

(No Model.)

F. J. HUBBARD.
VAPOR BURNER.

No. 371,942.

Patented Oct. 25, 1887.

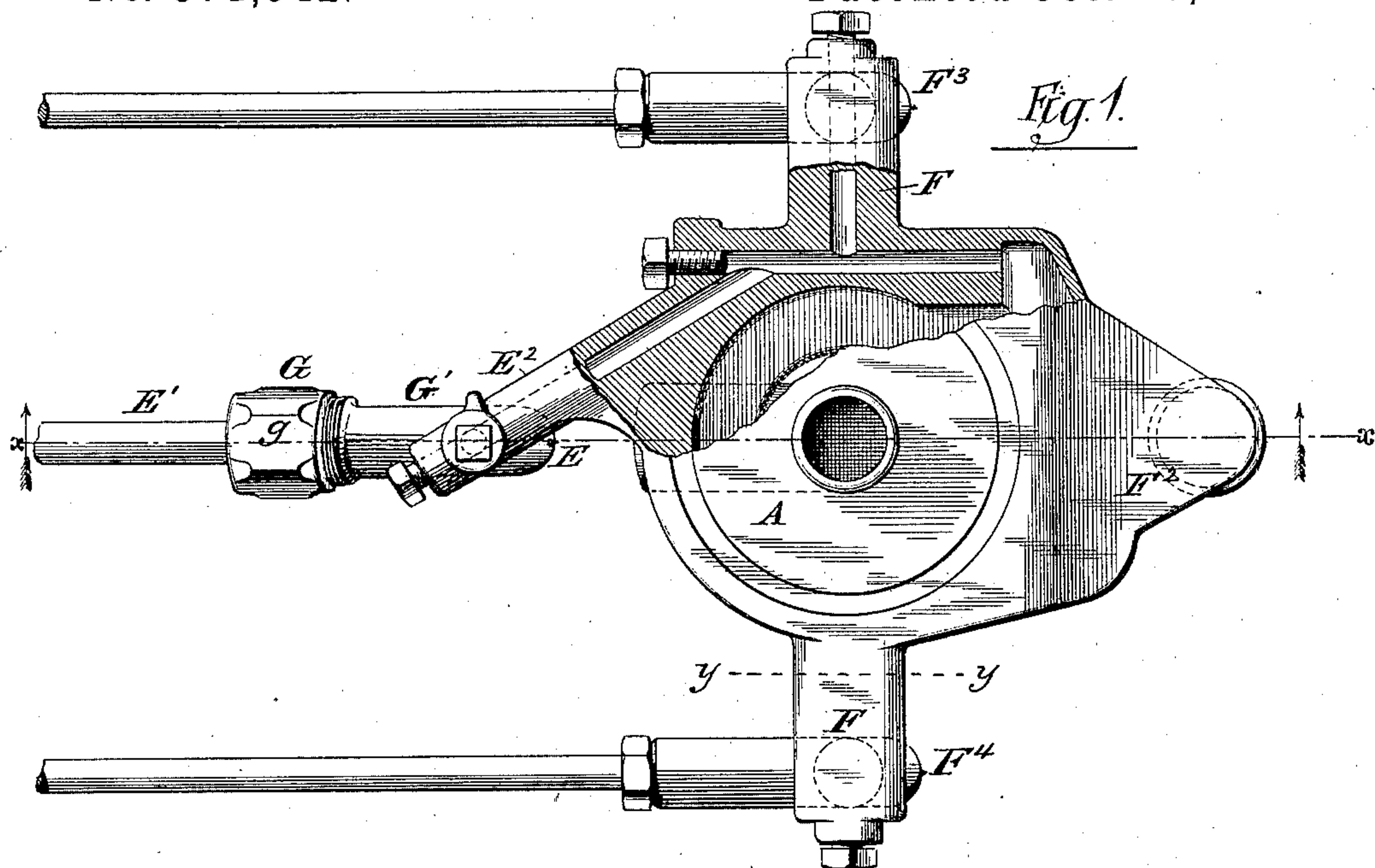


Fig. 2.

