No. 874,737. PATENTED DEC. 24, 1907.

H. BUCKLIN.

FLUID MIXER.

APPLICATION FILED SEPT. 26, 1905.

2 SHEETS—SHEET 1.

FIG. 1.

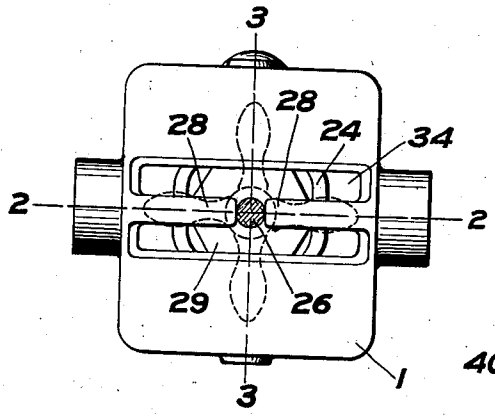


FIG. 4.

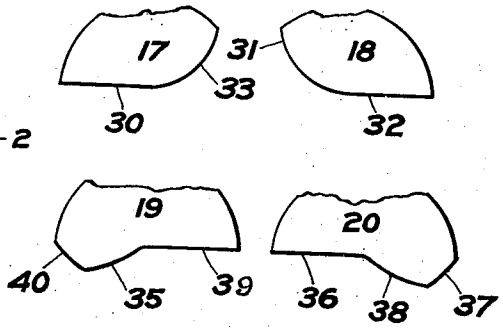


FIG. 2.

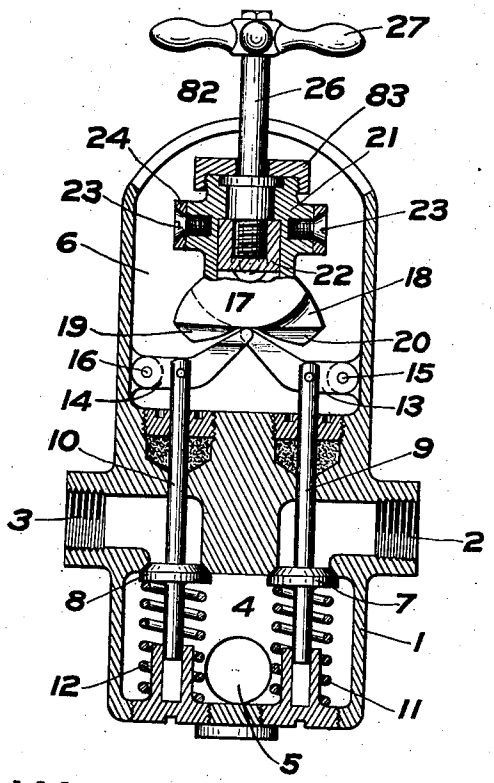
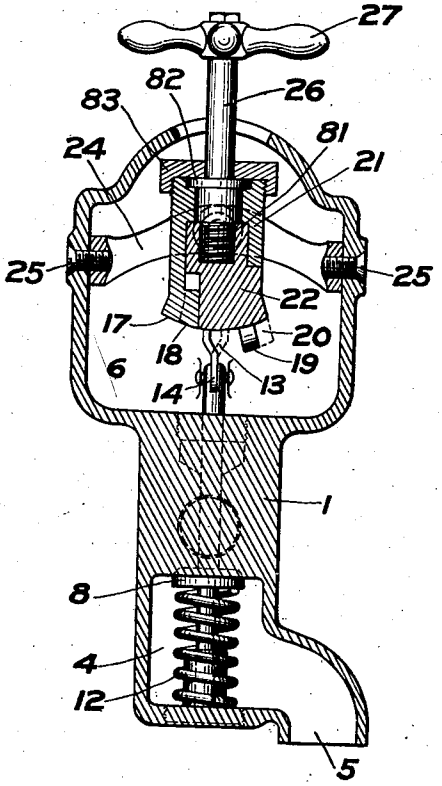


FIG. 3.



WITNESSES:

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N. Gurnee.

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2 SHEETS—SHEET 2.

FIG. 5.

