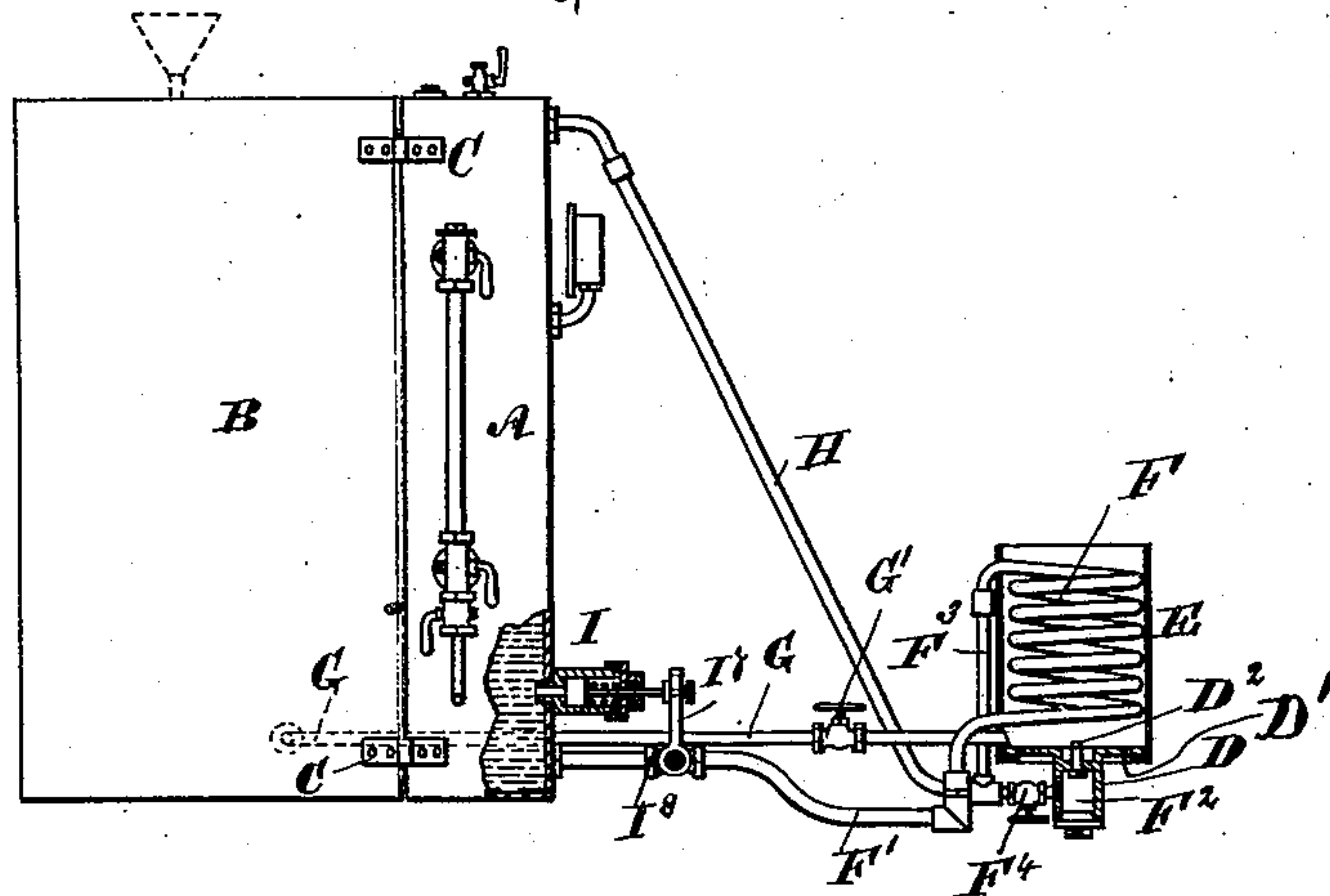


2 Sheets—Sheet 1

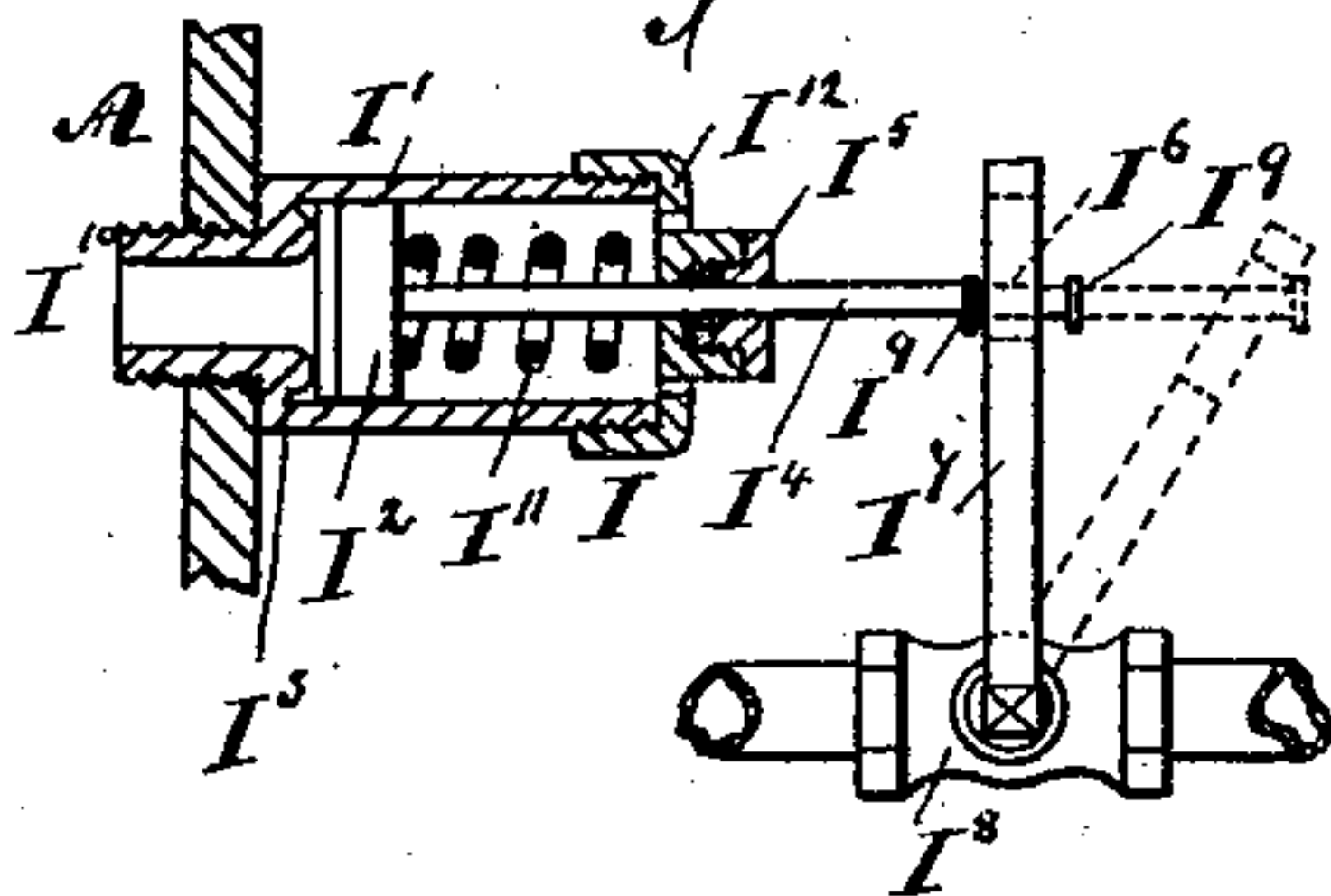
APPARATUS FOR BURNING HYDROCARBON OR OTHER OILS FOR  
LIGHTING AND HEATING.

