July 2, 1929. M. SYDNEY 1,718,989

BEATER

Filed April 6, 1925

Fig. 1

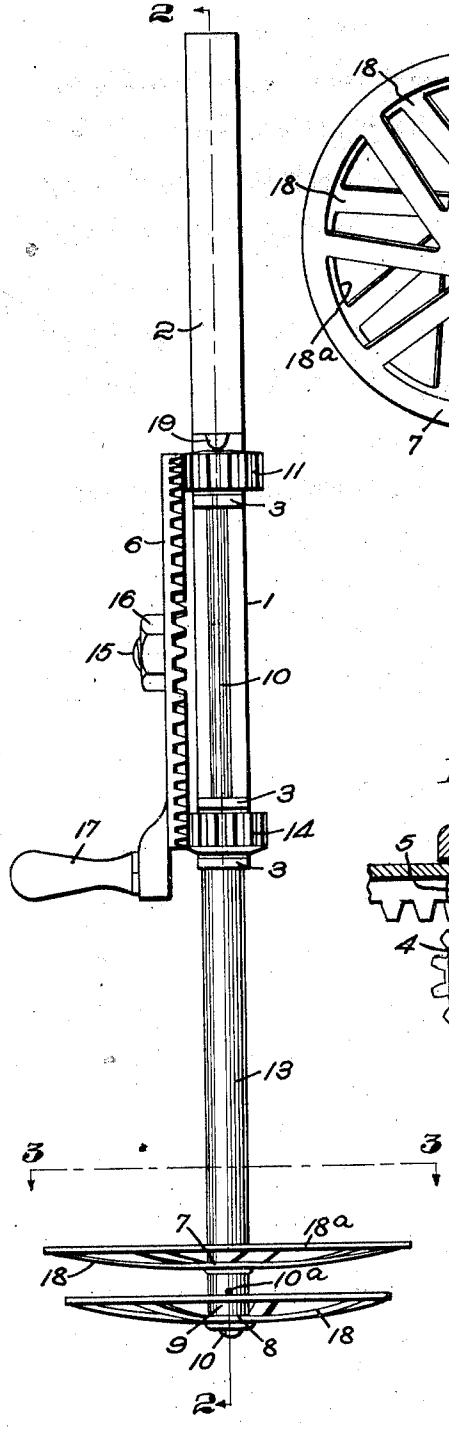


Fig. 3.

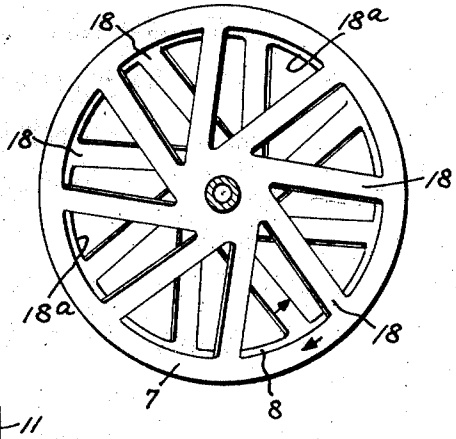


Fig. 2.

