July 9, 1935. A. KELLEY 2,007,249

EGG BEATER

Filed April 11, 1931

Fig. 1,

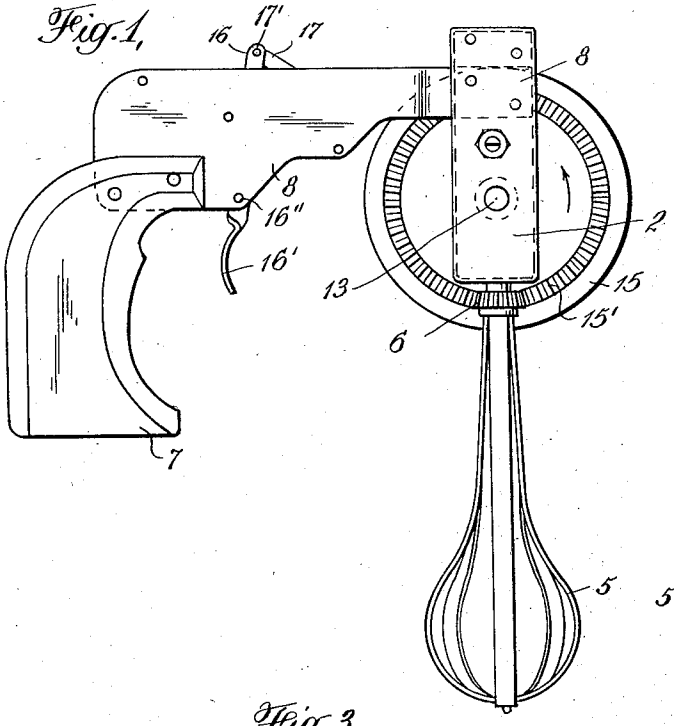


Fig. 2,

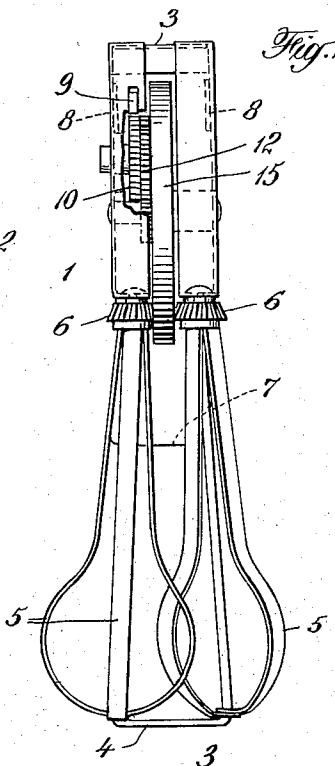


Fig. 3,

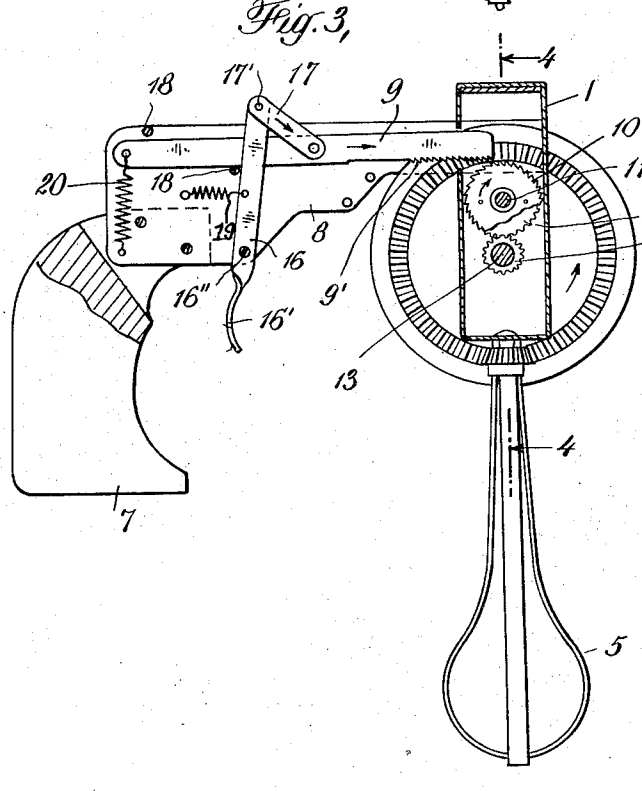
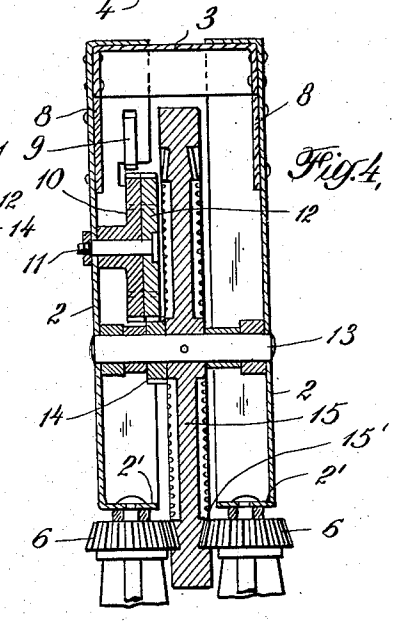


Fig. 4,



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EGG BEATER

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Application April 11, 1931, Serial No. 529,336

5 Claims. (Cl. 259—131)

This invention relates to improvements in the construction of egg-beaters, etc., and its chief object is to provide a device of this kind which will be easier to hold and operate than ordinary egg-beaters, yet accomplish more satisfactory results more quickly than heretofore possible.

