B. E. SHATTUCK.

APPARATUS FOR MIXING BEVERAGES.

APPLICATION FILED JAN. 13, 1911.

1,067,845.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

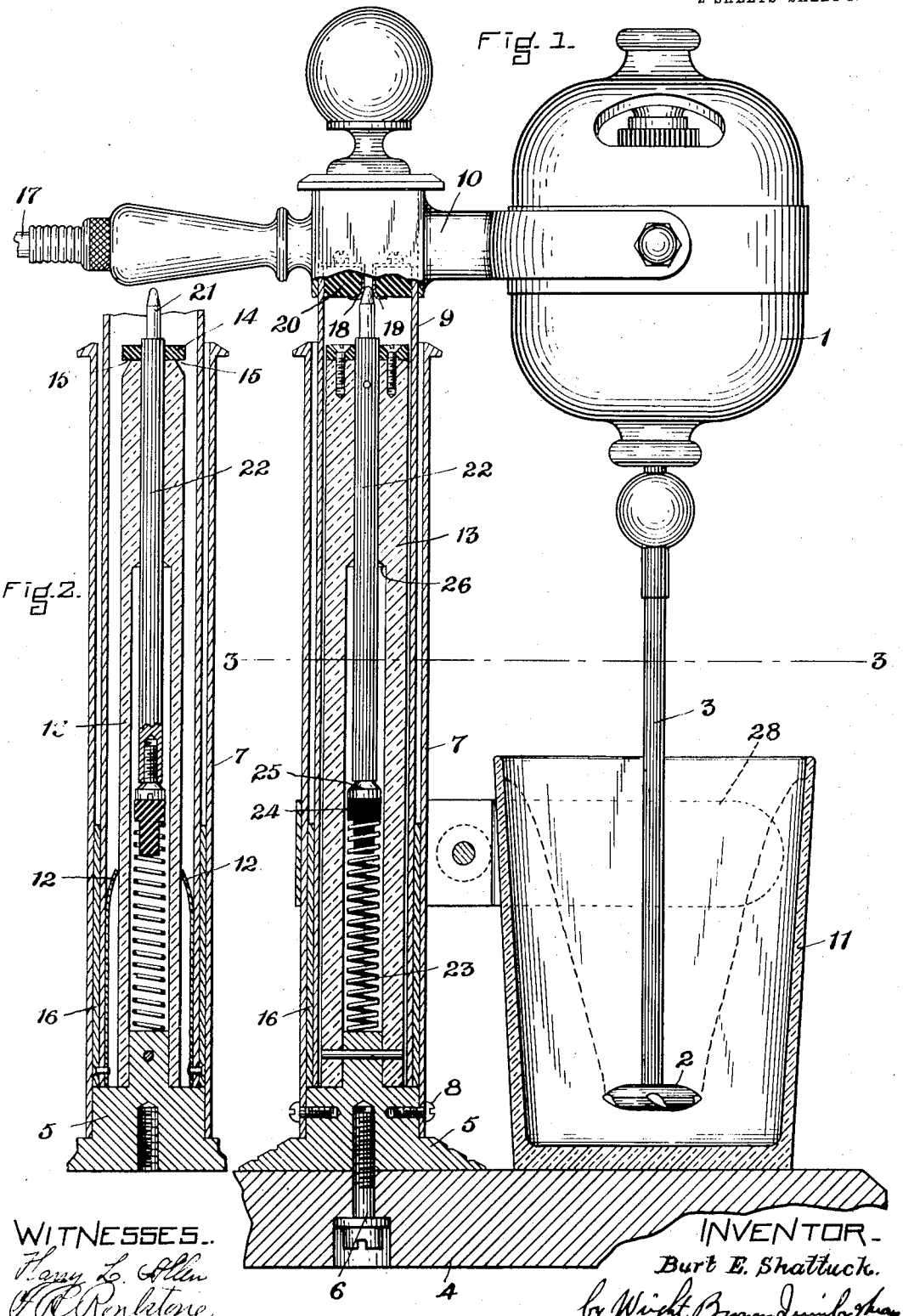

Fig. 2.

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2 SHEETS-SHEET 2.

Fig. 3.

