Nov. 11, 1947. F. C. BOOTH 2,430,600

BEATER

Filed May 1, 1944

Fig. 1

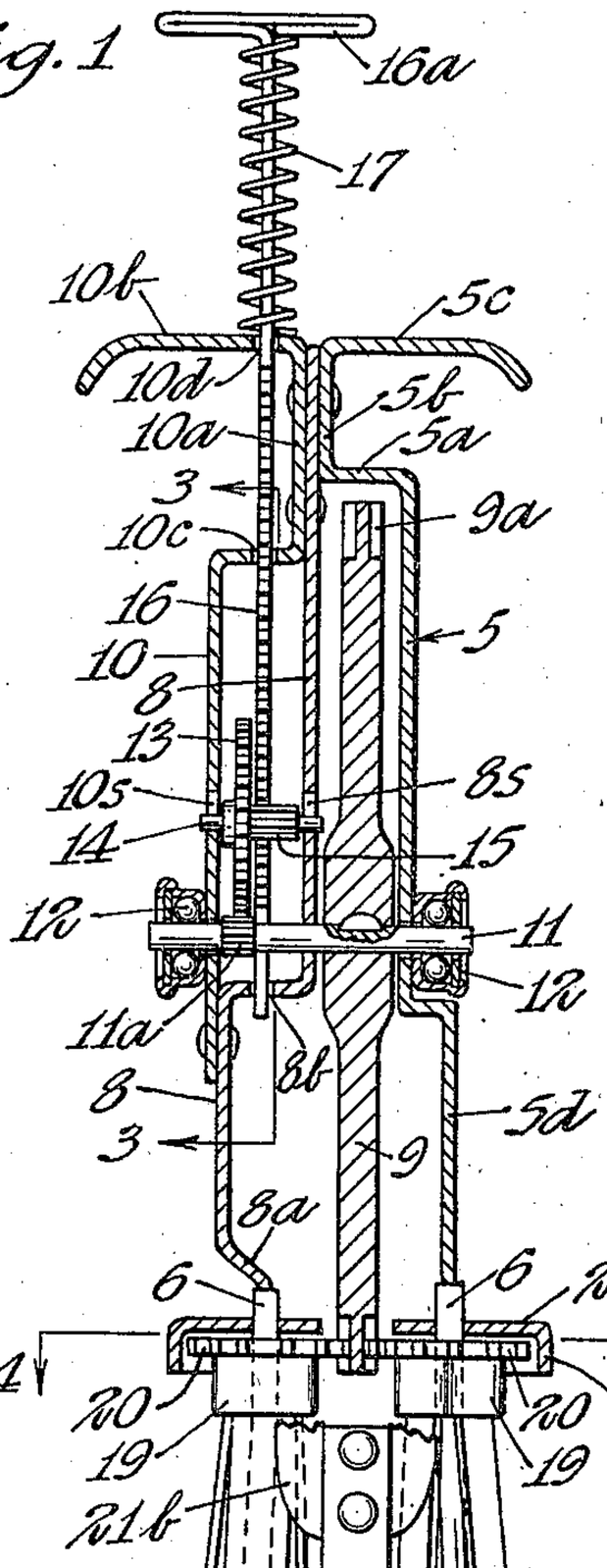


Fig. 2

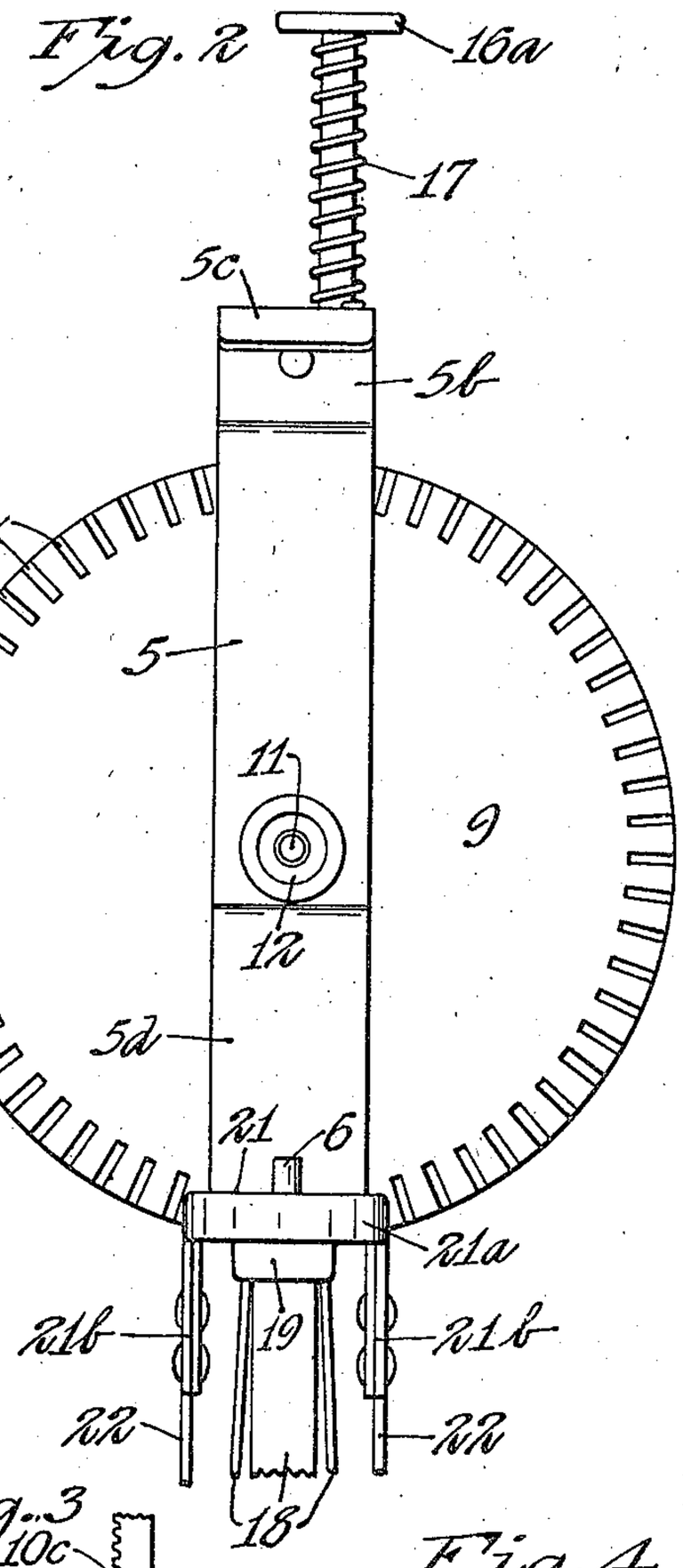


Fig. 3

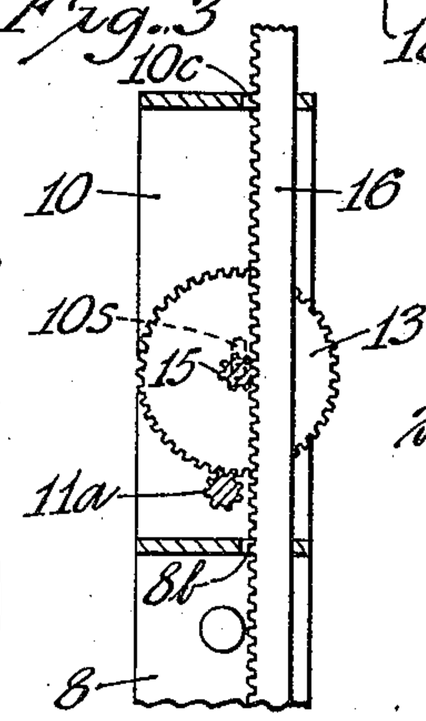
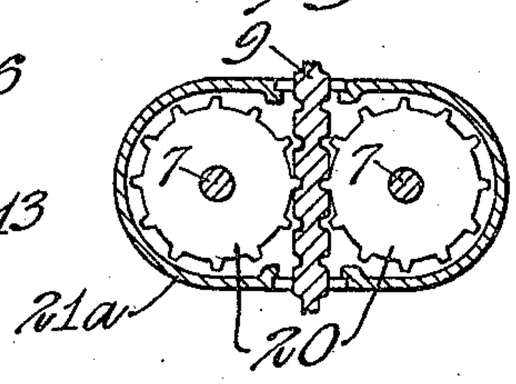


Fig. 4



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BEATER

Fred C. Booth, Minneapolis, Minn.

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2 Claims. (Cl. 259—131)

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This invention relates to beaters for liquid food mixtures such as eggs, cream, mixed drinks, etc.

It is an object of the invention to provide a beater of the class described which will be more conveniently operated and held than conventional types of egg beaters now extensively utilized.

More specifically it is an object to provide a beater which may be conveniently held in place and operated with one hand through the cooperation of fingers and thumb or fingers and palm of the hand to efficiently apply power with the elimination of cranks and the equivalent mechanical elements.

