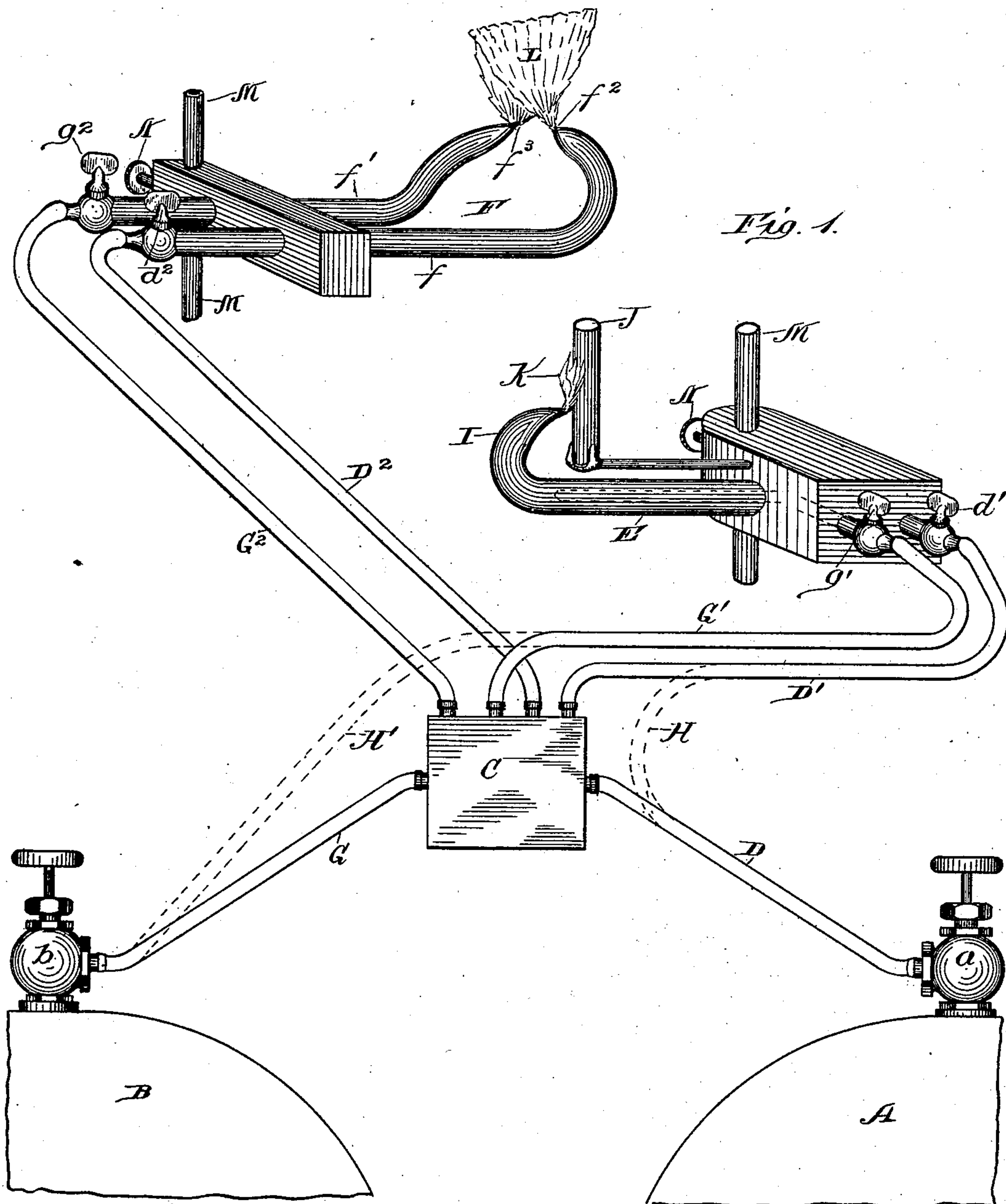


No. 724,416.

PATENTED APR. 7, 1903.

E. H. AMET.
COMPOSITION OF MATTER.
APPLICATION FILED JULY 20, 1901.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD H. AMET, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO THE STEREO-
OPTICON AND FILM EXCHANGE, OF CHICAGO, ILLINOIS, A CORPORA-
TION OF ILLINOIS.

COMPOSITION OF MATTER.

SPECIFICATION forming part of Letters Patent No. 724,416, dated April 7, 1903.

Application filed July 20, 1901. Serial No. 69,162. (No specimens.)

