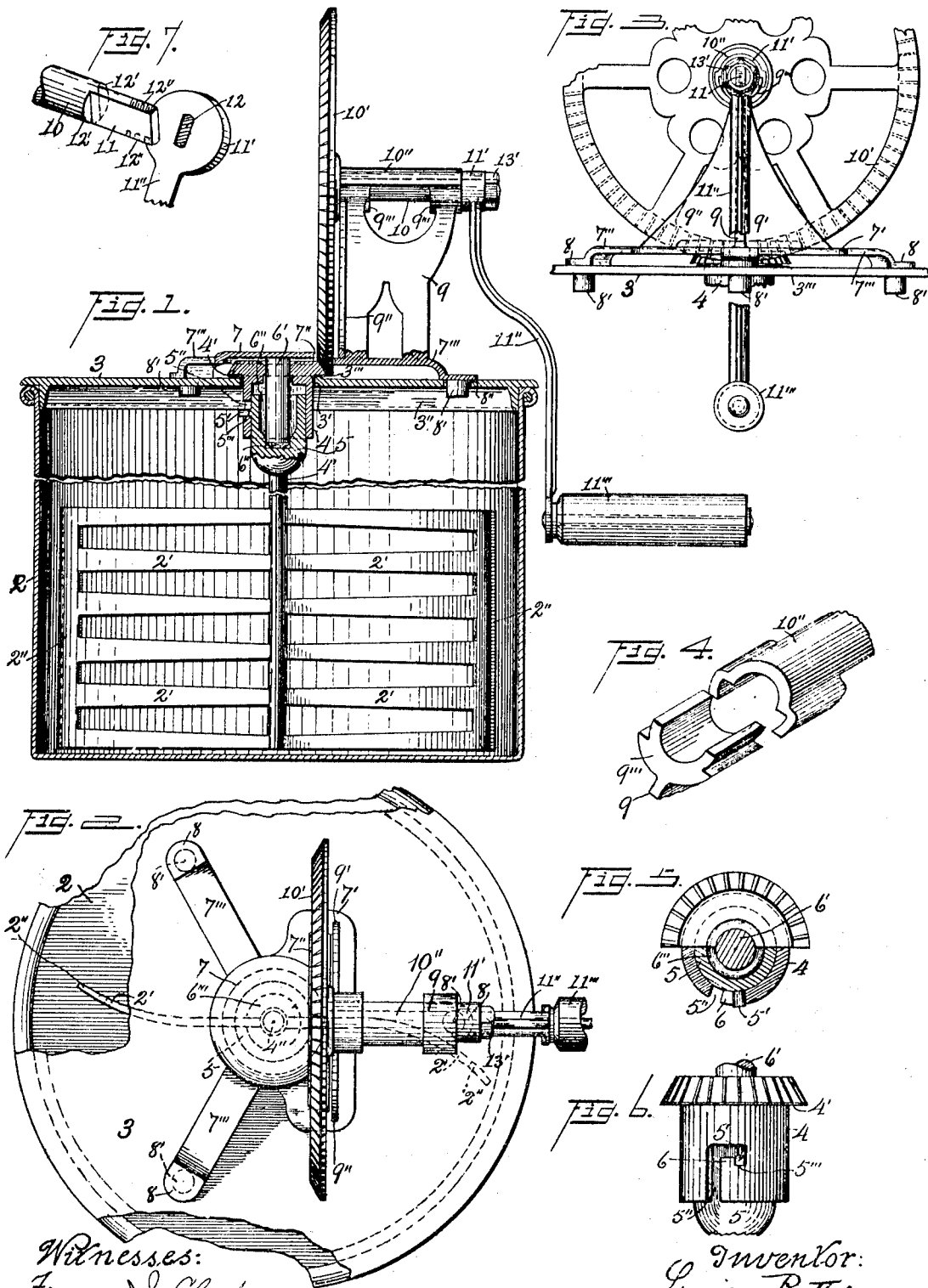


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 ROTARY STIRRER.
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ROTARY STIRRER.

