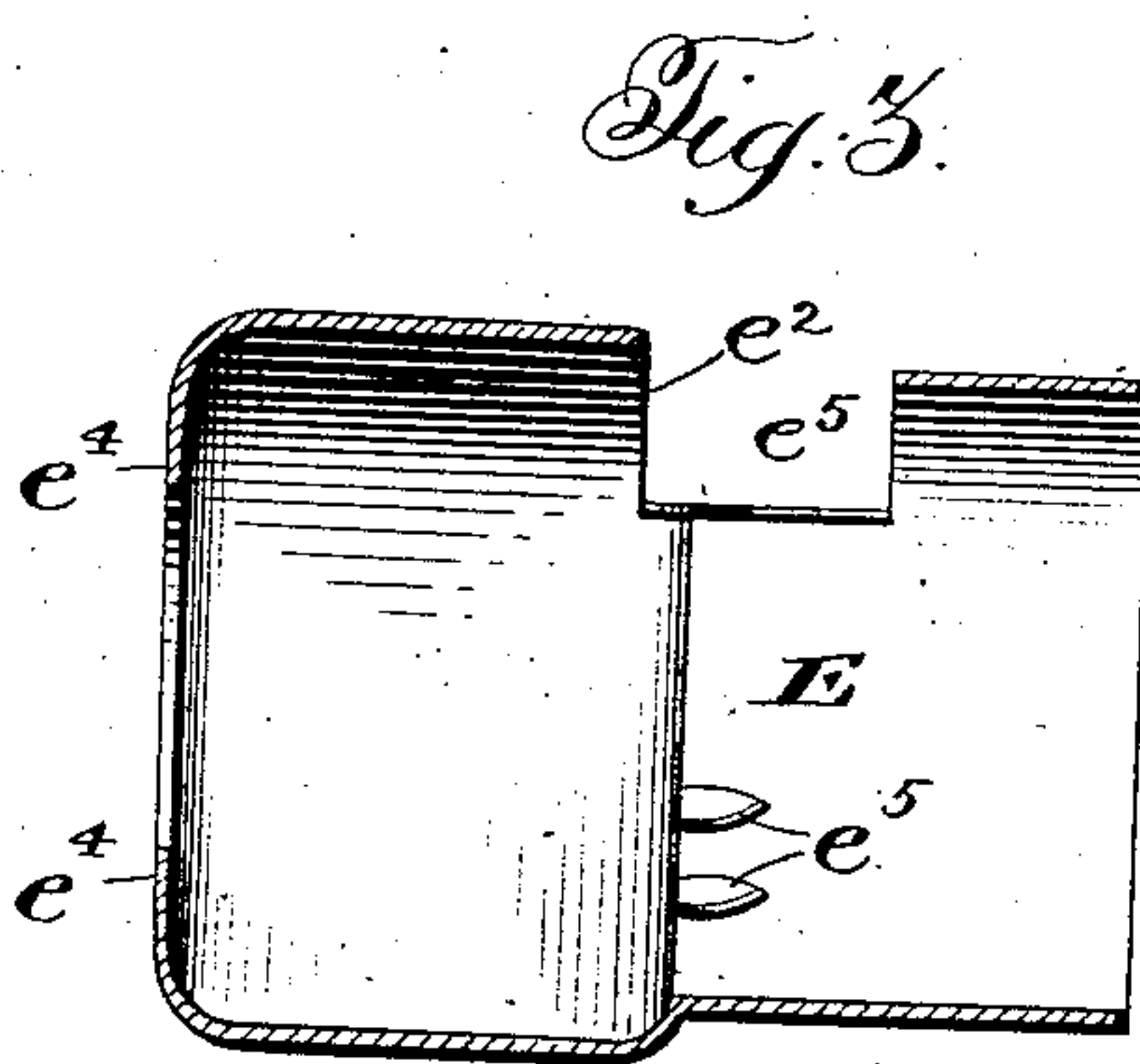
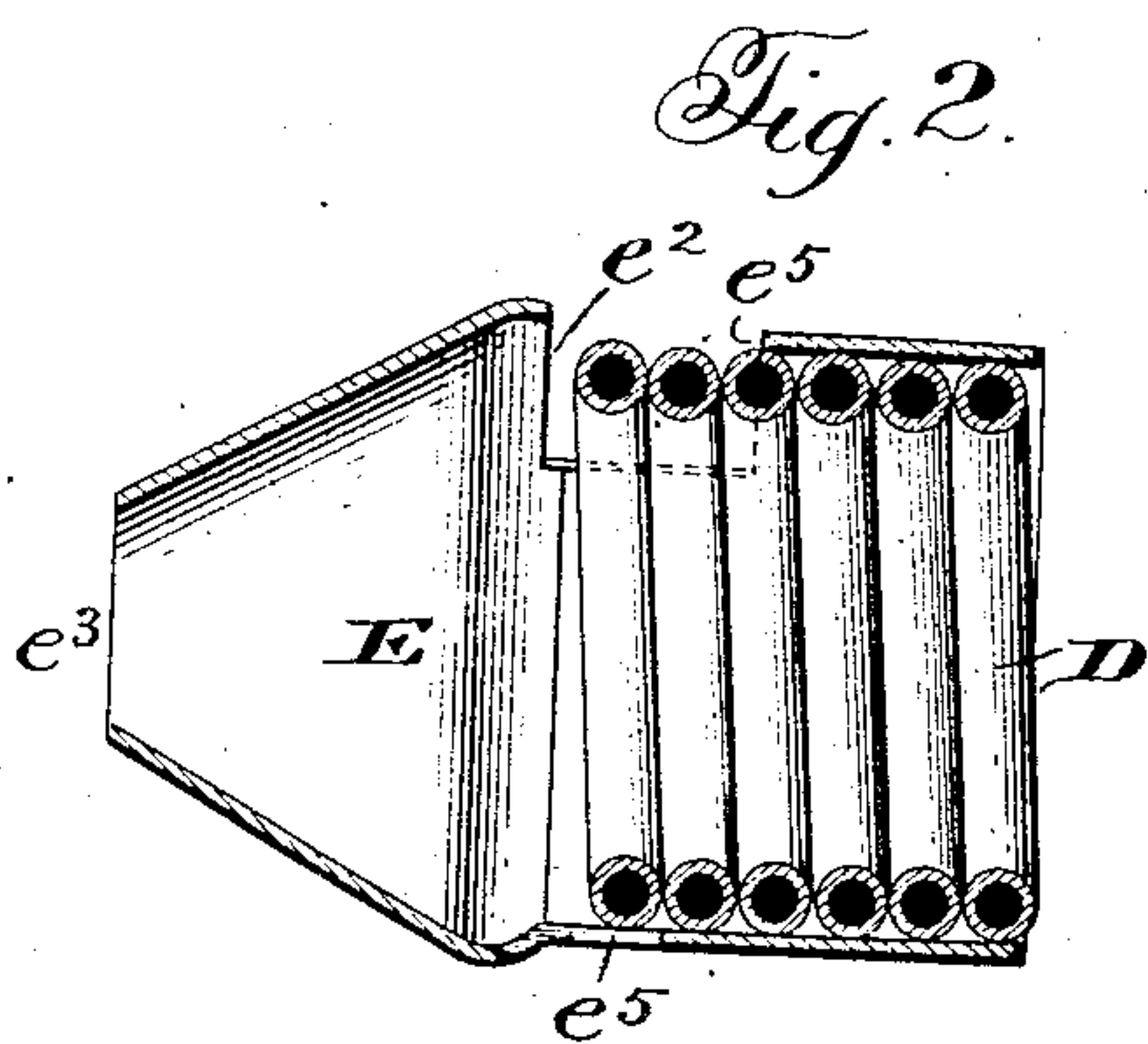
