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Patented July 19, 1898.

W. L. MERSFELDER.
MECHANISM FOR BURNING HYDROCARBONS.

(Application filed Dec. 28, 1897.)

(No Model.)

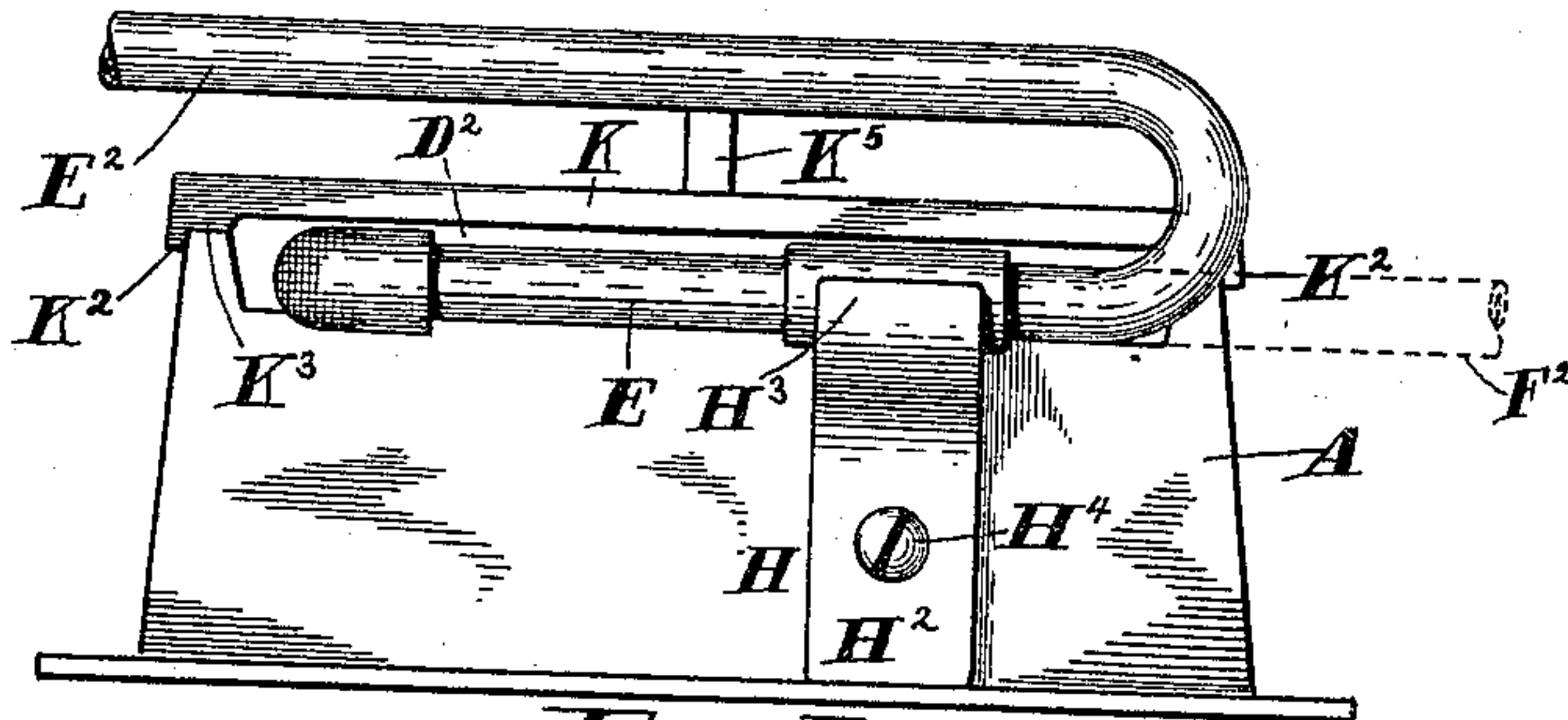


Fig. 1

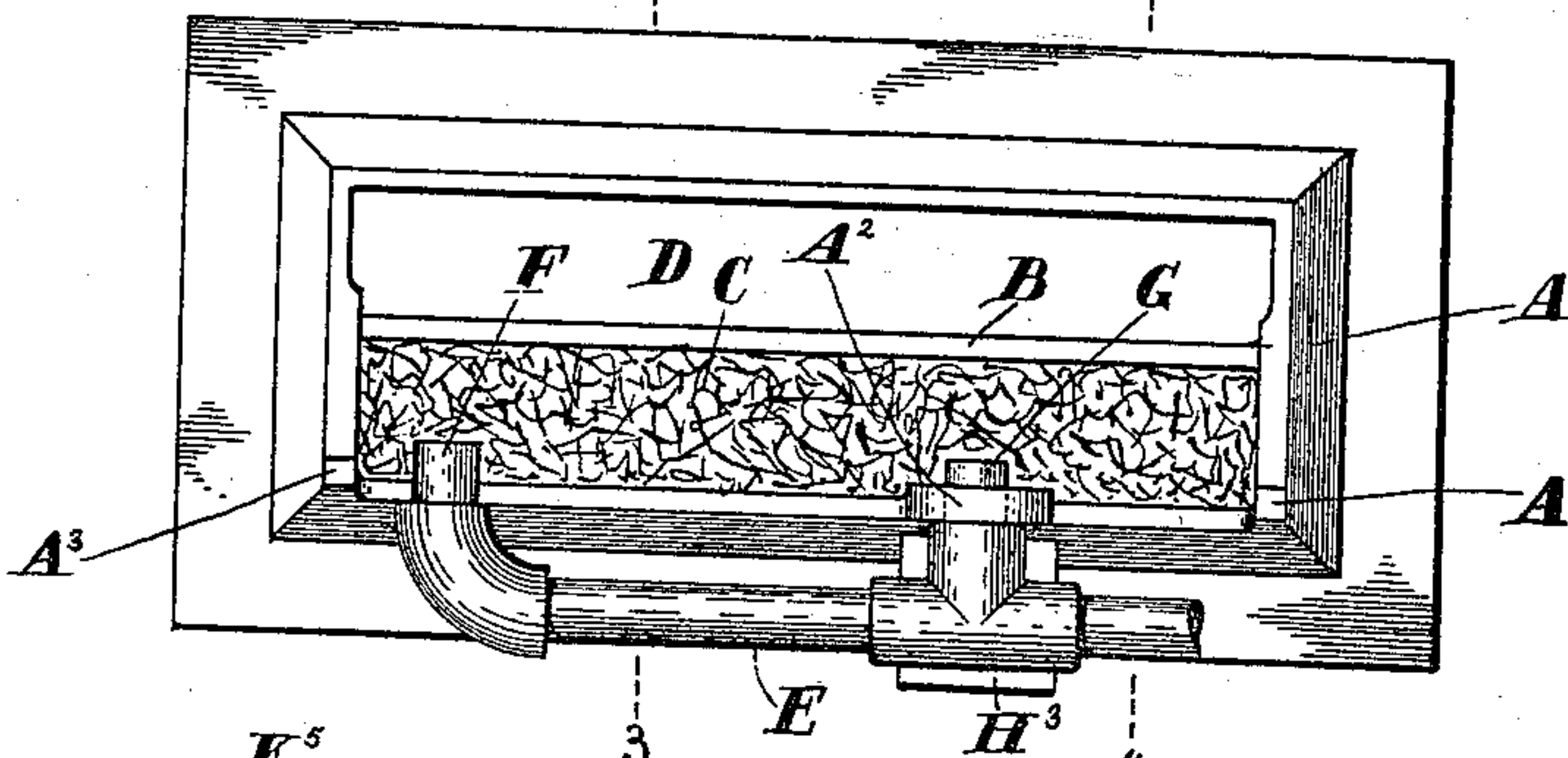


Fig. 2

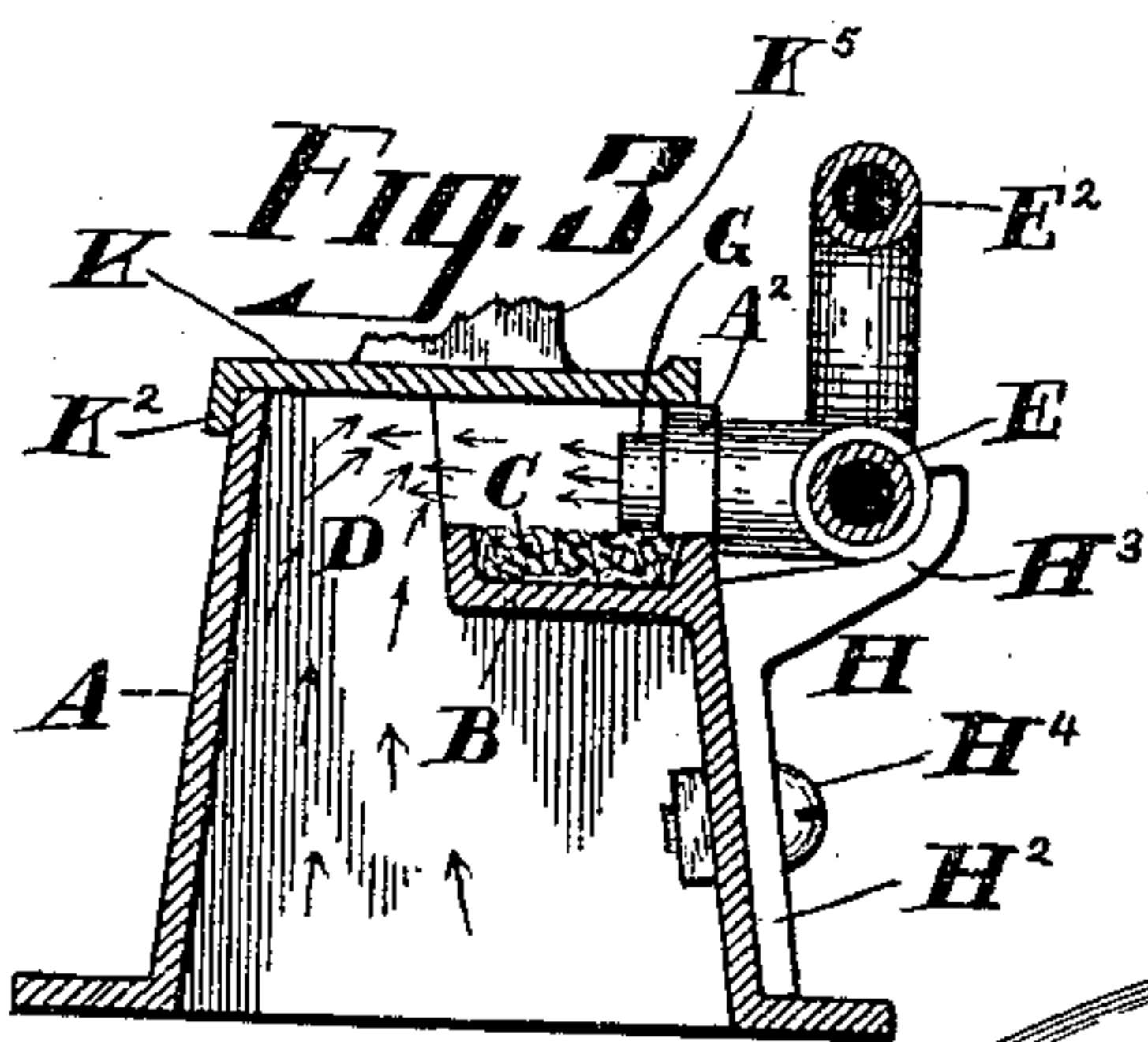


Fig. 3

