

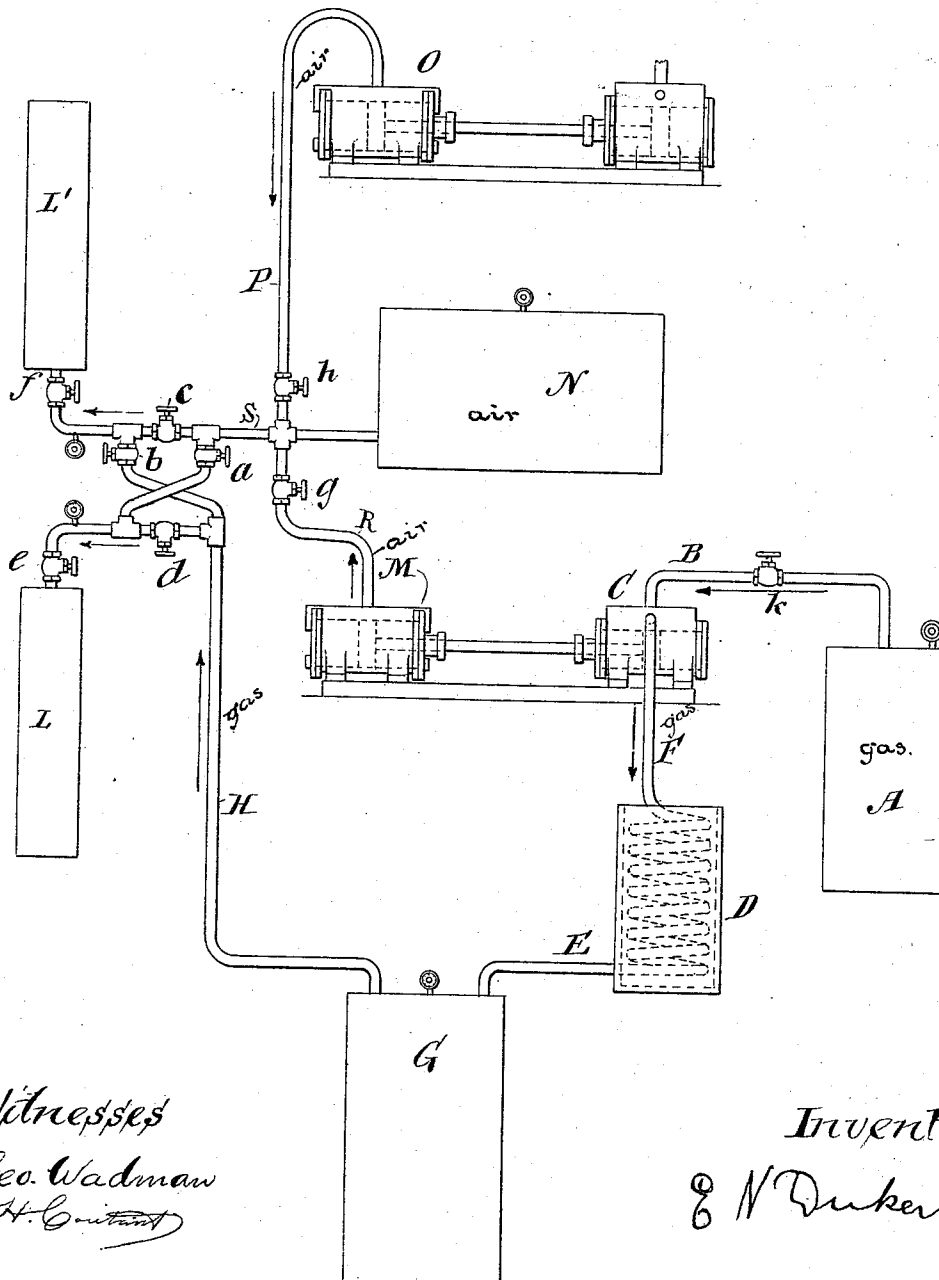
(No Model.)

E. N. DICKERSON.

PROCESS OF AND APPARATUS FOR MINGLING GASES.

No. 552,048.

Patented Dec. 24, 1895.



Witnesses
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PROCESS OF AND APPARATUS FOR MINGLING GASES.

SPECIFICATION forming part of Letters Patent No. 552,048, dated December 24, 1895.

Application filed February 6, 1895. Serial No. 537,485. (No model.)

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 Processes of and Apparatus for Mingling Two Gases Under Pressure, of which the following is a full, true, and exact description, reference being had to the accompanying drawing.

This invention relates to a process and apparatus whereby two gases may be mixed or mingled together under pressure and in which the expanding power of one of said gases is utilized to accomplish the compression of the other gas.

My invention is especially applicable for mingling air and acetylene under pressure. For the proper burning of acetylene in ordinary burners it is important that the acetylene should be mingled with air, either in equal proportions or in proportions varying from forty to fifty per cent. of air and sixty to fifty per cent. of acetylene, though, of course, other proportions may be utilized.

For illustration, in this application I refer to the mingling of equal quantities of air and acetylene.