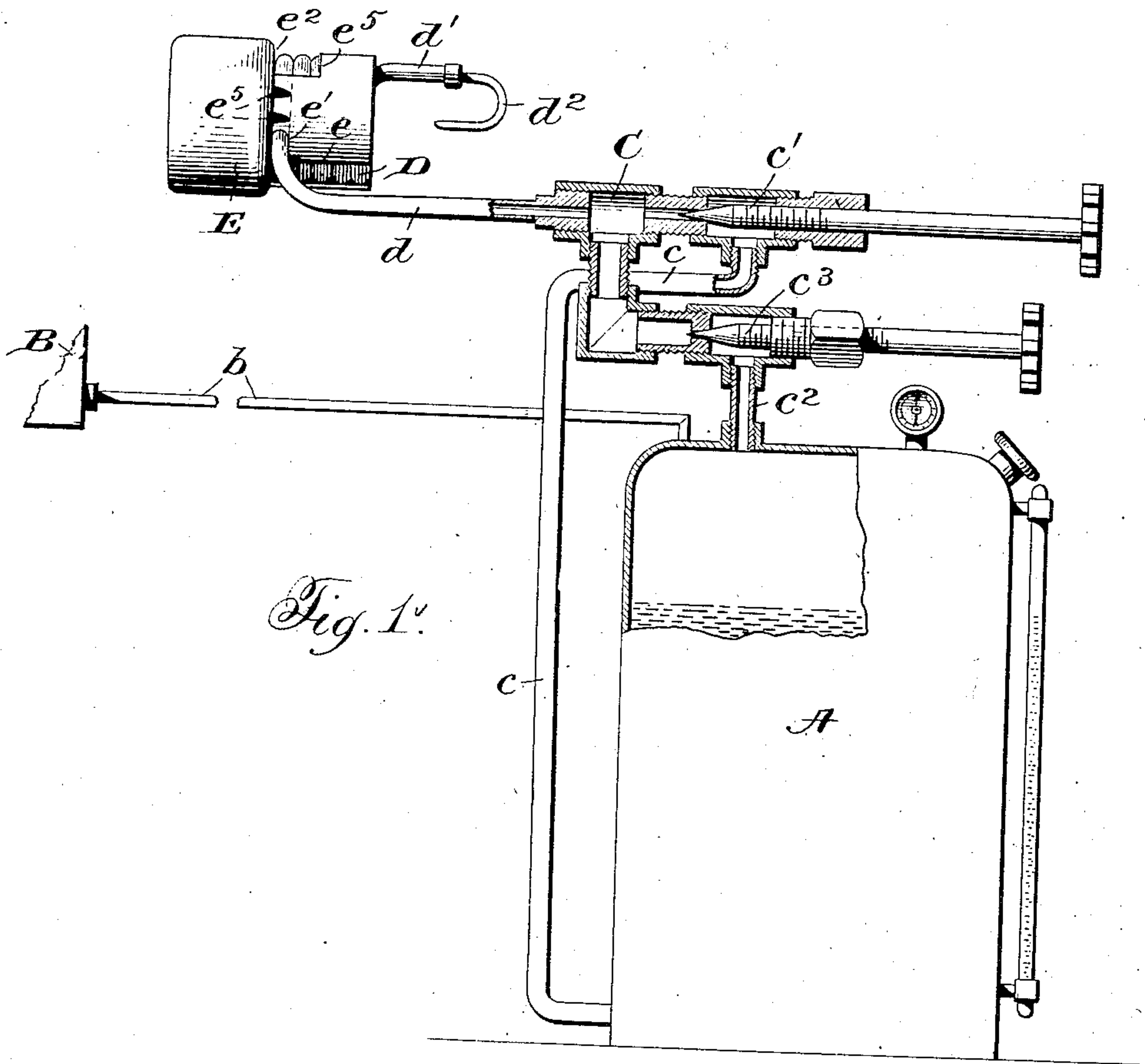


