

# PROCESS FOR THE MANUFACTURE OF A MIXTURE OF GAS AND AIR FOR ILLUMINATING PURPOSES.

935,444.

Fig. 2.

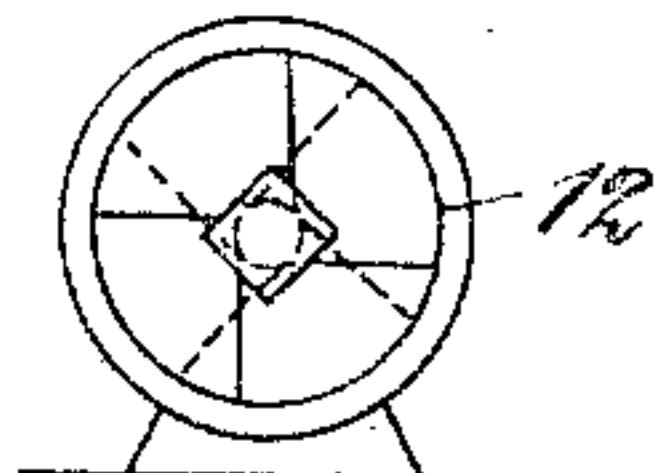
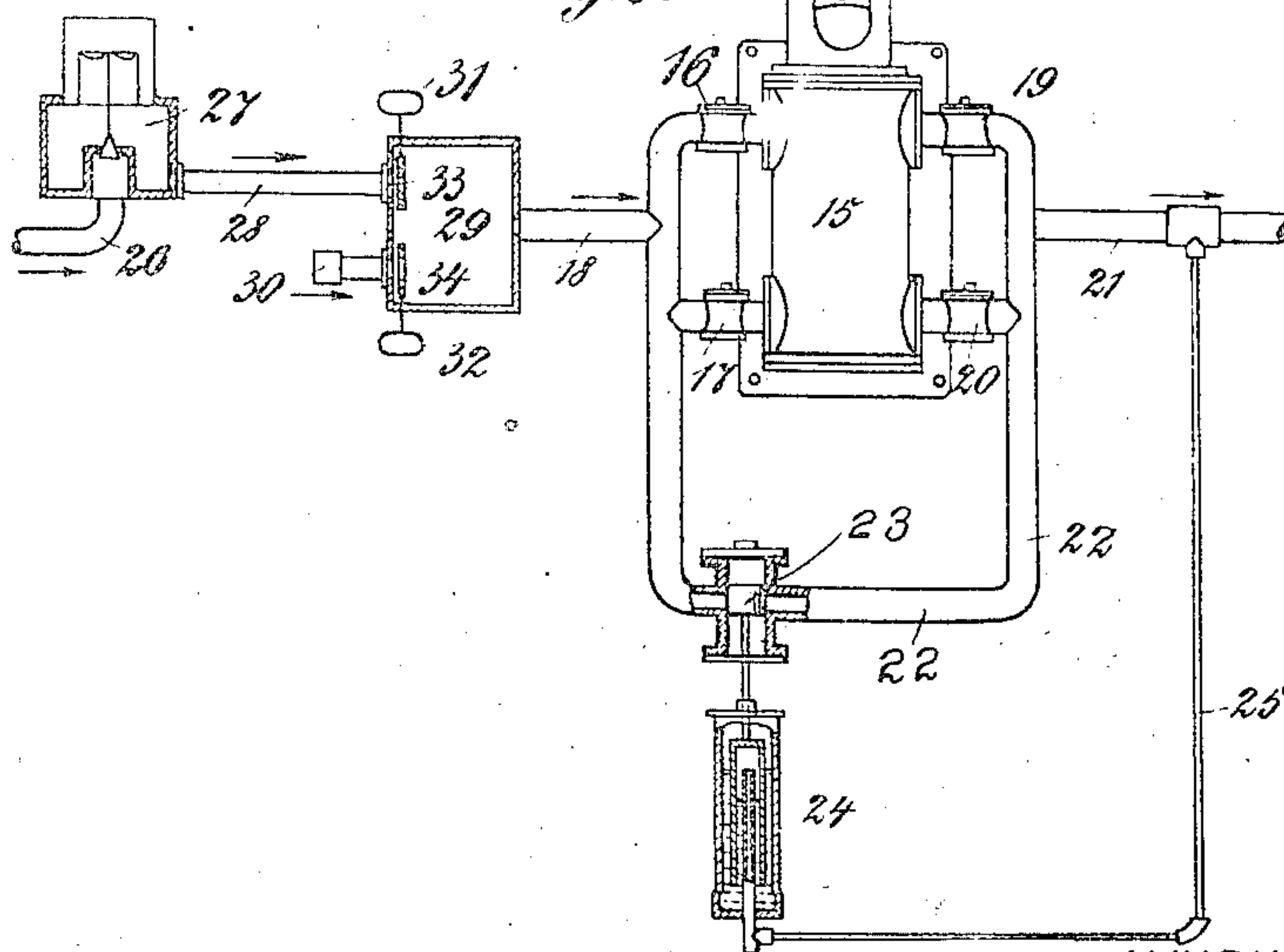


Fig. 3.



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PROCESS FOR THE MANUFACTURE OF A MIXTURE OF GAS AND AIR FOR ILLUMINATING PURPOSES.

935,444.

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Application filed February 7, 1906. Serial No. 300,021.

To all whom it may concern:

Be it known that I, FRIEDRICH WILHELM WOLFF, chief engineer, a subject of the German Emperor, and a resident of Berlin, Germany, have invented a certain new and useful Improved Process for the Manufacture of a Mixture of Gas and Air for Illuminating Purposes and Installation Thereof, of which the following is a specification.

