

No. 713,849.

Patented Nov. 18, 1902.

J. H. BULLARD.
VAPOR BURNER.

(Application filed Nov. 25, 1901.)

(No Model.)

Fig. 1.

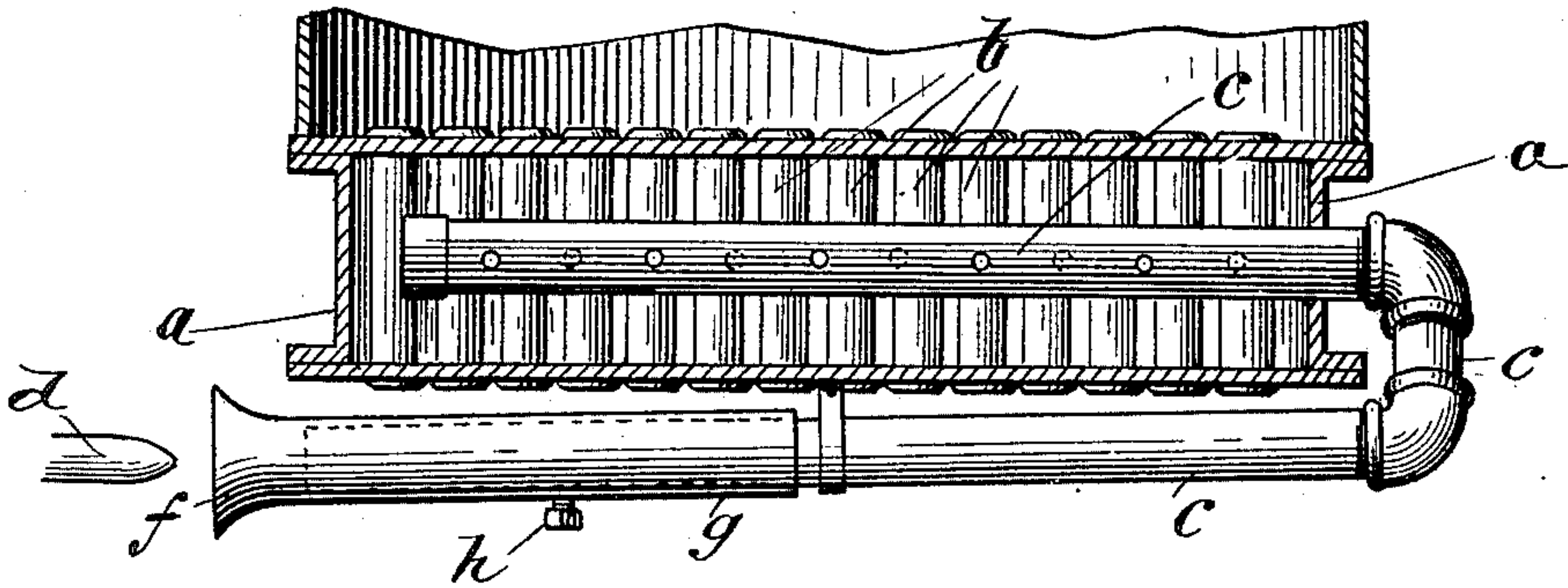


Fig. 2.