No. 835,627.

PATENTED NOV. 13, 1906.

F. C. LORING.  
HYDROCARBON BURNER.  
APPLICATION FILED DEC. 31, 1904.



Witnesses:  
Jas. Hutchinson.  
Thos. P. Heath.

Inventor:  
Frank C. Loring,  
By William Milam Attorneys.



# UNITED STATES PATENT OFFICE.

FRANK C. LORING, OF EASTPORT, MAINE.

## HYDROCARBON-BURNER.

No. 835,627.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed December 31, 1904. Serial No. 239,114.

*To all whom it may concern:*

Be it known that I, FRANK C. LORING, a citizen of the United States, residing at Eastport, in the county of Washington and State of Maine, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in hydrocarbon-burners, and more particularly to that class of hydrocarbon-burners in which a coil of the hydrocarbon-pipe is arranged in the path of the burner-jet, so as to constitute a vaporizer; and the object of the invention is the provision of a burner of this type which can be quickly and easily started.

The invention comprises a burner connected with a tank in which gasoline or other hydrocarbon is stored under air-pressure, a connection between the portion of the tank containing the air and the burner, whereby air can be mixed with oil to cause a blast from the burner to facilitate heating the vaporizing-coil when the burner is started, and means for cutting off the air-supply to the burner after it is started.

A further object is the provision of a hood surrounding the vaporizing-coil and so constructed as to greatly facilitate the heating of said coil.

In the drawings accompanying this specification, wherein like numerals of reference refer to similar parts in the several views, and wherein a preferable embodiment of my invention is shown, Figure 1 is a side elevation, partly in section, of my improved burner connected to the gasoline-storage tank. Fig. 2 is a sectional view of the vaporizer-coil and the hood secured thereto, and Fig. 3 is a similar view showing a modified form of hood.

Referring now more particularly to the drawings, A designates a tank adapted to contain gasoline or other hydrocarbon fluid, and B designates an air-pump connected by a pipe *b* with the upper portion thereof and adapted to compress air in the upper portion of said tank above the gasoline therein.

C designates the mixing-chamber of the burner, which is in the form of a horizontally-disposed pipe, one end of which is connected by a pipe *c* to the lower portion of the gasoline-storage tank A. A needle-valve *c'* is interposed between the mixing-chamber C and the tank A to regulate the amount of liquid fuel furnished to the burner. The

mixing-chamber C is also connected to the upper or air-containing portion of the tank A by means of a pipe *c''*, in which is arranged a needle-valve *c'''*. The burner consists of a single tube folded upon itself to form a helical coil D, one terminal *d* of which is bent to lie parallel with the axis of the coil and is connected to the forward end of the mixing-chamber C so as to form a continuation thereof, and the other terminal of which, *d'*, is extended parallel with the axis of the coil. Secured to the end of the terminal *d'* is a small tube *d''*, which has its free end bent back upon itself to lie in axial alinement with the coil, the free end of said tube constituting a burner-tip.