The invention relates to an improved method or process for the production of a gas and air mixture for illuminating purpose there being a connection with the pipes of a gas work and employed a suction and forcing apparatus which produces and sucks the mixture at low pressure and feeds it at an increased pressure to the consumption place.

The object of the invention is to prevent unequal mixing proportions of gas and air by bringing one of the two constituents of the mixture to the pressure of the other before the suction of the mixture takes place. This may be effected in such a manner that before its suction the air is brought to the pressure of the gas or that the gas is decreased to the zero pressure of the air.

Several examples of means for carrying the process into practice are illustrated in the accompanying drawing, in which:

Figure 1 shows diagrammatically an installation with rotary supply apparatus. Fig. 2 shows a detail of Fig. 1 in which the air is raised to the pressure of the gas. Fig. 3 illustrates an installation with piston supply apparatus in which the gas is conducted to the suction pipe without pressure.

In the manner of carrying the invention into practice in accordance with Figs. 1 and 2, the suction and forcing apparatus (for example a continuously rotating device 1 which may be driven off a suitable motor 3 by means of a belt 2) sucks the gas and air mixture from the suction pipe 4 and then supplies it to the service main 5. The burners 7, 8 and the like are connected with the service pipe in an appropriate manner by means of branch pipes 6. The gas flows through the pipe 9 and the air through the socket 10.

Now in order to maintain the two pressure differences referred to in the introduction, between the suction pipe 4 and the gas supply pipe 9 on the one hand and the

suction pipe 4 and the air supply pipe 10 on the other hand, equal in their proportional constant ratio and to prevent irregularities in the mixing proportion of gas and air the gas and air are brought to a corresponding pressure before their suction. In accordance with Fig. 1 this takes place by means of two suction and forcing apparatus 11, 12 which may be constructed in the manner of gas meters. It is assumed that the pressure of the gas to be supplied drives both the suction and forcing drums, so that the energy inherent in the gas serves as the motor medium for increasing the pressure of the air. In this manner the advantage is obtained that the energy of the gas supplied may be almost completely utilized, as by the suction effect of the suction and forcing apparatus 1 the driving of the two drums 11, 12 is maintained. In this case gas and air are rendered available for the suction and forcing apparatus at equal pressures so that the quantitative proportions of gas and air do not vary in spite of varying consumption of the gas and air mixture.

The influences of variations of pressure in the gas supply pipe may be eliminated by conducting the gas through a pressure regulator before it reaches the pipe 9 and flows to the drum 11. To this end a pressure regulator known *per se* such as 13 in Fig. 1 may be arranged in front of the pipe 9 and connected with the gas supply pipe 14.

In carrying the invention into practice in accordance with Fig. 3 a double acting supply pump 15 is provided and by means of the two suction valves 16, 17 sucks the mixture of gas and air out of the suction pipe 18 and by means of the forcing valves 19, 20 supplies it to the service pipe 21. The suction and force pipes of the piston supply pump are also connected in the known manner with circulation pipes 22 in which a non-return valve is inserted at 23. This latter is connected (likewise in the known manner) say by means of the regulator 24, with a pipe 25 which is in communication with the service pipe. So long as the valve 23 is closed and communication between the suction valves 16, 17 and the forcing valves 19, 20 consequently interrupted, the normal supply process takes place. If, however, the pressure in the service pipe rises above a certain limit, with the consumption, the



valve is opened, the more so the higher the pressure rises. By this means the result is attained that with an increase of pressure in the service pipe the supply furnished by the pump is influenced inasmuch as the suction valves 16, 17 not only suck from the suction pipe 18 but also a part of the mixture from the service pipe 21 and the quantity of the mixture sucked from the service pipe 21 with each stroke increases with the increase of pressure in this latter as the valve 23 is opened increasingly. By this means it is rendered impossible in the known manner for the pressure in the service pipe to exceed certain limits.

In the constructional form in accordance with Fig. 3 the gas, before it is rendered available for the suction and forcing apparatus, flows out of the pipe 26 through some appropriate, known form of pressure regulator 27 which is connected with the suction and mixing chamber 29 by means of a pipe 28. Air is introduced into this chamber through 30. In order that with this arrangement likewise the gas and air may be supplied to the suction and forcing apparatus with corresponding pressures, the pressure regulator 27 is of such construction that the gas reaches the suction chamber through the pipe 28 without pressure. By means of special slides or valves 31, 32 the suction orifices 33, 34 for gas and air may be appropriately regulated in cross section.

It will be understood that the two drums 11 and 12 do not equalize the pressure of gas and air except in the sense that the drum 12 brings the air to the pressure of the gas so that both gas and air are sucked in under a common pressure by the action of the apparatus 1. Both drums may be constructed after the manner of gas meters.

What I claim and desire to secure by Letters Patent of the United States is:—

The method herein described, of producing a mixture of gas and air, which consists in taking a quantity of gas and a quantity of air at different pressures, and in different volumes, altering the pressure of one of these two constituents so as to make it exactly equal to the pressure of the other constituent, while maintaining the relative proportion of the two constituents, thus bringing the gas and air to a common pressure before mixing said gas and air together, then mixing said gas and air, and finally increasing the pressure of the mixture to a comparatively high degree for the purpose of forcing said mixture to the place of consumption.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRIEDRICH WILHELM WOLFF.

Witnesses:

HENRY HASPER,  
WOLDEMAR HAUPT.