W. E. JENSEN.

MIXING DEVICE.

APPLICATION FILED MAR. 30, 1921.

1,401,475.

Patented Dec. 27, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

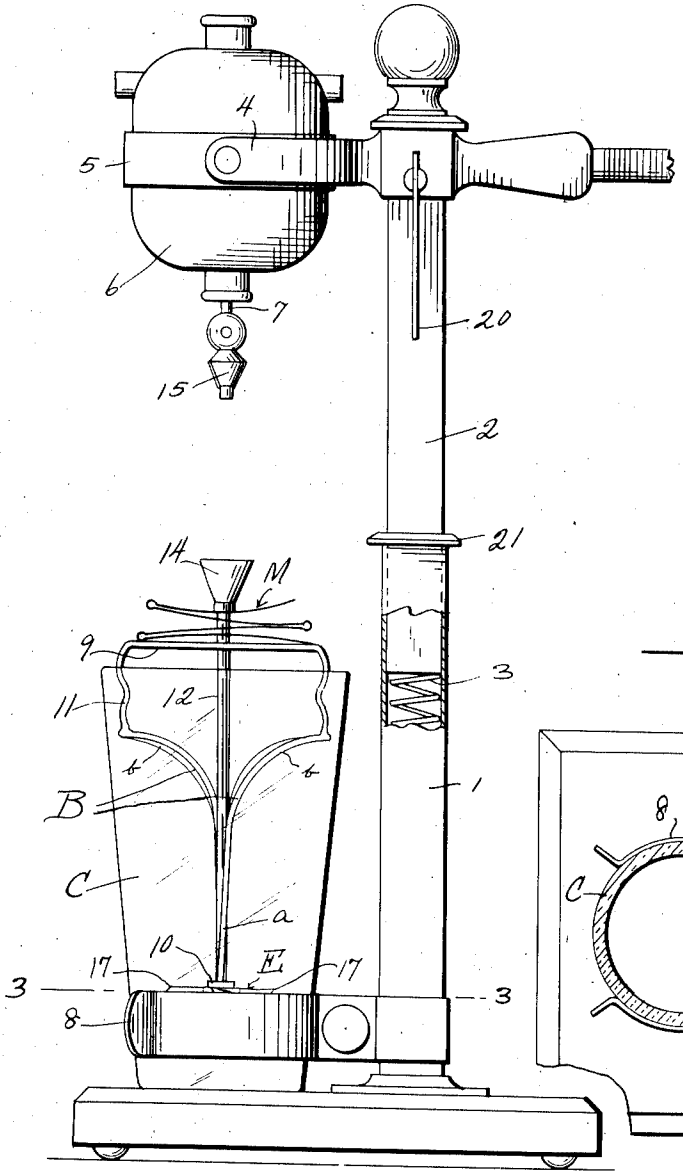


Fig. 2.

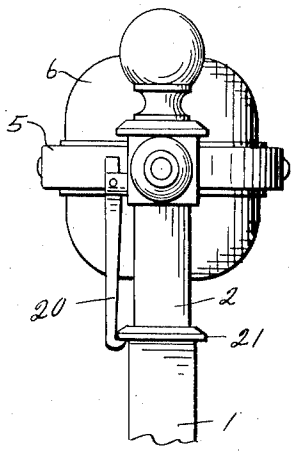
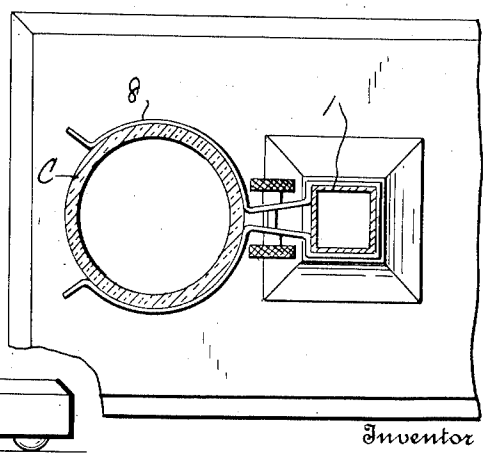


