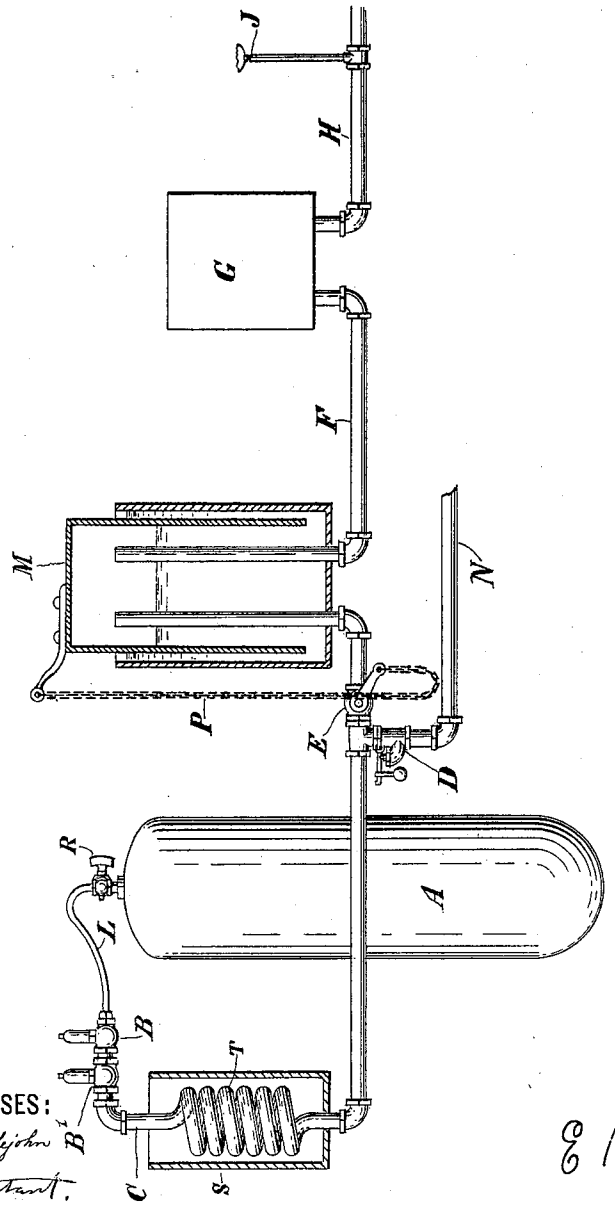
No. 611,168. Patented Sept. 20, 1898.

E. N. DICKERSON.

AUTOMATIC GAS SUPPLY APPARATUS.

(Application filed Dec. 20, 1894.)

(No Model.)



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EDWARD N. DICKERSON, OF NEW YORK, N. Y.

AUTOMATIC GAS-SUPPLY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 611,168, dated September 20, 1898.

Application filed December 20, 1894. Serial No. 532,425. (No model.) Patented in England June 18, 1895, No. 11,848B; in France June 18, 1895, No. 248,270; in Belgium June 18, 1895, No. 116,130; in Italy June 18, 1895, XXX, 39,163, LXXVI, 430, and in Spain June 19, 1895, No. 17,594.

To all whom it may concern:

Be it known that I, EDWARD N. DICKERSON, of the city, county, and State of New York, have invented a new and useful Improvement in Automatic Gas-Supply Apparatus, (patented to me in England, No. 11,848B, June 18, 1895; in France, No. 248,270, June 18, 1895; in Belgium, No. 116,130, June 18, 1895; in Italy, Vol. XXX, No. 39,163, Vol. LXXVI, No. 430, June 18, 1895, and in Spain, No. 17,594, June 19, 1895,) of which the following is a full, true, and exact description, reference being had to the accompanying drawing.

This invention relates to an improvement in apparatus for supplying illuminating-gas to houses or other places, and is especially applicable to the practical utilization of liquefied acetylene gas. I have discovered that such gas can be liquefied under suitable conditions at reasonable pressures and subsequently utilized for illuminating purposes. Preferably the gas should be mingled with a suitable proportion of air before burning.

My invention will be readily understood from the accompanying drawing, which represents an elevation, partly in section, of my device, in which—

A represents a liquefied-gas receiver; B, an automatic reducing-valve; T, an expansion-coil in brine-tank; E, regulating-valve; M, governing gas-holder; G, mixing device; J, a burner, and D a safety-valve.

