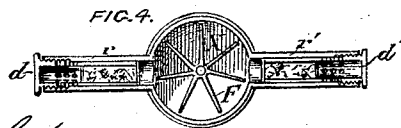
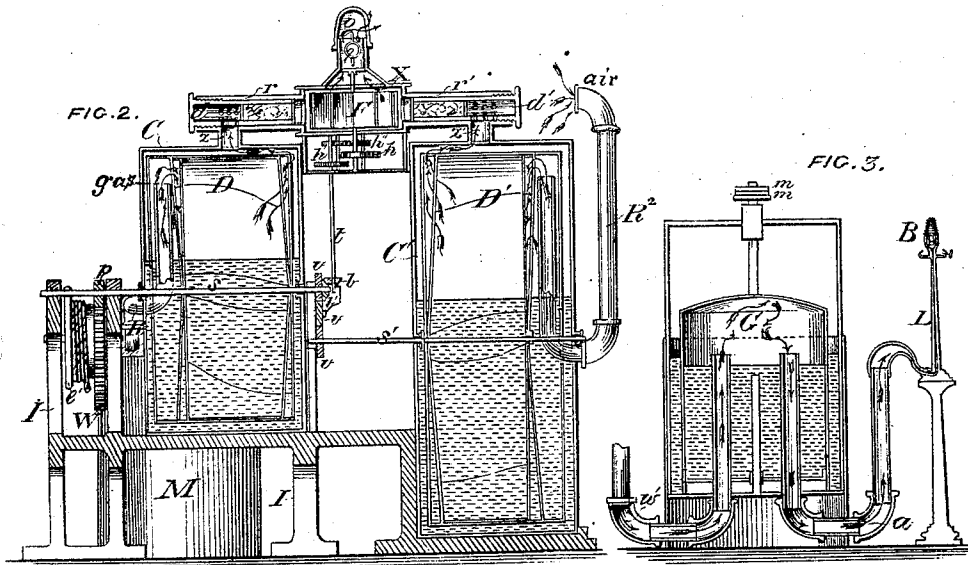
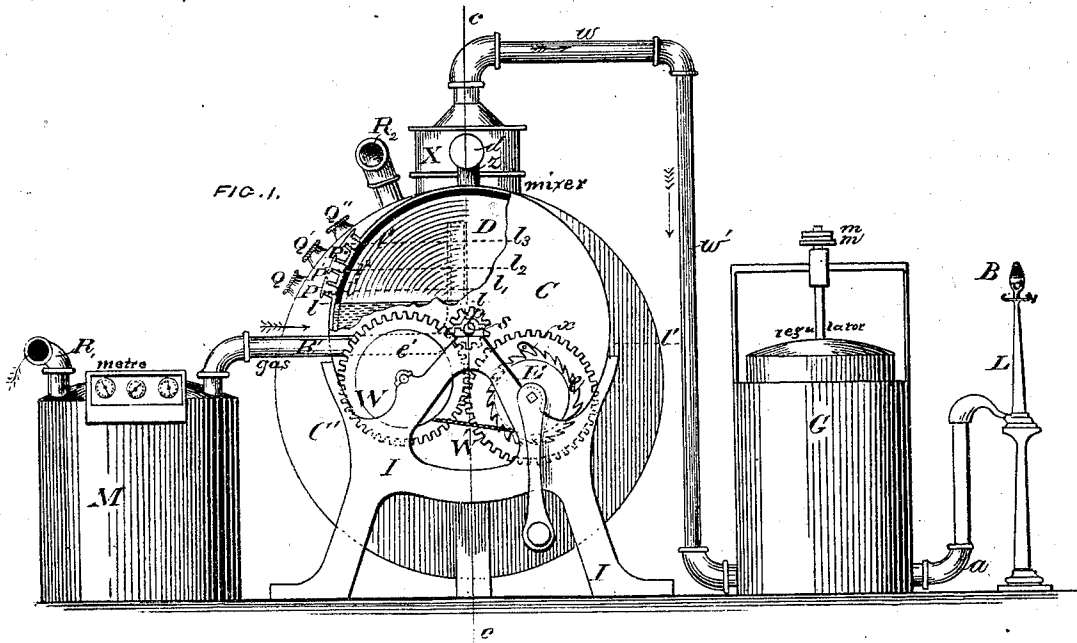


L. LANSZWEERT.
GAS-MIXING MACHINE.

No. 170,677.

Patented Dec. 7, 1875.



