(No Model.)

2 Sheets—Sheet 1.

C. M. & C. E. KEMP.

GAS MIXER.

No. 507,013. Patented Oct. 17, 1893.

Fig 1.

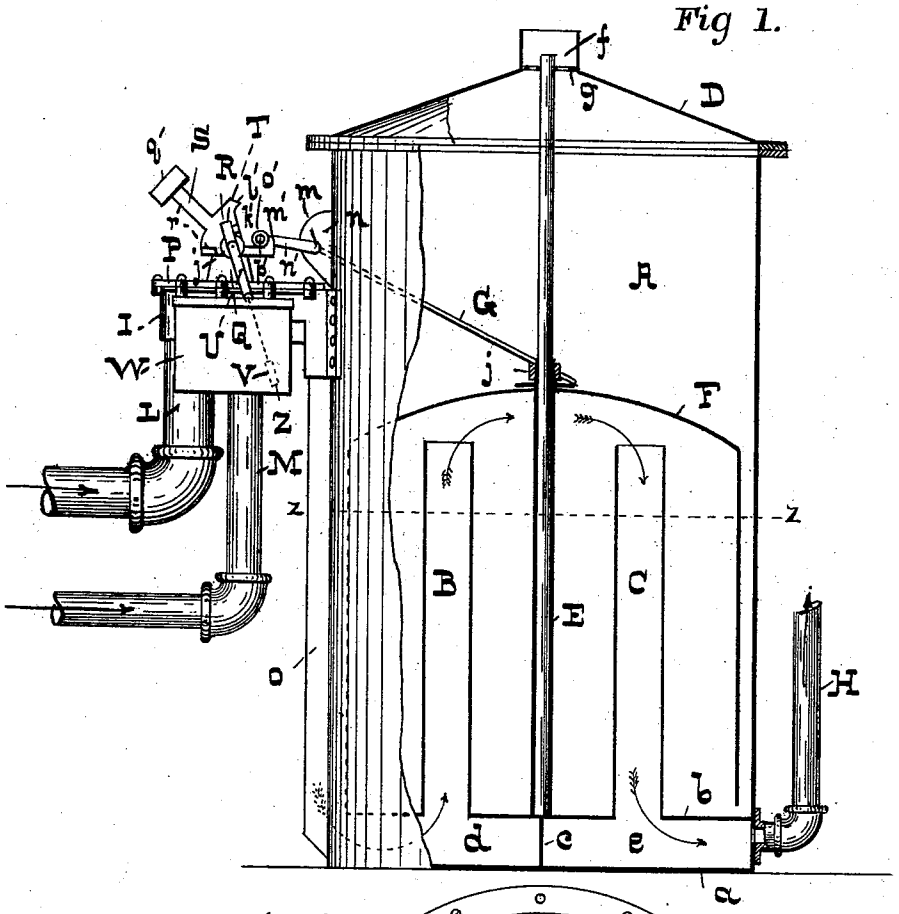


Fig 2.

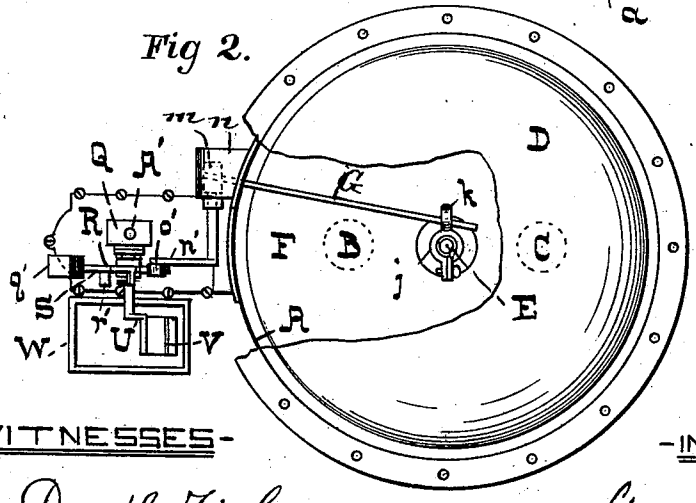
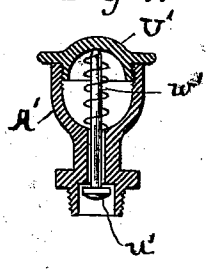


Fig 7.



