

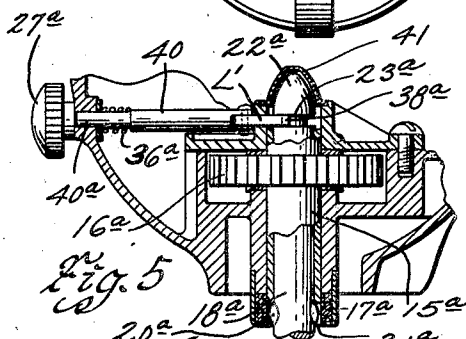
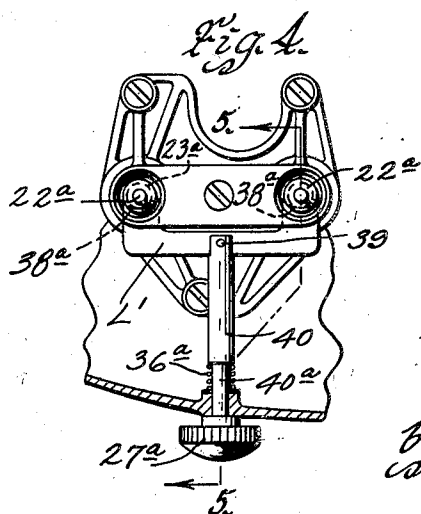
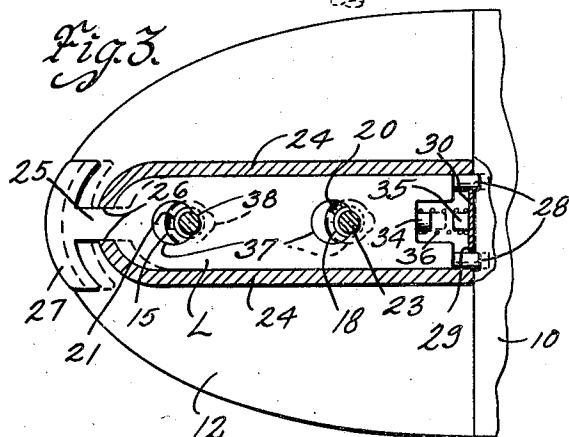
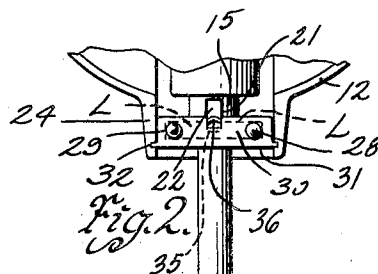
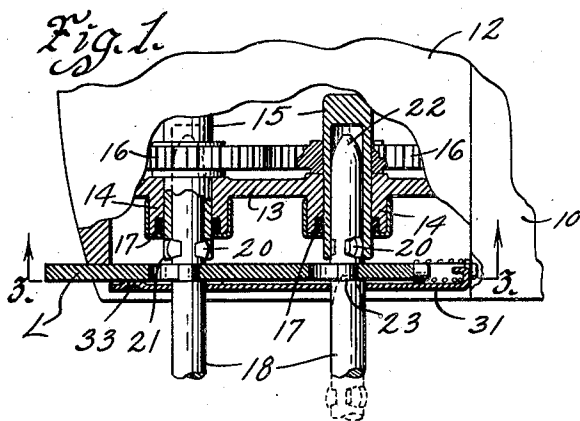
Sept. 14, 1943.

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2,329,640

MIXER-BEATER SHAFT LOCK

Filed April 27, 1942



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UNITED STATES PATENT OFFICE

2,329,640

MIXER-BEATER SHAFT LOCK

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Application April 27, 1942, Serial No. 440,651

7 Claims. (Cl. 287—26)

My present invention relates to a shaft lock particularly designed for locking the beater shafts of a food mixer or the like in operative position.

One object of the invention is to provide a shaft lock of simple and inexpensive construction.

Another object is to provide a shaft lock which permits mere insertion of the beater shaft to operative position and then automatically locks it in such position, release of the shaft thereafter being effected by movement of the lock plate manually to a releasing position.