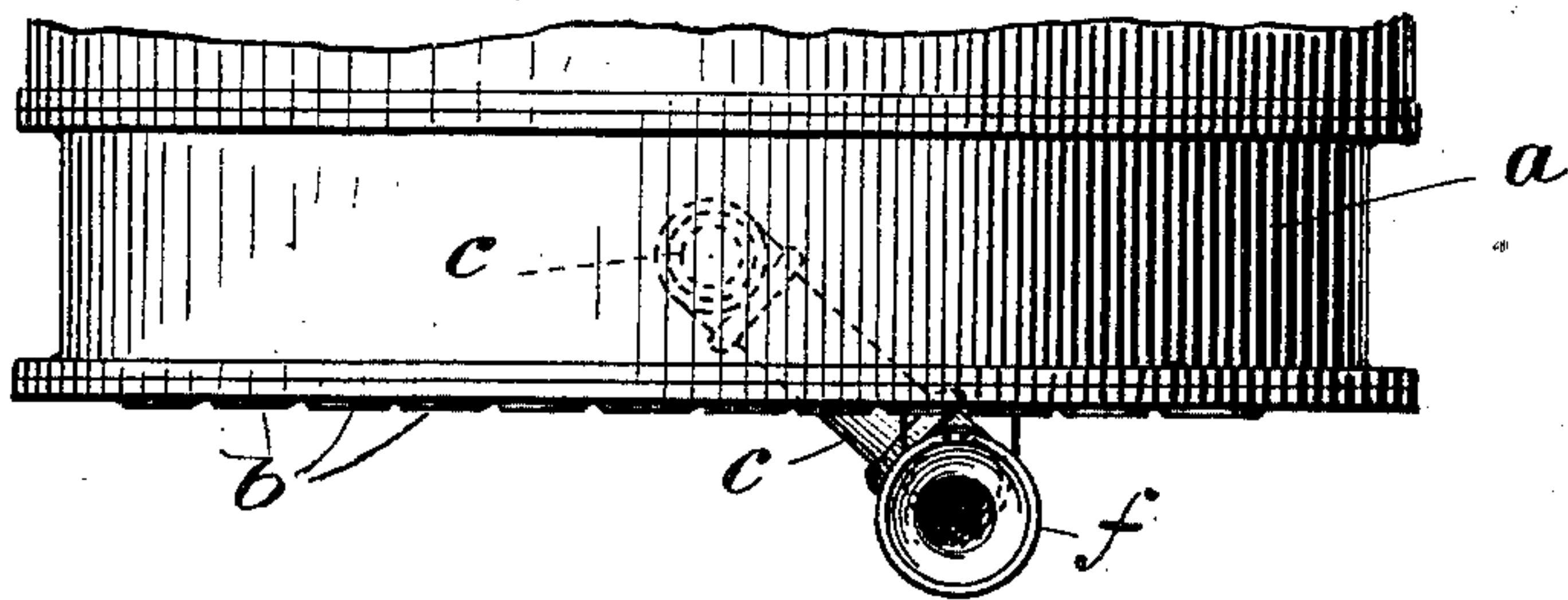
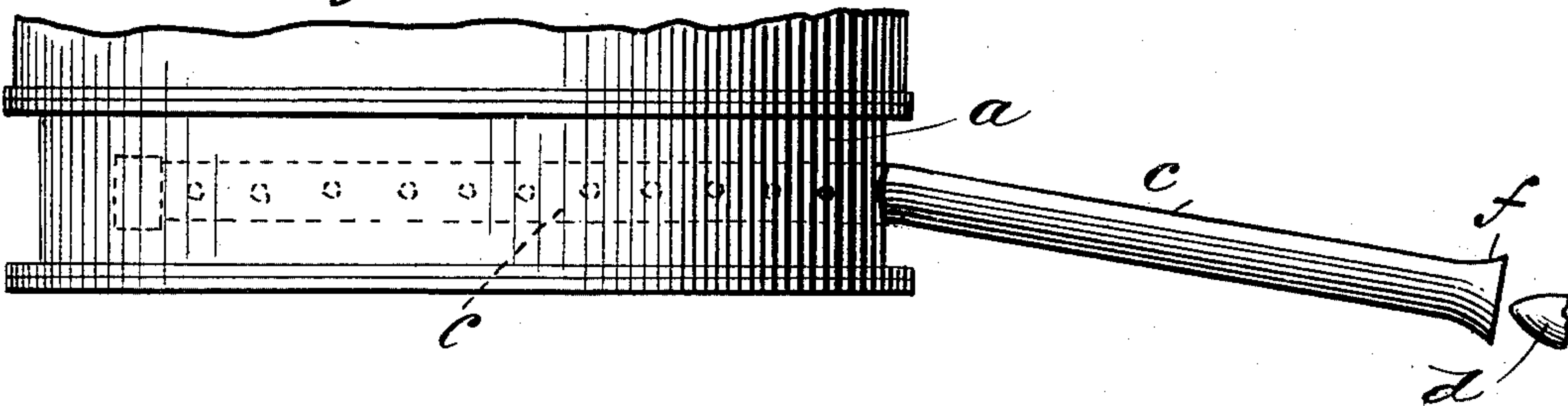


Fig. 3.



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UNITED STATES PATENT OFFICE

JAMES H. BULLARD, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE
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VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 713,849, dated November 18, 1902.

Application filed November 25, 1901. Serial No. 83,594. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BULLARD, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Vapor-Burners, of which the following is a specification.

This invention relates to the construction of burners for gas and air mixtures or for hydrocarbon vapors, the burner being of that type in which the combustible is delivered under more or less pressure in the form of jet into the open end of a pipe leading into the burner-body, whereby a certain volume of air is drawn into said pipe by the jet, the mixture passing out of the burner-body through small apertures therein. In the use of burners of this description in certain classes of work it is desirable and in many cases essential that the flames arising from these apertures should make their exit with sufficient force to extend the flame vertically above the latter to a considerable distance. It has been found in practice that this end can only be attained by an increase in length of the inlet-pipe outside the burner, unless a pressure is applied behind the jet of combustible of such force as to make the burner noisy in operation, and a high pressure involves the expenditure of considerable power to produce it. Furthermore, when vaporized hydrocarbons are burned, if the flame becomes extinguished by a puff of air or other cause, the continued delivery of the vapor into the burner-body will result in the deposit therein of condensed hydrocarbon, which will take fire when an attempt is made to relight the burner, the result being an uncontrollable fire of considerable volume until it has burned itself out.

This invention has for its object the production of a burner whereby the flame may be projected above the surface of the burner without an increase of pressure, whereby the burner would be noisy in operation, a further object being in the provision of means whereby liquid hydrocarbon cannot accumulate in the burner-body.

