

June 11, 1935.

A. M. LUTES

2,004,373

DRINK MIXER

Filed Sept. 14, 1932

4 Sheets-Sheet 1

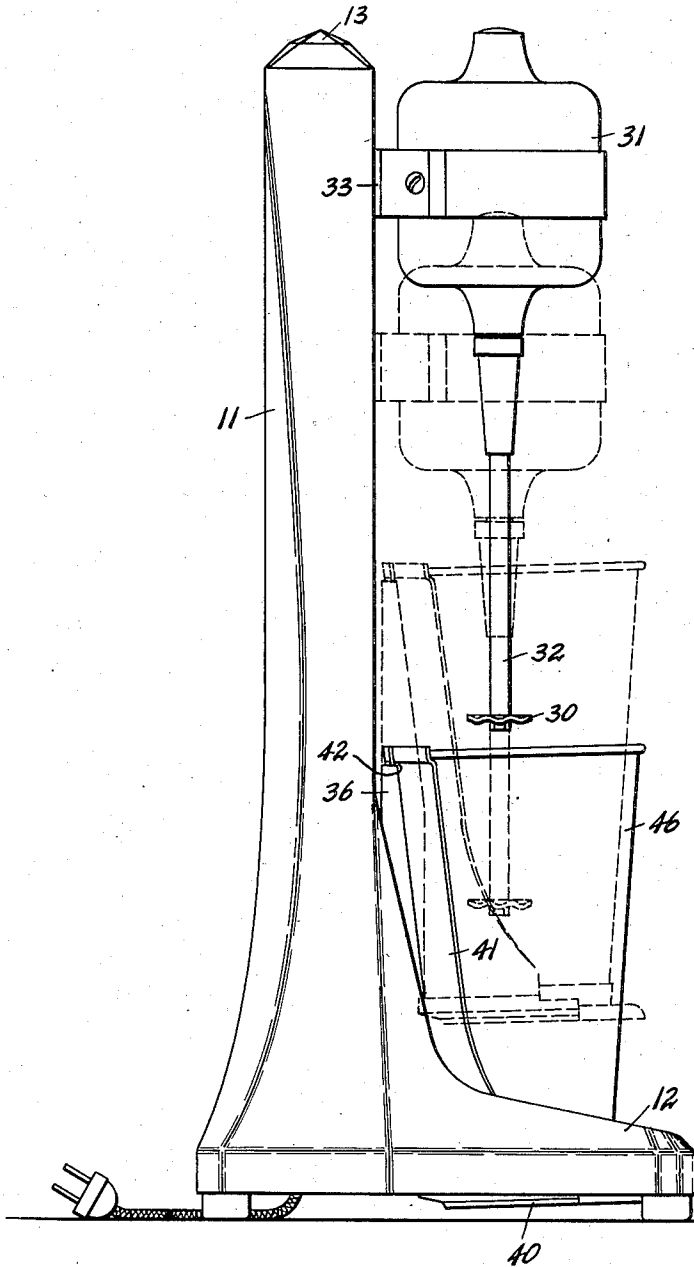


FIG. 1.