A further object of the invention is the provision of a compact highly efficient beater which is continuously operated through the reciprocating movement of a plunger member carrying a rack.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the views, and, in which:

Figure 1 is a view mostly in vertical longitudinal section and partly in side elevation of an embodiment of my invention;

Figure 2 is a side elevation of the upper portion of the beater;

Figure 3 is a vertical section taken on the line 3—3 of Figure 1; and

Figure 4 is a cross section taken on the line 4—4 of Figure 1.

In the embodiment of my invention illustrated a suitable frame for the power parts and working mechanism is provided, for the most part by strip metal of comparative rigid construction comprising a vertical side member 5 having its upper portion first angled for a short distance to form a flange 5*a* and then again bent upwardly at 5*b* to afford an attachment abutment and having its upper extremity then turned outwardly forming a finger gripping piece 5*c*, as clearly shown in Figure 1.

The lower portion of frame strip 5 is offset throughout a portion 5*d* with its lower extremity secured to a connector clip 6 which in turn is rigidly secured to the slotted upper end of an axle rod 7 for one of the beater elements. The second or intermediate frame strip 8 has its upper end connected with the abutment attachment portion 5*b* of the first strip and extends downwardly in parallel spaced relationship to the intermediate portion of strip 5 defining a wheel receiving space for accommodating the upper portion of a geared fly wheel 9. The lower portion of frame strip 8 is angularly bent outwardly and then downwardly and its extremity is inwardly bent at 8*a* to make rigid connection with a connection with a connector clip 6, the lower end of which is rigidly secured to the upper end of a second axle rod 7 upon which the second beater element is mounted. The two axle rods 7 may be constructed from an integral, heavy, relatively rigid wire shaped in the form of a yoke and flattened at its horizontal lower end and each having its main portion or shank inclined somewhat from the vertical with its lower portion bowed outwardly to avoid interference with the beater element disposed on the opposite axle rod. The rod 7 thus diverge somewhat from their upper to their lower ends.

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A third frame strip 10 is employed having a vertical upper portion 10*a* which is secured flush against the upper portion of intermediate frame strip 8, a rivet or other suitable means uniting the upper portions of frame strips 5, 8 and 10. The upper extremity of strip 10 is out-turned forming a finger piece 10*b* which extends for the most part in alignment with finger piece 5*c* of the first frame strip. The body and greater portion of frame strip 10 is disposed outwardly in offset relationship to the attachment portion 10*a*, being spaced from frame strip 8 a sufficient distance to form in conjunction therewith a mounting and housing for the power transmission elements of my device.

The geared fly wheel 9 is mounted between frame strips 5 and 8 being keyed or otherwise secured to a relatively heavy horizontal shaft 11 which is journalled in suitable bearings 12, as shown, of the ball type affixed to the outer sides respectively of frame strips 5 and 10. Shaft 11 has affixed near the left-hand end thereof a driven pinion 11*a* which normally is in mesh with a relatively large driving gear 13 affixed to a horizontal stub shaft 14, having its ends slidably mounted in vertical slots 8*s* and 10*s* provided in the medial portions of frame strips 8 and 10, it being clear that when stub shaft 19 is disposed at the lower ends of said bearing slots, gear 13 is then meshed with driven pinion 11*a*. Stub shaft 14 has also affixed thereto a pinion 15 the outer end of which is spaced a slight distance inwardly of the frame strip 8 and which pinion is in constant mesh with a vertical rack bar 16 which may be constructed of rugged relatively rigid metal of a suitable gauge. Rack bar 16

is guided at its lower end in an apertured portion 8*b* of the strip member 8 which extends horizontally to form the offset and its upper portion extends through a suitable slot 10*c* and an apertured portion 10*d* in the finger piece portion of the strip portion 10. The rack bar 16 is of sufficient length to project in its inoperative position for some distance, say approximately one and one-half inches or two inches above the finger grip pieces 5*c* and 10*b* terminating at its upper end in a reinforcing crosshead 16*a* which is adapted to be depressed either by the thumb or the palm of the hand. A coil spring 17 is interposed between the finger piece 10*b* and the underside of said crosshead 16*a* urging said rack bar to its upwardly projected normal position.