Patented June 21, 1892.

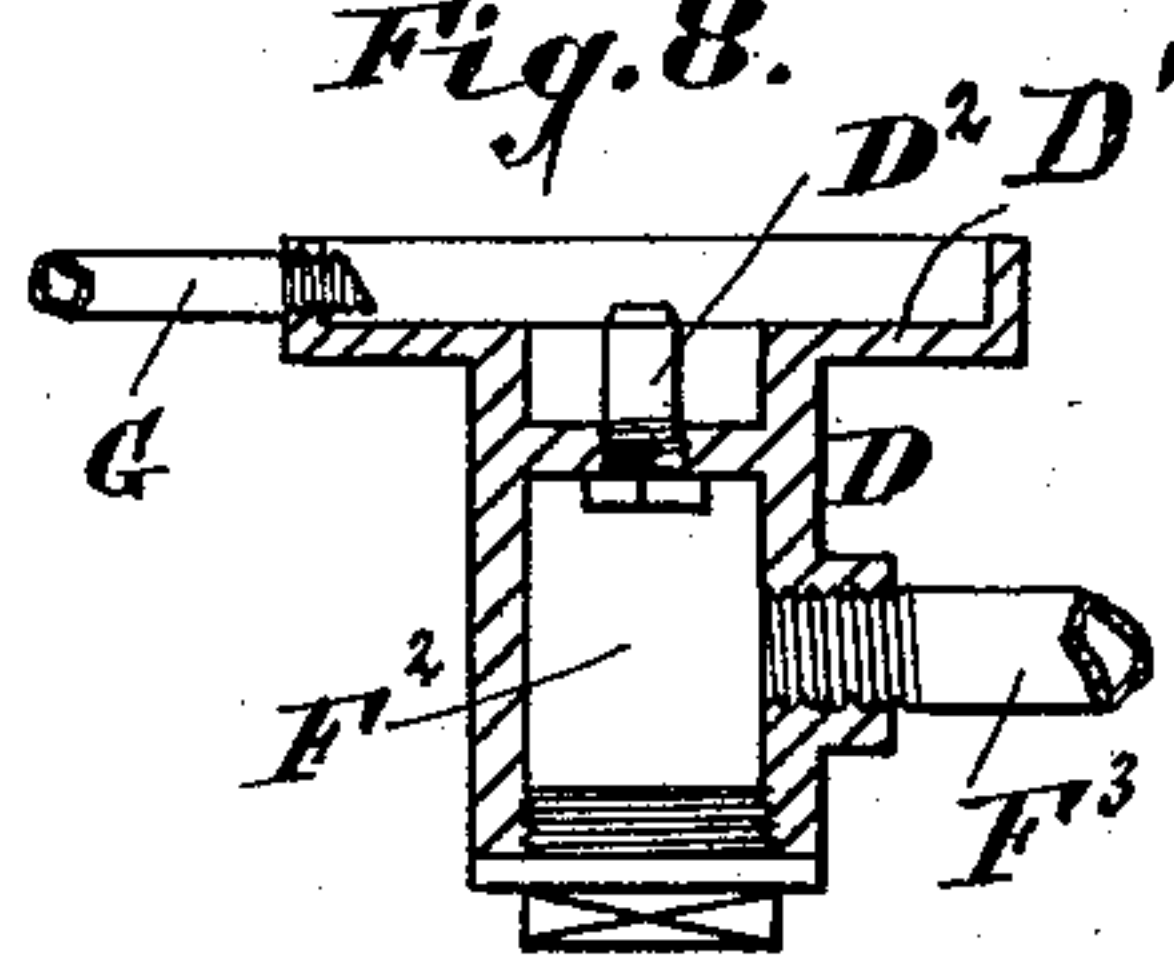
*Fig. 1.*



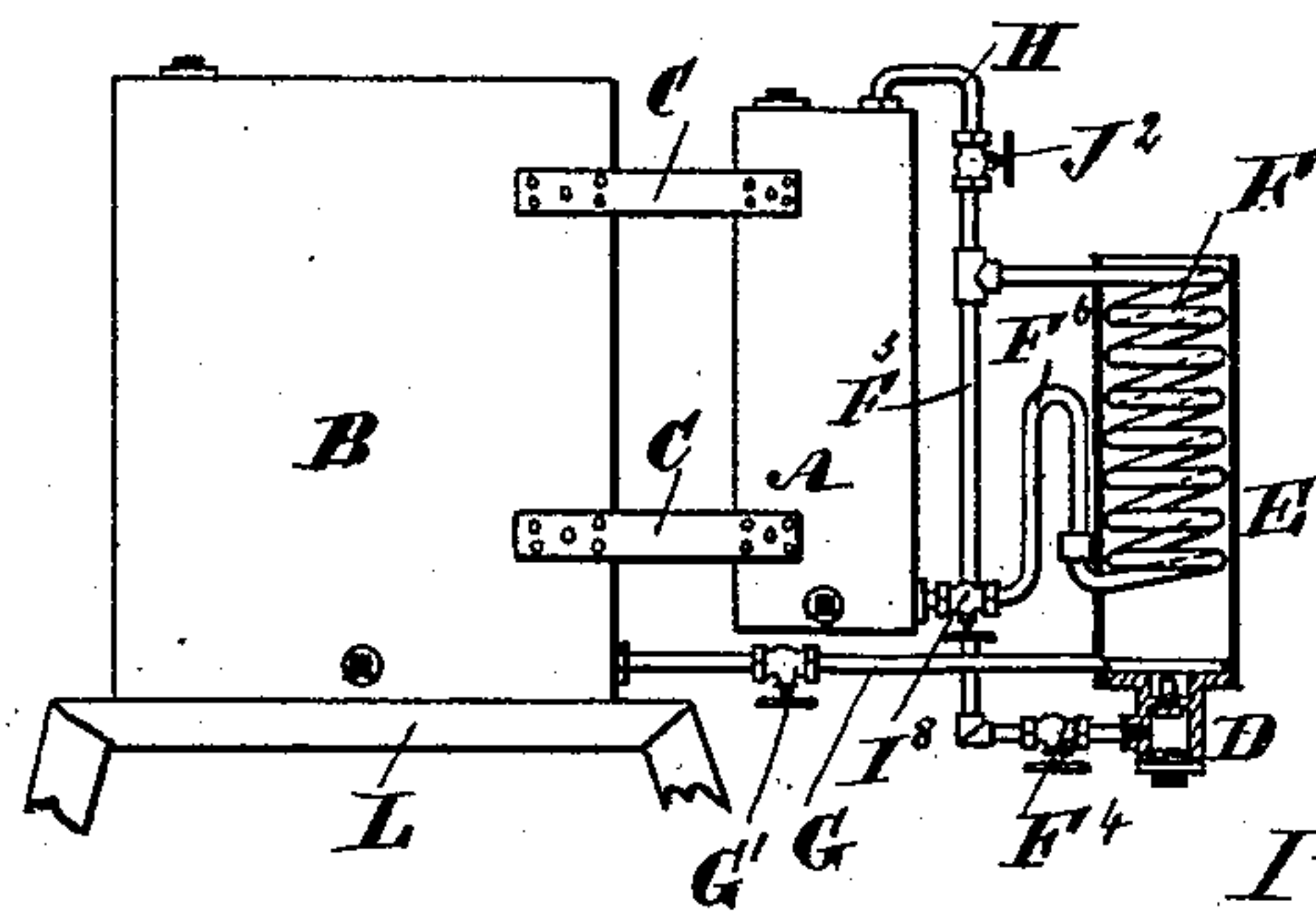
*Fig. 6.*



*Fig. 8.*