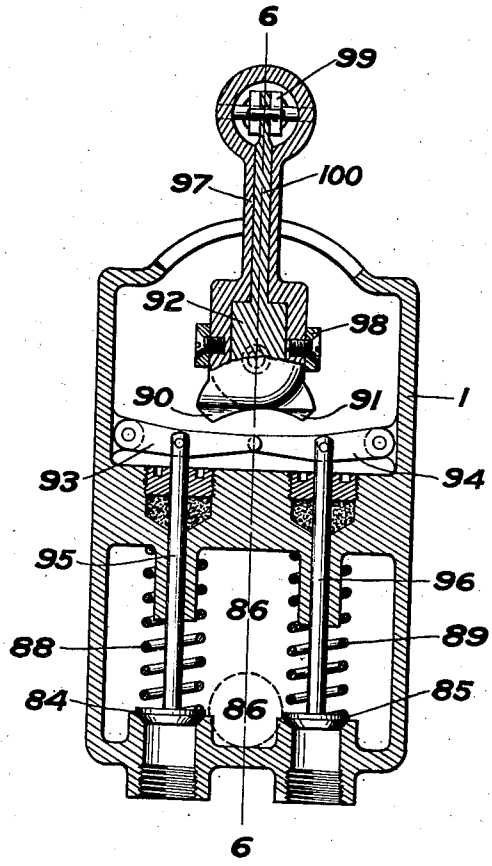
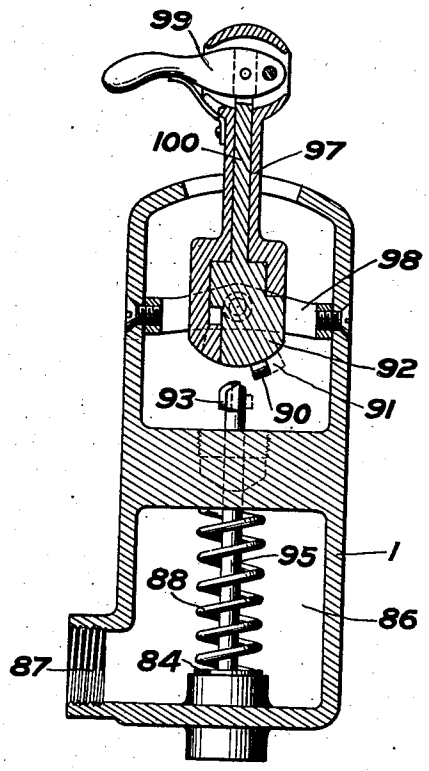


FIG. 6.



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UNITED STATES PATENT OFFICE.

HARRY BUCKLIN, OF ROCHESTER, NEW YORK.

FLUID-MIXER.

No. 874,737. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed September 26, 1905. Serial No. 280,165.

To all whom it may concern:

Be it known that I, HARRY BUCKLIN, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Fluid-Mixers, of which the following is a specification.

This invention relates to fluid mixers that are adapted so to control the supply from two different fluids that a mixture can be drawn in the proportions desired, and it has for its object to effect this by a mechanism that is simple and strongly made and is operated by a single lever.

In the drawings:—Figure 1 is a top view of the device; Fig. 2 is a vertical section on the line 2—2 of Fig. 1; Fig. 3 is a vertical section on the line 3—3 of Fig. 1; Fig. 4 shows certain cam actions; and Figs. 5 and 6 show a modified form.

1 is a casing of suitable form, having inlets 2 and 3, mixing chamber 4 that communicates with both said inlets, the discharge nozzle 5 leading from said mixing chamber, and the chamber 6 in which the operating parts are contained. We will assume that the mixer shown in Figs. 1 and 2 is connected with supplies of hot and cold water. The admission of water from the inlets 2 and 3 is controlled by the valves 7 and 8, respectively, which are carried by the stems 9 and 10, respectively, and are normally held to their respective seats by coiled springs 11 and 12. The valve stems 9 and 10 project up through the casing into the chamber 6, and are operated, respectively, by means of levers 13 and 14. The latter are pivoted at 15 and 16, respectively, to the casing and are connected intermediate their ends to said valve stems, respectively. The upper ends of these levers project upwardly so as to engage the operating cams 17, 18, 19 and 20. The cams 17 and 18 are formed upon the sleeve 21, and the cams 19 and 20 upon the block 22. The sleeve 21 is pivoted at 23 to the yoke 24 and the latter is pivotally supported within the casing at 25, 25. Thus the cams are adapted to swing in either of two directions at right angles to each other. The cams are swung by a stem 26 which enters the sleeve 21 and is screwed into the block 22, and which carries at its upper end the handle 27.

