

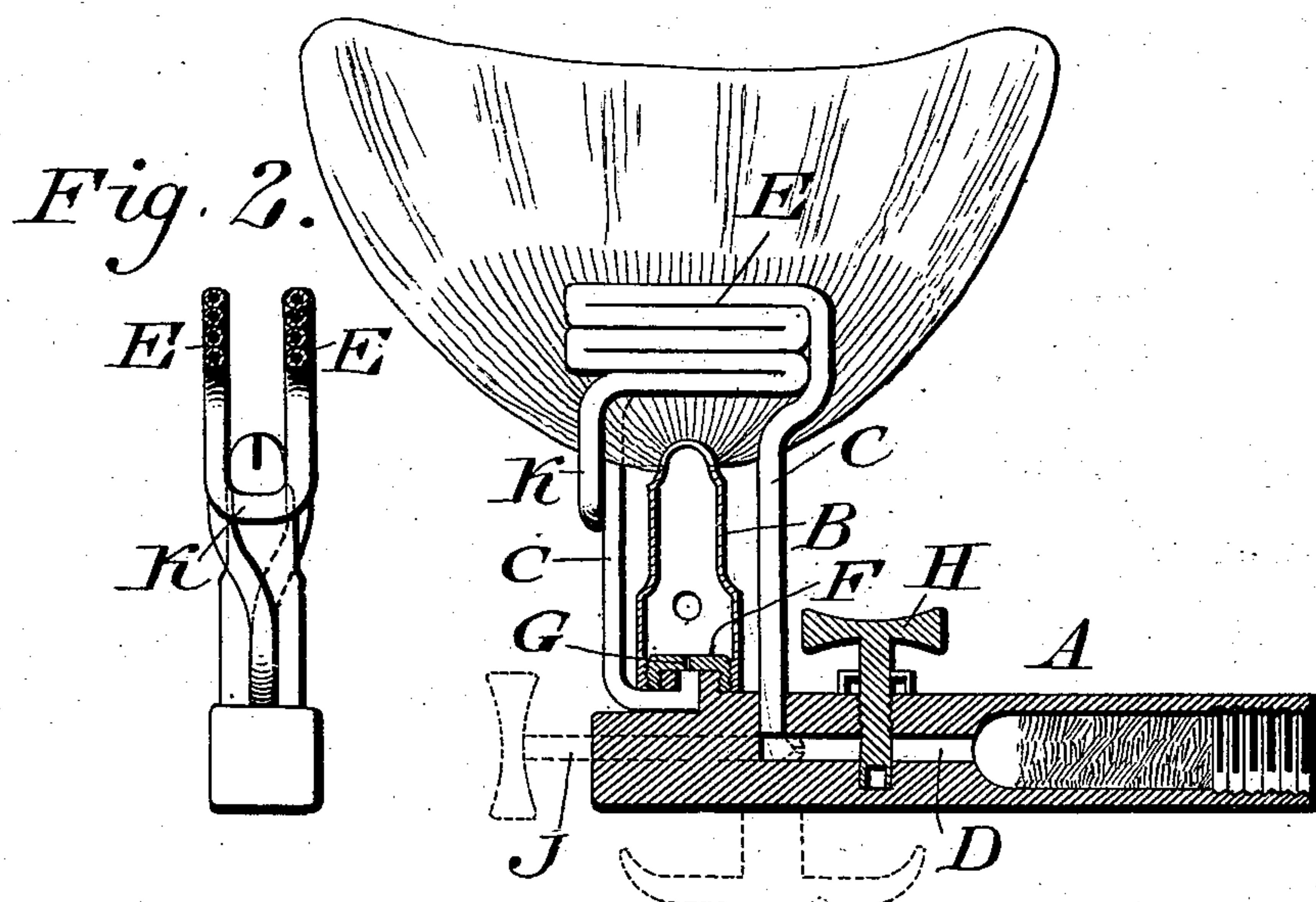
(No Model.)

H. F. SMITH.  
VAPOR BURNER.

No. 506,560.

Patented Oct. 10, 1893.

*Fig. 1.*



*Fig. 3*  
*F' ⊙ G*

WITNESSES:

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# UNITED STATES PATENT OFFICE.

HARPER F. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF FIVE-EIGHTHS TO WILLIAM F. McCULLY AND GEORGE MCGOWAN, OF SAME PLACE.

## VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 506,560, dated October 10, 1893.

Application filed April 27, 1892. Serial No. 430,859. (No model.)