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To all whom it may concern:

Be it known that I, LUCIEN PRATTE, a citizen of the United States, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Rotary Stirrers, which improvements are fully set forth in the following specification.

This invention relates to improvements in apparatus of that class appropriately known as rotary stirrers, since each thereof embodies, in conjunction with a suitable container, a rotatable operating member.

The object of this invention is to provide a rotary stirrer which shall be simple and comparatively inexpensive as regards construction; durable, efficient and reliable in practical service; which may be readily knocked down for shipment, cleansing, or other purposes; which shall embody novel features whereby are insured not only marked facility and convenience in the operation of assembling the parts for service, but,—and this mainly without the provision of separate or detachable fasteners for the purpose,—the maintenance of said parts under such relative adjustment as shall insure the most advantageous coöperative relation between the same; and which shall possess certain well-defined advantages over prior analogous constructions.

The invention consists in certain combinations, details and parts whereby, together with the novel disposition and relative arrangement of said parts, the attainment of the foregoing object is rendered practicable, all of which will be hereinafter more specifically referred to and set forth in the appended claims.

The invention is clearly illustrated in the accompanying drawings, wherein similar reference numerals denote like parts throughout the several views, as to which:

Figure 1 is a central, vertical section of a rotary stirrer embodying my said improvements, the beater proper, the primary driving mechanism, and the support for the latter, being shown in elevation. Fig. 2 is a top plan view of same, portions of the container and primary supporting medium being broken away. Fig. 3 is a view showing, in elevation, detached from the container, and looking at the crank-receiving end of the driving-shaft, the primary and secondary supporting mediums of the con-

struction, with the operating parts mounted thereon, respectively, the opposite sides of the primary supporting medium being broken away. Fig. 4 is a detail perspective view, showing one of the fixed segmental bearings for the driving-shaft, together with a portion of the bearing-cap in readiness for adjustment thereto, the scale being enlarged. Fig. 5 is a detail top plan view, partly in horizontal section, of the beater-carrying mandrel which I make use of, the scale being enlarged. Fig. 6 is a detail side elevation of the construction as shown in Fig. 5, the mandrel having been turned approximately ninety degrees to the right from the position it is shown as occupying in Fig. 1. Fig. 7 is a detail perspective view, showing more particularly minor features of the driving-shaft and the manner of adjusting the driving-crank thereto.

In carrying out my invention, reference being had to the accompanying drawings, I make use of a container 2, of any suitable material, enameled metal being preferred. Disposed at the upper extremity of said container is a primary supporting medium 3, preferably in the form of a cover, spanning and closing the entire top thereof. Supporting medium 3 is provided with a central opening 3', and at its under side, along the margin thereof, with a depending lip 3'', which fits snugly into the container 2, at the top thereof.

Within the opening 3', and projecting somewhat above and suitably below the supporting medium 3, there is freely disposed a hollow mandrel 4, the same being provided with a lateral shoulder 4', which engages the boss 3'', encircling the opening 3', and whereby said mandrel is held rotatably suspended from said supporting medium.

The mandrel 4 is provided to the end that a suitable agitating device may be disposed for coöperation therewith; and in this connection I provide a beater which comprises a vertical shaft 4'', from the lower portion of which, at suitable intervals therealong, radiate a plurality of arms 2', which arms merge, respectively, at their ends distant from the shaft 4'', into an upright gathering-web 2'', said arms and the gathering-web aforementioned being given, approximately as a whole, an appropriate general curvature away from the shaft 4'' and in the direction of the direct movement thereof.