A particular object of the invention is to provide an egg-beater which can be securely and easily held in place with but one hand, and operated by the fingers of that hand, leaving the other hand entirely unoccupied and free for holding the bowl, for adding ingredients thereto, etc.

Another object of the invention is to provide a beater in which the hand-power necessary to turn the mixer-blades will, disregarding the gradual thickening of the liquid, progressively decrease as the beating progresses, instead of increasing as in the ordinary beater; and in which the initial or starting power necessary will be reduced to the minimum.

A further object of the invention is to provide a beater in which the power necessary to operate the device will be applied horizontally, instead of vertically and the weight of which will be balanced by the act of holding it, in such manner as to obviate the usual unbalanced vertical forces, thereby reducing to a minimum the tendency of the end of the beater to slip around, spatter the contents, or overturn the bowl, as well as to make it easier generally to handle and operate.

An embodiment of my improved beater and mixer is shown in the accompanying drawing. In the drawing,

Fig. 1 is a side elevation;

Fig. 2 an end elevation, partly broken away;

Fig. 3 a substantially central longitudinal section, partly in elevation, and

Fig. 4 is an enlarged sectional detail on line 4—4 of Fig. 3.

The construction in the drawing comprises a substantially central, vertically extending yoke-frame 1, to which all the other elements of the device are attached. This yoke-frame, for manufacturing simplicity, is made by assembling together two parallel side plates 2, each of which is flanged or bent inwardly at each vertical edge, front and back. The parallel plates are united, at their tops only, by the cross plate 3, to which they are riveted. However, if desired, the whole bifurcated hollow structure may be made by die-stamping it at one time out of a single sheet of metallic material.

The lower portion of each side plate 2 is also inwardly flanged, as shown at 2', and mounted therein there is a substantially U-shaped member 4. This member 4 may consist either of an ordinary elongated U-bolt provided with suitable end nuts; or, as is preferable, of the specific bail-shaped member shown as riveted to the flanges 2' at each end. Disposed around each leg of the bail is an agitating element 5 preferably of the four-bladed type shown. The upper end of each of the four blades is soldered or otherwise suitably attached to the hub of bevel gears 6, 6, each bevel gear being loosely journaled on the leg of the bail 4. Satisfactory bearings are provided for each end of each agitator element, and the agitator elements are also placed in such relation to each other that the paths of the blades thereof overlap in an advantageous manner.

Suitably attached to the side plates 2 near the upper end of the central frame and extending substantially at right angles to the primary structure, are two transversely spaced plates 8, 8. These plates are suitably connected together, in transversely spaced relation, by rivets, screw bolts, or the like, two of which hold between the plates a handle 7, preferably shaped like the stock or grip of a pistol. The handle may, if desired, be made in two equal sections overlapping the ends of plates 8, instead of being embraced by the plates.

Loosely mounted between the plates 8, and guided at one end, top and bottom, by suitable transversals 18, is a thin elongated bar 9. This bar is connected to the rest of the structure only by a tension spring 20, normally tending to hold down the outer end of the bar, as shown. Hence the bar is adapted to be moved forwardly and backwardly and is also free to move to some extent in a vertical direction. The lower edge of this bar 9, starting at any desired distance back from the frame end thereof, is formed into rearwardly slanting ratchet teeth 9'. A bar 16, preferably shaped at its lower end 16' like the trigger of a pistol and also preferably mounted in the side plates 8 at a position corresponding to that of a pistol's trigger, is pivoted at 16'' between the side plates 8, and at 17' has an overhead link 17 pivoted thereto. The lower end of the link 17 is pivoted at a suitable point upon the rod 9. The trigger 16' can thus be grasped by the forefinger of a hand encircling the stock 7.

A ratchet wheel 10 is rotatably mounted on a stub shaft 11, preferably detachably mounted in the side plate 2, and is adapted to be engaged, on occasion, by the teeth on the ratchet rack 9. The stub shaft 11 also bears fixed on its innermost end, a spur gear 12, preferably equal in diameter

to that of the ratchet wheel. A main shaft 13 is suitably mounted in bearings extending transversely of the gear casing, and bears a very much smaller fixed gear 14 for meshing with the larger spur gear 12 and is adapted to be driven thereby at a high speed.