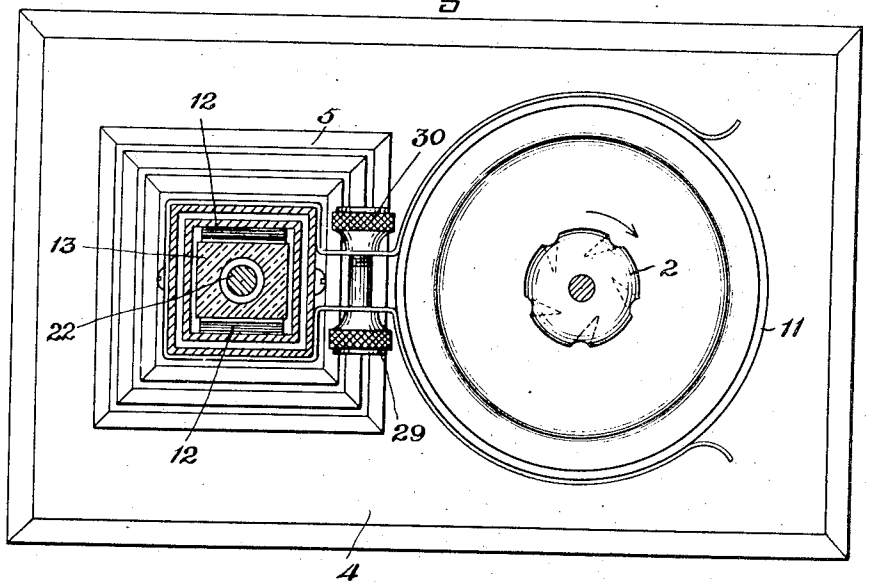


Fig. 5.

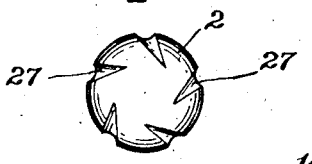
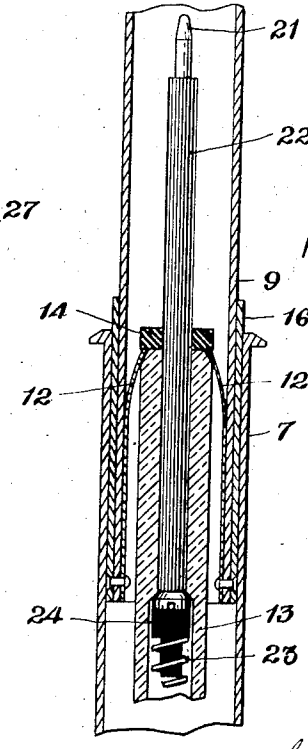


Fig. 4.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MIXING BEVERAGES.

1,067,845. Specification of Letters Patent. Patented July 22, 1913.

Application filed January 13, 1911. Serial No. 602,410.

To all whom it may concern:

Be it known that I, BURT E. SHATTUCK, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Mixing Beverages, of which the following is a specification.

The present invention relates to a mixing apparatus and has for its main object to provide an automatic machine capable of thoroughly mixing liquids together, or of mixing air with a somewhat viscous fluid, with perfectly homogeneous consistency, as in preparing beverages, beating egg batter, whipping cream, etc., without throwing the material out of the container, and doing this in a sufficiently short time to warrant the use of the machine.

A secondary object is to provide a simple and compact portable apparatus, so arranged that the agitating or beating member may be lowered and raised to enter and withdraw from the glass, or other container for the liquid.

Still another object is to provide an electrical driving motor for such an apparatus, with means by which the motor is set in operation when the agitating member is immersed in the container and stopped when the member is withdrawn.

In the accompanying drawings, I have illustrated an electrically driven mixing apparatus embodying the principles of my invention and exemplifying a mode of carrying the foregoing objects into practical effect.

Figure 1 represents a side elevation of the mixing apparatus showing a part thereof in longitudinal section. Fig. 2 is a sectional view of the post member of the apparatus on a plane at right angles to that at which the section of Fig. 1 is taken. Fig. 3 is a sectional plan view showing the parts below the line 3—3 of Fig. 1. Fig. 4 is a fragmentary sectional view of the parts shown in Fig. 2, but representing them in their extended or raised position. Fig. 5 is an under plan view of the stirring or agitating member.

The same reference characters indicate the same parts in all the figures.

The apparatus or device comprises a driver 1 which is conveniently an electric motor, a stirring or agitating member 2, a shaft 3 by which the latter is carried, and a support for the motor and agitator. The support conveniently consists of a telescopic post mounted upon a base plate 4, the latter being of such area and weight as to provide a firm foundation for the entire apparatus. The post comprises a foot piece 5 secured upon the base 4 by any suitable means such as a bolt 6, a tube 7 attached to the foot piece 5 by screws 8, and an inner tube 9 secured at its upper end to the arm or frame 10 which carries the motor. This support or post so holds the stirrer that it may extend downwardly into a glass 11 or other container for the liquid to be agitated or beaten. The telescopic arrangement of the tubes 7 and 9 allows the stirring device to be raised and held at such a height that a glass or container may be readily slipped under the stirring device.