When acetylene gas is generated from calcium carbide and water it generates pressure varying at normal temperatures from six hundred to three thousand or four thousand pounds to the square inch, dependent upon the internal temperature of the generator, which pressure can be utilized by my apparatus in effecting the compression of the air to be mingled with it in a compressed condition.

Another convenient source of acetylene gas is to be obtained from cylinders containing the liquefied gas having at ordinary temperatures a pressure of from six hundred to seven hundred pounds per square inch. By utilizing the pressure of the escaping acetylene from either of these sources I compress the air to the desired pressure. This I may do if low pressures only are desired—say thirty pounds to the square inch above zero—by, in the first place, filling a chamber with air and then allowing an equal volume of acetylene under pressure to enter, thereby compressing the air in the cylinder and mingling it with the entering gas. My apparatus is, however, es-

pecially designed for higher pressures—say one hundred and fifty pounds to the square inch above the atmosphere—when the tanks containing the compressed gas become useful for transportation on vehicles or similar purposes. They can, for instance, replace the tanks now utilized in the Pintsch gas system.

My invention will be readily understood from the accompanying drawing, which is a diagrammatic plan of the arrangement of my apparatus. The apparatus, however, is not intended to be shown in detail, being of well-known forms.

A represents a vessel containing acetylene under sufficient pressure to operate the apparatus, as, for instance, a vessel containing liquefied acetylene, or a vessel in which water and calcium carbide being brought in contact the necessary pressure is established.

The pressure of the gas in chamber A is carried by pipe B having cock *k* to motor C operating air-compressor M. The gas, having done its work in motor C, is expanded and very cold. Pressure can be restored to this gas and the cold can be utilized by passing it through heating-coil D, which may be placed in brine to absorb the cold to be subsequently utilized, or it may be filled with flowing water, thereby adding pressure, if required, to the escaping gas from the motor C. Whether such warming-coil is required depends upon the pressure desired in the transportation-cylinders L L'. Escaping from the coil D, the gas passes by pipe E to receiver G, which should be of sufficient capacity to retain an excess of gas until the same is required for the transportation-cylinders. The air passing from air-compressor M by pipe R passes through cock *g* to pipe S, communicating with air-receiver N. In case the power of the expanding acetylene from chamber A is not sufficient to compress the air to the requisite pressure an additional supply of air may be carried to the receiver N from air-compressor O by pipe P through cock *h*.

It is obvious that in place of air any other gas may be compressed by the compressors M O, to be afterward mingled with the acetylene.

In order to charge the shipping-cylinders L L', I proceed, as follows: In the first place, I fill the chamber L with the requisite air-pressure from the air-receiver N by opening

cocks *a* and *e*, cocks *b*, *c* and *d* being closed. Having admitted, for instance, seventy-five pounds of air to the cylinder L, as shown by the gage, the cock *a* is closed and the cock *d* opened, when the acetylene compresses the air in the cylinder L by its own pressure from the chamber G, which must have a pressure in excess of one hundred and fifty pounds, if that is the desired pressure in L. If one hundred and fifty pounds pressure be allowed to enter into the cylinder L from the receiver G, substantially equal quantities of air and acetylene will be contained therein. The cylinder L can then be removed for transportation by closing the cocks *d* and *e*, and the cylinder L' can be similarly charged, while an empty cylinder replaces the cylinder L.

The operation of the cocks will be manifest to any skilled mechanic, and both cylinders by means of the combination shown can be simultaneously filling. For instance, supposing the cylinder L to contain air delivered to it from the air-receiver N, by closing the cocks *a* and *b* and opening the cock *c* the air can be used to fill the cylinder L', while at the same time the air in cylinder L is being compressed by the acetylene from the receiver G by opening the cock *d*.

It is, of course, apparent that though air and gas may be compressed together, by this means any other gas, such as illuminating-gas, may be substituted for the air and compressed by the pressure of the acetylene.

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

1. The process of compressing air and gas together in a chamber, which consists in compressing the air by a motor driven from the generating gas, in causing the said compressed air to enter a cylinder, and in finally further compressing the air and mixing it with gas by admitting the gas which has previously passed through the motor which has compressed the

air and is still at a higher pressure than the air, substantially as described.

2. The combination of a gas generator A connected with and operating motor cylinder C, a chamber L, a connection from the exhaust of the motor cylinder C to the chamber L, the air compressor M operated by motor C, a connection from the air for supplying the air compressor M, and a connection from the air compressor M to the cylinder L, there enabling the simultaneous compression of air and gas, substantially as described.

3. The combination of the source of gas under high pressure, air compressor C M, gas chamber G, air chamber N, and the connections for leading the compressed air and subsequently the compressed gas into a chamber L, substantially as described.

4. The combination of the source of gas under high pressure, air compressor C M operated by the gas generated delivered from the source of gas, the gas heater D, the compressed gas chamber G, the compressed air chamber N, and connections shown for leading the compressed air and the compressed gas to chamber L, substantially as described.

5. The combination of the source of gas under high pressure, air compressor C M operated by the gas generated delivered from the source of gas, the gas heater D, the compressed gas chamber G, the compressed air chamber N, connected with additional air supply O, and connections shown for leading the compressed air and the compressed gas to chamber L, substantially as described.

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

E. N. DICKERSON.

Witnesses:

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ANTHONY GREF.