WITNESSES:

Sidney S. H. H. H.
Jacob L. H. H.

INVENTOR:

Louis Lanzweert
Per atty. Lionel Varicay

UNITED STATES PATENT OFFICE.

LOUIS LANSZWEERT, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-THIRD HIS RIGHT TO BÄR ADLER, OF SAME PLACE.

IMPROVEMENT IN GAS-MIXING MACHINES.

Specification forming part of Letters Patent No. 170,677, dated December 7, 1875; application filed June 18, 1874

To all whom it may concern:

Be it known that I, LOUIS LANSZWEERT, of the city and county of San Francisco, State of California, have invented an Improvement in Gas-Mixing Machines, of which the following is a specification:

My invention relates to an improved apparatus for the apportioning of gases that are to be mixed together, with devices for the more intimately mixing and purifying them previous to their combustion; the apportioning being effected by an arrangement of inlets affixed in certain definite positions onto casings in which gas-drums are made to revolve by the inflowing gases and auxiliary clock-work; the positions of these inlets regulating the heights of the contained water and remaining gas volumes; the purification being performed by forcing these apportioned gases through cylinders fitted with chloride of calcium and charcoal, or their equivalents, and the mixing by thoroughly stirring up these apportioned and purified gases by means of a fan kept revolving at a high speed in a separate chamber actuated by the same clock-work that operates the drums.

Figure 1 is a vertical longitudinal elevation of the improved gas-mixer embodying my invention, parts being broken away of the apparatus to exhibit the interior construction. Fig. 2 is a vertical transverse section of Fig. 1 through the line *c c*. Fig. 3 is a vertical longitudinal section of the governor with lamp attachments. Fig. 4 is a sectional plan of the purifying and mixing chambers.

My invention refers more particularly to the apportioning of certain gases, which, when purified and thoroughly combined together, and made to undergo combustion, produce such heat as to render a wire platina burner, or any other incombustible or infusible material, properly arranged and adjusted to the flame, incandescent and of great illuminative power.

These gases may be ordinary coal-gas and air, or pure oxygen and ordinary coal-gas, or the protoxide or deutoxide of azote with some other form of hydrocarbon; the main features of this invention being to regulate the propor-

tions with which such gases are to be mixed together, and their purity, so as to insure their greatest efficiency for illuminating and heating purposes, without incurring any danger in making explosive compounds.

As an example, for the sake of convenience, the gases supposed to be employed for this apparatus are ordinary coal-gas and common atmospheric air, in the proportions of one of the former to two of the latter, such mixture being admirably adapted for burning on an open wire-work platina burner, and is free from danger.

In order to effect this, I place in separate cylindrical gas-tight casings two gas-drums, side by side, with their central shafts in connection with one another, and affix a system of clock-work, or other suitable auxiliary power, onto the stands holding these casings, in such manner that it shall engage these shafts, and cause these drums to revolve in a positive direction; one drum receiving by inhalation its supply of air through an open pipe, and the other its supply of coal-gas from an ordinary gas-meter. The contents of each of these drums are discharged into small cylinders filled with chloride of calcium and carbon, or their equivalents, so that they may be desiccated and purified in their passage to a mixing-chamber, wherein a fan is kept revolving at a high rate of speed actuated also by clock-work.

The mixture thus perfected in this chamber flows through a large pipe to a governor, which is a vessel wherein the pressure of the combined gases can be regulated by the adjustment of weights previous to these gases being finally forced to a suitable vehicle for combustion. Onto these casings, which are fitted with revolving drums, several small inlets with stoppers are so arranged in certain definite positions that water can be poured into them according to the quantity required, so as to obtain certain determined proportions between the remaining gas capacity of each drum. Thus equal parts of gas and air may be made to fill these remaining spaces, and be discharged as explained, or the proportion of one of gas to two, three, or

four, &c., of air, or one, two, three, &c., of gas to other quantities of air, may be regulated and readily determined.

With reference to the figures in the drawing, C C' are the casings, and D D' are the gas-drums, which are fitted within them so as to have their central shafts or axes S S' respectively, on which they revolve, in gas-tight boxes, communicating with each other by the gearing *v v* in such manner that, on motion being communicated to one, the other will follow at the same rate of speed. For assisting in actuating these drums, regulating their movements, and mixing the gases, which pass through them, a system of clock-work, W W', *p*, E, *e e'*, is attached to the cast-iron stand I I, which holds the casings C C'. This clock-work consists, essentially, of loose and fixed tooth-wheels W W' respectively, which gear into one another and engage a pinion, *p*, fixed to the spindle *s* of the drum D.