*Fig. 4.*



*Inventor*

George Rose

By *Richard*  *his Attorneys.*

*Witnesses:*

E. B. Bolton

Ed Keale

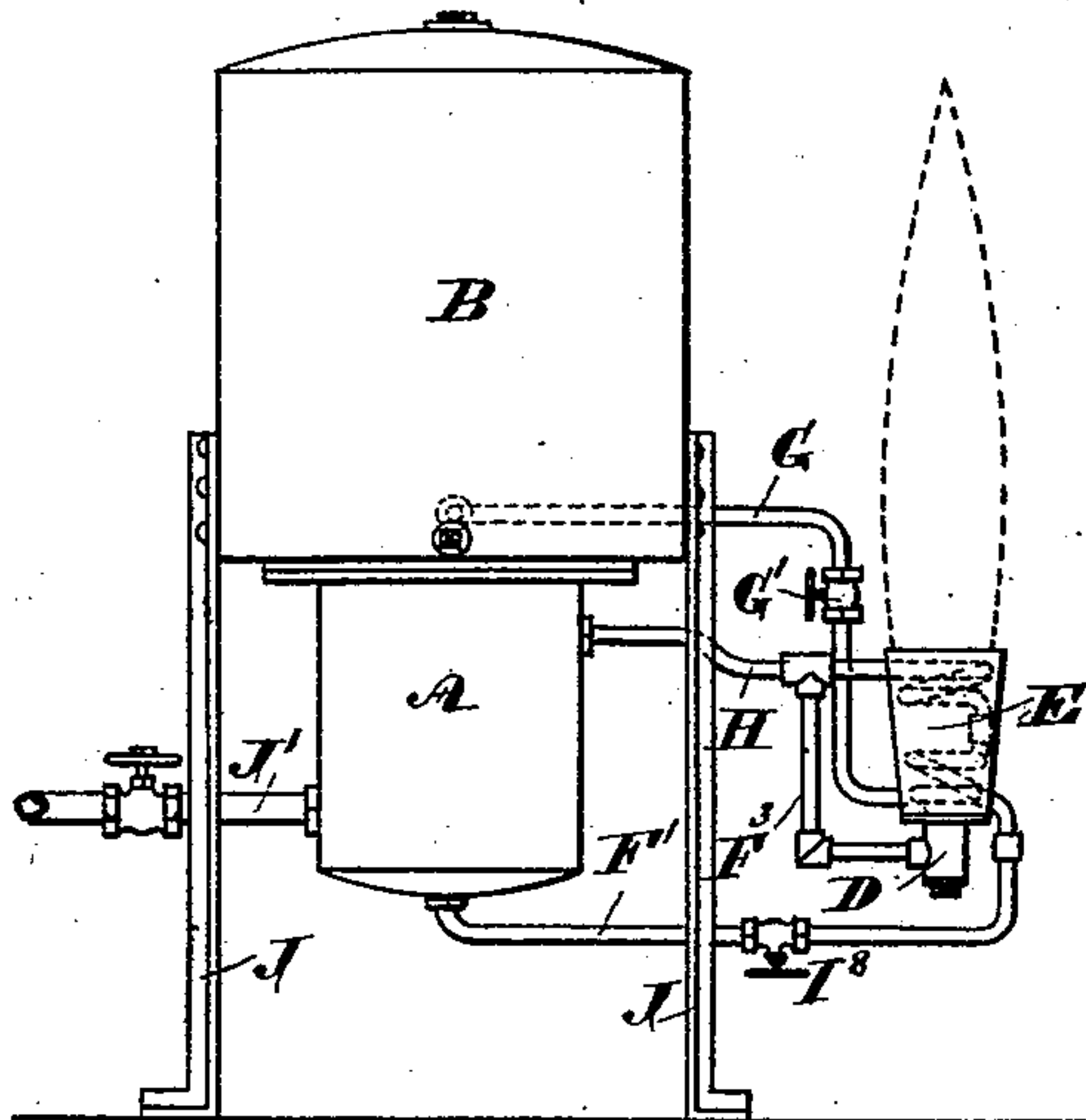
G. ROSE.