Normally the parts will occupy the central positions in which they are represented in the drawing, when the levers 13 and 14 are disengaged from the cams, as shown in Fig. 3. When the stem 26 is rocked to the left in Fig. 3, cam surface 17 is brought directly over and into engagement with the free end of the lever 13, and the cam surface 18 over the free end of the lever 13. We have assumed that the lever 13 controls the hot water supply and the lever 14 the cold water supply. If, after the stem 26 is rocked to the left, as stated, till it is free from the abutments 28, 28, and enters the guide slot 29 in the casing (see Fig. 1), said stem is swung to the left in Fig. 2, the cold water only will be admitted to the chamber 4, for then the straight portion 30 of the cam 17 forces down abruptly the lever 14, thereby opening the valve 8, while the curved surface 31 of the cam 18, since it has its center at the pivotal axis of the yoke 24, does not disturb the hot water lever 13. If now the stem 26 is swung to the right in Fig. 2, only the hot water is turned on for now the straight surface 32 of the cam 18 forces down abruptly the hot water lever 13, while the cold water lever 14 is not disturbed by the curved surface 33 of the cam 17, which too has its center in the pivotal axis of the yoke 24. If, instead of throwing the stem 26 into the slot 29, it is moved to the right in Fig. 3 till it enters the slot 34 (see Fig. 1), the cams 19 and 20 will be brought into contact with the free ends of the levers 13 and 14, respectively. If next said stem 26 is swung to the left in Fig. 2 the cold water is turned on abruptly at full head by the curved surface 35 of the cam 19, which engages the free end of the lever 14, while at the same time the hot water is turned in gradually by the straight surface 36 of the cam 20, which engages the free end of the lever 13 until the curved surface 40 comes into engagement with the lever 14. This latter is curved from a center in the pivotal axis of the yoke 24, but at this point the hot water is turned on full head. Finally, if the stem 26 is swung in the slot 34 to the right in Fig. 2, the hot water is turned on abruptly at full head by the curved surface 38 of the cam 20, which engages the free end of the hot water lever 13, while, at the same time the cold water is turned on gradually by the straight surface 39 of the cam 19, which engages the free end of the cold water lever 14,

until the curved surface 37 engages the lever 13. The surface 37 is curved from a center in the pivotal axis of the yoke 24, but at this point the hot water has been opened at full head.

The valves 7 and 8 are opened against the resistance of the coiled springs 11 and 12, which, respectively, return the valves to their seats when the cams permit.

This construction makes it possible to so control the hot and cold water inlets that by the manipulation of a single handle, water can be drawn from either the hot or the cold water supply, or from both at the same time, and furthermore that when water is drawn from both supplies either can be admitted at full head, while the flow of the other is gradually increased.

It is obvious that if desired the inlet 2 may be connected with a steam generator instead of with a hot water supply and that the operation will be the same, and that the temperature of the cold water can thereby be raised in the mixing chamber 4.

Since the operating lever 26 has an adjustable connection with the block 22 through its threaded lower end 81, said block will be forced down as said lever is screwed into said block, and raised as said lever is screwed out of said block, for the lever itself is held against axial movement by the flange 82 between the sleeve 21 and cap 83. Thus the block may be depressed or elevated by the operating lever whatever its position, and so both valves may be opened and closed the same distance, at the same time, whatever part of the surfaces of the cams 19 and 20 may engage the levers 13 and 14.

In Figs. 5 and 6 the device is adapted to gas engines in which air is mixed with vapor. In this construction the valves 84 and 85 admit, respectively, vapor from a fuel supply and air from atmosphere. They lead to a mixing chamber 86 which communicates with the combustion chamber by the passage 87. The valves 84 and 85 are raised against the resistance of their respective springs 88 and 89 when the mixing chamber is exhausted by the forward stroke of the piston of the gas engine to which it is attached as stated. Cam faces 90 and 91 on the block 92 are adapted to engage, respectively, the levers 93 and 94, as they are raised by the valve stems 95 and 96, respectively, and so to limit the extent to which said valves can open.