It is preferable that the foregoing beater-

arms and gathering-web be duplicated at the opposite side of the shaft 4'', as clearly illustrated in Figs. 1 and 2 of the drawing; and attention is here particularly called to the fact that the elongated space, intervening between any pair of the arms 2', uniformly decreases in width from the shaft 4'' to the gathering-web at the distant ends of said arms. To the end that the beater aforementioned may be quickly and conveniently attached to, or detached from, the mandrel 4, shaft 4'' carries, at its upper extremity, a terminal socket 5, provided with a lateral detent 5', while mandrel 4 has formed in the wall thereof a slot-like detent-way 5'', which comprises a vertical portion, open at its lower terminus, and a horizontal portion, the latter communicating with, and leading from, said vertical portion, at the upper extremity thereof, and at right-angles, approximately, thereto, said horizontal portion communicating at its end distant from said vertical portion, with a suitable depression or notch, whose bottom provides a detent-seat 5''', all as clearly indicated in Fig. 6 of the drawings. Hence, in assembling the mandrel 4 and the beater aforementioned, for service, socket 5 having been brought into axial alinement with said mandrel, at the lower end thereof, and in a manner proper to bring the detent 5' into registry with the detent-way 5'', said socket is passed endwise into said mandrel, the latter being hollow as indicated in the drawings and as hereinbefore stated; and during this adjustment of the parts, detent 5' moves upwardly along the detent-way 5'', to the top thereof; then, by rotating either said mandrel or said socket in the proper direction and relatively to the other, detent 5' is caused to move along, and throughout the extent of, the horizontal portion aforementioned of said detent-way; whereupon, the several parts occupying an upright position, the beater aforementioned, as a whole, descends, as by its own gravity, somewhat relatively to the mandrel 4, and detent 5' accordingly finds and occupies its seat 5''', where it is flanked on one side by a portion of the general wall of the mandrel 4, and on the opposite side by a small riser, 6. It will be observed that upon the parts being assembled as hereinbefore stated, said beater and said mandrel will act as a unit, upon the latter being rotated in either direction, and barring any undue upward thrust on the former. However, primarily to insure a fixed axis of rotation for said mandrel and beater, when assembled as above specified, and incidentally to key said parts against voluntary separation, as might casually follow an upward thrust on said beater, I provide a fixed, depending arbor 6', which projects axially into and downwardly along the interior of the mandrel 4, and correspondingly into and

downwardly more or less along the interior of the socket 5, with its lower end, preferably rounded, entering and occupying a recess 6'', constituting a continuation of the bore, as 6''', of said socket, and reduced in comparison therewith.

The length of the arbor 6' is such that its extreme lower end terminates at, or in close proximity to, the bottom of the recess 6'', when the parts are adjusted in a manner to cause the detent 5' to engage and occupy its seat 5'''. Hence, under a suitable pressure exerted downwardly on the arbor 6', detent 5' will, to all practical intents and purposes, become keyed to its seat 5''', and the mandrel 4 and beater aforementioned may not be separated, either voluntarily or at the will of the user, until such pressure is withdrawn from the arbor 6', and, ordinarily, the latter is more or less withdrawn from its position within said mandrel and the socket 5. Arbor 6' performs a still further advantageous function, in that it provides, axially of the mandrel 4 and the socket 5, an extensive bearing surface, or, as herein particularly contemplated, distantly removed bearing surfaces, for said mandrel and socket jointly, and whereby is insured marked uniformity or steadiness in the rotative action of the beater aforementioned, in the practical operation of my improved stirrer.

It will be understood that any appropriate driving means may be availed of for actuating the mandrel 4, and accordingly the beater suspended therefrom; but in this connection I purpose to provide said mandrel, at its upper extremity, with bevel-teeth set circumferentially thereof after the manner of a bevel-pinion, so-called, the purpose of which teeth will appear more clearly hereinafter.

There is seated, and at all times displaceably so, on the primary supporting medium 3, a secondary supporting medium, here shown as approximating a spider in general form, and comprising a central body 7, merged laterally into an extension 7'', provided with an elongated opening 7''', and from which general structure, consisting of said body and the extension aforementioned, joined therewith, radiate, preferably at equidistant intervals with respect thereto, a plurality of legs 7''', turned downwardly near their free ends, and merged, respectively, into feet 8, which feet engage the primary supporting medium 3, at the top surface thereof, due clearance between the latter and the body 7 being accordingly provided for the upper portion aforementioned of the mandrel 4.