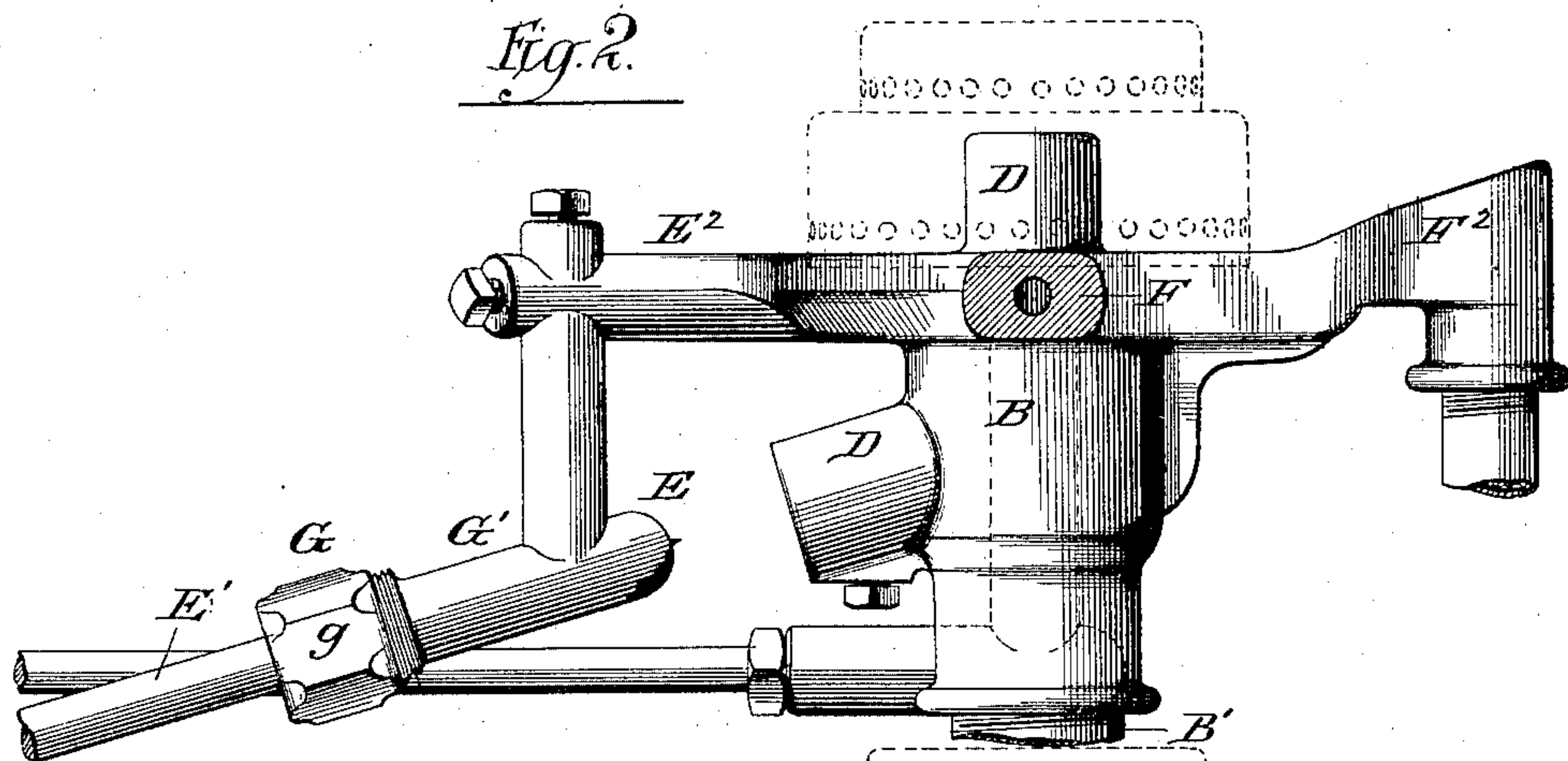


Fig. 3.