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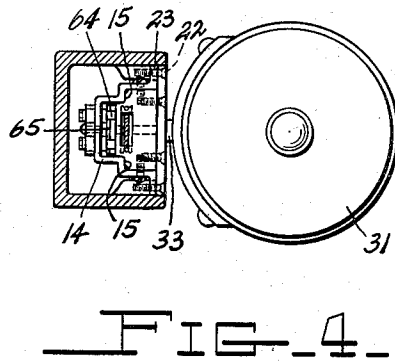
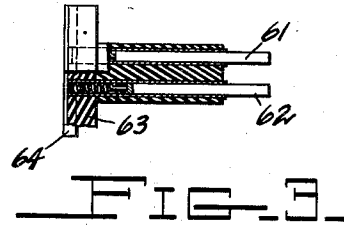
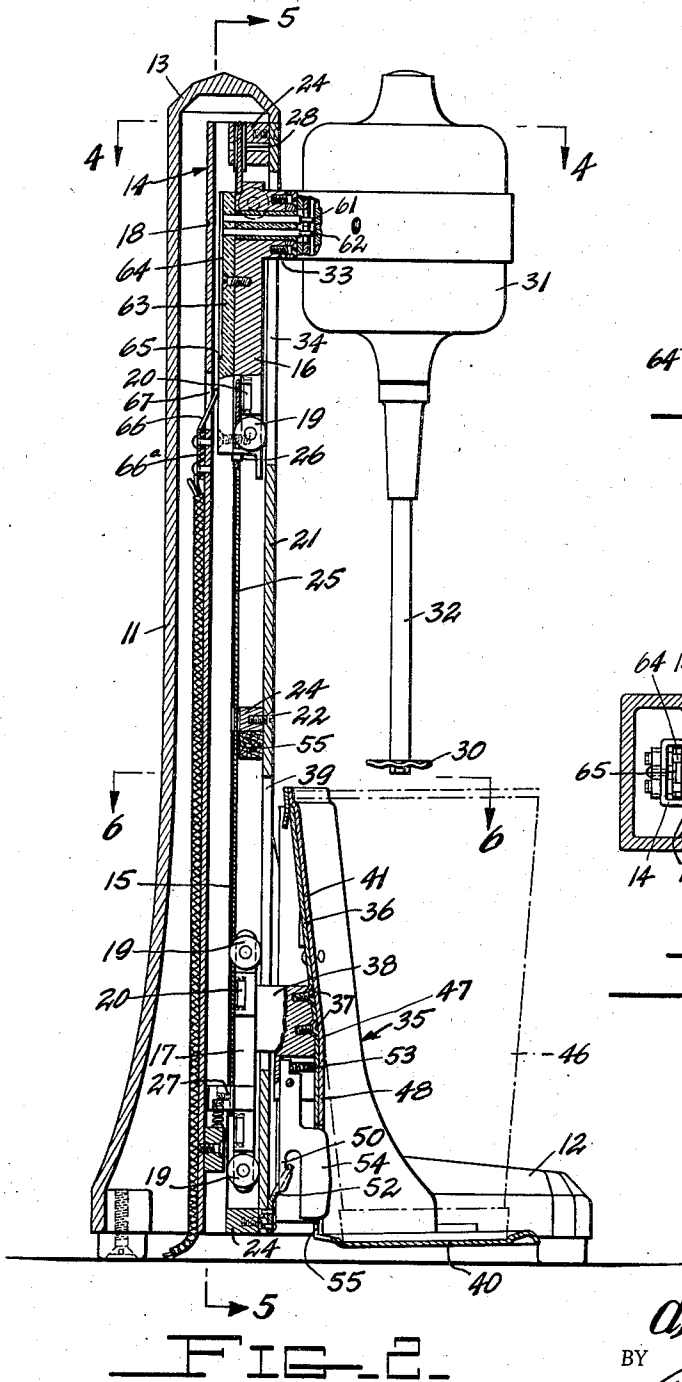
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4 Sheets-Sheet 2



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4 Sheets-Sheet 4

FIG. 8.

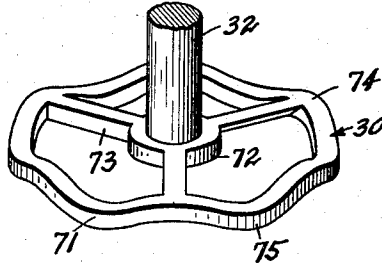


FIG. 9.

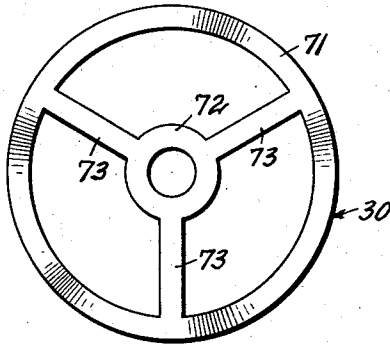


FIG. 11.