APPARATUS FOR BURNING HYDROCARBON OR OTHER OILS FOR  
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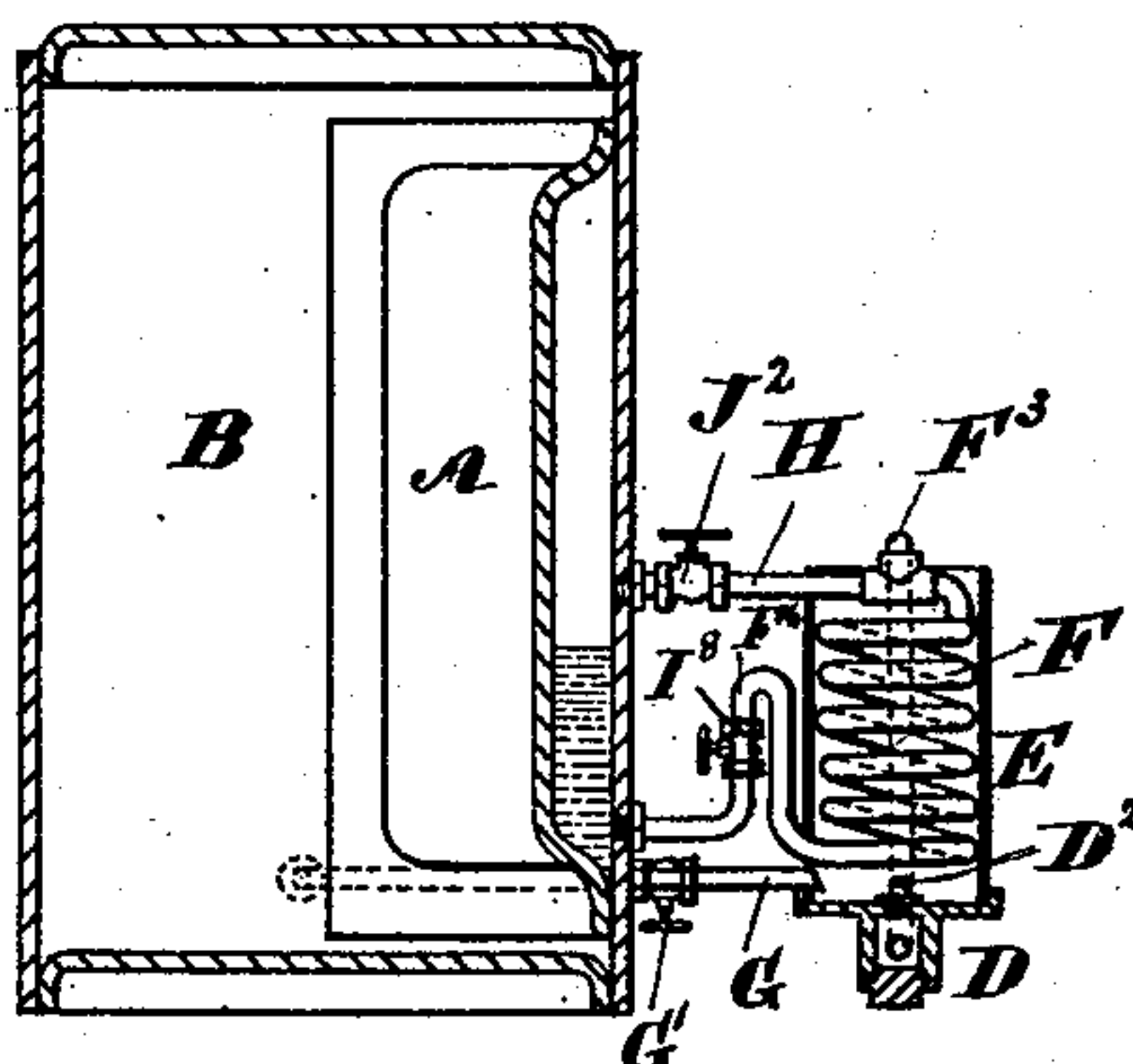
No. 477,271.

Patented June 21, 1892.