Substantial studs 8' depend, one from each of the feet 8, which studs project freely downward through the medium 3, by way of suitable openings, as 8'', formed therein for the purpose, said openings being suit-

ably spaced concentrically to, and each situated at a proper radial distance from, the center of said medium 3, to receive, each thereof one of the studs aforementioned. Arbor 6' is formed integrally with, and depends centrally from the body 7, and the latter spans and substantially houses the upper portion of the mandrel 4, save that marginal segment thereof which registers with the opening 7'' thereabove.

9 denotes a web-like standard, rising, as from one of the legs 7'', at right angles to the opening 7'', flanked, preferably, on opposite sides by reinforcing webs 9', 9'', and terminating at its top edge in a segmental bearing 9'', or a plurality thereof, for the reception of a driving-shaft 10. There is firmly mounted on said driving-shaft, at the end thereof which measurably overlies the body 7, a bevel-toothed driving-wheel 10', the lower margin of which projects downwardly through the extension 7', by way of the opening 7'' formed therein, to the end that the teeth of said driving-wheel may be brought into mesh with the teeth of the mandrel 4, whenever the shaft 10 shall have been duly adjusted to the bearing 9'', as clearly illustrated in the drawings.

10'' denotes a cap for the segmental bearing 9'', said cap being applied endwise to said bearing, after the manner of a dovetail, as clearly indicated in Fig. 4, and forming a complete and serviceable bearing for the shaft 10. The shaft last mentioned merges at its end opposite to the drive-wheel 10', into a flattened extension 11, adapted to receive the crank-eye 11', of a crank 11'', the latter being provided with a suitable handle 11'''; and to the end that shaft 10 shall turn with the crank 11'' upon the latter being turned, the extension 11 is longitudinally flattened at one side, or at opposite sides, thereof, and the opening, as 12, of the crank-eye 11', is shaped or formed accordingly, the flattening of said extension 11 resulting in the formation of a shoulder or shoulders 12', against which the crank-eye 11' impinges, to prevent any binding effect between the same and the driving-wheel 10', on the cap 10'' and as under stress from a fastening-nut 13', the distance between said shoulder or shoulders and said driving-wheel being greater, to this end, than the length of said cap. The extension 11 is oppositely threaded, as at the points 12'' for the reception of a fastening-nut 13', which locks the crank-eye 11' on said extension, firmly against the shoulder or shoulders 12', and incidentally, through the medium of said crank-eye, locks cap 10'' in place on the segmental bearing 9'', said cap being adjusted to said bearing prior to the adjustment of either the crank-eye 11' or nut 13' on the extension 11, all as will be readily understood.

The operating parts being assembled as hereinbefore explained, it will be noted that studs 8', each occupying the opening provided in the medium 3 to receive it, prevent shifting action on the part of the secondary supporting medium aforementioned, independently of, and concentric to, said medium 3, while at all times said secondary supporting medium, with the several elements supported thereby, may be directly and at once removed from the medium 3, by a mere lifting force applied thereto. Again, in replacing said secondary medium on the primary medium 3, arbor 6' is first inserted downwardly into the bore of the mandrel 4; whereupon, if the studs 8' chance to be in registry, respectively, with the openings 8'', they will at once enter the same, otherwise they will engage the medium 3, at the top surface thereof and at arbitrary points therealong. In this latter contingency it is only necessary to duly shift the secondary supporting medium aforementioned concentrically to the medium 3, and as about the arbor 6', to bring the studs 8' into due registry with the openings provided to receive the same, said arbor, being relatively greater in length than said studs, respectively, and acting, accordingly, more or less as a finder. A further advantage traceable to the employment of the arbor 6', resides in the fact that the elimination from the construction as a whole of any additional bearing, as at the lower end of beater-shaft 4'', is rendered feasible, the beater of my improved stirrer being merely suspended from the mandrel 4 thereof.