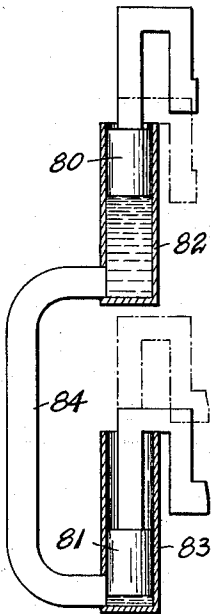
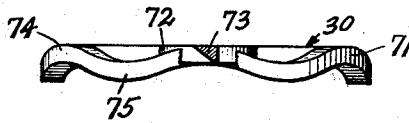


FIG. 10.



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UNITED STATES PATENT OFFICE

2,004,373

DRINK MIXER

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Application September 14, 1932, Serial No. 633,143

13 Claims. (Cl. 259—108)

This invention relates to drink mixers, that is, devices for mixing the various ingredients of beverages etc., such as are served at soda water fountains, and has for its object a drink mixer wherein the carriage for the cup support, when movable, or the stirrer support, when movable, or both of them, when both are movable, move along a guide with minimum friction.

It further has for its object, a particularly simple and efficient motion transmitting and reversing means between the movable carriages when both are movable, which motion transmitting means operates easily and with minimum friction so that the carriages move rapidly when released for movement.

It further has for its object, a structure by which the movable mechanism can be assembled as a unit to a frame, or guide, and the unit assembled to a suitable support, as a wall, or stand-ard.

It further has for its object, a latch mechanism for normally holding the movable carriage, or carriages, in normal position, which latch means is released by a shifting movement of the cup out of its normal position when resting on the cup support, and for restoring the cup to its normal position after being shifted to release the latch.

A further object is a drink mixer of the type described, which is particularly simple and economical in construction, rapid in operation, and highly efficient in use.

Other objects appear throughout the specification.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation of one embodiment of my machine showing the normal position of the carriages, and in dotted lines the position of the carriages when the cup is in operative relation to the stirrer.

Figure 2 is a side elevation, partly in section.

Figure 3 is an enlarged fragmentary, sectional view of parts shown in Figure 2.

Figure 4 is a sectional view on line 4—4, Figure 2.

Figure 5 is a sectional view taken on line 5—5, Figure 2.

Figure 6 is a sectional view on line 6—6, Figure 2.

Figure 7 is a fragmentary exploded view of parts of the cup support.

Figure 8 is a perspective view of the stirrer, the contiguous part of the motor shaft, or stirrer rod, being shown.

Figure 9 is a plan view of parts seen in Figure 8, the shaft being removed.

Figure 10 is an edge view of the stirrer, partly broken away.

Figure 11 is a fragmentary view of a modified form of drink mixer showing a different form of motion transmitting and reversing mechanism between the carriages.

This drink mixer is of the general type disclosed in Schlicker Patent No. 1,344,565, issued June 22, 1920 wherein both the stirrer with the motor for operating it, and the cup support move toward each other to bring the cup and stirrer into coacting relation, and move away from each other after the mixing operation to permit the removal of the cup without interference from the stirrer.

This drink mixer comprises generally, a frame, and a support therefor, the frame being provided with a carriage guide, upper and lower carriages, both of which, in the illustrated embodiment of my invention, are movable rectilinearly along the guide, a stirrer, and actuating means, as an electric motor carried by the upper carriage, and a cup support carried by the lower carriage, motion transmitting and reversing means between the carriages, and releasable latch means for normally holding the carriages separated and which, when released, permit the carriages to move toward each other, one carriage, through the motion transmitting and reversing mechanism, forming the actuator for the other carriage. Preferably, the upper carriage and the parts carried by it overbalance the lower carriage and the parts carried by it, so that the carriages move automatically, when released, into operative position, and are separated by pulling down on the lower carriage, or applying an upward force to the upper carriage.