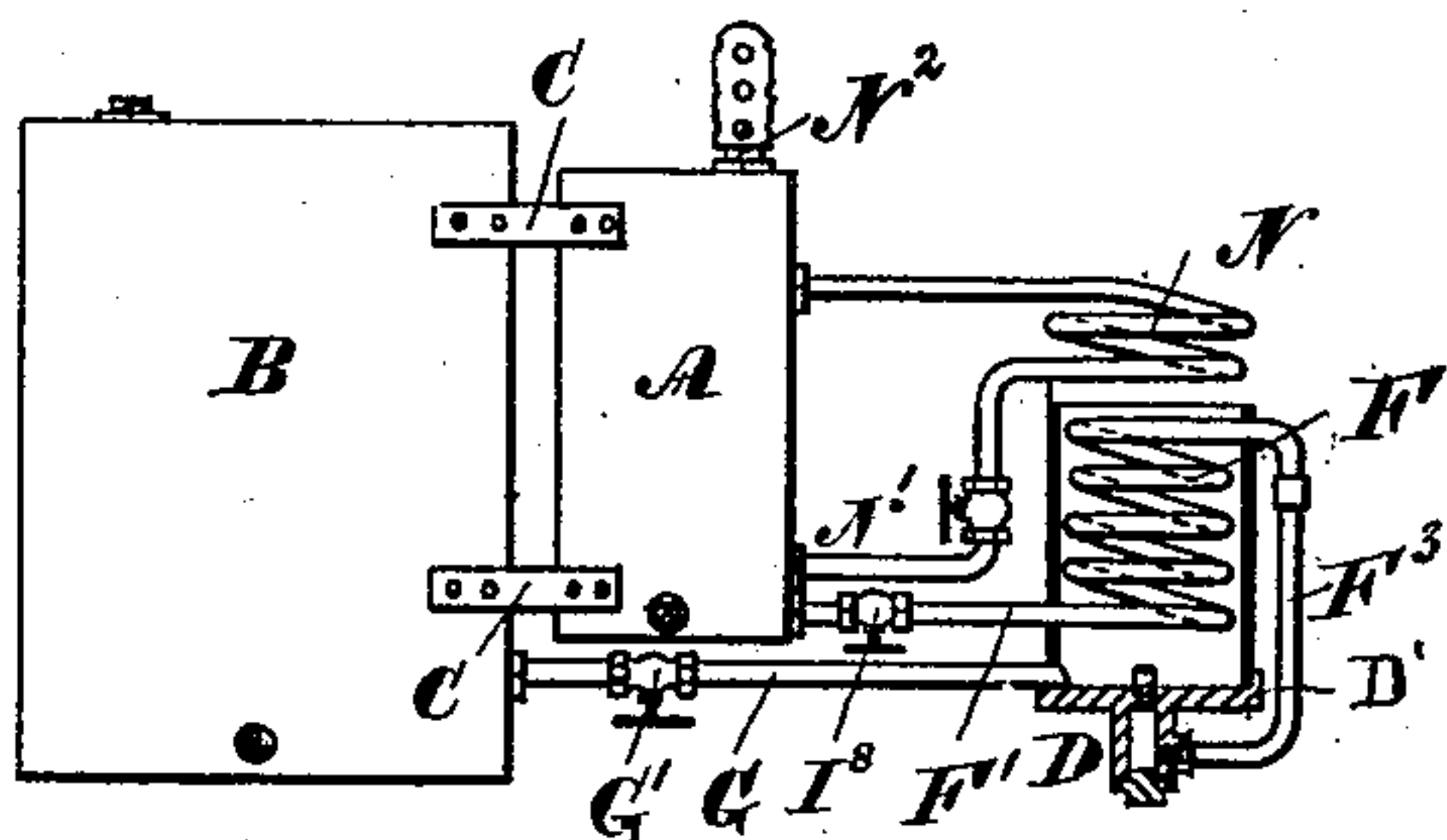
*Fig. 2.*



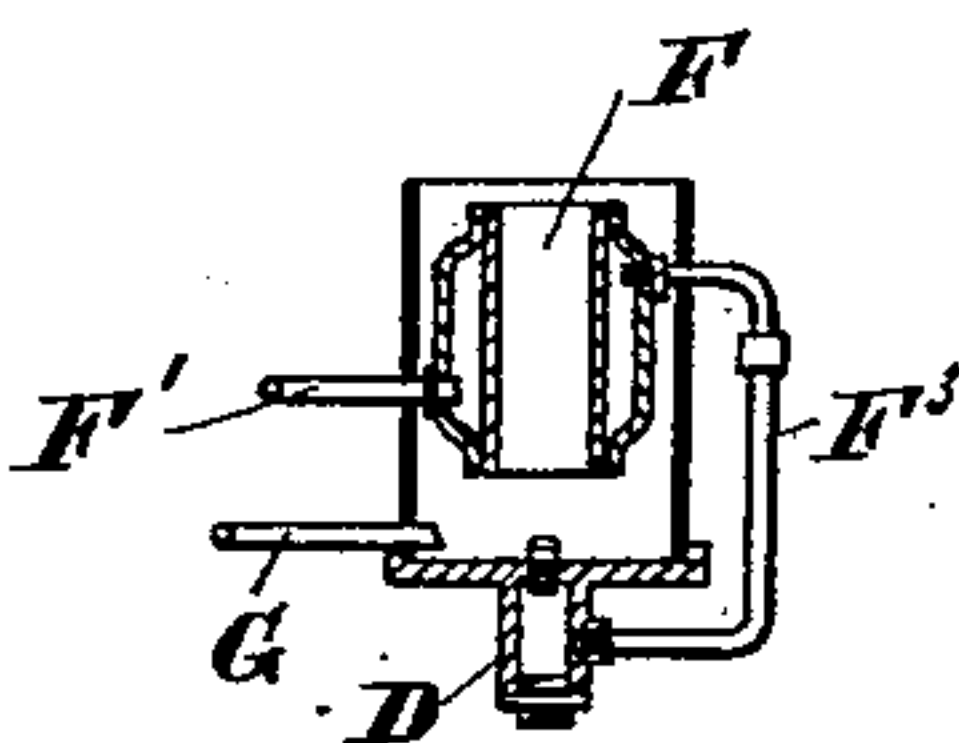
*Fig. 3.*



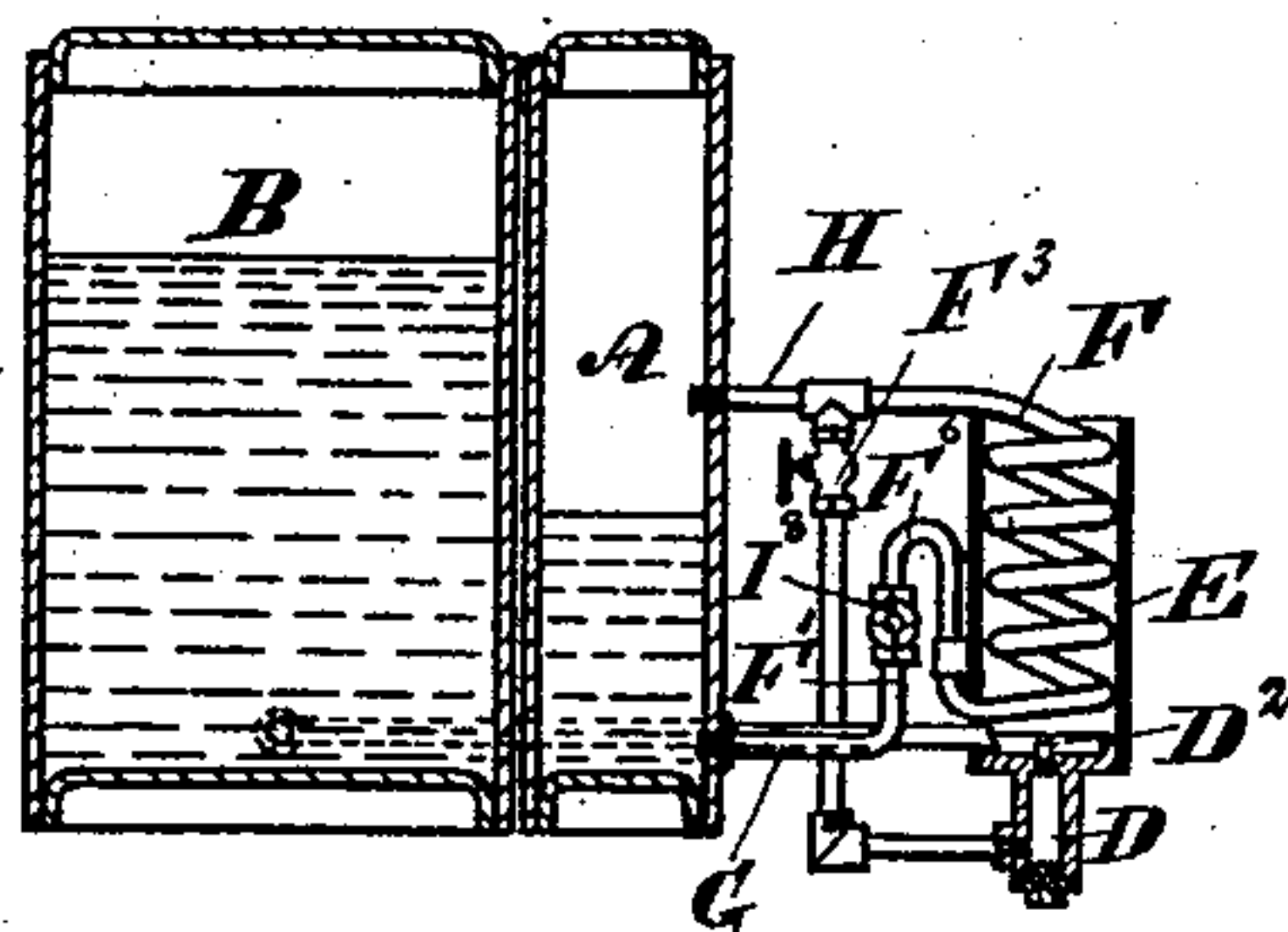
*Fig. 4.*



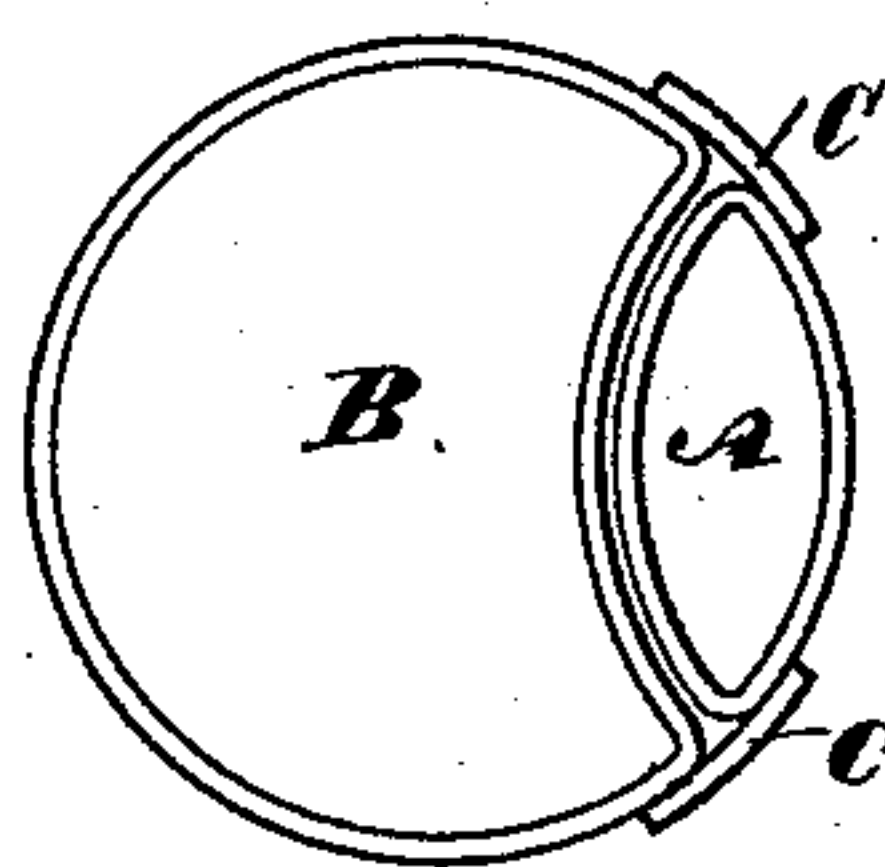
*Fig. 9.*



*Fig. 5.*



*Fig. 5^a.*



Witnesses:  
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J. H. Keane

Inventor:  
George Rose  
By *Richard D. [Signature]*  
his Attorneys.