To all whom it may concern:

Be it known that I, EDWARD H. AMET, a citizen of the United States, residing at Waukegan, in the county of Lake and State of Illinois, have invented or discovered certain new and useful Improvements in a Composition of Matter, of which the following, when taken in connection with the drawing accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

The object of the invention or discovery is to obtain a composition of matter in gaseous form which may be burned in the open air or in a chamber to which the atmosphere has free access where great heat is desired and not an illuminating-flame—that is to say, I obtain a composition of gaseous matter, including acetylene gas, whereby upon the ignition thereof in the open air a non-illuminating flame of high temperature is produced.

A further object of the invention or discovery is to obtain a composition of matter in gaseous form which may be used for the purposes set forth and in the manner described and which will be permanent in character, non-explosive while stored and not liable to explosion while in use, and which may be readily controlled.

The figure of the drawing accompanying and forming a part of this specification is a perspective view of an apparatus by means of which the composition of matter invented or discovered by me may be used for obtaining a heat-producing flame.

In such drawing, A is a portion of a tank in which acetylene gas (forming a part of such composition of matter) may be stored under pressure.

a is the valve controlling the outlet of tank A; B, a portion of a tank in which the remainder of the composition of matter invented by me may be stored in gaseous form and also under pressure.

b is a valve controlling the discharge from tank B.

C is the casing of chambers into which the pipes or conduits D and G, respectively, extend and in which such pipes or conduits

communicate with pipes or conduits D' D² and G' G².

D is a pipe or conduit from the casing of the valve a to one of the chambers in casing C, and D is a pipe extending from such chamber to pipe f of burner F.

G is a pipe extending from chamber B to the remaining chamber in casing C.

G' is a pipe extending from such last-named chamber to mixing-chamber E, and G² is an additional pipe extending from such chamber to and communicating with pipe f' of burner F.

H H' are broken lines indicating connecting pipes or conduits between the pipes or conduits D and D' and the pipes or conduits G G', respectively, such connecting-pipes H H' being used in place of the chambers in casing C when preferred.

d' and g' are valves in pipes D' and G', respectively, and d² and g² are like valves in pipes D² and G², respectively.

I is the outlet of mixing-chamber E, and J is a calcium-stick against which the flame K, obtained by ignition of the mixed gases discharged from outlet I, may be directed when a calcium-light is desired to be obtained from the ignition of the acetylene gas in the composition of matter obtained by me.

L is the flame obtained from the ignition of the acetylene gas forming part of the composition of matter invented by me and which is discharged from outlet or burner f² when the mixed gases forming the remaining part of the composition of matter invented by me are discharged from outlet or burner f³, and such parts of such composition of matter are directed against each other at the point of ignition of the acetylene gas thereof, the mixing-chamber hereinbefore described being omitted.

M M are standards on which, respectively, the mixing-chamber and the burner F may be mounted, and N N are set-screws for holding them, respectively, in an adjusted position.

In using the composition of matter invented or discovered by me for the combustion of the acetylene gas therein such acetylene gas, hereinafter termed "part one" of the composition of matter embodying my invention, may

be contained in tank A, and the remaining gaseous mixture, hereinafter termed "part two" of the composition of matter, may be contained in tank B, both tanks being under greater than atmospheric pressure.

I have found that the attempt to burn acetylene gas (part one of my composition of matter) in a flame of any considerable size where pure oxygen or where any composition of matter in gaseous form other than that of part two of the composition constituting my invention or discovery is employed, either by mixing such oxygen or such composition of matter with the acetylene gas before ignition, as in a mixing-chamber, or directing the same against a flow of acetylene gas at the time of or immediately prior to the ignition thereof will result in a series of explosions, which are disagreeable, if not dangerous, to the operator, or the flame will repeatedly go out, or great quantity of soot will be produced—that is, first, if any effort be made to burn acetylene gas by mixing commercially-pure oxygen gas therewith, as in a mixing-chamber, or by directing such acetylene gas and such oxygen gas to a common point and there igniting such acetylene gas the same will be found impractical, as a series of explosions will occur with a liability, requiring a skilled operator to prevent, of the flame running back from the point of ignition into the mixing-chamber and burning there with a kind of a roaring noise; second, when an effort is made to obtain a heat-producing flame by mixing, but in different proportions from those hereinafter set forth, the elements which in the proportions hereinafter specified constitute part two of the composition of matter invented or discovered by me (as, say, in the proportions in which such elements are found in the atmosphere) a white light is obtained which is extremely brilliant, but of insufficient heat for the purposes set forth, and in no way does such flame resemble the blue flame desired.

The composition of matter invented or discovered by me, besides containing acetylene gas or part one thereof in the proportions hereinafter set forth, preferably consists of the following gaseous materials forming part two thereof in the following proportions: Of thirty thousand parts in volume and in dry condition eighteen thousand one hundred and twenty are oxygen, eleven thousand eight hundred and sixty-eight nitrogen, six carbonic acid, and six carbureted hydrogen.