11 designates a suitable support, which, in this embodiment of my invention, is a standard having a base 12 for resting upon a table, shelf, and the like, the standard being hollow and open at one side, or in the general form of a channel, as best seen in Figure 6, and is provided with a suitable cap 13 at its upper end.

14 designates a guide mountable in the frame through the open side thereof, this guide being in the form of a channel in cross section and being wider at its outer open side providing upright

tracks 15 facing the open side and located at the junction between the wider and narrower parts of the channel.

16 and 17 are upper and lower carriages movable rectilinearly in the guide 14, these carriages being spaced apart, or having portions spaced apart from the bottom 18 of the channel, and having sets of antifriction means, as rollers 19, for engaging the tracks 15 at spaced apart points along the carriages, and other spaced apart antifriction members, as rollers 20, coacting with the side walls of the wider part of the guide 14. One set of rollers 19, that is, those toward the top of the carriage engage the face plate, to be described, as the overhanging weights of the motor and cup support tend to tilt the carriages in the guide, toward the face plate.

21 designates a face plate for covering the open side of the channel, and secured thereto by screws 22 extending through the margins thereof and through laterally extending flanges 23 at the open side of the channel shaped guide 14 into suitable lugs 14^a, and also into suitable cross pieces, or braces 24.

The motion transmitting and reversing means between the carriages extends lengthwise of the channel shaped guide 14 between the carriages, and the bottom of the channel, and as here shown, includes a cord, wire, or cable 25 secured at 27 and 27 at spaced apart points to the carriages 16 and 17 and having its intermediate portion running over an idler pulley 28 located above the carriages 16, 17, and suitably supported at the upper end of the frame or channel 14. This arrangement of the motion transmitting and reversing means works with minimum friction in connection with sliding or rectilinearly movable carriages, and owing to the fact that the motion transmitting and reversing mechanism is located for the most part in the channel shaped guide 14, the construction is particularly compact and lends itself to the assembly of all the work parts in a unit.

30 designates the stirrer, and 31 the casing of an electric motor supporting the stirrer, the stirrer being carried by a shaft 32 which is suitably coupled to, or formed integral with the motor shaft. The motor casing 31 is suitably mounted on a bracket arm 33 extending from the upper carriage 16 through a slot 34 in the face plate 21.

35 designates generally the cup support which is movable with the lower carriage 17. In the illustrated embodiment of my invention, this cup support comprises two main parts, one of which is a plate, or hanger 36 secured, as by screws 37, to a bracket arm 38 extending from the lower carriage 17 through a slot 39 in the face plate 21, and the other of which is a shelf 40 which is detachably coupled to the hanger 36. The shelf is provided with an upwardly extending back wall 41 provided with means for detachably securing it to the hanger 36, and as here shown, the back wall is provided with a socket 42 at its upper end for receiving the upper end of the hanger, and with buttons 43 between its ends for engaging key slots 44 in the hanger, the socket engaging the upper end of the hanger, and the buttons engaging the slots therein by an inward and downward movement of the cup support, and being removed by the reverse of these movements. The upper or wider portions of the key slots are formed with inclined back walls or guides 45.

The cup 46 is of the usual type which is conoidal in general form, with the side walls flaring up-

wardly and outwardly, and the back wall 41 of the cup support has its upper portion inclined out of the vertical to conform to the inclination of the side walls of the cup; the lower edge of the upper portion so inclined terminates intermediate of the top and bottom of the cup forming a fulcrum at 47, for a purpose to be presently described. The lower portion 48 of the wall is not inclined out of the vertical, or not inclined to the same extent as the upper portion, and it is the apex of the two portions that meet to form the fulcrum 47, although the lower portion may be omitted, except to form a connection or support for the shelf 40. Thus, when the cup is normally standing on the shelf 40, its wall conforms to the incline of the upper portion, and is spaced apart from the lower portion 48 of the back wall.