E designates a hood surrounding the coil D and projecting beyond the forward end thereof, which serves to concentrate the flame and prevent the same from spreading, thereby giving a very powerful flame, which is very necessary in brazing operations and the like. The hood E is provided with a longitudinal slot *e* therein, adapted to receive the terminal *d* of the coil D when the hood is slipped thereon, said slot being provided with a lateral extension *e'* at the upper end thereof, so that the hood may be locked to the coil after it has been slipped thereon by giving it a slight turn. The inner portion of the hood E is of a size to snugly fit over the coil D, and the projecting portion of said hood is provided on its interior with a narrow outwardly-extending flange *e''* adjacent the outermost wrap of said coil and with a reduced outlet *e'''* smaller in diameter than the inner diameter of the coil. The reduced outlet *e'''* can be produced by either tapering the projecting portion of the hood, as shown in Fig. 3, or by providing the outer end of said hood with an abrupt annular flange *e''''*, as shown in Fig. 4. A plurality of elongated slots *e'''''* are formed in the portion of the hood fitting over the coil E, the upper ends of which extend slightly above the outermost wrap of the coil E and terminate in the outwardly-extending flange *e''''*.

Having described the construction of my burner, I will now proceed to set forth the operation of the same. The needle-valve *c'* in the gasoline-pipe C is first opened, and the gasoline which will then issue from the burner-tip is ignited. The valve *c'''* is then opened to allow compressed air to pass from the top of the tank A to the mixing-chamber C, where it mingles with the gasoline and



causes the same to issue from the burner-tip in the form of a blast. A flame is thus produced which completely fills the interior of the coil D and which will consequently in a short time heat said coil to cause the vaporization of the liquid contained therein. As the flame completely fills the interior of the coil D and as the outlet of the hood E is of a smaller diameter than the interior of said coil, a portion of the flame will be deflected back and will be caused to pass through the slots  $e^5$  in the hood E and impinge upon the exposed portions of the back of the coil D, thereby facilitating the heating of the coil in starting the burner and serving to keep the coil hot at all times after the burner has been started. As soon as the burner is started the air-valve  $c^2$  is turned off and vaporized hydrocarbon only is burned at the burner-tip.

I do not desire to limit myself to the precise form and construction shown in the drawings, as it is obvious that many minor changes might be made thereto without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In an apparatus of the character described, a tank adapted to contain a supply of liquid hydrocarbon, means for supplying compressed air to the upper portion of the tank above the liquid contained therein, a burner, a horizontally-disposed mixing-chamber, a vaporizing-coil arranged adjacent the burner connected to one end of the horizontally-disposed mixing-chamber, separate pipes connecting said mixing-chamber with the upper and lower portions of the tank and permitting the entrance thereto of independent jets of oil and air, and valves for controlling the flow of air and fuel to the mixing-chamber, whereby either a mixture of oil and air or oil alone may be supplied to the burner.

2. In an apparatus of the character described, a tank adapted to contain a supply of liquid hydrocarbon, means for supplying compressed air to the upper portion of the tank above the liquid contained therein, a burner, a horizontally-disposed mixing-chamber, a vaporizing-coil arranged adjacent the burner and connected to one end of the horizontally-disposed mixing-chamber to form a continuation thereof, a pipe connecting the opposite end of the horizontally-disposed mixing-chamber with the lower end of said tank, and a separate pipe connecting the mixing-chamber and the upper portion of the tank, and valves for controlling the flow of oil and air to the mixing-chamber, whereby either a mixture of oil and air or oil alone may be supplied to the burner.

3. In an apparatus of the character described, a tank adapted to contain a supply of liquid hydrocarbon, means for supplying compressed air to the upper portion of the tank above the liquid contained therein, a burner, a horizontally-disposed mixing-chamber, a vaporizing-coil arranged adjacent the burner, a connection from the mixing-chamber to the vaporizing-coil, said connection extending from one end of and in alignment with the mixing-chamber, a pipe connecting the opposite end of the horizontally-disposed mixing-chamber and the lower portion of the tank, a separate pipe extending from the upper end of the tank to the mixing-chamber intermediate its connection with the first pipe and the vaporizing-coil, and valves in said pipes controlling the flow of oil and air to the mixing-chamber.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK C. LORING.

Witnesses:

CHAS. C. RUMERY,  
WILLIAM BANKS.