The various separable parts of the construction, together with the minor elements attached thereto or conjoined therewith, are preferably produced from metal, metal alloy, or other suitable material, and either by the process of casting, stamping, or otherwise, as found advisable in practice.

As to the operation of my improved stirrer, it may be stated that, the material or materials to be stirred, and consequently, where different materials or ingredients constitute the mass to be stirred, more or less intimately blended or merged together, having been placed within the container 2, and the mandrel 4 and beater aforementioned having been adjusted each relatively to the other and jointly with respect to the medium 3, the latter is positioned on, and in such a manner that said mandrel and beater jointly depend therefrom within, the container 2, as clearly illustrated in Fig. 1; then the secondary supporting medium aforementioned, with the several parts supported thereby, is positioned, as hereinbefore explained, on said primary supporting medium, under which adjustment of the parts the teeth of the driving-wheel 10' are brought into mesh with the teeth of the mandrel 4; whereupon

crank 11" is turned in that direction proper to cause the beater aforementioned to turn coincidentally with the direction of curvature of the arms 2', relatively to the beater-shaft 4".

5 During this operation, the gathering-web 2" gathers, as it were, more or less of the contents of the container 2 at and along the circumferential wall thereof and directs the same toward the axis of movement of the
10 beater aforementioned, and through the opening or openings formed in said beater, between the arms thereof, in volumes varying in conformity with the variation in width of such openings, or any thereof.

15 During the foregoing operation the user, while turning the crank 11" with one hand, applies, as with a finger or fingers of his other hand, a downward pressure, as to the body 7 of the secondary supporting medium
20 aforementioned, thereby holding the same duly in place, and incidentally steadying the whole construction while crank 11" is being thus turned.

While, as will be noted, my improved
25 stirrer may be advantageously availed of for stirring various commodities or ingredients, the same is more particularly intended for use in the process of commingling or merging together an oleaginous solid, as
30 butter, and a suitable fluid, as sweet milk, as for the production of a known and wholesome butter product; and as the application of heat becomes needful in this connection, my improved stirrer is peculiarly well
35 adapted for the purpose, since the container 2, with such contents as shall have been placed therein, may be placed directly upon or over any convenient and approved heat generator, as an ordinary cooking
40 range.

It will be seen that my improved stirrer is well adapted for the purposes for which it is intended, and further that the same may be modified to a considerable extent.
45 particularly as regards the form of either the primary or secondary supporting mediums made use of, the disposition of the rigid arbor 6', the specific features whereby detachability of the beater from the man-
50 drel made use of, is secured, and various minor details of the general construction, without departing from the spirit and principle of my invention.

I claim:

55 1. A rotary stirrer comprising a container; a mandrel having a longitudinal bore, rotatably supported thereon; a beater detachably suspended from said mandrel; and a non-rotatable arbor, the latter enter-
60 ing said mandrel axially and downwardly, and being at all times freely removable upwardly therefrom.

2. A rotary stirrer comprising a container; a mandrel having a longitudinal
65 bore, rotatably supported thereon; a beater

detachably suspended from said mandrel; and a non-rotatable arbor, the latter entering said mandrel axially and downwardly, serving, under pressure duly applied downwardly thereon, to prevent casual detach- 70 ment of said beater from said mandrel, and being at all times freely removable upwardly from the latter.

3. A rotary stirrer comprising a container; a mandrel having a longitudinal bore, rotatably supported thereon; a beater, within said container, engaging said man- 75 drel and rotatable therewith; and a supporting medium, the latter overlying the mandrel aforementioned, and having formed thereon a depending arbor, which arbor enters downwardly the bore of said man- 80 drel upon adjustment of said supporting medium being effected.