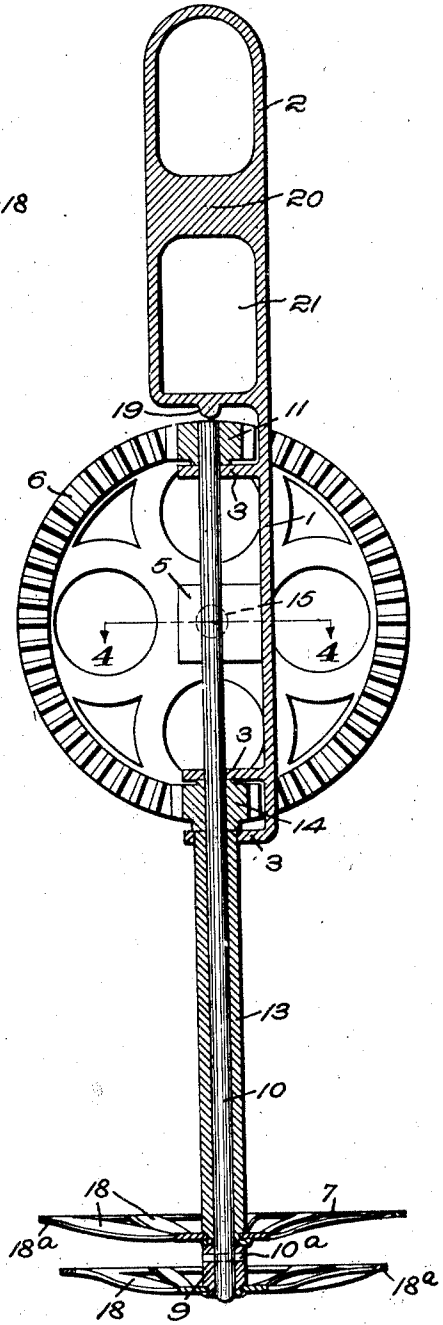
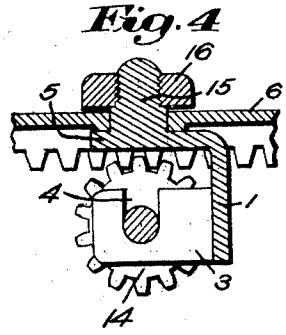


Fig. 4



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UNITED STATES PATENT OFFICE.

MINATOJO SYDNEY, OF BOSTON, MASSACHUSETTS.

BEATER.

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This invention aims to provide an improved beater, particularly, though not exclusively, useful for beating eggs, cream, etc.

In the drawings which illustrate a preferred embodiment of my invention:—

Fig. 1 is an elevation view of the beater;

Fig. 2 is a section on the line 2—2 of Fig. 1, being partly in elevation;

Fig. 3 is a plan section on the line 3—3 of Fig. 1 showing the propeller-like members; and

Fig. 4 is a section on the line 4—4 of Fig. 2 showing the assembly of the parts of the beater.

Referring to the drawings, I have shown a beater which includes a frame part 1 formed from a single piece of metal. The frame presents a handle 2, a plurality of fingers 3 axially aligned with the handle and a plurality of U-shaped slots 4 facing toward a finger 5 formed integral with the frame for supporting a driving gear 6. The beater also includes two propeller-like members or beaters 7 and 8 located one above the other at a substantial distance below the frame.

The beaters are formed in units, each of which includes a propeller-like part, a shaft and a pinion gear, and both units are assembled together prior to assembly with the frame. The beater 8 is secured to a collar 9 which in turn is secured to one end of a shaft 10 by a pin 10^a, as best illustrated in Fig. 2. At the other end of the shaft I have provided a pinion gear 11 which may be secured to the shaft 10 in any suitable manner. The propeller-like member 7 is secured directly to one end of the hollow shaft 13 surrounding the shaft 10 and at the other end of the shaft 13 I have secured thereto a second pinion gear 14, similar to the pinion 11. The second described unit may be entirely assembled and placed over the shaft 10 before the pinion gear 11 is secured to the shaft 10, then when this pinion is secured in its proper position, both units are assembled, although one may slide axially relative to the other for purposes more fully hereinafter described.

The whole beater is assembled as follows:—

First the shafts 10 and 13 are placed into the U-shaped slots 4 by sliding them between the finger 5 and the fingers 3, Fig. 4, then into the slots 4 so that the pinion 11 is located between the upper finger 3 and the handle 2. The pinion 14 is placed between the two lower fingers 3 thereby preventing axial movement of the beater units relative to the frame 1 or relative to each other. The driving gear 6 is then placed over the hub 15 formed integral with the finger 5 and a nut 16 is threaded onto the hub to hold the gear in position. The gear 6 meshes with the pinions 11 and 14 and prevents movement of the shafts 10 and 13 out of the U-shaped slots until the nut 16 is removed. Thus all the units of the beater are held in assembled relation by a single nut. The usual handle 17 is provided on the gear 6 for rotation thereof. The rounded projection 19 is formed on the handle 2 so as to provide a smooth bearing point for the end of the shaft 10.