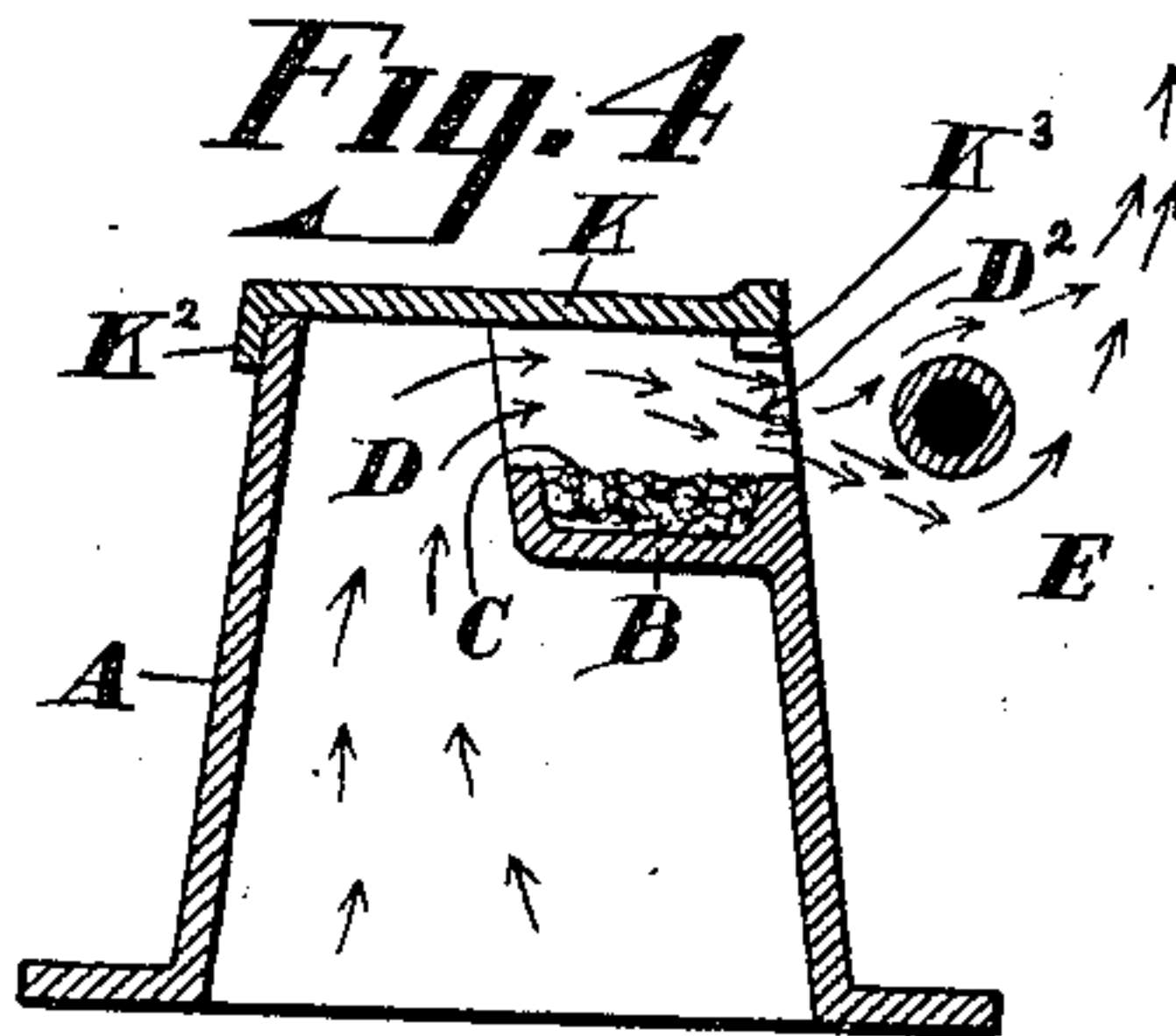


Fig. 4

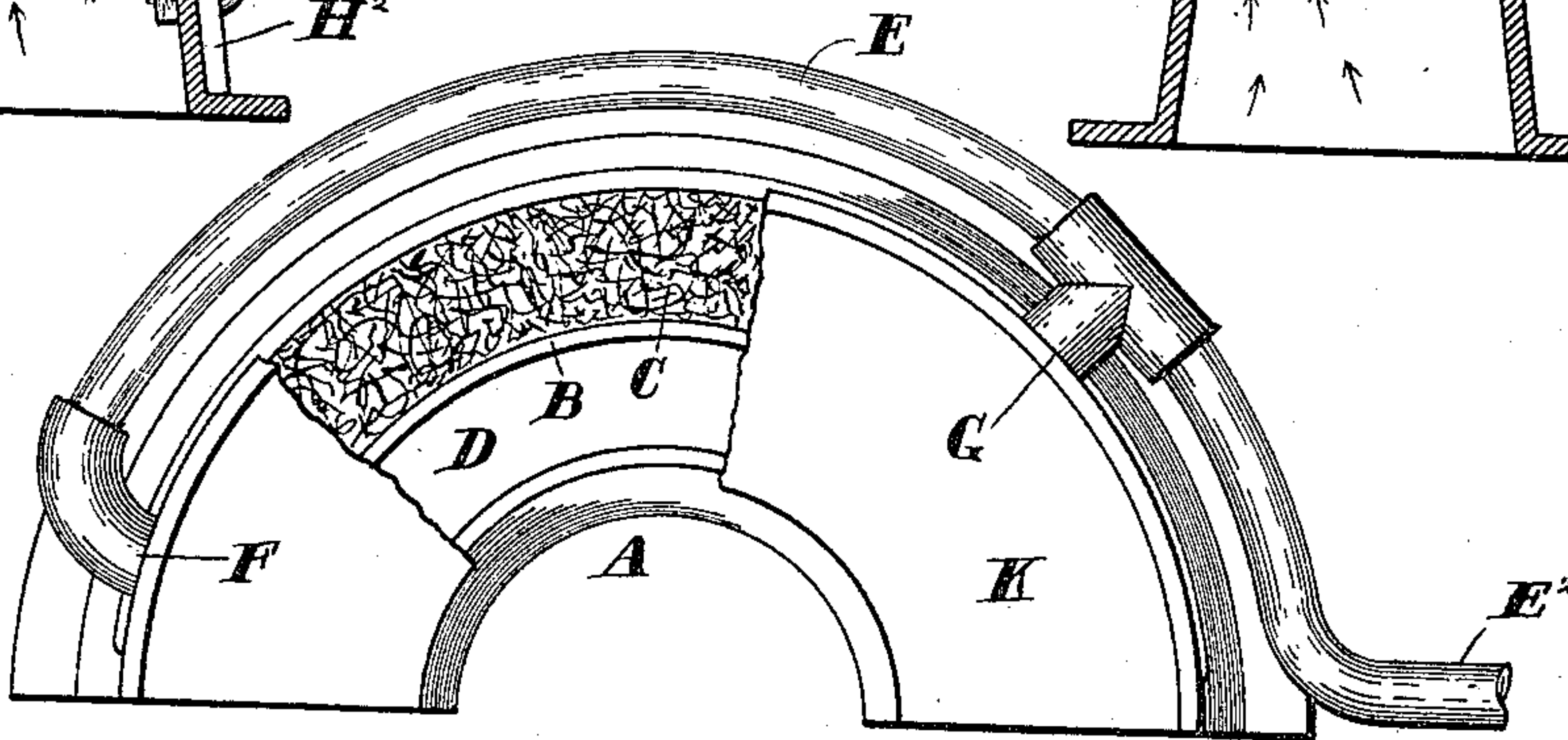


Fig. 5

WITNESSES

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MECHANISM FOR BURNING HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 607,694, dated July 19, 1898.

Application filed December 28, 1897. Serial No. 663,852. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. MERSFELDER, a citizen of the United States, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Mechanism for Burning Hydrocarbons, of which the following is a specification.

It is my purpose to burn usually kerosene-oil as the preferred hydrocarbon.

The several features of my invention and the various advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

In the accompanying drawings, making a part of this specification, Figure 1 represents a front elevation of mechanism embodying my invention. Fig. 2 represents a top view of the same when the cover has been removed. Fig. 3 represents a vertical transverse section of the same, taken in the plane of the dotted lines 3 3 of Fig. 2. Fig. 4 represents another vertical transverse section—to wit, one taken in the plane of the dotted lines 4 4 of Fig. 2. Fig. 5 represents a top view of a modification of the mechanism. In this view a portion of the top is broken away to disclose the interior construction.

I will now proceed to particularly describe my invention.