The means for latching the carriages in their separated positions comprises two members, one of which moves with the carriage 17, and the other of which is fixed relatively to the frame, or guide 14, and as here illustrated, the movable latch member is carried by the carriage 17.

50 designates the movable latch member, which is pivoted at 51 to the bracket 38 and coacting with a keeper 52 mounted on the face plate 21 at the lower end thereof, the latch being pressed by a spring 53. The latch is also provided with a nose 54 extending through a slot 55 in the back wall 41 into the space that is normally present between the lower portion 48 of the back plate 41 and the lower portion of the cup when the cup is resting squarely on its shelf 40, the nose being in position to be engaged to trip the latch when the cup is shifted, or tilted, about the pivot 47 to move its bottom portion inwardly. When the latch is tripped, the carriage 17 is moved upwardly by the downward movement of the carriage 16 through the motion transmitting and reversing mechanism. When the cup is released, it automatically moves away from the latch to rest squarely on the shelf 40, due to the fact that the margin of the shelf 40 is tapered upwardly, thus having a tendency to automatically center and return the cup to normal position. The movement of the carriages toward each other are limited by suitable buffers 55.

The current is supplied to the motor through a suitable feed circuit having a switch therein which is operated by the movement of one of the carriages 16 and 17, here shown as by the movement of the carriage 16, which carries the motor, but it is obvious it may be operated by either carriage, or by one carriage, if only one were movable.

61 and 62 designate plugs or terminals of any suitable construction by means of which wires are connected to the motor. The switch mechanism includes a base or switch block 63 of insulation mounted on the carriage 16, a pair of running contacts 64 mounted on the block, the contacts extending in the direction of movement of the carriages, and their lower ends lying behind shoulders 65 on the block so that they are flush with, or depressed below the shoulders.

The switch further includes a pair of brushes 66 carried by the frame 14, and coacting with the former contacts during the movement of the carriage. As here shown, the brushes 66 are mounted on a suitable base block 66^a of insulation on the outer side of the bottom of the channel shaped frame 14 and extend through an opening 67 in the bottom of the channel in position to wipe on the contacts 66. Normally, the contacts

or brushes 66 rest on the insulating block 63, but when the latch 50 is tripped and the carriages move toward each other, the brushes 66 engage the contacts 64, thus completing the circuit to the motor so that it starts and rotates the stirrer 30. When the carriages are separated by pulling down on the cup support, or applying an upward force to the motor carriage, the contacts 64 wipe out of engagement with the brushes 66 and the shoulders at the ends of the contacts lift the brushes away from the contacts so that the circuit is broken without burning or sparking.

The base block 66^a is adjustable vertically on the frame 14 to shift the brushes vertically and hence vary the time at which the motor starts, while the carriages are moving toward each other. It will be understood that the motor starts before the stirrer enters the liquid in the cup and not after the cup is in operative relation to the stirrer. In other words, the starting of the motor is not delayed until the carriages have moved their full distance toward each other. This feature is particularly desirable, as oftentimes drinks contain semi-solid matters, as ice cream and the forcing of the stirrer into the ice cream, when the stirrer is not in motion causes the ice cream to be pushed to one side; this often strains and distorts the agitator shaft and throws the motor out of balance. By starting the motor before the stirrer enters the contents of the cup, the stirrer plows or bores its way through the solid matter; thus tearing it apart and speeding up the process of mixing.

Owing to the switch construction, the brushes 66 come into and out of engagement with the terminals 64 with a wiping rather than a contact action, and hence, to adjust the time that the circuit is closed by the brushes and the contacts, it is merely necessary to shift either the brushes or the contacts, preferably the brushes without shifting both the brushes and the contacts, that is, without relocating the entire switch. Preferably, the base block 66^a is held in position by one or more screws, which extend through slots in the base block and thread into the bottom of the channel-shaped frame 14, the slots permitting shifting of the base block 66^a upon loosening of the screws.