-WITNESSES-

Dan'l Fisher

George Kemsley

-INVENTORS-

Clarence M. Kemp,

Charles E. Kemp,

by Wm. N. T. Wood, atty.

(No Model.)

2 Sheets—Sheet 2.

C. M. & C. E. KEMP.

GAS MIXER.

No. 507,013. Patented Oct. 17, 1893.

Fig 3.

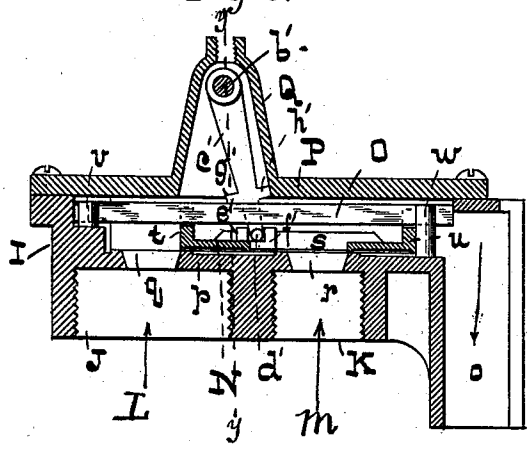


Fig 4.

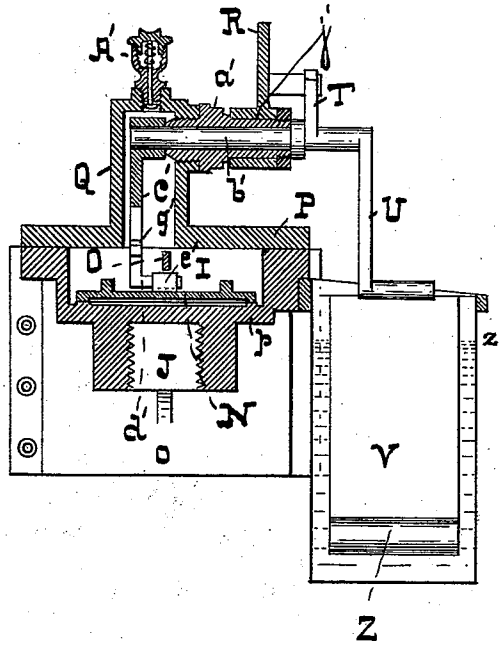


Fig 5.

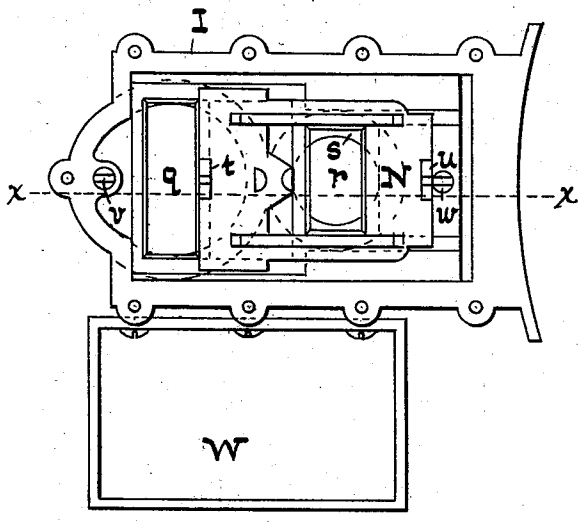
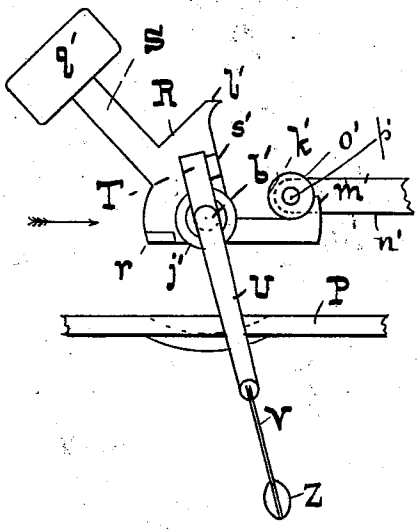


Fig 6.



-WITNESSES-

Dan'l Fisher

George Hemsley

-INVENTORS

Clarence M. Kemp,

Charles E. Kemp,

by Wm. H. T. Maud, Atty.

UNITED STATES PATENT OFFICE.

