided at its lower end with a gear wheel 7, the latter meshing with a pinion 9 on a driving shaft 10 at one side of the machine. Turning with the shaft 6 within the vessel is a hub 11 having projecting arms 12 to which are secured depending blades or rabbles 13 whose lower edges approach closely to the bottom of the vessel or may touch the same, if desired, the hub 11 being either secured to the shaft 6 or free to move vertically thereon. The rabbles 13 are angularly disposed upon the arms 12, so that, as the shaft 6 is rotated, said blades will have a tendency to feed either inwardly or outwardly any solid material which may be deposited upon the bottom of the vessel, or the rabbles on one arm may be disposed in reverse relation to those on the other in order that one set of rabbles may feed the material inwardly and the other set may feed it outwardly, and thus cause constant movement or agitation of said material independently of that caused by the forward push of the rabbles.

The shaft 6 is hollow and contains a pair of bars 14 and 15, each of which is connected at its upper end, and above the upper end of the shaft, to a stirrer 16 of any appropriate character, that shown in the present instance consisting of a bar located adjacent to the shaft 6 and provided with a number of radial stirring blades. At its lower end each stirrer is connected to a segment 17 partially surrounding the shaft, adjoining edges of these segments being confined together by means of a dovetailed rib on the edge of one segment adapted to a correspondingly dovetailed groove in the edge of the other segment, as shown in Fig. 2, whereby the segments are closely confined to the shaft and the lateral separation of the lower portion of either stirrer from the shaft is prevented.

The lower end of each of the bars 14 and 15 has a radially projecting arm 21 which carries an anti-friction roller 22, the latter traveling upon a cam ring 23 supported upon a hanger 24 depending from the bottom of the vessel, whereby, as the shaft 6 is rotated and the rollers follow the upper surface of said cam 23 the bars 14 and 15 will be caused to rise and fall, carrying with them the stirrers 16, the radial arms of which therefore sweep through the fluid mass contained in the vessel in constantly varying horizontal planes, so as to act upon all portions of said fluid mass and effect a thorough admixture of the component parts thereof.

If solid matters are to be dissolved in the fluid mass such solid matters will, in the first instance, be deposited upon the bottom of the vessel, and, when the shaft 6 is rotated, will be constantly stirred by the blades or rabbles 13 until finally dissolved. When the fluid mass has been thoroughly mixed it may be withdrawn from the vessel through a valved outlet 25 in the bottom of the same.

If desired, the shaft 6 may be equipped with but a single stirrer and its operating mechanism, although the use of a plurality of stirrers is preferred. It is also immaterial to my invention whether the receiving vessel is fixed and the shaft rotates therein or whether the reverse construction is

adopted, the rotating shaft, however, being the simpler and preferred construction.

My improved mixer is intended for acting upon liquid or semi-liquid mass generally, or upon a liquid mass in which solid matters have to be dissolved. It has been designed especially for mixing batches of milk, cream, sugar and flavoring extracts intended for the production of ice cream.

I claim:

1. The combination, in a mixer, of a receiving vessel, a shaft therein, an arm secured to said shaft and carrying depending rabbles for acting upon the material deposited upon the bottom of the vessel, a stirrer located in the vessel above said rabbles, and means for imparting to said stirrer longitudinal movement in respect to the shaft.

2. The combination, in a mixer, of a receiving vessel, a shaft therein, means for rotating said shaft, an arm carried by and rotating with the shaft and having depending rabbles for acting upon material deposited upon the bottom of the vessel, a rotating stirrer located in the vessel above said rabbles, and means for imparting to said stirrer longitudinal movement in respect to the shaft.

3. The combination, in a mixer, of a receiving vessel, a rotating hollow shaft therein, a stirrer contained in said vessel outside of the hollow shaft, means for causing said stirrer to rotate with said shaft, a bar extending through said shaft and connected to the stirrer above the top of the shaft, and means below the bottom of the shaft for imparting longitudinal movement to said bar as it rotates with the shaft.

4. The combination, in a mixer, of a receiving vessel, a rotating hollow shaft therein, a stirrer contained in said vessel outside of said shaft, a ring surrounding said shaft and connected to the lower portion of said stirrer, a bar extending through the shaft and connected to the upper portion of the stirrer above said shaft, and means disposed below the lower end of the shaft for imparting longitudinal movement to said bar as it rotates with the shaft.

5. The combination, in a mixer, of a receiving vessel, a rotating hollow shaft therein, stirrers contained in the vessel outside of the shaft and each having a bar extending through said shaft and connected to its respective portion of the stirrer above the top of the shaft, and means located below the bottom of the shaft for imparting longitudinal movement to said bars independently of one another.

6. The combination, in a mixer, of a receiving vessel, a rotating hollow shaft therein, a plurality of stirrers contained in said vessel outside of the shaft and each having a bar extending through the shaft and connected to its respective stirrer above the top of the shaft, a ring composed of segments surrounding the shaft and having interlocking joints, said segments being also secured to the stirrer, and means for imparting longitudinal movement to the bars of the structure which project through the shaft.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANK TYSON.

Witnesses:
KATE A. BEADLE,
HAMILTON D. TURNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."