In the operation thus far described, the cup with the contents to be mixed, is placed upon the cup rest 40. This can be easily done as the stirrer and cup support are separated far enough to permit this operation without the stirrer interfering with the top of the cup. The operator then tilts, or upsets the cup by pushing the bottom portion inwardly, the cup tilting inwardly about the fulcrum 47 and tripping the latch 50 so that the upper carriage travels downwardly owing to the weight of the motor and the lower carriage upwardly bringing the cup up around the stirrer, and the stirrer into the cup. During this movement, the circuit is closed to the electric motor, and the stirrer operated. When the mixing is completed, the operator either pulls down upon the cup support 40 until the latch 50 engages the keeper 57, or pushes upwardly on the motor 31 when the cup with the mixed contents can be removed.

Owing to the fact that rectilinearly movable, or sliding, carriages are used, to the channel shaped guide and the motion transmitting and reversing means, the operation is particularly easy and rapid, as compared with the lever movement of the Schlicker patent, and also owing to the construction, all the working parts can be

assembled as a unit in the frame or channel 14 and applied to a suitable support, as the standard 11.

As the stirrer 30 is rotating when it enters the contents of the cup, and as it is undesirable to use a cover, the stirrer is so formed as to enter the contents and agitate the contents without spattering or throwing them laterally. Also, the stirrer is being rotated as it leaves and after it passes upwardly out of the contents of the cup before it passes out of the cup so that the stirrer automatically cleans itself at the end of each operation. The construction of the stirrer will now be described.

This agitator, or impeller 30, comprises generally, a wheel having a rim 71, a hub 72, and vanes 73 connecting the rim and the hub, the rim being formed throughout its extent with undulations 74, 75, one set, as the lower set 75 being out of the normal plane of the rim, or out of the disk of the rim, the undulations 75 alternating with the undulations 74 and extending downwardly below said plane so that the rim is a series of undulations or waves. The vanes 73 are preferably straight, or radial, relatively to the hub, and are joined to the upward undulations of the rim. These vanes are angular in cross section, and are preferably in the form of a right angle triangle in cross section with the hypotenuse side of the triangle presented downwardly on the leading edge of the vane with respect to the direction of rotation of the agitator. The hub 72 is suitably mounted on the lower end of the shaft 32 of the electric motor of the mixing machine.

In operation, the cup with the contents to be mixed is brought into juxtaposition to the agitator with the agitator submerged in the contents of the cup. During the rotation of the agitator, the undulated rim tends to force the contents downward without a violent outward, or centrifugal action, and also the vanes force a current downwardly with a greater effect than the undulated rim with sufficient force to create a current to the bottom of the cup where the contents return upwardly around the central currents to the top and are again drawn downwardly by the agitator. The upward current is due partly to the momentum of the fluid and partly to the draw of the wheel.

An agitator of this construction can rotate very rapidly with minimum power, even when the contents of the cup are comparatively thick, without a violent centrifugal action tending to throw the contents over the top of the cup, but also thoroughly and quickly mixes the drink. Also, the stirrer, while rotating, bores through the contents of the cup when the cup and stirrer are being brought together, without throwing or spattering the contents so that a cover for the cup is unnecessary.

In Figure 11, I have shown a modification of the motion transmitting and reversing means between the carriages for the motor and for the cup support wherein the carriages are shown as pistons 80 and 81 movable in cylinders 82, 83 respectively, which are connected by a by-pass 84 so that the motion of each piston is transmitted and reversed through a hydraulic fluid filling the by-pass. The by-pass 84 is comparatively large and preferably of as large diameter as the cylinders, in order to effect a quick displacement of the fluid from one cylinder to the other during the movement of the carriages either toward each other or away from each other. Also, the hy-

draulic means dispenses with the use of bumpers, as the hydraulic means has a dash pot action.