The liquefied gas is contained in the receiver A, of which several may be simultaneously connected to the pipe, if desired, or they may be consecutively connected to the gas-pipe L, as desired. This gas will exist in a liquid form at ordinary temperatures at a pressure of less than a thousand pounds to the square inch. The gas escaping from the liquid passes through cock R to pipe L to automatic pressure-reducing gas-governors B, of which a series B B′ may be employed, if desired, so as to reduce the pressure to the point desired for the holder. I do not describe the construction of such automatic pressure-reducing valves for they are well known. They may be of the kind employing a diaphragm or piston to close a valve, or the said valve may be adjustable by hand to the exact determined pressure. It is generally advisable to reduce the pressure by successive steps in a series of such valves. The expansion of the liquid to a gas produces cold, which may be utilized by causing the pipe C to pass through the brine-tank S. Of course this coil will be arranged with reference to the expansion of the liquid at a suitable point. It may, for instance, be between the reducing-valves B B′. The cold so produced in the brine-tank may be utilized in any well-known way, or the expansion-coil T may be itself placed in a refrigerator as a source of cold. I prefer, however, for household purposes to cool a suitable body of brine, the cold of which can be afterward utilized, because the cold produced by the gas is necessarily intermittent, dependent upon the consumption of the gas. The gas passes by pipe C to holder M, which may be of any suitable construction or may be replaced by a pressure-regulating device. This holder M controls the stop-cock E on the inlet of the holder, thereby shutting off the pressure when the holder has reached its capacity. The holder itself is weighted to the pressure adapted to operate the air-mixing machine G, to which the gas passes by the pipe F and from which it passes by pipe H to burner J. This air-mixing machine may be of any suitable kind, the object being to add to the gas a proportionate amount of air. A suitable proportion is fifty-five per cent. of acetylene gas and forty-five per cent. of air. In case of excess of pressure in the pipe C a safety-valve D may be provided, allowing the escape of such pressure through the pipe N to the open air or other receptacle.

The operation of my device will now be readily understood. The pressure of the gas being reduced by the reducing-valves to a reasonable amount enters the governing-holder M. When the same is filled, the entry-valve E, which opens by its own weight, is raised by the chain P, so as to prevent further passage into the holder. The holder itself automatically supplies the gas-main F, delivering through the mixer G to the burner. In case of any excess of pressure es-

caping through the regulating-valve B, so as to endanger the apparatus, such excess may escape by the safety-valve D.

Though I prefer to employ the governing-holder M for exact uniformity of pressure, it is evident that in some cases this may be omitted, the regulating-valve B taking its place. Also the safety-valve D is merely a question of additional precaution in some constructions of the apparatus and is non-essential to the operation.

I do not claim to be the first inventor of a regulating-valve for regulating the pressures delivered from liquefied gas, such idea being in common practice in refrigerating-machines. By the combustion of an illuminating-gas derived from a liquefied gas a different condition exists—namely, the necessity of obtaining at the burner a substantially uniform pressure. If the consumption at the burner is uniform and the pressure in the liquefied tank is substantially uniform, an intermediate regulating-valve will maintain a practically constant pressure on the burner. A liquefied combustible gas, so long as there is any liquid remaining, maintains at the same temperature substantially the same pressure, and it is the utilization of this law to maintain on the combustion side of the regulating-valve a uniform pressure that I accomplish by this invention. By this apparatus the practical combustion of liquefied acetylene has been for the first time accomplished, and though it is desirable for absolute uniformity of pressure to have the valves B B′ automatically moving and to have the gas-holder M and for some purposes the air-mixer G, yet these parts are in fact immaterial for some uses of the invention. If, for instance, a burner J or a number of burners are to be lighted, the regulator-valve B can be set so as to supply the requisite pressure to the burner, and then the cock R being opened the burners J will burn properly so long as there is any liquid in the receiver A, provided the consumption be not so rapid as to greatly reduce the temperature in the receiver A.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the gas-receiver A containing combustible gas in a liquefied condition, by reason of the pressure of said gas in the receiver, reducing-valve B, expansion-coil T, liquid-chamber S and governing-holder M, substantially as described.

2. The combination of the gas-receiver A containing combustible gas in a liquefied condition, by reason of the pressure of said gas in the receiver, reducing-valve B, governing-holder M, mixing device G, and safety-valve D and the connections as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

E. N. DICKERSON.

Witnesses:
H. COUTANT,
W. LAIRD GOLDSBOROUGH.