A ratchet-wheel, *e*, actuates the wheel W' by the fixed pawl *a*, when a spring contained within the drum E attached to this ratchet-wheel is wound up to a sufficient tension by the handle H, while a cord from this drum E to a roller, *e'*, winds up and unwinds, so as to regulate the movements.

M is an ordinary coal-gas meter, supplied by a pipe, R, which conveys this gas to the drum D by a pipe, R', which enters the casing C near the center, and is bent upward for a considerable distance into the space provided in the drum D, so as to reach above all levels of the water contained, and so that each of its four or more compartments shall receive and deliver its gas contents through slits arranged in the same manner as in the gas-meter M.

The drum D' in the case C' receives air from the pipe R² by inhalation, and discharges the contents of its compartments in the same manner as the drum D, the one passing through the pipe Z and the other through the pipe Z', fixed to the top of the casings C C' respectively. Each gas in escaping is forced to enter perforated cylinders *d d'*, filled with chloride of calcium and charcoal, or their equivalents. These cylinders are closed at one end, and are made adjustable by screwing into pipes *r r'*, fixed at right angles to the pipes Z Z'.

X is the mixing-chamber, into which the pipes *r r'* discharge on opposite sides, so that after the gases have passed through the chloride-of-calcium and carbon compound, they may enter the chamber simultaneously. In this compartment X a fan, F, provided with several blades, is kept revolving at a high speed by the multiplying-gearing *h h' h''*, connecting with the beveled wheels *b b'* by the spindle *t*, and by the spindle with the clock-work W W' *p e e'*, which actuates the drums D D'. In this compartment the gases are thoroughly and intimately mixed, so that

the illuminating and heating power of the combination may be increased, as, in practice, the color of the light in such illuminating mixtures depends a great deal on the perfection of the combination formed.

From the chamber X the gases escape by lifting up a hollow ball-valve, *q*, which serves to prevent any back action, and pass through the opening O into the pipes *w w'*, and thence into the governor G, wherein the necessary pressure of the mixed gases is regulated by weights *m m'*, and, by this arrangement, is made to descend in a continuous stream through the pipe *a*, and upward again to the lamp L and burner B.

For the apportioning of such gases, inlets P P' P'' Q Q' Q'', with stoppers fitted thereto, are provided respectively on the upper parts of the casings C C' in certain determined positions, so that when a liquid is poured through them into these casings to the several levels indicated by these inlets, the gas capacities of the contained drums D D' and their deliveries shall bear a certain relative proportion to one another, for, if a liquid be poured into the casings C C' to the levels *l l' l''* respectively, so that the gas-volume that may be delivered from the drum D' shall be double that from the drum D, then, by pouring more liquid into the inlet Q' of the casing C', the delivery may be made equal; whereas, if the level *l''* be attained in the casing C, and that in C' remain at *l' l'*, as at first, the gas capacities and deliveries of the drums may be as 1 to 4, say, and so on, for such other proportions as may be desirable, the different levels *l' l' l'' l'' l''' l'''*, &c., indicated by the inlets P P' P'' in the casing C, giving to the remaining gas capacity of the drum certain relative fractional proportions of one another, and as the casing C' is similarly arranged, gases may be measured out by this process in various quantities to suit the requirements of the mixture afterward made, as already described.

I do not claim broadly the apportioning of gases for such mixtures, as I am aware that this is not new, but

What I claim as my invention, and for which I am desirous of obtaining Letters Patent of the United States, is—

1. In a machine for mixing gases, substantially such as herein described, the casings holding the several gases to be mixed, provided respectively with a graduated series of nozzles, through which they may be filled up to determined relative levels with a liquid, to regulate their respective capacities for gas, substantially as and for the purpose specified.

2. The cylinders *d d'*, fitted to the pipes *r r'* between the casings C C' and mixing-chamber X, filled with chloride of calcium and carbon, or their equivalents, for purifying the gases delivered by the drums D D' previous to their combination, substantially

as and for the purposes herein set forth and specified.

3. The fan or blower F, provided in the mixing-chamber X, actuated by the clock-work W W' p E e e' b b' t h h', for the more intimately mixing of the gases delivered by the drums D D' through the pipes Z Z', and

purifying-compartments d d' described, substantially as and for the purposes herein set forth and specified.

LOUIS LANSZWEERT.

Witnesses:

ALFRED U. CRANE,
LIONEL VARICAS.