One of the improvements in which my invention consists relates to the construction of the telescopic tube or post, and the means by which the extended condition of the post with the stirring device elevated is maintained. For this purpose the inner tube is furnished with friction and stop members, in the form, preferably, of springs 12 which bear against the sides of a post or upright bar 13, which also is secured to the foot piece 5. On the top end of the upright bar is secured a stop or abutment, consisting of a plate or cap 14, and the sides of the bar at the end next to the cap are beveled to provide notches or inclined shoulders 15. When the motor and stirrer are raised and the post extended, the inwardly bowed ends of the springs 12 enter the notches 15 and maintain the parts in their elevated and extended condition. The action of the springs is assisted by the cramping effect of the tube 9 in the tube 7. The space between the tubes at the lower end of the inner tube is filled by an intermediate tube section 16, which is secured to the lower end of the tube 9, as shown in Figs. 1 and 2. This section has an easy sliding fit in the outer tube 7. The weight of the motor being outside of, or eccentric to, the post causes a lateral thrust to be exerted between the intermediate tube section

16 and the outer tube 7, thereby producing a frictional pressure and tending to resist downward movement of the inner tube. The total frictional effect is such that when the springs are engaged in the notches 15 the telescopic post is held extended and the weight of the parts held thereby is not sufficient to shorten the post, but when an initial push is applied sufficient to disengage the springs from the notches, gravity causes the motor and inner tube to descend slowly with an even gradual motion, until the inner tube comes to rest on the foot piece 5. It will be seen that the lower, which is also the relatively stationary, part of the post is composed of two members, viz: the outer tubular member or tube 7 and the inner member or bar 13. The upper and relatively movable part of the post, which is the tube 9, moves telescopically with respect to both these members, within the tube 7 and outside of the bar 13. The tube 9 with the bar 13, and irrespective of the outer tube 7, have all the characteristics and perform all the functions of a telescopic post or support, and would serve that purpose if the outer tube were omitted. Such outer tube, however, serves the useful purpose of an additional guide for the relatively movable member, making the post, when extended, more rigid than it would otherwise be, and gives a better finish and appearance than the post would have if it were omitted. Considering the tube 9 and bar 13 as two members of an extensible post, the plate 14 is a stop at one end (the upper end) of one member, and the springs 12 are both friction devices and complemental stops at or near the respectively opposite end (the bottom end) of the other member, which coöperate with the first-named stop to prevent separation of the members when they are extended. Another important feature of the invention is an improved means, positive and certain in its action, for causing the motor to be set in operation when it descends sufficiently to immerse the agitator 2 in the contents of the container, and to cause the motor to stop when it and the agitator are raised. The current for the motor is supplied from a conductor 17, one feed wire of which is connected directly to one of the brushes of the motor, while the other is interrupted. The interruption takes the form preferably of two separated strips 18 and 19, to each of which one of the sections of the interrupter conductor is electrically connected. These strips are insulated from each other by the gap between them, and by the fact that they are secured to a piece 20 of insulating material. The circuit is completed by means of a plug 21 having an end arranged so as to enter the space between the contact pieces 18 and 19 and make contact with both of these pieces. The plug is mounted upon a rod 22 which is contained slidingly in the interior post or bar 13 previously mentioned, which is of some non-conducting or insulating material, such as wood or any other material suitable for the purpose. The rod has a close sliding fit or bearing in the upper part of a longitudinal passage in the bar 13, the extent of this bearing being so great that there is no likelihood of the rod being deflected to either side. The lower part of the passage in the bar 13 is enlarged and contains a spring 23 which bears at the lower end on the foot piece 5 and exerts an upward thrust on the rod 22 through the medium of an insulating block 24. The rod 22 has on its lower end an enlarged head 25 which coöperates with a shoulder 26 in the bore of the bar 13 to limit the amount by which the rod and plug may be projected, as shown in Fig. 4. By comparing Figs. 1 and 4 it will be seen that a considerable latitude for motion of the plug 21 and its carrying bar 22 is permitted, but that this motion is less than that of the inner telescopic tube 9. As a consequence the plug follows the motor-carrying frame 10 when the latter is raised or lowered a short distance, but is arrested and caused to break the circuit of the motor when the latter is raised to the limit. The plug is given this efficient range of movement to enable the agitator to be moved up and down in the liquid on which it acts for the purpose of thoroughly stirring and mixing the same, but its movement is so limited that the agitator is caused to cease rotating before it is raised to the limit of its upward motion, and ordinarily before it rises above the rim of the container 11. This insures positiveness in causing the motor to operate when the agitator is immersed in the liquid, and causing it to stop when withdrawn, without requiring a separate and specially manipulated switch, and also insures that the agitator will cease rotating at a level sufficiently below the top of the container to guard against throwing the liquid out of the container.