More particularly, it is my object to provide means for locking a beater shaft in operative position, including a movable lock plate having an edge engageable in an annular groove of the beater shaft under constraint of a spring, and being manually disengageable therefrom for releasing the beater shaft from operative position.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawing, wherein:

Figure 1 is a side elevation of a portion of a food mixer motor and gear housing with my shaft lock applied thereto, parts of the mixer and lock being shown in section;

Figure 2 is a rear elevation of a portion of the gear housing and my shaft lock cooperating with the shaft of the beater;

Figure 3 is a sectional view on the line 3—3 of Figure 1 showing the mounting of the lock plate in position and a partial bottom plan view of the gear housing;

Figure 4 is a plan view of a modified form of construction showing it associated with a gear housing that is shown in section; and

Figure 5 is a sectional view on the line 5—5 of Figure 4.

On the accompanying drawing I have used the reference numeral 10 to indicate a mixer motor, and 12 the gear housing mounted thereon. The mixer may be of any type, such as that shown in Kochner Patent No. 2,131,290, of September 27, 1938. The mixer illustrated in the present drawing has one shaft ahead of the other instead of the shafts being side by side.

The gear housing 12 has a partition 13 provided with a pair of bearings 14. Rotatable in the bearings 14 are driving sleeves 15, geared together by gears 16 which are rotated by the usual step-down gearing arrangement from the motor 10. The gears 16 are secured to the sleeves 15, and a packing 17 is provided for each sleeve to prevent lubricant from leaking out of the gear housing 12 above the partition 13. The beater shafts are shown at 18, a beater 19 being illustrated on one

of them in Figure 2. The shafts 18 are operatively driven by the driving sleeves 15 by means of opposite lugs 20 pinched into the beater shafts and entering slots 21 in the lower ends of the sleeves. The shafts 18 are tapered or pointed at their upper ends, as indicated at 22, and are provided with annular grooves 23 for purposes which will hereinafter appear.

I provide a lock element L in the form of a plate of suitable composition or metal, and slidably mounted between a pair of run-ways or guides 24 of the gear housing 12. The lock plate L has a neck 25 slidable in a slot 26 formed between the run-ways 24. The neck terminates in a head or handle 27. At the rear end the lock plate L has a pair of stud-like extensions 28 slidable through perforations 29 of a flange 30 of a retainer plate 31. The retainer plate 31 is assembled by sliding into grooves 32 in the run-ways 24. The forward end of the plate has an upward depression 33 (see Figure 1) bearing against the bottom of the lock plate L to support it in proper position.

The lock plate L has a third stud-like projection 34, and the flange 30 of the plate 31 has a forwardly projecting finger 35. A spring 36 is positioned on the elements 34 and 35 to bias the lock plate L toward the left in Figures 1 and 3.

The lock plate L has a pair of key-hole slots, the large parts of which are indicated at 37 and the small parts thereof at 38. The key-hole slots 37—38 are designed for reception of the beater shafts 18, as will hereinafter appear.

In the modified construction shown in Figures 4 and 5 the beater shafts are indicated at 18^a, and have their annular grooves 23^a adjacent the top or tapered part 22^a instead of spaced considerably therefrom, as shown in Figure 1. The other parts of Figures 4 and 5 bear the same reference numerals as in Figures 1, 2 and 3, with the addition of *a*, because they are similar thereto. The lock plate in these figures is indicated at L'. It is in the form of a bar pivoted at 39 to a slide pin 40, and has terminal ends 38^a to engage in the annular grooves 23^a of the beater shafts instead of key-hole slots 37—38, as shown in Figure 3. The lock retracting handle in this case is a knob 27^a, secured to a reduced portion 40^a of the slide pin 40, the spring 36^a being mounted on such reduced portion.

*Practical operation of the form shown in
Figures 1, 2 and 3*

The parts are in operating position in Figure 1. When it is desirable to release the beater shafts 18 for removing the beaters 19 for cleaning purposes it is merely necessary to push the handle 27 in as far as it will go, whereupon it assumes the dash-line position shown in Figure

3. The key-hole slots 37—38, in their dash-line position, it will be noted, have the portions 37 thereof aligned with the sleeves 15, and the smaller portions 38 thereof removed from the annular grooves 23. Accordingly, the shafts 18 can drop out of position, the parts 37 of the key-hole slots being larger in diameter than the diameter across the driving lugs 20.