I have obtained good practical results with a variation of the several elements of part two of the composition of matter between the following limits: in thirty thousand parts in volume and in a dry condition, first, twenty-two thousand and eighty oxygen and seven thousand nine hundred and twelve nitrogen, four parts carbonic acid, and four parts carbureted hydrogen, and, secondly, fourteen thousand one hundred and fifty-five parts oxygen, fifteen thousand eight hundred and

twenty-nine parts nitrogen, eight parts carbonic acid, and eight parts carbureted hydrogen. There is, however, some liability of the flame becoming automatically extinguished or popping out in using in part two of such composition of matter, the first above-named variation of the preferred proportions of the elements, although an extremely hot flame results, and in the hands of a skilled operator the same may be kept ignited.

When the elements constituting part two of the composition of matter embodying my invention are mixed in the proportions set out in the second variation named and part one of such composition of matter (acetylene gas) is mixed therewith, a steady permanent flame—that is, one not liable to go out—will be obtained, which produces more of a white than a blue light and which is deficient in heat.

I find that the proportions of the elements constituting part two of such composition of matter which are preferred by me—to wit, of thirty thousand parts in volume and in a dry condition, eighteen thousand one hundred and twenty of oxygen, eleven thousand eight hundred and sixty-eight of nitrogen, six parts of carbonic-acid gas, and six parts of carbureted hydrogen—produce a steady blue or violet flame with no probability of the same becoming automatically extinguished, with no noise to the flame, and with great heat when the same is directed against part one of such composition of matter either in a mixing-chamber or immediately prior to ignition thereof, and I further find that when part two of the composition, comprising oxygen and nitrogen in the preferred proportions given, is used as described in combination with part one of such composition (acetylene gas) I require for the best obtainable combustion of such acetylene gas in the open air or in a chamber to which the atmosphere has free access to use not less than two parts of such part two to one part of such part one—that is, in consuming fifteen thousand parts of part one of the composition of matter not less than thirty thousand parts of part two of such composition of matter will be used, amounting to a total in both tanks A and B of not less than forty-five thousand parts. In other words, when part two of the composition of matter invented by me is used in the preferred proportions hereinbefore given the acetylene contained in such composition of matter constitutes substantially thirty-three per cent. thereof, the oxygen contained therein constitutes substantially forty per cent. thereof, and the nitrogen substantially twenty-seven per cent.

When the variation of part two of the composition of matter, which consists, essentially, of twenty-two thousand and eighty of oxygen and seven thousand nine hundred and twelve of nitrogen, is used, I find that the proportion of oxygen to acetylene should still be in the neighborhood of forty parts of oxygen to

thirty-three parts of acetylene, and so in every one hundred parts of the composition of matter there would be about thirty-eight per cent. of acetylene and, say, forty-six per cent. of oxygen, with about seventeen per cent. of nitrogen, and when the remaining variation of part two of the composition of matter embodying this invention is made and the relative proportion of forty parts oxygen to thirty-three parts acetylene is retained it will consist of about thirty-three per cent. of oxygen, twenty-eight per cent. of acetylene, and twenty-nine per cent. of nitrogen. I have thus found in practice that the lowest percentage of oxygen which I can use in my composition of matter, for the reasons hereinbefore given, is about thirty-three per cent., the lowest percentage of acetylene gas is about twenty-eight per cent., and the lowest percentage of nitrogen is about seventeen per cent.

I have obtained the better results by having a mixing-chamber into which the oxygen, nitrogen, and acetylene gas in about the preferred proportions above described are discharged adjacent to the point of ignition thereof, and I prefer such process of using such composition of matter.

I prefer at all times to have the oxygen, nitrogen, carbonic-acid gas, and carbureted hydrogen contained in one tank, as B, under

greater than atmospheric pressure, as such mixture is non-explosive and not inflammable, and the acetylene gas in a second tank, as A, also under greater than atmospheric pressure.

I do not consider the carbonic-acid gas and the carbureted hydrogen essential elements in the composition of matter invented or discovered by me; but in my manufacture of the mixture of oxygen and nitrogen in the proportions named I find such elements present, and as the same are not injurious to the uses for which I desire to put the same I have named them as present.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The herein-described composition of matter consisting, essentially, of oxygen, nitrogen and acetylene, containing not less than twenty-eight per cent. of acetylene, not less than thirty-three per cent. of oxygen, and not less than seventeen per cent. of nitrogen; substantially as set forth.

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

EDWARD H. AMET.

Witnesses:

CHARLES TURNER BROWN,
C. A. ADAMS.