

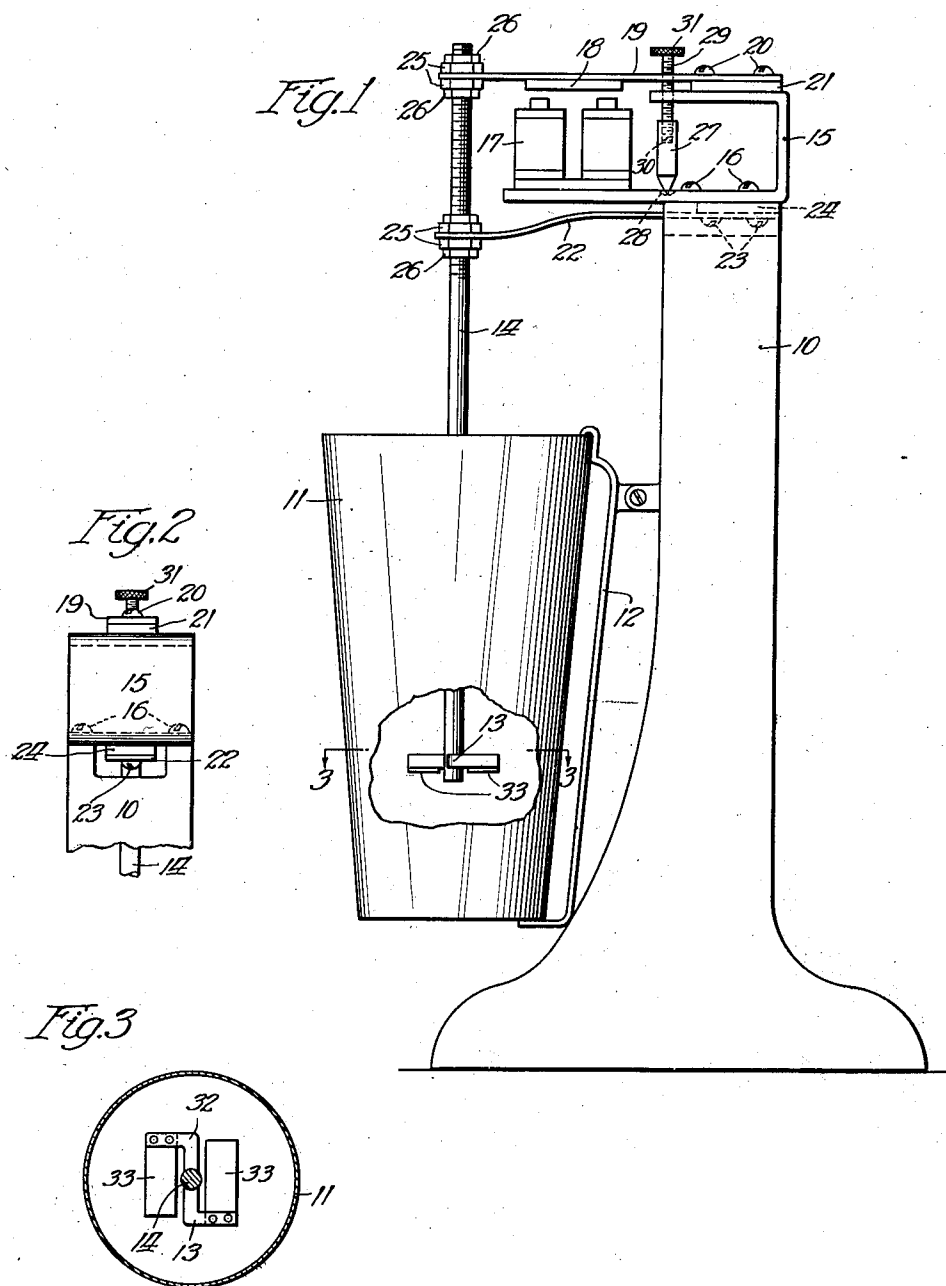
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L. J. WAHL

VIBRATOR

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Inventor
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UNITED STATES PATENT OFFICE.