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4

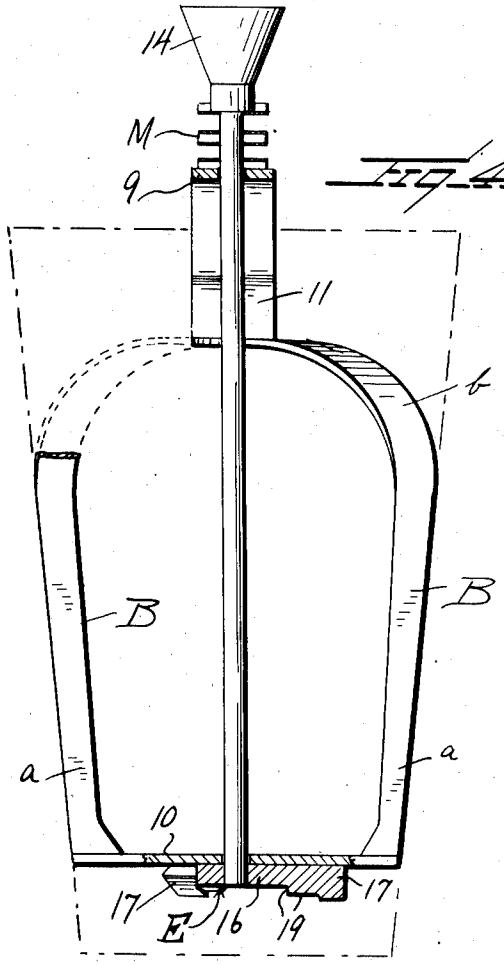


Fig. 7



Fig. 6

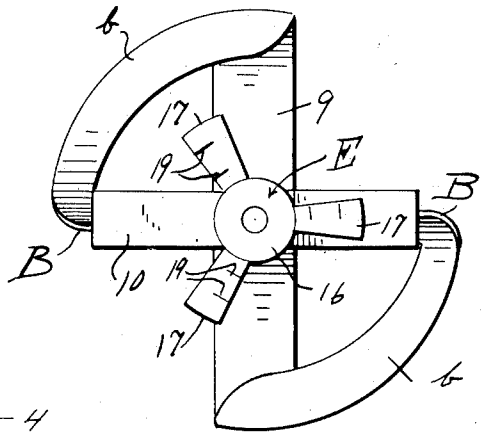
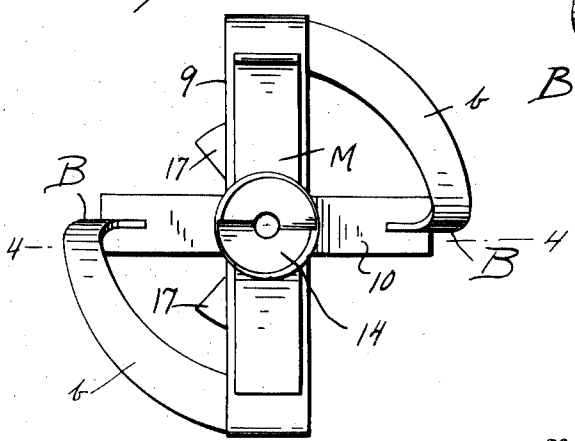


Fig. 5



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UNITED STATES PATENT OFFICE.

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MIXING DEVICE.

1,401,475. Specification of Letters Patent. Patented Dec. 27, 1921.

Application filed March 30, 1921. Serial No. 457,001.

To all whom it may concern:

Be it known that I, WALTER E. JENSEN, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Mixing Devices, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in mixing devices and has relation more particularly to a device of this general character especially designed and adapted for use in the mixing of beverages, and it is an object of the invention to provide a device of this general character having novel and improved means whereby the materials to be mixed are directed in a plurality of spiral streams of relatively different lengths and wherein said streams will intersect each other at spaced points during the return of said streams to the bottom of the container in which the materials are being mixed.

