

No. 614,299.

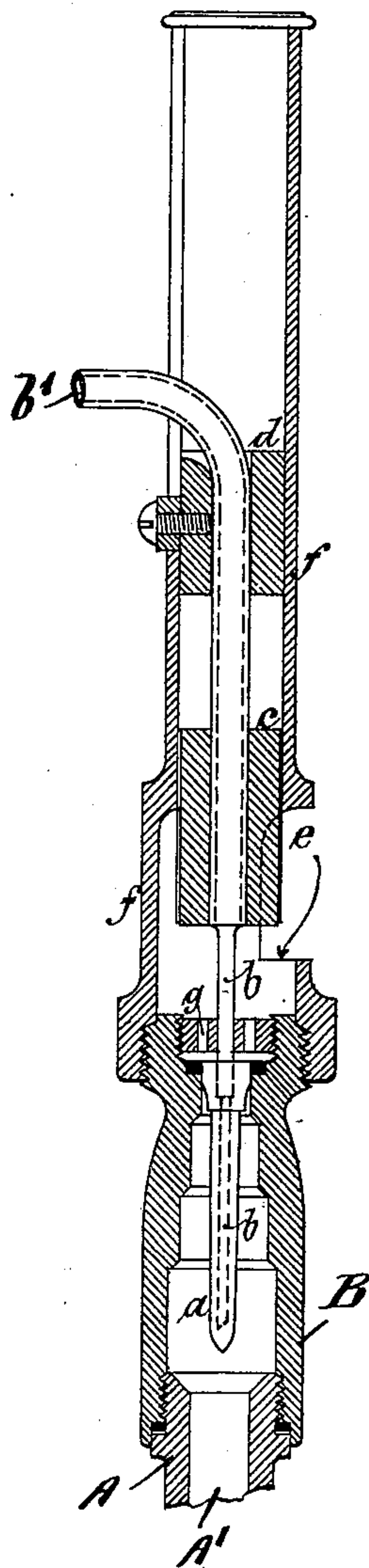
Patented Nov. 15, 1898.

P. F. GANS.

LIGHTING APPARATUS FOR EXPLOSIVE GAS MIXTURES.

(Application filed Jan. 13, 1896.)

(No Model.)



Witnesses:

H. Engel
A. J. Naddau

Inventor:

P. F. Gans
per *A. J. Naddau*
His Attorney.

UNITED STATES PATENT OFFICE.

PAUL F. GANS, OF FRANKFORT-ON-THE-MAIN, GERMANY.

LIGHTING APPARATUS FOR EXPLOSIVE-GAS MIXTURES.

SPECIFICATION forming part of Letters Patent No. 614,299, dated November 15, 1898.

Application filed January 13, 1896. Serial No. 575,310. (No model.)

To all whom it may concern:

Be it known that I, PAUL FRIEDRICH GANS, a subject of the German Emperor, and a resident of Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Lighting Apparatus for Explosive-Gas Mixtures, (for which I have obtained a patent in Belgium, No. 118,026, dated October 23, 1895,) of which the following is a specification.

This invention relates to an incandescent device suitable for use as an igniter for explosive-gas mixtures in gas or similar motors, and its peculiarity is that it becomes incandescent when a portion of the gas mixture is passed through it, but does not inflame said mixture—that is to say, it consumes the mixture without flame.

In previous igniters in which a combustible gas is brought into contact with platinum in one or other of its modifications or into contact with a similar metal having the same capacity of occluding the gas and becoming heated the object has always been to cause the gas to be inflamed by the platinum or the like, so that it burns with a flame which serves as the actual igniting medium. The present invention involves a construction in which the gas is not inflamed, but is wholly consumed in contact with the platinum by which, as will be readily understood, the total heat is absorbed in heating the platinum, which is thus brought to a much higher temperature than in igniters in which a flame is developed, with consequent increase in its igniting efficiency and absence of liability to disturbance from drafts and other influences which affect flames.

The annexed drawing illustrates a section through the improved lighter, some parts thereof being shown in elevation.

A is an extension of the wall of motor-cylinder or other device in which is the gas mixture to be inflamed or exploded.