A indicates a casing or shell of suitable material to withstand heat. This casing is hollow and is open at the bottom and the top. Preferably the entire bottom is open. Not far below the top, along an inner side of the casing and occupying a portion of the opening in the top of the casing, there is located a gutter B, closed at each end. In this gutter I place a material C, adapted to take up the hydrocarbon and adapted after the hydrocarbon is lighted to give it forth to the flame. Thus layers of wire may be used; but I prefer to use asbestos, and I closely pack the gutter with this substance. There remains an elongated opening (passage-way) D, preferably as long as the inner space of the casing A and of considerable width.

Outside of the casing A and just above the extended plane of the upper edge of the gutter I locate a pipe E. This pipe extends horizontally along near the casing and is duly connected with the reservoir or source whence

the immediate supply of hydrocarbon is obtained. At the terminal end of this pipe I locate a burner F, and the latter is quite near or at one end of the casing. A second burner G is located on the pipe E and near the mid-length of the casing, but to that side of the mid-length in which the burner F is not present. Both burners preferably extend a short distance over the gutter B and its asbestos filling, as shown.

The hydrocarbon-pipe E after leaving the casing may extend in any desired direction. The dotted lines E² show how it may be extended in a straight line; but I prefer to curve it back and extend it above and parallel to that portion of the conduit E first described, thus forming a portion E², substantially as shown in Figs. 1 and 3.

Convenient means of supporting the conduit E are to be employed. The preferred means for this purpose consist as follows: A short flange A² rises from that edge of the casing which is nearest conduit E, and the burner passes through a close-fitting opening in this flange. A bracket-clamp H is present, whose leg H² is secured to the outer side of the casing A, preferably by a bolt and nut H⁴. The arm or finger H³ of the bracket comes up against the lower side of the conduit E and passes up and partially around the rear side of the conduit, substantially as shown. Thus the conduit E and its burners are firmly supported in place.

To better promote the desired draft and combustion, the walls of the casing incline downward and apart as they go downward, substantially as shown. A removable cover K sits upon the top of the casing and is provided with suitable means for lifting it from the casing and replacing it. The preferred means is a handle K⁵, part of which is shown in Fig. 3. The under side of the front and two end edges of the cover each have a downwardly-depending edge flange K², which when the cover is set down in place fit down over the respective adjacent upper edges of the casing A. To prevent the cover from slipping forward, it is provided at its rear corners with downwardly-depending lugs K³ K³, which latter respectively fit into recesses A³ in the corresponding corners of the upper part of the casing.

The manner in which my invention operates is as follows: The hydrocarbon is allowed to flow through the conduit E^2 E and runs out at the burners F and G into the asbestos packing C. The operator immediately lights the hydrocarbon in the asbestos and lets the machine take care of itself. The heat generated by the burning hydrocarbon on and in the asbestos rapidly heats the conduit and burners, as well as the casing and the asbestos, and the former thereupon generate hydrocarbon vapor and expel the same with force through the burners and over the asbestos and across the casing and over and across the upper portion of the passage-way D of the casing. At the same time air within the hot casing being heated by the latter rises through the passage-way D. As it (this hot air) passes above the opening the hydrocarbon vapor is forcibly blown or injected into it and a most thorough mixing of the vapor and the air is at once effected. Nor is this all. The combined and mixed air and vapor deflected from and by the front side and the top of the casing and seeking the highest outlet of escape pass out through the opening D^2 of the casing. The greater portion of the burning intermixed air and vapor passes below the conduit E and then rises, while a smaller portion of this mingled air and vapor passes out above the conduit E, and farther out beyond the conduit meet and combine with the burning air and vapor rising from below the conduit. The burning of these gases results in a broad and intensely-hot sheet of flame, which not only continually heats all of the casing and the conduit E and E^2 , but also has a large quantity of caloric to spare to be utilized as desired.

One great advantage of my devices results from the forcible injection of the hydrocarbon vapor, thus the more thoroughly intermingling the air and vapor.

Other burners, so far as I am aware, mix the vapor with the air by allowing the air to come up around the vapor and, as it were, submerge it. Such a process is obviously not as effective within a compact machine and a small compass as is my mechanism.

When desired, the shape of the casing in plan view may be changed. In such event the conduit will be bent to accommodate such change. Thus in Fig. 5 I have illustrated one desirable form of modification. Here the casing and its accompanying conduit (viewed from above) assume the shape of a half-circle.