Still another object is to provide means for

adjusting the length of the inlet-tube of the burner, whereby the height of the flame above the burner may be regulated.

In the drawings forming part of this application, Figure 1 is a sectional elevation of a burner having an inlet-tube therein, the outer end of which is doubled under the burner. Fig. 2 is a view of the outside of the burner, looking into the end of the inlet-tube. Fig. 3 is another elevation of the burner, showing the inlet-pipe extending outwardly of the burner.

Referring to the drawings, the burner is indicated by *a* and is of that type in which the body constitutes a flat shallow box having air-supply tubes *b* extending vertically through it, and around the upper ends of which apertures are made through the top plate of the burner for the exit of the combustible mixture. These apertures are not shown in the drawings, as this part of the burner construction forms no part of the invention, but is illustrative only of a kind of burner that may be used and of which there are a number of variations, any one of which would answer as well as this one.

Through the side wall of the burner the inlet-pipe *c* is introduced. Ordinarily this pipe extends only a short distance outwardly of the burner and has located opposite its open end the jet-nozzle *d*. This inlet-pipe varies in internal length in different burners, and as far as this invention is concerned its length inside the burner-body is immaterial. The end of this inlet-pipe *c* within the burner-box is closed. As ordinarily constructed, with its open end terminating close to the side of the burner, the flame can only be projected away from the top plate of the burner by the use of so much pressure behind the jet of gas or vapor that the burner is rendered very noisy. This is a great disadvantage in the use of the burner for the boilers of steam-propelled road-wagons.

I have found as a result of extended experiment that by varying the length of the inlet-pipe outside the burner according to the volume of the jet of combustible and the cross-sectional area of the pipe the height to which the flame may be projected above the top

plate of the burner may be varied to a considerable degree without any change of the other conditions.

In power-propelled road-wagons it is inconvenient to have the inlet-pipe extend outward in a straight line from the burner, for it would project beyond the side of the vehicle too far, it being understood that the jet is, for convenience sake, located at the side to permit easy access to it for adjustment. Therefore I prefer to double back the pipe on itself and a little to one side of that portion thereof in the burner-body, as shown in Fig. 2. This arrangement brings the bell-shaped mouthpiece *f* of the pipe in such position that the jet may be located, as usual, just inside the body of the vehicle.

Preferably, though not necessarily, the portion of the inlet-pipe located outside of the burner is provided with a longitudinally-slidable part *g*, consisting merely of a length of pipe similar to the pipe *c*, but of sufficiently greater diameter to slip over the other portion of the pipe. This telescoping section has the usual flaring end. When this construction is employed, it is of course necessary to provide for adjusting the jet toward and from the mouth of the inlet-pipe, and this may be done in any convenient manner. A set-screw *h*, if desired, may be located in the extensible end *g* of the inlet-pipe to secure it in any desired position. By means of this member *g* of the inlet-pipe an exact regulation of the flame may be made in a moment.

A further advantage in extending the pipe *c* back under the burner is that there is thus provided a sure means of preventing the burner-body from filling up with condensed hydrocarbon on account of the difference in the level of the entrance portion of the pipe *c* relative to that portion of it in the burner. When this latter part of the pipe extends into the burner, as shown, the inner end thereof is closed and the sides thereof are perforated with holes *i*, drilled through the wall of the pipe well above the bottom, as shown. By this means the gas or vapor is uniformly distributed throughout the burner.

When the location will permit, the pipe *c* may extend outward from the burner, as shown in Fig. 3, and slightly downward to

provide for the proper drainage thereof. This last-named figure shows the pipe *c* made without the telescoping portion *g*. Where no variation of the height of the flame is desired, this part of the pipe may be adjusted to produce the flame desired during the process of manufacture of the burner.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A burner comprising a box-like structure for the reception of gaseous or vaporized combustible, there being air-passages extending through said structure transversely; an inlet-pipe having a closed end extending into and partially through said structure, and having openings only in the sides thereof above the bottom of the pipe, the outer portion of the latter being bent back under said structure and extending thereacross, and having an open end located beyond the side of the burner.

2. A burner comprising a box-like structure for the reception of gaseous or vaporized combustible, there being air-passages extending through said structure transversely; an inlet-pipe having a closed end extending into and partially through said structure, and having openings only in the sides thereof above the bottom of the pipe, the outer portion of the latter being bent backward upon that portion of the pipe within the burner, and in a lower plane, and having an open end located outside of that part of said burner in which said air-passages are located.

3. A burner comprising a box-like structure for the reception of gaseous or vaporized combustible, there being air-passages extending through said structure transversely; an inlet-pipe having a closed end extending into and partially through said structure, and having openings in the sides thereof above the bottom of the pipe, the outer portion of the latter being extensible and being bent backward upon that portion of the pipe within the burner, and in a lower plane, and having an open end located outside of that part of said burner in which said air-passages are located.

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