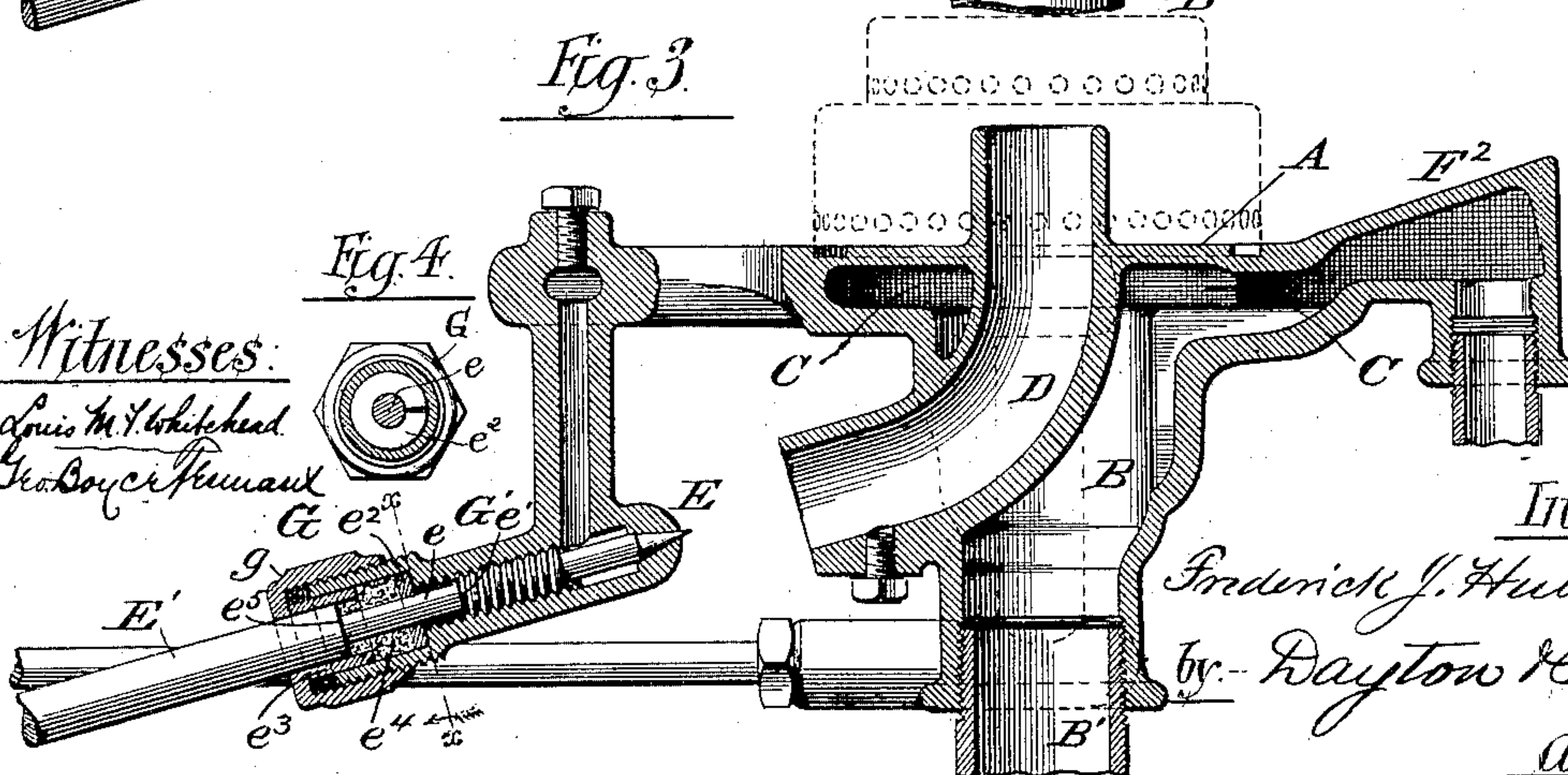
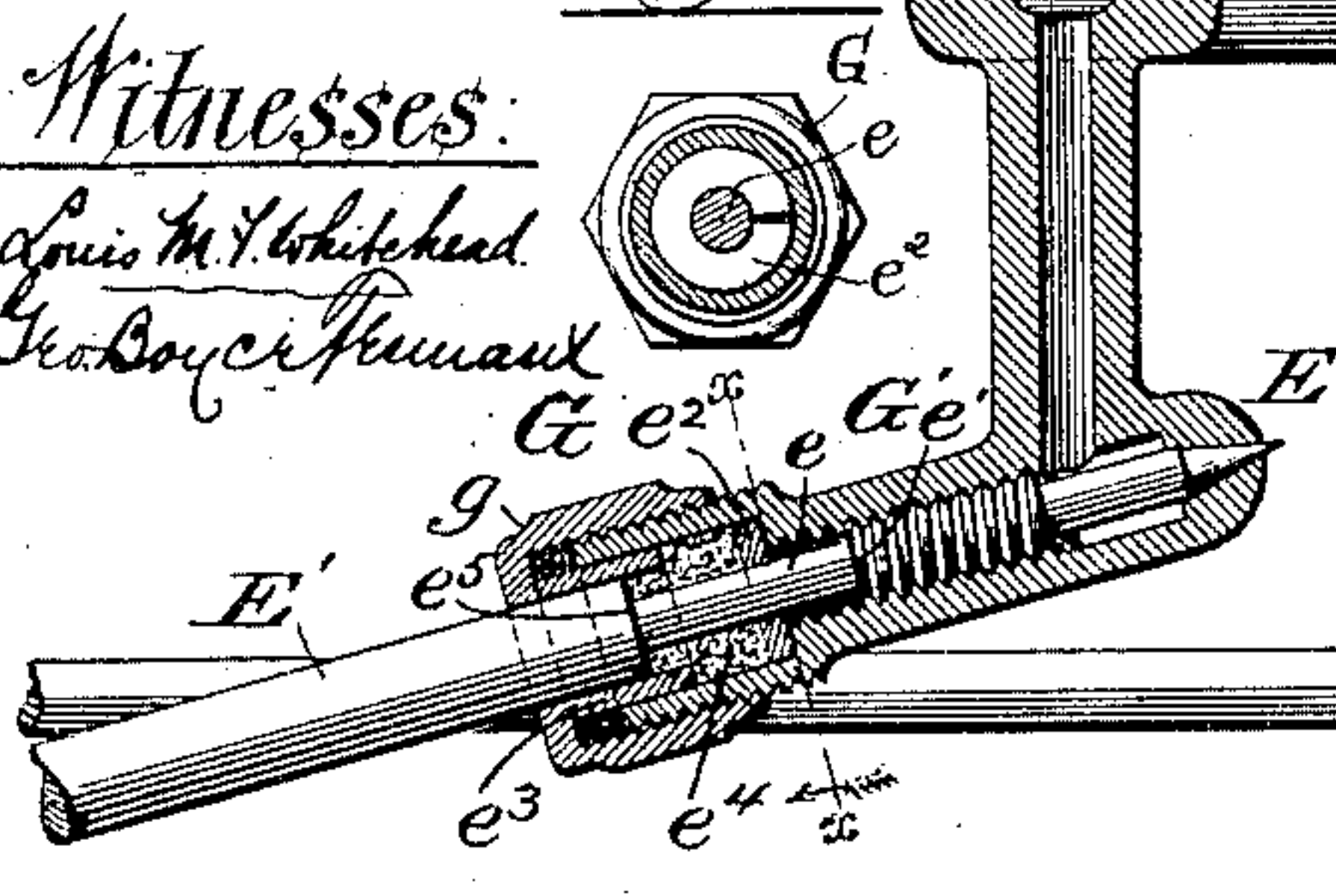