CLARENCE M. KEMP AND CHARLES E. KEMP, OF BALTIMORE, MARYLAND

GAS-MIXER.

SPECIFICATION forming part of Letters Patent No. 507,013, dated October 17, 1893.

Application filed May 9, 1893. Serial No. 473,499. (No model.)

To all whom it may concern:

Be it known that we, CLARENCE M. KEMP and CHARLES E. KEMP, both of the city of Baltimore and State of Maryland, have invented certain Improvements in Gas-Mixers, of which the following is a specification.

This invention relates to certain improvements in a gas mixer whereby air and the vapor of some light hydrocarbon, or any two gases, admitted thereto in preferably known proportions, are mixed, and the mixture forced therefrom, as will hereinafter fully appear.

In the further description of the said invention which follows, reference is made to the accompanying drawings forming a part hereof, and in which—

Figure 1 is a partly sectional side view of the improved apparatus, and Fig. 2 a top view of the same with certain parts thereof broken away to show other parts underneath. Figs. 3 to 7 inclusive, are enlarged details of the apparatus, hereinafter described.

Referring to the drawings, A represents a tank having a bottom *a*, and above it a false bottom *b*. The space between the true and false bottoms, *a* and *b*, is divided by a partition *c* into the compartments *d* and *e*.

B and C are standing pipes the lower ends of which are secured in the false bottom *b*. These pipes extend to a point above a certain water line hereinafter alluded to, and serve to place the compartments *d* and *e*, respectively, in communication with the interior of the tank A. The upper edge of the tank A is flanged, and to this flange is secured a conical flanged top D having a central opening *f*.

E is a rod placed centrally of the tank, and it extends from the false bottom *b* to the opening *f* where it is supported by a perforated plate *g*.

F is a hood adapted to slide on the central rod E, into which the gases to be mixed are introduced, as hereinafter described.

To the top of the hood F is secured a clamp collar *j* having an eye *k* extending from one side. Through this eye is inserted a rod G, the upper end of which is inserted in a shaft *m* partially inclosed in a box *n* attached to the outside of the tank A. The wall of the tank is slotted where the rod G passes through it to allow of the vibratory motion of the rod as the hood is moved up and down in the operation of the apparatus.

The gases to be mixed are introduced to the compartment *d* between the true and false bottoms, through an exterior channel *o* having at its upper end a valve chest containing valve mechanism and other attachments hereinafter described, and pass thence through the pipe B to the interior of the hood. The mixed gases pass down the stand pipe C to the compartment *e* and thence to the delivery pipe H.

I is the valve chest before alluded to, attached in any suitable manner to the upper end of the channel *o*. Fig. 5 is a top view of this chest and its immediate connections without its top or cover, on an enlarged scale. A sectional side view of this chest, on an enlarged scale, and taken on the dotted line *x*—*x*, Fig. 5, is shown in Fig. 3 and a cross section on the dotted line *y*—*y*, in Fig. 4.

The bottom of the valve chest which is denoted by *p*, has two ports *q* and *r* therein. Under the ports *q* and *r*, and in communication therewith, are nozzles J and K, and into these are screwed the pipes L and M for the introduction of the gases to be mixed.

On the valve face which is the upper surface of the bottom *p* of the valve chest I, is situated a slide valve N with one port *s* therein and the valve is held in place by the bar O which rests on the projections *t* and *u*. The ends of this bar O, rest in slotted lugs *v* and *w* on the surface of the valve face. The lifting of the bar O is prevented by the cover P of the valve chest which is nearly in contact with the upper end of the lugs *v* and *w* and the upper edge of the bar G.

Q is a box cast as a part of the valve chest cover P, having a plug *a'* screwed into one side thereof, and through this plug is passed a shaft *b'* the inner end of which has an arm *c'* for operating the valve N. The lower end of the arm *c'* has a pin *d'* which rests between the lugs *e'* and *f'* on the upper surface of the valve N. The said arm has also stops *g'* and *h'* one of which, as the arm is moved over in either direction, strikes the side of the box Q, and limits its swinging movement.