What I claim is:

1. A drink mixer comprising a frame having a guide, upper and lower carriages movable along the guide, a stirrer and means for actuating it supported by the upper carriage, a cup support carried by the lower carriage, and motion transmitting and reversing means between the carriages comprising a pulley carried by the frame above the upper carriage and a cord fixed at spaced apart points to the carriages respectively and having the portion between the fixed points passing over the pulley.

2. A drink mixer comprising a frame provided with a guide, upper and lower carriages movable along the guide, a stirrer and means for actuating it supported by the upper carriage, a cup support carried by the lower carriage, and motion transmitting and reversing means between the carriages including a pulley carried by the frame above the upper carriage and a cord fixed at its opposite ends to the carriages respectively and having its intermediate portion passing over the pulley.

3. A drink mixer comprising a frame having a channel shaped upright guide, a stirrer, and means for actuating it, a carriage therefor, a cup support, a carriage therefor, one of said carriages having a portion movable in the guide, said guide being wider at the open side of the channel than at the bottom, and formed with lengthwise tracks at the junction of the narrow and wider portion, said tracks facing toward the open side of the channel, a face plate closing the open side of the channel, and the movable carriage having antifriction means engaging the tracks, the face plate and the side walls of the wider portion of the channel and being spaced apart from the bottom of the channel.

4. A drink mixer comprising a frame having a channel shaped upright guide, a stirrer, a support for, and means for actuating, the stirrer, a carriage therefor, a cup support, and a carriage therefor, one of said carriages having a portion movable in the guide, said guide being wider at the open side of the channel than at the bottom, and formed with lengthwise tracks at the junction of the narrow and wider portion, said tracks facing toward the open side of the channel, and the movable carriage having means engaging the tracks and the side walls of the wider portion of the channel and being spaced apart from the bottom of the channel, a face plate covering the open side of the channel and formed with a slot, the movable carriage having a bracket portion extending through the slot and connected to the corresponding support.

5. A drink mixer comprising a frame having an upright guide in the form of a channel in cross section, spaced apart carriages movable in upper and lower portions of the guide and having portions spaced apart from the bottom of the guide, a stirrer, and means for actuating it carried by the upper carriage, a cup support carried by the lower carriage, and motion transmitting and reversing means between the carriages comprising a cord secured at spaced apart points to the carriages and extending into the space between the carriages and the bottom of the channel, and an idler carried by the frame above the upper carriage over which pulley the intermediate part of the cord runs.

6. A drink mixer comprising a frame having an upright guide in the form of a channel in

cross section with the portion toward the open side of the channel wider than the bottom portion providing outwardly facing tracks between the bottom and open side of the channel, upper and lower carriages movable in the channel and having anti-friction means coacting with the outwardly facing tracks and the side walls of the wider portion of the channel, the carriages being spaced from the bottom of the channel, a stirrer, and means for actuating it carried by the upper carriage, a cup support carried by the lower carriage, and motion transmitting and reversing means between the carriages and extending downwardly through the narrower portion of the channel, and means for controlling the movement of the carriages.

7. A drink mixer comprising a frame having an upright guide in the form of a channel in cross section with the portion toward the open side of the channel wider than the bottom portion providing outwardly facing tracks between the bottom and open side of the channel, upper and lower carriages movable in the channel and having anti-friction means coacting with the outwardly facing tracks and the side walls of the wider portion of the channel, the carriages being spaced from the bottom of the channel, a stirrer, and means for actuating it carried by the upper carriage, a cup support carried by the lower carriage, and motion transmitting and reversing means between the carriages and extending downwardly through the narrower portion of the channel, said motion transmitting and reversing means including a cord secured at spaced apart points to the carriages, and an idler fixed from movement with the carriages and arranged above the upper carriage over which the intermediate part of the cord runs.