Fig. 4.

Witnesses:

Louis M. Whitehead
Geo. Boyce Hummel



Inventor

Fredrick J. Hubbard

by Dayton & Poole

Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK J. HUBBARD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE
ADAMS & WESTLAKE MANUFACTURING COMPANY, OF SAME PLACE.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 371,942, dated October 25, 1887.

Application filed June 3, 1886. Serial No. 203,982. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK J. HUBBARD, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vapor-Burners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has for one of its objects to provide an improved construction in vapor-burners, wherein the walls of the vapor-induction tube are subjected directly to the heat of the vaporizing-chamber, in order to more effectively heat the air which is injected with the vapor into the burner.

In this particular the invention consists in a vapor-burner provided with a generating-chamber immediately below the base-plate, said chamber being centrally enlarged and extended downward to form a central chambered boss, to the lower end of which the liquid-supply or stand pipe is connected, and through which the induction-pipe passes on its way to the mixing-chamber, the improvement consisting in the enlargement of the space immediately surrounding said induction-tube within the generating-chamber and the consequent exposure of a larger area or surface of said induction-tube to the heating action of the hot vapor within said generating-chamber.

The invention also relates to an improved construction in devices for packing the needle-valve of a vapor-stove, the particular nature of which improvement will hereinafter more fully appear from the following description of the drawings.

In the accompanying drawings, Figure 1 is a plan or top view of a generating-burner containing my improvements and having a part of the base-plate for the perforated cap broken away and the cap removed. Fig. 2 is a side elevation of the burner-base shown in Fig. 1, the rear vapor-tube of Fig. 1 being cut off in the line *y y*. Fig. 3 is a central vertical section in the line *x x* of Fig. 1. Fig. 4 is a section through *x x* of Fig. 3.

A represents the so-called "base-plate" of the burner, on which rests the perforated

burner-cap. (Shown in dotted lines of Figs. 2 and 3.)