R is a plate having a hub *j'*, adapted to vibrate on a projecting part of the plug *a'*. This plate has a recess *k'* in one side, and in the up-

per and lower ends of the recess are hooks l' and m'. The shaft m before alluded to as having its end inclosed in the box n, has an arm n' with a roller o' adapted to turn on a pin p' at its end. This roller is situated in the recess k' in the vibratory plate R, see Figs. 1 and 2. The plate has also an arm S with a weight q' at its end, and two tappets r' and s' for the purpose hereinafter described. The shaft b' has an upwardly extending arm T, and downwardly projecting arm U. The arm T is in such position as to be struck by the tappets r' and s' when the plate R is vibrated by the roller o' of the arm n' striking either hook l' and m', and the arm U has a paddle or fan V which is situated in a box W containing water.

Z is a float on the lower edge of the paddle V.

A' is an oil cup in the top of the box Q whereby oil is introduced to lubricate the valve N. The valve u' of the oil cup opens inward, and its stem is of such length, that when the cap v' is screwed down the valve is slightly opened which allows oil to pass to the chest. When the cap is taken off the spring w' seats the valve and prevents escape of gas.

The oil cup is shown on an enlarged scale in Fig. 7.

To prepare the apparatus for use, the tank is supplied with water to a height indicated by the dotted line z, and certain valves not shown in the pipes L and M opened. Supposing the hood F to be in its lowest position as shown in Fig. 1, the gases, in proportions governed by the sizes of the pipes L and M, the openings in the valves in the pipes, and the respective pressures of the gases, pass through the valve N into the chest I and down the channel o to the compartment d under the false bottom b. They then pass upward through the stand pipe B into the hood F, and down through the stand pipe C to the compartment e and then thence to the delivery pipe H. At the same time, the hood rises. The gases are thoroughly mixed in taking the circuitous passage described and indicated by the arrows in Fig. 1. As the hood rises the arm n' with its roller o' depresses the lower hook m' of the plate R, and raises the weighted arm S, until, when the hood has reached a desired high point, the weighted arm S is brought into a position beyond its center of gravity from which it falls and the tappet r' strikes the arm T, and that device is thrown suddenly over which changes the position of the valve or closes it so that no more gas is admitted from either pipe. The shock which would be occasioned by the reversal in position of the parts, as described, is reduced by the retarding influence of the water in the box W acting on the paddle V. The float Z attached to the paddle V, by reason of its flotation, that is to say its tendency to rise in the water in the box W, serves to lock the arm U in either position in which the said arm may be placed. The float may be integral with the paddle, or attached thereto as shown. As the mixed gases are drawn off, the hood falls and in this movement the upper hook l' of the plate R is lifted until the hood reaches its low position, when the weighted arm S falls over in an opposite direction thereby opening the valve N, and the hood is again filled, as before described. The perforations in the plate g in the nozzle f allow of the escape of air from the tank as the hood rises.

We claim as our invention—

1. In combination with a gas mixer having therein a vertically moving hood, a valve chest constructed to be applied to the gas mixer, having suitable pipes whereby the gases to be mixed are introduced to the said chest, a passage leading from the said chest to the mixer, a valve to control the admission of gases to the interior of the chest, a box erected on the cover of the chest, a shaft constructed to vibrate within a plug in the side of the box, having at its inner end an arm constructed to operate the said valve and at the other end an arm with a paddle, a float at the lower edge of the paddle and a box containing water in which the said float and a portion of the said paddle are immersed, the said float serving as a lock to hold the paddle in either of its extreme positions in the box, and mechanism to connect the said shaft with the hood of the mixer substantially as specified.

2. The combination of a valve chest and a valve, means to actuate the valve, a vessel containing water, and a paddle in the water having a motion derived from the valve operating mechanism, substantially as specified.

3. The combination of a valve chest and a valve, means to actuate the valve, a vessel containing water, a paddle having a motion derived from the valve operating mechanism, and a float whereby as the said valve is moved, it is locked, substantially as specified.

4. The combination in a gas mixer, of a valve chest with a valve therein, the said valve chest having a lid on which is mounted mechanism for operating the said valve, which mechanism consists of a shaft constructed to vibrate within a plug in the side of a box in communication with the said chest, said shaft having at its inner end an arm constructed to operate the said valve, and at the other end an arm with a paddle, a float at the lower end of the paddle, and a box containing water in which the said float is immersed, the said float serving as a lock to hold the paddle in either of its extreme positions, in the box, substantially as specified.

CLARENCE M. KEMP.
CHARLES E. KEMP.

Witnesses:
JOHN S. COLE,
W. ROBY PURNELL.