The propeller-like members 7 and 8 are pressed from sheet metal and have blades 18 twisted so as to direct the medium, which is being mixed or whipped, upwardly in the case of the member 8 and downwardly as in the case of the member 7, thereby insuring a complete mixing of the medium. The blades 18 are connected at their outer ends by a continuous ring or band 18^a, Fig. 3, and from this band the blades extend toward the center or hub portion of the propeller-like member tangential thereto and at an angle pointing away from the direction of rotation relative to a radial line from the center of the shaft. This is done so that the medium may be carried from the outer ends of the blades toward the center of the propeller-like members. These members are rotated in opposite directions and, therefore, the blades of each member slant inwardly in opposite directions as clearly indicated in Fig. 3.

In operation, the gear 6 is rotated, thereby turning the pinion gears at a relatively high rate of speed and in opposite directions, thereby turning the shafts so that the propeller-like members 7 and 8 are whirled at a relatively high rate of speed in opposite directions. When this action takes place with the rounded end of the shaft 10 resting on the bottom of a pan or dish, the substance therein will be drawn from the sides of the dish by both members 7 and 8. The blades 18 of the member 8 draw the substance from the edges of the dish toward the center thereof and at the same time direct it upwardly into the path of the member 7. At the same time the blades 18 of the member 7 are drawing the substance to be whipped from the edges of the dish toward the center and downwardly into the path of the member 8, thereby insuring a complete intermixing process, the whole substance being churned over and over.

The web 20 is formed in the handle 2 to prevent grasping the handle with the fingers in the opening 21, as it has been found that the whole handle must be grasped to properly steady the beater during operation.

Assembly and disassembly of the beater is such a simple operation that the beater may be taken apart so that the units may be moved axially relative to each other to provide a convenient space between the propeller-like members 7 and 8 whereby the blades may be very easily and quickly cleaned.

While I have shown and described a preferred embodiment of my invention, it will be understood that changes involving omission, alteration, substitution of parts and even changes in the mode of operation may be effected without departing from the scope of my invention which is best defined in the appended claims.

Claims:

1. A beater including a frame, two propeller-like members located relatively close together one above the other and means for rotating said propeller-like members in opposite directions, each of said members having a series of blades twisted so as to direct the medium which is being mixed into the path of the other member and said blades angled relative to radial lines from the center of the member in a direction away from the direction of rotation so as to direct the medium toward the centers of said members.

2. A beater including a one-piece frame, two propeller-like members located one above the other and means for rotating said propeller-like members in opposite directions, each of said members having a plurality of twisted blades angled relative to radial lines from the center of the member, said blades being thereby adapted to direct the medium which is being mixed from the outer periphery of said members toward the centers thereof and also upwardly and downwardly into the path of each member.

3. A beater comprising, in combination, a frame part presenting a plurality of fingers each having a U-shaped slot generally axially aligned with each other, a hand operated gear secured to said frame and a plurality of propeller carrying shafts presenting pinion gears for meshing with said hand-operated gear, said shafts being held in said slots by engagement of said gear with the pinions, said fingers thereby providing bearings for said shafts and preventing axial movement of said shafts relative to said frame.

4. A beater comprising, in combination, a frame part formed from a single piece of metal, a plurality of beater units secured together and supported by said frame, and a gear for operation of said beaters, said gear secured to said frame so as to hold said beater units in assembled relation with said frame.

5. A beater comprising, in combination, a frame part, beater means, a gear for operating said beater means and a single fastening member for holding said frame, beater means and gear in assembled relation with each other.

6. A beater including a frame, a plurality of propeller-like members located relatively close together, one above the other, at least one of said propellers being curved in cross-section and means for rotating said propeller-like members in opposite directions, each of said members having a series of relatively narrow closely arranged blades twisted with relation to the direction in which said members are rotated so that one of said members will direct the medium which is being mixed into the path of another of said members and each of said propeller-like members when rotated setting up a resistance to passage of the medium through the propeller-like member because of the close arrangement of the blades, a central hub portion provided by each of said propeller-like members and said blades being connected tangentially with the hub portions thereby to draw the material being mixed toward the centers of the propeller-like members and means connecting the free ends of said blades to hold them in proper spaced and twisted relation.

In testimony whereof, I have signed my name to this specification.

MINATOJO SYDNEY.