The formation of the stirrer or agitator is another most important feature of the invention. This agitator is a solid disk or head formed somewhat like a button, and having grooves 27 on its under side. The under side is convex and the notches extend from the periphery downwardly and inwardly, until they vanish in the flat under surface of the disk. The notches are inclined with respect to the radii of the disk, being tangent to a circle nearly midway between the center and circumference of the disk. The inclination of these notches with respect to the direction of rotation of the disk is toward the axis, as shown in Fig. 3. That is, the agitator turns in the direction

of the arrow, and the notches are inclined in such a way that the liquid which enters the notches and is acted upon by them is drawn inward, thus somewhat counteracting the centrifugal effect due to the rapid rotation of the agitator. The result of the form and of the rapid rotation of the agitator is that the liquid is caused to rise at the sides of the container and is drawn down at the center, leaving an open space in the center extending down to the agitator, as indicated by dotted lines in Fig. 1. The liquid is thrown into great agitation, being forced downward in the center of the container, thrown out thence to the walls of the container, raised along the walls and drawn down in the central vortex. Every particle of liquid is thus acted upon by the agitator. The apparatus is thus extremely effective in producing a thorough mixture of ingredients. One of the uses for which the apparatus is most conspicuously adapted is in the mixing of egg drinks, for this agitator is able to break up the egg into minute particles and thoroughly disseminate the same among the other ingredients of the drink, without leaving undiffused particles, lumps, or strings of the egg.

The agitator not only beats and breaks up the particles of the liquid on which it acts, but it also draws in and distributes in the liquid a considerable amount of air. Thereby it is especially well adapted for producing such frothy substances as are made by whipping or beating a somewhat viscous liquid, such as egg batter, cream, or the like. In fact I have found that the apparatus is remarkably efficient in beating eggs and whipping cream, and that after acting only a very few seconds on such substances, a froth sufficiently stiff for any purpose, and of homogeneous consistency is produced.

It should be noted that the base plate 4 on which the supporting post for the apparatus is mounted, is preferably made of stone or other material having considerable weight, so that when the post is extended and the motor raised, the base itself will not be lifted from the table or counter on which it rests. The area of the base is also extended far enough in all directions to give a stable support and to provide a space on which a glass or other container may be placed. Such a container is held in a central position with respect to the agitator by a clip 28 having curved arms to embrace the container and otherwise so made as to surround and be adjustably clamped to the post. A clamping bolt 29 with a screw 30 is provided for that purpose. When the telescopic post is extended the springs 12 are arrested by the cap 14, which provides an abutment preventing withdrawal of the inner tube, the springs and cap thus being complemental stops on the members of the post for preventing separation of the members when extended. The operator therefore, when lifting the agitator from the container, need take no care to avoid lifting it so high as to separate the parts of the post, because such an accident cannot by any possibility occur.

I claim,—

1. A mixing apparatus comprising a base, a telescopic post rising from said base, a holder mounted upon the upper end of the post, a shaft projecting downward from said holder, means for rotating the shaft, an agitator on the end of the shaft, and means carried by one member of the telescopic post for retaining the same in its extended condition.

2. A mixing apparatus comprising a base, a post rising from said base and consisting of members, one of which slides telescopically relatively to the other, a friction device carried by one of the members engaging the other, a stop engageable by such friction device for preventing separation of the members, an arm carried by the movable member of the post, a rotary shaft extending downwardly from the arm, driving means for such shaft, and an agitator on the lower end of the shaft.

3. A mixing apparatus comprising a base, a post or bar rising from said base, a tube surrounding said bar, springs secured to said tube and bearing resiliently against the bar, the bar having notches in its upper part adapted to be entered by the ends of the springs when the tube is raised, whereby the latter is held in raised position, and prevented from passing from the bar, an arm projecting from the tube, a shaft carried by said arm and extending downwardly, means for rotating the shaft, and an agitator carried on the lower end of the shaft.