# UNITED STATES PATENT OFFICE.

GEORGE ROSE, OF GLASGOW, SCOTLAND, ASSIGNOR OF TWO-THIRDS TO  
ARCHIBALD BAIRD AND MATTHEW BARR BAIRD, OF SAME PLACE.

APPARATUS FOR BURNING HYDROCARBON OR OTHER OILS FOR LIGHTING AND HEATING.

SPECIFICATION forming part of Letters Patent No. 477,271, dated June 21, 1892.

Application filed June 10, 1891. Serial No. 395,769. (No model.) Patented in England November 13, 1889, No. 18,101.

*To all whom it may concern:*

Be it known that I, GEORGE ROSE, a subject of the Queen of Great Britain, and a resident of the city of Glasgow, Lanarkshire, Scotland, have invented certain new and useful Improvements in Apparatus for Burning Hydrocarbon or other Oils for Lighting and Heating Purposes, (patented in England November 13, 1889, No. 18,101,) of which the following is a specification.

My invention relates generally to apparatus for burning hydrocarbon or other oils in the form of spray for lighting and heating purposes; and the improvements are mainly applicable to that class of apparatus wherein steam generated from water supplied to a coil-pipe or chamber heated by the flame is used to spray the oil or oil-vapor in the burner or combustion-box.

The present invention is a further development of my prior patent for self-generating steam-lamps and heating apparatus; and it consists in certain improvements applicable to such apparatus; and in order that my said invention may be properly understood I have hereunto appended two explanatory sheets of drawings, whereon—

Figure 1 shows partly in side elevation and partly in section a spray-lamp. Fig. 2 shows in side elevation a different arrangement of spray-lamp. Fig. 3 is a vertical section of a spray-lamp; Fig. 4, a side view, partly in section, of a spray-lamp; Fig. 5, a vertical section of a spray-lamp. Fig. 5<sup>a</sup> is a plan view of the basement-tanks, Fig. 5. Fig. 6 is a detail view, partly in section, to an enlarged scale. Fig. 7 is a side view, partly in section, of a spray-lamp. Fig. 8 is a vertical section of an oil-well burner. Fig. 9 represents in section an annular steam-generator as being used instead of a coil-pipe.

On the drawings the same reference-letters, wherever repeated, indicate similar or like parts.

Referring to Fig. 1, the lamp here shown consists of a double tank A B, the part or chamber A being for water and the part or chamber B for oil. The tanks A B, which form in plan segments of a circle, are strapped, bolted, or hinged together at C. Projecting out from the double tank A B is the oil-

well burner D. (Shown enlarged at Fig. 8.)

It is of a similar construction to the burners of my prior patents, except that the top of the burner is in this case shown as made with a broad flange D', to which is secured the combustion-box or casing E.

F is the coil-pipe for generating steam, and it is supplied with water from the tank A by means of a pipe connection F'.

Oil is supplied from the tank B to the oil-well of the burner D by means of the pipe G, which is provided with a controlling-valve G'. The self-generated steam from the coil F is conducted down to the steam-chamber F<sup>2</sup> of the burner by the pipe F<sup>3</sup>. The pipe F<sup>3</sup> has or may have a regulating-valve F<sup>4</sup> on it.

In the present invention there is connected to the pipe F<sup>3</sup> a pipe H, leading to the top or other part of the water-tank A. This pipe is for the purpose of conducting some of the self-generated steam to the tank A, so as to create a pressure therein, and thus obviate the necessity of forcing in air under pressure by means of a hand-pump, as formerly. The burner-nipple D<sup>2</sup> has an opening or orifice of such size in it that there will always be sufficient steam generated in the coil F by means of the heat of the lamp-flame as will supply sufficient steam to give a steady and regular pressure in the water-tank A and also to spray the oil.

In connection with the water-pipe F' is or may be fitted an automatic supply-regulating valve I. The valve consists of a casing I', (shown more particularly at Fig. 6,) in which works a piston or plunger I<sup>2</sup>. The casing is narrowed at one end, so as to form a seat for the piston, and is screwed or otherwise fitted into the side of the water-tank A. Connected to the piston I<sup>2</sup> is a piston-rod I<sup>4</sup>, which passes out through a stuffing-box I<sup>5</sup> and through a slot I<sup>6</sup> (shown dotted) or its equivalent in the handle I<sup>7</sup> of the stop-cock I<sup>8</sup>, which latter may be of the usual construction. The piston-rod I<sup>4</sup> may have stops I<sup>9</sup> on it, so that when the piston is traversed back and forward the handle of the cock I<sup>8</sup> will be reciprocated and the supply of water cut off or turned on. The casing I' is open at its inner end I<sup>10</sup>. To keep the piston I<sup>2</sup> normally closed against its seat, a spiral spring I<sup>11</sup> or equivalent is provided.



This spring bears on the casing-cover  $I^{12}$ , which may be perforated, and the back of the piston  $I^2$ . With this arrangement when the lamp has been started, which may be done by means of naphtha or other volatile oil being poured into the box or casing E and ignited, so as to generate sufficient heat to convert the water in the coil into steam, the steam passes from the coil down to the junction of the pipes  $F^3$  and H, where it divides into two streams, one passing to the burner-nipple to spray the oil and the other passing up the pipe H to the tank A and creating pressure therein. On the steam-pressure in the water-tank becoming great the piston  $I^2$  of the valve I is forced outward against the action of the spring  $I^{11}$  and the piston-rod traverses the handle  $I^7$  of the cock  $I^8$ , and so cuts off the water-supply to the coil. On the pressure falling the spring  $I^{11}$  forces back the piston to its original position for water-supply. The valve is or may be so arranged that, as shown, the cock  $I^8$  will be open when the piston  $I^2$  is closed against its seat and the cock will be shut on the piston being forced outward, although it may be arranged to operate in an opposite manner.