*To all whom it may concern:*

Be it known that I, HARPER F. SMITH, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Vapor-Burners, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a vapor burner which is provided with a coil or coils through which oil or fluid, such as gasoline, is directed and thereby vaporized, said coil or coils being subjected to the heat of the burner, and by their nature producing a large surface for the passage of the partially formed and completely generated vapor or gas.

Figure 1 represents a partial side elevation and partial section of a gas burner embodying my invention. Fig. 2 represents an end view thereof. Fig. 3 represents a plan view of a diaphragm employed within the burner.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates the pipe which is supplied with oil or fluid such as gasoline, from a proper source, as usual in such cases.

B designates the burner which is screwed or otherwise connected to the closed end of said pipe.

C designates a tube, one end of which is connected with a bore D to the pipe A, the same rising from said pipe and formed at top into a coil E, and its opposite end enters the burner B at or about the base thereof, after passing within the end of the gas pipe it being seen that said tube C forms a communication between the pipe A and the burner B. Within the burner, above the end of the tube C therein, is a plate or diaphragm F, which has a small orifice G therein, of less diameter than the bore of the tube C said plate being screwed or otherwise secured to the closed end of the pipe A, said orifice causing the passage of generated gas from said tube C to the burner B.

Connected with the pipe A is a valve H, whereby the supply of fluid to the tube C may be adjusted or entirely cut off. In the closed end of the pipe A is a valve J, which is adapted to open and close the inlet end of

the tube C, and nicely adjust the supply of oil or partially generated vapor thereto, it being evident that while both valves H and J may be employed, they may be used separately.

The coil E is double, as most clearly shown in Fig. 2, it being noticed that a coil is formed at the top of the inlet portion of the tube C, after which said tube passes to the opposite side as at K, and then rises having at the top thereof the other coil E, after which it descends and joins the burner, by which provision the surface of the pipe is vastly increased, it being noticed that the coils are on opposite sides above the burner, and on the sides of the flame therefrom so as to be subjected to the heat thereof.

The ends of the tube C respectively lead from and enter the supply pipe A, at or near the center of the top thereof, so as to be in line with the longitudinal direction thereof.

The operation is as follows: The fluid in the pipe A enters the bore D, where it may be heated by the alcohol cup, shown in dotted lines, thus partially vaporizing the same, the vapor then passing into the pipe C and the coil E, where it is subjected to the intense heat thereof, thus fully vaporizing the oil and generating a highly volatile gas which is directed into the burner, at the tip of which it may be consumed, thus producing a brilliant light and serving to heat the coils E, E, and the adjacent portions of the tube C. The small orifice G in the plate F admits the gas to the burner in a uniform manner, thus causing the light to burn steadily and without flickering.

The burner is provided with openings in the side thereof, whereby air may be admitted into the same, in order to intermix with the gas and produce a more perfect combustion thereof.

In my burner the flame is perfectly white for illuminating purposes. The reason for having one or both sides of flattened or doubled coil, is that the action of the heat on the vapor in the coils tends to so lighten it that the longer it is exposed to the heat, the better its quality and brightness. In the old construction where there is a tube on each side in case the wind blows the flame away from



one side, the oil in that side is not being vaporized, and thus vapor and oil will pass through together and make the flame jump, whereas in my burner formed of a single tube, making coils on each side of the burner, the flame is always in contact with the retort, whichever way the wind may blow. Consequently all of the oil is vaporized.

It is evident that a torch, &c., may be employed to heat the bore or chamber D and coil E preliminary to vaporization.

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

1. A gas supply pipe having a bore and a closed end, a burner supported on said pipe, a tube communicating at one end with said bore and opening at the other end into said burner, a diaphragm within said burner having an opening of less diameter than the opening in the pipe leading into the burner, said tube rising vertically from the supply pipe and having flattened coils on opposite sides above the top of the burner, said parts being combined substantially as described.

2. A gas supply pipe having a bore in a closed end thereof, a valve in said bore, a burner supported on the closed end of said pipe, and a tube leading from one end of said bore to above the tip of the burner on one side thereof, and then passing below the level of said tip to the opposite side of the burner and entering the burner on the opposite side therefrom from the connection of the tube and bore, said tube being coiled on opposite sides of said burner, said parts being combined substantially as described.

3. A gas supply pipe with a burner supported thereon at the closed end thereof, and a tube rising from said pipe and communicating with the bore thereof, then having coils on one side of the burner, passed to the other side thereof, and having coils thereat, then descending and having its discharge end connected with the burner, said parts being combined substantially as described.

HARPER F. SMITH.

Witnesses:

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A. P. JENNINGS.