Substantially on the transverse center line of the shaft 13 a member 15 is fixedly mounted. This member consists essentially of a wheel having a massive, enlarged periphery, so as to have a marked fly wheel effect when rapidly rotated. Just inside the circumference of the enlarged periphery, on each face of the fly wheel, there is cut an outwardly slanting circular bevel gear, 15'. The member 15 is driven at the same angular velocity as is gear 14, but at a many times greater linear velocity. The bevel gears 15' engage respectively with the bevel gears 6 of the agitator elements.

When the trigger 16' is pressed back with the forefinger while holding the handle with the rest of the hand, the lever 16 moves the bar 9 forwardly against the action of the spring 19 and downwardly against the action of the spring 20, causing the teeth 9' to engage the teeth on the wheel 10 and rotate same a partial revolution. The beaters attached to bevel gears 6, which have a much smaller number of teeth and diameter than the wheel 15, which has a linear velocity many times greater than that of the ratchet wheel, are thereupon rapidly rotated and by their interaction and high speed produce a very effective "beating" of the eggs, cream, or other desired substance. When the finger on the trigger 16' is relaxed, the spring 20 pulls down the far end of the bar 9 and the rack end is instantly pulled up and held off the wheel 10. Simultaneously, the spring 19 retracts the bar 9, which is thus removed from all contact with wheel 10. Thus all the rotatable parts of the device, including the member 15, are released and left free to revolve in the central frame, without any drag or brake on them other than bearing-friction. Thus the member 15, rotating freely like a fly wheel, gathers momentum and stores up energy, due to the moment of inertia of the massive periphery. Hence, after the trigger has been pulled fully and released a few times to get up momentum, the beater may be kept at the desired speed by an intermittent operation of the trigger, which is not nearly so tiring as the direct rotation of the rotary driving element, as in the ordinary beater. Once the fly wheel has been gotten up to speed only that force necessary to compensate for the inevitable thickening of the liquid and for bearing-friction, will have to be applied by the user, who can more than overcome this and keep it at high speed by merely slightly tensing the fingers occasionally. It is hence evident that the minimum of exertion is required in operating the beater of the present invention. Since also by virtue of the power-applying and transmitting means of the present invention, the beaters are revolved at a much greater speed than can be achieved in ordinary beaters, it is obvious that the time required for finishing a given piece of work is considerably reduced from that usually necessary.

Though the device is placed in the usual manner in a bowl containing the substance to be beaten, with the blades resting on bottom thereof, the general "hook-shape" configuration of the device, pivoting down around the handle into the bowl, makes it easy to maintain it in place without requiring the heavy downward pressure needed in ordinary beaters. Due to the pistol-like arrangement of the operating means, with most of the weight at the "nose" end of the "pistol", instead of applying the motive force displacing or upsetting the device, pulling the trigger tends to hold the lower end more firmly in place in the bowl. By these means, the danger of upsetting the bowl, etc. is reduced to the minimum.

All the parts of the device, including all the gears, can be easily and cheaply made from sheet metal by stamping or die-cutting, though, if desired, the gears can instead be made out of cheap castings. There is hence no complicated machining involved, and since the device can be made of some relatively inexpensive material such as sheet steel or iron, though of the improved construction outlined above it may nevertheless be made at almost the same cost as the ordinary egg-beater.

I claim:

1. In a device of the class described, an agitating member, a gear for actuating said member, a pistol-like frame, a trigger-like member therein, a one-way actuator for the actuating member, a link-connection between said trigger and said actuator, means for retracting the trigger, and means for depressing one end of the actuator to cause the same to engage and actuate said gear.

2. In a device of the class described, a pistol-like frame, a trigger-like member supported therein, a ratchet-toothed rack thereinabove, a link connecting the trigger and the rack, a spring for retracting the trigger, and a spring for depressing one end of the rack when the trigger is released.

3. In a device of the class described, a support, an agitator, an actuating member for the agitator, means carried by said support and normally disconnected from the actuating member, said means including a reciprocable member operable when moved in one direction to apply power to the agitator-actuating member, said means being the sole power applying means for said actuating member.

4. In a device of the character described, a support, a plurality of agitators, an actuating member for the agitator having a counterweighted periphery with a relatively excessive moment of inertia, said periphery having driving formations at opposite sides for imparting movement to said agitators, means carried by said support and normally disconnected from the agitating member for intermittently applying power thereto, said means being the sole power-applying means for said actuating member.

5. In an egg beater, a vertical frame, a beater member carried by said frame, a pistol-frame attached thereto in substantially parallel relationship with the beater member and having a pistol handle depending below the center of gravity of the beater, a trigger adjacent the handle for applying power with one finger, the pivotal point for said trigger being above the center of gravity of the beater, a gear for driving the beater member, an actuating member for said gear, said actuating member applying power to said gear in one direction only and a connection between said trigger and said actuating member for operating the latter as the trigger is operated.

ALBERT KELLEY.