B is a central depending tube or hollow boss or body formed on the casting of the base and forming a connection for the stand-pipe B', by which liquid hydrocarbon is delivered to the generating-chamber of the burner.

C is said generating-chamber, located immediately beneath the base-plate, being an extension of the interior of the boss B, which, in fact, forms part of the generating-chamber.

D is the induction-tube for the admission of vapor from the jet-valve E (together with air carried thereby) into the burner-cap through the middle of the base-plate A.

F, F', and F² are chambered or pierced projections of the burner-casting, communicating with the jet-valves, (of which two, F³ F⁴, are shown,) for the supply of vapor to non-generating burners for other parts of the stove.

G is a novel stuffing-box or device for packing applied to the jet-valve tube G' and stem E'.

The burner-base, as here shown, and as preferably constructed, is a single casting, comprising the base-plate A, the depending boss B, the pierced or chambered arms supporting the jet-valve tubes, and the induction-tube D, and embracing the generating-chamber C, with its branches or ducts leading to the several jet-valves. The boss B forms a central and downwardly-extending enlargement of the generating-chamber below the base-plate, and connects at its lower end with the stand-pipe B'. The induction-tube D is curved or angular in direction and enters the boss B at one side, rising through the middle thereof to the central region of the mixing-chamber embraced within the perforated cap shown in dotted lines of Figs. 2 and 3. Inasmuch as the interior of the boss B forms a part of the vapor-generating chamber and is highly heated, the induction-tube D, passing through said boss, as shown in the drawings, has a much greater portion of its surface or exterior exposed to the heat of the generating-chamber than when said chamber is of shallow depth and the induction-tube passes vertically through it, this latter being a construction previously known. Said former construction

has, in reality, little effect in communicating heat from the generating-chamber to the induction-tube, owing to the small extent of the surface of said tube which is exposed directly to the action of the heated vapor, while in the construction here shown the extent to which the surface of the induction-tube is so exposed to the heat of the vapor-generating chamber enables the latter to materially raise the temperature of the partially-mixed air and vapor which enters said induction-tube to the mixing-chamber of the burner, and to thereby better fit the same for proper combustion as it emerges from the perforations of the burner-cap.

The burner shown is designed to accomplish the generation of vapor not only for its own combustion, but for the use of other burners of the stove, and to this end has the pierced branches F , F' , and F'' , leading to jet-valves F^3 , F^4 , &c., for as many non-generating burners in addition to that branch, F^2 , which leads to the jet-valve E for the principal burner, said several branches leading from various points on the margin of the generating chamber C .

The improvement in the packing for the valve-stem consists in the provision of a reduced part, e , on the valve-stem E' back of the screw-thread thereon, giving shoulders at e' and e^5 , a collar, e^2 , movably embracing this reduced part e and reaching across the packing-space, and a movable or follower sleeve, e^3 , surrounding the stem, which sleeve is forced and held in the packing-space by the head of the cap-nut g of the stuffing-box G . The packing e^4 surrounds the reduced part e of the stem and is compressed by the movable sleeve e^3 .

In the operation of the stuffing-box or mechanism thus constructed the full or considerable retreat of the needle valve or stem E' brings the shoulder e' against the collar e , which,

being supported by the packing, backed up by the sleeve or follower e^3 , forms a stop which prevents the needle-valve from being withdrawn.

The shoulder e^5 on the stem is not essential to this action and may be omitted, provided the diameter of the part e is sufficient to give strength throughout the whole length of the stem, which, obviously, only requires that the screw-threaded part of the stem be made enough larger to afford a sufficient shoulder at e' .

To apply the collar e^2 about the reduced part e of the valve-stem when both shoulders e' and e^5 are present, said collar will commonly be split, as shown in Fig. 4.

I claim as my invention—

1. A vapor-burner base having a generating-chamber beneath the base-plate, which is centrally enlarged by a downward extension thereof, forming a chambered boss connected at its lower end with the liquid-inlet pipe, and an induction-tube for the admission of air and vapor to the mixing-chamber of the burner, which induction-tube enters said boss laterally and passes upward through the vapor-generating space included within said boss, substantially as described, and for the purpose set forth.

2. The combination, with a stuffing-box and its cap, of a valve-stem provided with a shoulder, e' , a collar, e^2 , back of said shoulder, and a sleeve or follower, e^3 , substantially as described, and for the purpose set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FREDERICK J. HUBBARD.

Witnesses:

M. E. DAYTON,

C. CLARENCE POOLE.