Consequently, when it is desirable to insert the beater shafts in position they may be merely thrust through the retainer plate 31, which is provided with guide perforations to receive them, and the tapered upper ends 22 of the beater shafts will force the lock plate L toward the right, against the bias of the spring 36, until the beater shafts are in operating position. If the driving lugs 20 are not aligned with the slots 21, the shafts may be rotated until they do become aligned, whereupon the shafts may be pushed up to their final position. In such final position the annular grooves 23 register with the lock plate L so that the small portions 38 of the key-hole slots may enter the annular grooves to the locked position shown in Figure 1 under the action of the spring 36.

Practical operation of the forms shown in Figures 4 and 5

With this form of the invention the knob 21^a is manually pulled outward for releasing the beater shafts 18^a. When re-inserting the beater shafts the tapered ends 22^a thereof engage the edges 38^a of the lock bar L' and force them back against the bias of the spring 36^a until they can snap into the annular groove 23^a. Due to the pivot at 39, one beater shaft 18^a at a time may be inserted, or both of them may be simultaneously inserted, as desired.

In Figure 5 a formed sheet metal cover 41 is shown for the upper end of the beater shaft 18^a. A cover 41 is provided for each shaft but they have been omitted from Figure 4 to better show the coaction of the edges 38^a of the lock bar L' with the grooves 23^a of the beater shafts.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure, or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a mixer-beater shaft lock, a lock element movably mounted in a gear housing of a mixer having a pair of beater shafts, said shafts being annularly grooved, said lock element having key-hole slots therein adapted to receive said beater shafts through the larger parts of the slots, spring means moving said lock element in a direction for the smaller parts of said slots to simultaneously coact with said annular grooves of said beater shafts, and a handle on said lock plate element to move it in opposition to said spring means to thereby release said beater shafts, the inner ends of said beater shafts being tapered to move said lock element in opposition to said spring means to a position permitting insertion of the shafts to operative position.

2. In a mixer-beater shaft lock, a lock element mounted for sliding movement in a gear housing of a mixer having a pair of beater shafts, said shafts being annularly grooved to receive

edges of said lock element only when said shafts are in a position of operative engagement with the beater shaft drive mechanism in said gear housing, and spring means associated with said lock element to move it in a direction for engagement of its edges in said grooves.

3. A shaft lock of the character described for a shaft insertable into a driving sleeve rotatably mounted in a gear casing or the like comprising a lock element movably mounted in said gear casing in a plane substantially normal to the axis of rotation of said shaft, said shaft having an annular groove therein to receive an edge of said lock plate, a handle for retracting said lock element, and spring means for moving said lock element to engaging position with relation to the groove of said shaft only when said shaft is in a position to be driven by said driving sleeve, said shaft having its end tapered to effect movement of said lock element to a position permitting insertion of said shaft to operating position during the inserting operation.

4. In a mixer-beater shaft lock, a lock bar movably mounted in a gear housing of a mixer having a pair of beater shafts, said shafts being annularly grooved, a slide pin pivotally connected with said lock bar with parts of the lock bar on opposite sides of the beater engageable in said grooves, spring means associated with said slide pin to move said lock bar in a direction for engagement in said grooves, and a handle on said slide pin for sliding it and thereby moving said lock bar in opposition to said spring means.

5. In a mixer-beater shaft lock, a lock bar movably mounted in a gear housing of a mixer having a pair of beater shafts, said shafts being annularly grooved, a slide pin connected with said lock bar with parts of the lock bar on opposite sides of the beater engageable in said grooves, spring means associated with said slide pin to move said lock bar in a direction for engagement in said grooves, and a handle on said slide pin for sliding it and thereby moving said lock bar in opposition to said spring means, the inner ends of said beater shafts being tapered to move said lock bar to a position permitting insertion of the shafts to operative position.

6. In a mixer-beater shaft lock, a lock element movably mounted in a gear housing of a mixer having a beater shaft, said shaft being annularly grooved, said lock element having a key-hole slot therein adapted to receive said beater-shaft through the larger part of the slot, spring means moving said lock element in a direction for the smaller part of the slot to coact with said annular groove of said beater-shaft, the inner end of said beater-shaft being tapered to move said lock element in opposition to said spring means, to a position permitting insertion of the shaft to operative position.

7. In a mixer-beater shaft lock, a lock element mounted for sliding movement in a gear housing of a mixer having a beater shaft, said shaft being annularly grooved to receive an edge of said lock element only when said shaft is in a position of operative engagement with respect to the beater-shaft drive mechanism in said gear housing, and spring means associated with said lock element to move it in a direction for engagement of its edge in said groove.

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