B is a hollow chamber screwed upon the extension A and having its interior in communication with the said gas mixture through the passage A' in the extension A. Into the chamber B there extends a tube *a*, closed at its inner end and open at the other end exteriorly of the chamber B. The diameter of this tube *a* is from three to four millimeters

only. On the end of the chamber B is screwed the sleeve *f*, having a lateral opening at *e*, and into this sleeve there is guided a pipe *b'*, supported in the blocks *c* and *d* of insulating material. This pipe is narrowed below to form a thinner and finer pipe *b*, which extends into the pipe *a* nearly to the lower closed end thereof. The pipe *b* is opened at its end and is made of a thin metallic platinum plate or of other modification of platinum or of other metals of the platinum group, which will have, like platinum, in this apparatus the quality of continuing automatically to glow when in contact with carbureted hydrogen without formation of flame. If this small tube glows in any degree, its temperature on passing through it a combustible gas mixture—for instance, carbureted-hydrogen gas and air—rises so that the tube *a* is brought to a white heat. The apparatus is kept durably at this temperature by the further addition of the gas mixture, which can be effected either by means of a pump out of a reservoir or, for instance, in benzene-motors, &c., immediately and automatically by the compressed explosive mixture in the cylinder of the motor. In the latter case the mixture is first conducted from the cylinder by means of a tube into a reservoir provided with the necessary valves and from there to the lighter through the tube *b'*. The tube *b* is first brought into glow in a different manner. If this is done by electricity, then the cylinders *c* and *d* or other fixing places of the tube *b'* must be insulated from the tube *a*, in which case on the approach of the points of *a* and *b* to each other a heating is effected which is sufficient to give such temperature to the lighter that on the addition of the gas mixture it rises to a white heat.

Previous warming of the lighter may be effected by introducing the small flame of a match through the opening *e* in the casing *f*, the small tube being drawn a little upward and afterward returned again, whereupon the entering gas mixture augments the temperature and makes the lighter glow; also, at the first moment the gas mixture can be admitted, and one can produce by lighting the lighter a small flame sufficient for heating, which flame, as soon as this is effected, becomes extinct by the occluding of the gas

mixture and in cases of other constructions of the lighting apparatus is extinguished, as the whole combustible part of the gas mixture is absorbed by feeding the tube *b*. The gases can leave through the opening *g* between the tubes *a* and *b* and thence through the opening *e*.

The length of the tube *b* is such that the gas mixture, which has to pass along its whole length, is entirely absorbed, so far as its combustion properties are concerned, by the platinum or equivalently-acting material of which the tube *b* is made, thus bringing the tube to a white heat and exhausting the capacity of combustion of the gas, which on issuing from the tube is therefore inert and does not burn with any flame. By this construction, in which the tube is heated without flame, a higher temperature is obtained than would be the case if flame were present, and the efficiency of the lighter and the rapidity and consequent energy of the explosion are thus increased.

I claim—

1. In an igniter, the combination, with a chamber for the inflammable mixture, and an ignition-tube closed at one end and projecting within the said chamber; of a casing connected to the said chamber, and a gas-tube of platinum supported by the said chamber, said gas-tube being slidable longitudinally in the said ignition-tube and casing, substantially as set forth.

2. In an igniter, the combination, with a chamber for the inflammable mixture, and an ignition-tube closed at one end and projecting within the said chamber, a gas-tube of platinum projecting within the said ignition-

tube, and insulating material interposed between the said tubes, whereby the said gas-tube can be preheated by an electric current, substantially as set forth.

3. In an igniter, the combination, with an ignition-tube closed at one end, of a gas-tube of platinum slidable longitudinally in the said ignition-tube, and means for supporting both tubes and guiding the slidable tube, substantially as set forth.

4. In an igniter, the combination, with an ignition-tube closed at one end, of a gas-tube of platinum arranged in the said ignition-tube, and means for preheating the said gas-tube, the said gas-tube being of great length in proportion to its diameter and operating, when preheated, to consume all the gas which enters it at one end before it reaches its other end, substantially as set forth.

5. The combination, with a chamber *B*, of a tube *a* extending into said chamber, closed at its inner end and open exteriorly of the chamber, a housing *f* having a guiding portion parallel to the axis of tube *a* and having a lateral opening *e*, blocks *c d* movable in said guiding portion, a gas-mixture feed-pipe *b'* traversing said blocks, and a gas-occluding pipe *b* forming an extension of said gas-mixture feed-pipe and movable therewith so as to enter or withdraw from the tube *a*, substantially as and for the purpose set forth.

In witness whereof I have signed this specification in presence of two witnesses.

PAUL F. GANS.

Witnesses:

EUGEN GREGCL,
M. GREGCL.