4. A rotary stirrer comprising a container; a primary supporting medium, hav- 85 ing a central opening, mounted thereon; a mandrel having a longitudinal bore, rotatably seated on said primary supporting medium, in registry with the opening there- 90 of aforementioned a secondary supporting medium, overlying said mandrel, seated on said primary supporting medium, and having formed thereon a depending arbor, which arbor enters downwardly the bore 95 of the mandrel aforementioned upon adjustment of said secondary supporting medium being effected.

5. A rotary stirrer comprising a container; a supporting medium thereon; a 100 beater therein, said supporting medium having formed thereon an arbor which depends therefrom in axial alinement with the axis of movement of said beater; and connections between said depending arbor and 105 said beater, whereby the latter may be rotated.

6. A rotary stirrer comprising a container; a primary supporting medium thereon; a beater therein; a secondary sup- 110 porting medium seated, at all times displaceably, on said primary supporting medium, and having formed thereon an arbor which depends therefrom in axial alinement with the axis of movement of said beater; 115 and connections between said depending arbor and said beater whereby the latter may be rotated.

7. In a stirrer, in combination, a container; a primary supporting medium there- 120 on; a mandrel having a longitudinal bore, mounted on said primary supporting medium; and a secondary supporting medium, the latter overlying, and having an arbor which enters downwardly the bore of, said 125 mandrel, and being thereby rendered capable of automatically finding its proper seat on said primary supporting medium, when turned concentrically thereto.

8. A rotary stirrer comprising a con- 130

tainer; a supporting medium, having an arbor formed integral therewith and depending therefrom, mounted thereon; a mandrel rotatably supported beneath said supporting medium, and having a longitudinal bore; and a beater within said container, said beater affording a shaft having a terminal socket engaging the mandrel aforementioned after the manner of a bayonet-lock, and said socket and the arbor aforementioned entering the bore of said mandrel from the lower and upper ends thereof, respectively.

9. A rotary stirrer comprising a container; a supporting medium thereon; a mandrel rotatably mounted on said supporting medium; a beater depending from said mandrel and rotatable therewith; and an additional supporting medium, the latter seated, at all times displaceably, on the supporting medium first named, overlying said mandrel, and sustaining suitable mechanism whereby the mandrel may be driven.

10. A rotary stirrer comprising a container, a supporting medium thereon, a beater therein, said beater embodying a shaft having duly spaced arms radiating therefrom and merging at their distant ends into an upright gathering-web, and the space or opening between any pair of said arms decreasing in width, as from said shaft to said gathering-web, connections between said supporting medium and said beater whereby the latter may be rotated, and a duly supported, fixed element, arranged in axial alinement with the shaft of said beater and determining the axis of rotation thereof.

11. A rotary stirrer comprising a container, a primary supporting medium thereon, a mandrel rotatably depending from said primary supporting medium, and provided, at its upper extremity with teeth set circumferentially thereof, a beater within said container and held detachably in en-

gagement with said mandrel, and in a manner to rotate as a unit therewith, a secondary supporting medium, freely seated at all times on said primary supporting medium, and provided with a fixed arbor which depends therefrom and determines the axis of rotation of said mandrel, and with an elongated opening, and a driving-shaft rotatably mounted on said secondary supporting medium, and provided with a crank and a toothed driving-wheel, the latter projecting downwardly partially through said secondary supporting medium, by way of the opening aforementioned, to permit meshing of its teeth with the teeth of said mandrel, upon said secondary supporting medium being duly positioned upon said primary supporting medium.

12. In a stirrer, in combination, a container, a primary supporting medium thereon, provided with openings arranged uniformly as to distance from the center thereof, and at equal intervals apart, a secondary supporting medium, provided with downwardly projecting studs adapted to register with and fit into, each thereof one of the openings aforementioned, upon said secondary supporting medium being duly positioned relatively to and upon said primary supporting medium, driving mechanism supported by said secondary supporting medium, a beater within said container, and connections between said beater and said driving mechanism, whereby the former is caused to rotate upon said driving mechanism being duly actuated, said secondary supporting medium having a central, depending element serving to determine the axis of rotation of said beater.

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