Another object of the invention is to provide a novel and improved device of this general character which includes an exciter, together with means for directing in the container the material to be mixed in a plurality of streams.

Furthermore, it is an object of the invention to provide a novel improved device of this general character adapted to be arranged within a container and embodying a series of baffles or vanes arranged in fixed relation one with respect to the remainder, said baffles or vanes operating to divide the materials to be mixed into separate streams or currents traveling in the same general direction.

It is still further an object of the invention to provide a novel improved mixing device adapted to be inserted in the container wherein the materials are to be mixed and wherein said device embodies a plurality of baffles or vanes disposed in relatively different obliquely inclined planes with relation to the direction of flow of the materials to be mixed, together with an exciter operating at a point below the vanes to create the requisite agitation of the materials.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved mixing device whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings wherein,—

Figure 1 is a side elevation of a mixing device embodying the improvements of my invention.

Fig. 2 is a detail side elevation of the upper end of the device.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary sectional view of the baffles.

Fig. 5 is a top view thereof.

Fig. 6 is a bottom view thereof, and

Fig. 7 is an end view of one of the arms 17 hereinafter described.

As disclosed in the accompanying drawings, 1 denotes an upstanding hollow post having a hollow standard 2 in telescopic engagement therewith and arranged within the base portion of the post 1 and coacting with the standard 2 is a spring 3 for constantly urging the standard 2 upwardly.

Extending forwardly from the upper portion of the standard 2 is a bracket 4 which serves as a support for the casing 5. Arranged within the casing 5 is an electric motor 6, including a depending shaft 7 disposed through the casing 5 and terminating a desired distance therebelow. The motor 6 is adapted to be suitably connected with a desired source of electrical energy and the standard 2 is provided with suitable means for automatically controlling the circuit for said motor. As this controlling means forms no part of my present invention and is of a type now in use it is not believed necessary that a description or illustration thereof be given other than to state that when the standard 2 is at the limit of its upward movement the operating circuit is opened and when the standard 2 is forced downwardly said circuit is closed.

The lower portion of the post 1 is provided with a forwardly directed spring clip or jaw 8 adapted to receive the lower portion of a container C in which a beverage

or the like is to be mixed. It is to be particularly understood that when the standard 2 is at the limit of its upward movement the lower end of the shaft 7 terminates a sufficient distance above the top of the container C to permit the ready removal or application of said container with respect to the clip 8.

My improved mixing device as herein disclosed comprises a pair of vertically spaced cross arms 9 and 10 in perpendicular relation with the centers of said members 9 and 10 co-planer.

Depending from the opposite end portions of the upper cross member 9 are the arms 11, each of a relatively short length and possessing a certain degree of inherent resiliency. The lower extremities of the arms 11 and the extremities of the lower cross member 10 are connected by the baffles or vanes B, said baffles or vanes being disposed in relatively different inclined planes.

Each of the baffles or vanes B comprises a strip of material having opposed side faces substantially flat in cross section, said faces being gradually increased in thickness from their lower end portions to their upper end portions and having their outer margins disposed on such curvature to cause said outer margins at all points throughout their length to have substantially close contact with the inner wall of the container C when the mixing device is inserted therein.

The lower portion *a* and each of the baffles or vanes B is directed upwardly on a slight incline, such inclination of one of the baffles or vanes B being reverse to that of the other. The upper portion *b* of each of the vanes is disposed on a spiral.

Slidably disposed through central portions of the cross members 9 and 10 is a shaft 12, said shaft being of a length in excess of the distance between the cross members 9 and 10. Secured to the upper end portion of the shaft 12 is a clutch member 14 adapted to coöperate with a clutch member 15 carried by the lower end portion of the shaft 7, and when the standard 2 has been depressed. The clutch members 14 and 15 are particularly illustrated and described in an application for patent executed on even date herewith.