8. A drink mixer comprising a frame having a channel shaped upright guide, a stirrer, and means for actuating it, a carriage therefor, a cup support, and a carriage therefor, one of said carriages having a portion movable in the guide, said guide being wider at the open side of the channel than at the bottom and formed with lengthwise tracks at the junction of the narrow and wider portion, said tracks leading outwardly, and the movable carriage having means engaging the outwardly facing tracks and a face plate and the side walls of the wider portion of the channel and being spaced apart from the bottom of the channel, and said face plate for the open side of the channel and holding the carriage in the channel.

9. A drink mixer comprising a frame having an upright guide in the form of a channel in cross section with the portion toward the open side of the channel wider than the bottom portion providing outwardly facing tracks between the bottom and open side of the channel, upper and lower carriages movable in the channel and having anti-friction means coacting with the outwardly facing tracks and a face plate and the side walls of the wider portion of the channel, the carriages being spaced from the bottom of the channel, a stirrer, and means for actuating it carried by the upper carriage, a cup support carried by the lower carriage, motion transmitting and reversing means between the carriages and extending downwardly through the narrower portion of the channel, and means for controlling the movement of the carriage, and said face plate closing the open side of the channel and holding the carriages therein, the face plate being formed with slots and the carriages having brackets ex-

tending through the slots and connected respectively to the actuating means for the stirrer and to the cup support.

5 10. A drink mixer comprising a frame provided with an upright guide, a stirrer, and means for actuating it, a cup support, carriages for the stirrer and its actuating means and for the cup support, one of the carriages being movable along the guide toward and from the other carriage, latch means including a member fixed to
10 the frame and a member carried by the movable carriage and arranged to coact when the movable carriage is separated to its maximum extent from the other carriage, and means operated by tilting movement of the cup on the support about a
15 horizontal axis between its upper and lower ends when the cup is on the support to trip the movable member of the latch, and means on the cup support for causing the cup to tilt and trip the
20 latch when lateral force is applied to the cup toward the latch.

11. A drink mixer comprising a frame provided with an upright guide, a stirrer, and means for actuating it, a cup support, carriages
25 for the stirrer and its actuating means and for the cup support, one of the carriages being movable along the guide toward and from the other carriage, latch means including a member fixed to the frame, and a member carried by the movable carriage and arranged to coact when the
30 movable carriage is separated to its maximum extent from the other carriage, the cup support being formed with a fulcrum for engaging the side of the cup when the cup is resting squarely on
35 the support, and the movable latch member being normally arranged away from the cup when the same is resting squarely on the support, and to be engaged by the cup when the cup is tilted relatively to the support about said fulcrum.

12. A drink mixer comprising a frame provided with an upright guide, a stirrer, and means for actuating it, a cup support, carriages for the stirrer and its actuating means and for the cup support, one of the carriages being movable along
5 the guide toward and from the other carriage, latch means including a member fixed to the frame, and a member carried by the movable carriage and arranged to coact when the movable carriage is separated to its maximum extent from
10 the other carriage, the cup support being formed with a bottom wall and an upright wall having its upper portion inclined out of the vertical, to conform to the flare of the side wall of the cup, a greater distance than the lower portion of said
15 wall, thereby providing a fulcrum for the cup, the movable latch member being arranged in the rear of a line extension of the inclined upper portion of said wall, and arranged to be engaged by the cup when tilted about said fulcrum.
20

13. A drink mixer comprising a frame having an upright guide, a stirrer and means for actuating it, a cup support, carriages for the stirrer and its actuating means and for the cup support, one of the carriages being movable along the
25 guide toward and from the other, latch means for normally holding the movable carriage from movement including a member fixed to the frame, and a member carried by the movable carriage and arranged to coact when the movable carriage is separated to its maximum extent from the
30 other carriage, the movable member being arranged to trip by a lateral upsetting movement of the cup on the support, and means for causing said upsetting movement when a lateral force is applied to the cup and for restoring the cup to
35 its normal position when the force is discontinued.

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