The block 92 is movable longitudinally within the sleeve 97 by which it is supported. The sleeve is pivotally supported by the yoke 98, and the latter is in turn pivotally supported within the casing, as in the construction previously described, so that said sleeve 97 and block 92 are adapted to rock in either direction. When the sleeve 97 is rocked to the right of Fig. 6, the cams 90 and 91 overlie the free ends of the levers 93 and 94, respectively, and then when the sleeve is rocked from left to right, in Fig. 5, or vice versa, different parts of the cam surfaces are presented to the levers. These cams 90 and 91 are, respectively, similar in contour to those of the cams 19 and 21, shown in Fig. 4, so that one valve will be opened more rapidly than the other, as described above.

In the construction shown in Figs. 5 and 6, the cams 90 and 91 are depressed together by the lever 99 which is pivoted within the sleeve 97, extends out therefrom for manipulation, and engages the stem 100 on the block 92.

What I claim is:—

1. A mixer comprising a chamber having two separate inlets, and an outlet; valves adapted to move in one direction to close said inlets and in the opposite direction to open them; cams pivotally supported within said mixer to swing together, and adapted when rocked in one direction to depress one of the valve stems, and when rocked in the opposite direction to depress the other valve stem; springs controlling, respectively, the movement of said valves in one direction; a hand operating lever attached to said cams whereby they are rocked; and means for moving said cams vertically when in any position, whereby said valves are depressed simultaneously and to the same extent.

2. A mixer comprising a chamber having two separate inlets, and an outlet; valves adapted to move in one direction to close said inlets and in the opposite direction to open them; a hand operated lever; connections between said lever and the valve stems, whereby, as said lever is rocked in one direction, said valves are moved at the same time in the same direction at different velocities; means also operated by said lever whereby said valves are opened siimultaneously and to the same extent; and springs controlling, respectively, the movement of said valves, in one direction.

3. A mixer comprising a chamber having two separate inlets, and an outlet; valves adapted to move in one direction to close said inlets and in the opposite direction to open them; a hand operated lever; connections between said lever and the valve stems, whereby, as said lever is rocked in either direction, both of said valves are moved at the same time in the same direction but one with a greater velocity than the other, according to the direction in which the lever is moved; means also operated by said lever, whereby said valves are opened simultaneously and to the same extent; and springs controlling, respectively, the movement of said valves in one direction.

4. A mixer comprising a chamber having two separate inlets, and an outlet; valves adapted to move in one direction to close

said inlets and in the opposite direction to open them; levers pivoted to the mixer casing and attached to the valve stems, respectively; a block pivotally supported within said mixer, having two cam surfaces adapted, respectively, to engage the free ends of said levers, and, when said block is rocked in one direction, to depress one lever and valve stem, and, when said block is rocked in the opposite direction, to depress the other lever and valve stem; springs controlling, respectively, the movement of said valves in one direction; and means for rocking said block.

5. A mixer comprising a chamber having two separate inlets, and an outlet; valves adapted to move in one direction to close said inlets and in the opposite direction to open them; levers pivoted to the mixer casing and attached to the valve stems, respectively; a block pivotally supported within said mixer, having two cam surfaces adapted, respectively, to engage the free ends of said levers, and, when said block is rocked in one direction, to depress simultaneously both levers and valve stems at different velocities; springs controlling, respectively, the movement of said valve stems in one direction; and means for rocking said block.

6. A mixer comprising a chamber having two separate inlets, and an outlet; valves adapted to move in one direction to close said inlets and in the opposite direction to open them; levers pivoted to the mixer casing and attached to the valve stems, respectively; a block pivotally supported within said mixer, having two cam surfaces adapted, respectively, to engage the free ends of said levers, and, when said block is rocked in one direction, to depress one lever and valve stem, and, when said block is rocked in the opposite direction, to depress the other lever and valve stem; springs controlling, respectively, the movement of said valves in one direction; means for rocking said block; and means for moving said block vertically, when in any position, whereby said valves are depressed simultaneously and to the same extent.

HARRY BUCKLIN.

Witnesses:
D. GURNEE,
L. THON.