Fixed to the lower end portion of the shaft 12 and below the lower cross member 10 is an exciter E. The exciter E as herein disclosed comprises a hub 16 from which it radiates a plurality of arms 17. The arms 17 are preferably equi-distantly placed in a direction circumferentially of the hub 16, and each of said arms is substantially V-shaped in cross section with the apex rearwardly disposed with respect to the direction of rotation of the shaft 12 as driven by the power shaft 7.

Each of the arms 17 gradually increases in thickness from its inner end to its outer end and the forward base of said arms has disposed longitudinally thereof a groove or channel 18 substantially V-shaped in cross section. The under portion of each of the arms 17 is stepped, as at 19.

A particular construction of the exciter when the shaft 12 is being driven from the power shaft 7 results in an effective excitement or agitation of the materials within the container C to be mixed while the baffles or vanes B operating to divide the agitated or excited materials into separate spiral streams or currents which are of relatively different lengths, so that the said streams or currents will intersect each other at spaced points during their return to the bottom of the container.

The shaft 12 is constantly urged upwardly through the instrumentality of an expanding element M interposed between the upper cross member 9 and the clutch member 14. By this means the shaft 12 is capable of limited withholding movement which is of particular importance and advantage in order to facilitate the requisite coöperation between the clutch members 14 and 15.

Carried by the standard 2 is a latch 20 adapted to engage a flange 21 carried by the upper portion of the post 1, whereby the standard 2 may be held depressed to maintain the clutch members 14 and 15 in working engagement.

From the foregoing description it is thought to be obvious that a mixing device constructed in accordance with an embodiment of my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without materially departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

1. A mixing device adapted to be arranged in a container and comprising a series of radially disposed baffles in relatively fixed relation, said baffles being disposed in different inclined planes to divide the material being mixed into separate spiral currents, said device including the baffles being removable as a unit from the container.

2. A mixing device adapted to be arranged in a container and comprising a series of radially disposed baffles in relatively fixed relation, said baffles being disposed in different inclined planes to divide the material being mixed into separate spiral currents traveling in the same direction, said device includ-

ing the baffles being removable as a unit from the container.

3. A mixing device adapted to be arranged in a container and comprising a series of radially disposed baffles in relatively fixed relation, said baffles being disposed in different inclined planes to divide the material being mixed into separate spiral currents, and an exciter arranged below the baffles, said device including the baffles and the exciter being removable as a unit from the container.

4. A mixing device adapted to be arranged in a container and comprising a series of radially disposed baffles in relatively fixed relation, said baffles being disposed in different inclined planes to divide the material being mixed into separate spiral currents, the outer margins of the baffles having substantially close contact throughout their length with the inner wall of the container when the device is applied therein, said device including the baffles being removable as a unit from the container.

5. A mixing apparatus comprising, in combination, a driving shaft supported for endwise movement, a mixing device insertable within a container positioned below the driving shaft, said device including a driven shaft having yieldable endwise movement, coacting clutch members carried by the opposed end portions of the driving shaft and the driven shaft, said clutch members having working engagement one with the other upon downward movement of the driving shaft, and an exciter carried by the lower end portion of the driven shaft, said device including the baffles and the exciter being removable as a unit from the container.

6. A mixing device comprising a pair of angularly related cross arms in predetermined spaced relation, baffles connecting the extremities of the cross arms, each of said baffles having a spiral portion, a shaft rotatably supported by the cross arms and an exciter carried by the shaft, said device including the baffles and the exciter being removable as a unit from the container.

7. A mixing device comprising a pair of angularly related cross arms in predetermined spaced relation, baffles connecting the extremities of the cross arms, each of said baffles having a spiral portion, a shaft rotatably supported by the cross arms, and an exciter carried by the shaft, each of said baffles gradually increasing in width from one end portion to the opposite end portion, said device including the baffles and the exciter being removable as a unit from the container.

In testimony whereof I hereunto affix my signature.

WALTER E. JENSEN.