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VIBRATOR.

Application filed June 28, 1926. Serial No. 119,049.

My invention relates to vibrators or agitators and has for its object the provision of an improved device of this nature for the agitation of the contents of a receptacle in such a manner as to thoroughly mix the same.

In my copending applications, respectively Serial No. 107,514, filed May 7, 1926, and No. 107,513, filed May 7, 1926, I show two forms of devices having this general nature and my present application is an improvement over the forms disclosed in said copending applications.

It is a prime object of my present invention to so construct a machine of this general character, in which a vertically reciprocable element is provided, that all bearings are eliminated. Thus, the machine requires no oiling and the machine is practically fool-proof.

My invention, similar to that disclosed in my copending applications, concerns itself primarily with the provision of a mechanism in which vibratory or reciprocatory elements are utilized in securing the mixture of the ingredients in the receptacle. To this end I utilize an electro-magnet controlling an armature, which electro-magnet is supplied with undulatory current thus to secure a to and fro movement of the armature. In the preferred form of the invention I preferably supply alternating current of the commercial frequency of sixty (60) cycles to the electro-magnet, thus producing one hundred and twenty (120) to and fro movements of the agitating member per second. I find, after considerable experimentation, that I am thus enabled to secure the proper mixture of the ingredients by this very much simplified device. The vibratory element is given an up and down motion by the electro-magnet, that is, it reciprocates vertically, and I find that by properly constructing the lower extremity of this agitating member that the contents of the receptacle are given a rotary motion by virtue of this reciprocatory motion of the agitator.

I will explain my invention more in detail by referring to the accompanying drawings in which—

Fig. 1 is a side view illustrating my improved device, certain portions being broken away more clearly to reveal a feature of construction;

Fig. 2 is a fragmentary end view; and Fig. 3 is a sectional view on line 3—3 of Fig. 1.

In the drawings, I show a standard 10 upon which all the parts of my device are mounted. This standard is provided with suitable means for carrying a receptacle 11 which may consist of the pivotally mounted supporting element 12 so that this receptacle may be inserted in place or removed therefrom at the wish of the operator. My improved agitating element 13 is mounted at the extremity of a rod 14, this rod projecting into the said receptacle. This rod is given a vertical reciprocatory movement in order to agitate the contents of this receptacle so as to cause a thorough mixing of the ingredients.

My invention concerns itself with the particular design of this agitating element presently to be described more in detail, but concerns itself primarily with the means for actuating this element, that is, the means which bring about the vertical reciprocatory movement thereof. This mechanism is found at the upper extremity of the standard 10 and consists of an L-shaped plate 15 which is suitably fastened to this receptacle by the screws 16, 16. The longer leg of the element 15 supports an electro-magnet 17 having upwardly extending pole pieces as shown, which are designed to cooperate with an armature 18. The electro-magnet is suitably supplied with alternating current so as to produce a vibration of the armature 18. The armature 18 is mounted upon a suitable, rather strong spring 19 which is held in place by means of the screws 20 upon the shorter leg of the element 15, a distance piece 21 being inserted so as to give the spring 19 freedom of movement. A second spring 22 is mounted upon the longer leg of the element 15 as by screws 23, a similar distance piece 24 being provided for the same purpose as the distance piece 21. The free extremities of the springs 19 and 22 support the rod 14 heretofore referred to.

In order to securely hold the rod in position upon the springs, I provide a plurality of nuts 25—25 which are sufficiently large so that a portion of the spring is held constantly at right angles to the rod 14, that is, no bending of the spring occurs between these nuts. Suitable lock nuts 26

then further aid to hold these parts in their adjusted position. It will be noted that the springs are adjustable relatively to the rod 14 so as to initially adjust their period of response if desired. From this it will be noted that as the armature 18 is attracted to the pole pieces of the electro-magnet 17 that the rod 14 is given a vertical reciprocatory movement, thus causing a vertical reciprocation of the agitator 13.