A pair of more or less conventional blade-beater elements 18 having upwardly converging shank portions 18*a* and looped lower portions 18*b*, are pivotally mounted upon the axle rods 7, said elements, as is commonly the case, being constructed from hardened thin strip metal such as spring steel and having their upper ends affixed to annular collars 19 which are rotatably mounted on the upper portions of the axle rods 7. Sprockets 20 are affixed to the upper ends of the collars 19 and to the beater elements and these sprockets are in constant mesh with gear teeth 9*a* and 9*b* respectively formed on the outer and inner marginal portions of the geared fly wheel 9. A reinforcing mounting head 21 of general elliptical shape and having a depending guard flange 21*a*, covers the top and edges of the sprockets 20 and serves to reinforce the connection between the frame members 5 and 8 with the axle rods ends and is provided at the front and back of the beater with large depending attachment lugs 21*b* to which the upper ends of a reinforcing yoke member 22 are attached at front and rear of the beater, said yoke member being looped at its lower portion to clear and be spaced from the loops of the beater elements 18. The central portion of the loop yoke member 22 is riveted or otherwise rigidly affixed to the intermediate portion of the yoke member which forms the axle rods 7.

Figure 3 clearly shows the operating parts which transform reciprocating motion and to continuous rotary motion of the two cooperating beater elements.

In operation the device is held and operated by the use of one hand only, the index and second finger of the hand preferably being disposed beneath the finger pieces 5*c* and 10*d* with either the thumb or the palm of the hand positioned above the T head 16*a* of the rack bar plunger to depress the same. When the rack bar 16 is depressed and in constant mesh with the pinion 15 fixed to shaft 14, rotary movement is imparted to this shaft and the shaft is, during the downward movement of the rack bar, journalled in the lower ends of the bearing slots 10*s* and 8*s* respectively, gear 13 being then meshed with the driven pinion 11*a* on the main wheel shaft 11. Geared wheel 9 is thus rotated and is of adequate thickness and weight to produce a fly wheel effect and, of course, drives the two sprockets 20 for the beater elements in opposite directions, the blades of the beater elements being properly synchronized and positioned to cooperate and clear in their rotated movements. When pressure on the rack bar is released spring 17 retracts the bar, moving the same upwardly and in so doing through the meshing of the small pinion 15 with the rack bar 16 slightly raises shaft 14 in the slotted bearings 8*s* and 10*s* respectively, thereby disengaging the

driving gear 13 from driven pinion 11*a* of the main shaft. Thus the fly wheel 9 continues to revolve and speed is progressively increased through successive downward reciprocating strokes of the plunger or rack bar 16.

The operation of the device is very convenient, enabling an operator to manipulate and position the device with the use of one hand only. A gyroscopic action is produced by the rapidly rotating fly wheel 9 which tends to stabilize the position of the beater in the material to be mixed or beaten and with the very efficient transmission of rectilinear movement to the rotating wheel shaft. Adequate power and speed may be obtained for beating thick liquids or semi-liquids as eggs, mixtures of flour, cream and many food products.

It will, of course, be understood that various changes may be made in the form, details, arrangements and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. A hand-supported beater device, having in combination, an upright frame having a lower portion for journalling a pair of beater elements, the upper portion of said frame including a pair of upwardly extending strip members spaced apart at their intermediate portions and fixed together adjacent their upper portions, said frame including a third strip extending parallel to and intermediate of the spaced portions of said first mentioned and outer strips, a shaft extending transversely through all of said strips; means on said outer strips for journalling said shaft, a beater-driving wheel fixed to said shaft and accommodated between said third strip and one of said outer strips, the upper extremities of said outer strips being out-turned to provide finger grips, a reciprocating, actuating member extending longitudinally of said frame and having its driving portion accommodated between said intermediate strip and one of said outer strips, driving connections between said reciprocating member and said wheel for revolving said wheel when said reciprocating member is depressed, resilient means for elevating said actuating member, means for releasing driving engagement between said actuating member and said wheel during the elevating stroke of said actuating member and said actuating member having a head piece extending above said frame.

2. A hand-supported beater device having in combination, an upright frame having a lower portion for journalling a pair of beater elements, the upper portion of said frame comprising a pair of upwardly extending strip members spaced apart and disposed parallel at their intermediate portions and offset and secured together at their upper portions, said frame including a third strip extending parallel to and intermediate of the spaced portions of said first mentioned outer strip, a shaft extending transversely through all of said strips, means on said outer strip for journalling said shaft, a beater driving wheel fixed to said shaft and accommodated between said intermediate strip and one of said outer strips, the upper extremities of said outer strips being out-turned to provide finger grips, a reciprocating rack member having its lower portion accommodated between said intermediate strip and the other of said outer strips, said last mentioned strips having angularly bent portions wherein said rack member is guided, a shiftable gear mounted between said last mentioned pair of strips and meshed with said rack and adapted to be meshed with said shaft during the downward stroke of said rack,

said reciprocating rack member extending above said frame and having a head piece and a spring interposed between said head piece and the top of said frame for elevating said rack.

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