Particularly attention is drawn to the following important facts: The air rising in the chamber strikes the roof and is deflected in a horizontal direction toward the passage-way D. The hydrocarbon is thrown out horizontally from the jets, and in the form of jets directly into the outcoming air. The air and vapor thus meet while going in opposite directions. The air is thus interpenetrated with the hydrocarbon. These com-

bined—viz., in a close and thorough intermixture—are forced out together at the edge of the burner and against the generating-pipe and burn in front of the latter and above, below, and behind the latter.

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

1. In a hydrocarbon-burner, the combination of a chamber, having a horizontal opening in one of its walls at an upper corner, and a horizontal generator located a short distance outside of this opening and there being room afforded for the circulation of heated air and flame from the chamber, above and below the generator, one or more delivery jet-tubes from the generator being present in said opening, and adapted to deliver the hydrocarbon directly in the air in the chamber, approaching said opening, and intermingle the same, the combustion of the latter thereupon immediately taking place, means for causing air to flow from the casing out through the opening D^2 , substantially as and for the purposes specified.

2. In a hydrocarbon-burner, the combination of a chamber, having a horizontal opening in one of its walls, at an upper corner, and a pan extending from the lower edge of said opening inwardly into the chamber, and a horizontal generator located approximately to this opening and outside of it, and there being room afforded for the circulation of heated air and flame from the chamber above and below the generator, one or more delivery jet-tubes from the generator being present and adapted to deliver the hydrocarbon directly into the air of the chamber, as the air approaches between the roof and the pan toward the opening, and to cause the air and hydrocarbon to intermingle, the combustion of the latter thereupon immediately taking place, means for causing air to flow from the casing out through the opening D^2 , substantially as and for the purposes specified.

3. In a hydrocarbon-burner, a chamber having an opening in one of its upper corners, a deflecting roof in connection therewith, arranged to force the air rising in the chamber out horizontally, through said opening, a generating horizontal conduit located in proximity to said opening, but arranged to allow the mixture of air and hydrocarbon vapor to surround said conduit as they issue from said opening, and the jets F and F^2 , the one located near one end of the chamber and the other a little to one side of the mid-length of the opening, and arranged to discharge their jets horizontally into the air of the chamber, as it, the air moves toward its exit at the said upper opening of said chamber, and mixes therewith, substantially as and for the purposes specified.

4. In a hydrocarbon-burner, a chamber having an opening in one of its upper corners, a deflecting roof in connection therewith, arranged to force the air rising in the chamber out horizontally, through said opening, a gen-

erating horizontal conduit located in proximity to said opening, but arranged to allow the mixture of air and hydrocarbon vapor to surround said conduit as they issue from said opening, and the jets F and F², the one located near one end of the chamber and the other a little to one side of the mid-length of the opening, and arranged to discharge their jets horizontally into the air of the chamber, as it, the air moves toward its exit at the said upper opening of said chamber, and the gutter or pan located below the opening and extending from the lower edge of the latter into the chamber, and assisting in forming a horizontal passage wherein the air of the chamber is horizontally directed against the jets, and the air and hydrocarbon are intermixed, and issuing in combustion, envelop the generating-conduit, substantially as and for the purposes specified.

5. The combination of the casing, having upper opening D², and conduit located as shown, in reference to the same, and having burners, and a flange of the casing receiving through its opening one of the burners, and the bracket for securing the conduit, and the

gutter beneath the burners, substantially as and for the purposes specified.

6. The combination of the casing, having upper opening D², and conduit located as shown, in reference to the same, and having burners, and a flange of the casing receiving through its opening one of the burners, and the bracket for securing the conduit, and the gutter beneath the burners, and a removable roof or cover, substantially as and for the purposes specified.

7. The combination of the casing, having upper opening D², and conduit located as shown, in reference to the same, and having burners, and a flange of the casing receiving through its opening one of the burners, and the bracket for securing the conduit, and the gutter beneath the burners, and a removable roof or cover, the walls of the casing inclining outward as they descend, substantially as and for the purposes specified.

WILLIAM L. MERSFELDER.

Attest:

WM. E. JONES,
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