I provide further means which may be utilized to adjust the frequency of the springs 19 and 22 and this consists of a distance piece 27 loosely fitting into a socket 28 provided therefor in the long leg of the element 15, which distance piece 17 cooperates with a screw 29 having screw-threaded engagement with the short leg of the element 15 and loosely fitting a socket 30 provided in the upper extremity of the distance piece 17. An adjustment of the screw 29 by means of a knurled finger piece 31 spreads the legs of the element 15, thus to bring about the desired adjustment of the springs. The preferred form of agitating element is shown more clearly in Figs. 1 and 3 and this consists of a Z-shaped cross piece 32 securely held in position horizontally at the bottom of the rod 14. This cross piece 32 carries two agitating vanes 33—33 which are somewhat flexible, being made of springy material. These vanes 33 are suitably riveted to the legs of the cross piece 32. I find that a vertical reciprocation of the rod 14, thus agitating the contents of the receptacle, brings about a rotary motion of these contents whereby thorough admixture thereof is produced.

It will be noted that the device as thus described is free of any and all bearings. The movable parts are mounted upon springs so that the device needs practically no attention after having once been put together and adjusted. Its extreme simplicity will also be readily apparent.

From what has been thus described, the nature of my invention will be readily clear to those skilled in the art and it will also be apparent that many modifications may be made without departing from its spirit. However, having described one form which my invention may take, what I desire to claim and secure by Letters Patent is:

1. A device of the character described comprising a support, means associated therewith adapted to carry a receptacle, vertically reciprocable means carried by said support to agitate the contents of said receptacle and a pair of separated horizontally extending springs upon which said reciprocable means is mounted.

2. A device of the character described comprising a standard, a support thereon adapted to carry a receptacle and means pro-

jecting in part into said receptacle for agitating the contents thereof, said means including an electro-magnet and a cooperating spring mounted vertically vibratory armature.

3. A device of the character described comprising a standard, a support thereon adapted to carry a receptacle and means projecting in part into said receptacle for agitating the contents thereof, said means including an electro-magnet, a cooperating spring mounted vertically vibratory armature and an agitator controlled by said armature.

4. A device of the character described comprising an agitator adapted to agitate the contents of a receptacle and means for vertically reciprocating said agitator, said agitator comprising a pair of oppositely extending vanes mounted side by side adapted when reciprocating vertically to cause a rotation of the liquid in said receptacle.

5. A device of the character described comprising an agitator adapted to agitate the contents of a receptacle and means for vertically reciprocating said agitator, said agitator comprising a pair of oppositely extending vanes mounted side by side adapted when reciprocating vertically to cause a rotation of the liquid in said receptacle, one extremity of one vane being fixedly supported and the opposing extremity of the other vane being fixedly supported.

6. A device of the character described comprising a standard, a support thereon adapted to carry a receptacle, and means projecting in part into said receptacle for agitating the contents thereof, said means including an electro-magnet, a cooperating vertically vibratory armature and a pair of parallel springs for supporting said armature.

7. A device of the character described comprising a standard, a support thereon adapted to carry a receptacle, and means projecting in part into said receptacle for agitating the contents thereof, said means including an electro-magnet, a cooperating vertically vibratory armature, a pair of parallel springs for supporting said armature and an agitator controlled by said armature.

8. A device of the character described comprising an agitator adapted to project into and agitate the contents of a receptacle and means for vertically reciprocating said agitator, said agitator comprising a vertical stem, supporting means projecting from said stem and elongated resilient vanes each having one end secured to said means, said vanes extending in opposite directions.

In witness whereof, I hereunto subscribe my name this 18th day of June, A. D., 1926.

LEO J. WAHL.