4. A mixing apparatus, comprising a base, a telescopic post rising from said base, an arm projecting laterally from the upper end of said telescopic post, a motor carried by said arm, a shaft projecting downwardly from said motor parallel to the post, an agitator carried by the lower end of the shaft, adapted to be inserted in a container by downward movement permitted by the telescopic post, and means for retaining the telescopic post in extended condition and preventing separation of the members thereof.

5. In an apparatus of the character described, a telescopic post, including two members engaged together with capability of endwise movement, a switch plug mounted in one of said members and movable longitudinally thereof, a spring tending to move the plug in the direction of elongation of the post, and a stop arranged to limit the movement of the plug to an extent less than that of the elongating movement of the post.

6. A mixing apparatus comprising a motor, a shaft connected to and rotated by the motor, an agitating member mounted upon the shaft, a holder for the motor, a supporting post by which said holder is supported and with respect to which it is movable vertically, a vertically movable switch plug mounted in said supporting post, separated contact members in the motor circuit, carried by the motor-holder in line with the plug, whereby the plug is adapted to bridge the break between said contact members when the motor and its holder are lowered, yielding means tending to raise the plug, whereby it follows and remains in contact with said members during a part of the upward movement of the motor-holder, and a positive stop for arresting the plug before the upward limit of movement of the motor-holder; whereby the circuit of the motor is broken when the motor is raised.

7. A mixing apparatus comprising an extensible supporting post including in its construction a plurality of members, one of which is movable endwise relatively to the other, a shaft and means for driving said shaft mounted upon one of said members, an agitator implement secured to said shaft, a stop mounted near one end of one of said members, and a complemental stop mounted on the other member near its respectively opposite end in position to engage the first-named stop when a post is extended, to prevent separation of the members.

8. A mixing apparatus comprising in combination an upright extensible post, consisting of members one of which is movable up and down with respect to the other, a mixer carried by said movable member, and complemental stops on said members arranged to engage one another when the movable member is raised, to prevent separation of the members.

9. A mixing apparatus including in its combination a mixing implement and means for driving said implement, a support for said implement and its driving means including members interengaged and relatively movable for extension and contraction, a friction device carried by one member yieldingly engaging another member of said support and said other member having a shoulder located where it may be engaged by said friction device when the members are relatively extended, and forming a non-positive lock for coöperation with said friction device in holding said members in extended position and adapted to be unlocked by application of external force.

10. A mixing apparatus comprising a base, a post rising from said base and consisting of members movable endwise relatively to one another, and a spring carried by one of said members bearing resiliently against another of said members, thereby constituting a friction device for yieldingly retarding the relative movement of said members, and a stop mounted upon said other member in position to be engaged by said spring to prevent complete separation of the members.

11. A mixing apparatus comprising a base, a post rising from said base and consisting of members movable endwise relatively to one another, and a spring carried by one of said members bearing resiliently against another of said members, thereby constituting a friction device for yieldingly retarding the relative movement of said members, and said other member having a notch adapted to be entered by said spring when said members are relatively extended, whereby said spring forms a non-positive lock holding the members in extended condition.

12. A mixing apparatus comprising an electric motor, an agitator implement connected to and driven by said motor, a telescopic post for supporting said motor and comprising a plurality of members, one of which is movable relatively to the other, to which said motor is connected, separated terminals or contact members in the electric circuit of said motor mounted upon said movable post member, and a switch member movably supported in the stationary post member in position to make contact with said terminals when the movable post member is in one location, and positive means for disconnecting said switch member from said terminals when the movable post member is in another location.

13. A mixing apparatus comprising a composite post consisting of a stationary upright bar, a relatively movable member arranged to move endwise with respect to said bar, an electric driving motor mounted upon said relatively movable member, an agitator implement connected with said driving motor, separated terminals or contact members in the circuit of said motor mounted upon said movable member, a switch device mounted upon said stationary bar in position to engage said terminals when the movable member is lowered, a spring arranged to cause said switch to follow the movement of the terminals during a portion of the rising movement of said movable member, and positive means for separating said switch device from said terminals at a point in the travel of the movable member intermediate the limits of such travel.

14. In an apparatus of the character described an extensible post consisting of two members, one of which is relatively movable with respect to the other, separated terminals or contact members connected with the parts of an electric circuit mounted upon one of said members, a switch device mounted upon the other of said members adapted

to engage said terminals when the relatively movable members are in one position, means tending to move said switch device in the direction of relative movement of said members, and positive means for arresting said switch device at a point short of the extent of the extreme limit of such relative movement.

In testimony whereof I have affixed my signature, in presence of two witnesses.

BURT E. SHATTUCK.

Witnesses:
A. H. BROWN,
P. W. PEZZETTI.