The tanks A B may be mounted on top of a trestle or may sit on a bracket.

The lamp shown at Fig. 2 has a cylindrical oil-tank B, supported on three legs or supports J. The water-tank A is in this case fitted to the under side of the oil-tank B. The water-tank is, as shown, preferably of smaller diameter than the oil-tank B, as a much smaller supply of water is required for the lamp than oil. The water-tank A has a filling-tube  $J'$ , to which water from the main or other source is supplied to fill this tank A. The burner D is of the same construction as in Fig. 1. The automatic supply-regulating valve I is not shown as applied to this lamp. With this arrangement the steam-pressure from the generating-coil is at first allowed to pass into the top of the water-tank through the pressure-pipe H, so that the pressure in the tank will balance the pressure in the generating-coil. If pressure were not admitted to the water-tank A through the pipe H, there would be a back-pressure along the water-supply pipe F, which is, together with the lower part of the coil, always filled with water up to the same level as in the water-tank when the valve  $I^8$  is open, and as a consequence water would flow irregularly, and thus cause the lamp to go out. By having the pressure in the tank and in the generating-coil balanced, as aforesaid, water will flow in small quantities, as required, into the generating-coil. When starting the lamp, a small quantity of water is supplied by gravitation to the generating-coil by opening the valve  $I^8$  on the water-supply pipe. The valve  $I^8$  may, if desired, be dispensed with.

In Fig. 3 a lamp is shown having a large oil-tank B, fitted with a pocket A on the inside for holding the necessary supply of water. The pocket A, as will be seen, is fitted

to that side of the tank B which is nearer to the lamp-burner, in order that the heat radiated off the flame may heat up the imprisoned air in said pocket and cause it to expand, and so create pressure therein. The pressure-steam from the generating-coil F is led into pocket A by the pipe H, which in this case has a valve  $J^2$  on it to regulate the supply of steam to said pocket. The water-supply pipe  $F'$  is shown as having a siphon-bend  $F^6$  on it, which is for the purpose of keeping a supply of water in the generating-coil F. The bottom of the casing E is shown in this case as being used as the oil-well of the burner D. With this arrangement when starting, the water is supplied from the pipe  $F'$  by opening the valve  $I^8$ , and as it comes into contact with the heated surface of the generating-coil F steam is at once generated and by opening the valve  $J^2$  on the steam-pressure pipe H is passed into the water-pocket A to create or increase the pressure therein. This being done, the steam-supply to the water-pocket may be turned off and the steam-supply to the burner turned on by means of a valve on the connection  $F^3$ , (not shown on the drawings,) so as to maintain the flame by spraying the oil or oil-vapor in the casing E. The pressure in the water tank or pocket A can be thus maintained by turning on a supply of steam at intervals from generating-coil F. The pocket may be inclosed in a casing forming an air-jacket, so as to retain the heat. The oil is supplied by gravitation, as in the case of the arrangements at Figs. 1 and 2.

The lamp shown at Fig. 4 works in the same manner as the lamp Fig. 3, the only difference in the construction of this lamp being that the water-tank A is supported or held out from the oil-tank B by means of straps c. The lamp is shown as fitted on a trestle L, which is broken away. In this lamp the valve  $F^4$  is shown for turning on steam to the burner D.

In Fig. 5 the lamp is shown with a crescent-shaped oil-tank B, and into the hollow of the crescent is fitted the water-tank A. The shape of the tank is shown more particularly in the plan view at Fig. 5<sup>a</sup>. The tanks A and B are strapped together at C.

In Fig. 7 an arrangement is shown whereby steam for creating pressure in the water is obtained apart altogether from the generating-coil of the burner. The arrangement consists of a coil N, fitted on top of or it may be around or inside the generating-coil F of the burner. This auxiliary or pressure coil N is supplied with water direct from the tank A by means of the pipe connection  $N'$ , and steam generated in the coil N passes into the upper part of the tank A and creates a pressure therein sufficient to force the water to the generator or coil (or chamber, if that is used) of the burner. A safety-valve  $N^2$  is shown as fitted on top of the water-tank A, and although it is not shown in all cases on the drawings it is to be understood that I prefer al-



ways to fit a safety-valve on the water-tank in cases where steam is used to create a pressure therein. Pressure-gages are also used. The safety-valve N<sup>2</sup> may be of any suitable construction. I prefer, however, to use a small spring-valve, as shown.

In Fig. 9 the lamp is shown as having an annular steam-generating vessel fitted above the burner instead of a coil-pipe. The action is the same as with the coil. H is the pressure-pipe.

With the arrangement of steam-pressure tanks hereinbefore described not only is the necessity for repeated pumping obviated, but the water in the water-tank is warmed sufficiently to facilitate a rapid steam generation in the generating coil or chamber.

A whistle may be fitted on top of the pressure-tanks to indicate when the pressure has reached a certain point, so that the attendant can then cut off further supply of steam.

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

1. The combination of an oil-supply, a closed water-tank, a burner, an oil-supply pipe thereto, steam-generator in proximity to the burner, a supply thereto from the water, steam connections from said generator to the

water-tank, a piston controlled by the pressure in said tank, a spraying device in the burner, and steam connections therefrom to said generator, substantially as set forth.

2. In combination, the burner having a steam-chamber, an oil-well above and opening into the steam-chamber, an oil-supply pipe for said oil-well, a water-tank, a steam-coil in the burner, having a supply from the water-tank, said supply having a siphon-bend and a steam connection to the water-tank, and a steam connection to said steam-chamber, substantially as set forth.

3. In combination, an oil-tank, a water-tank, a burner comprising a sprayer, a steam-generator in proximity to the burner, a water-supply from the water-tank to said generator, a valve in said pipe, a piston controlling said valve and controlled by the pressure in the tank, and steam connections from said generator to said spraying device and to said water-tank, substantially as set forth.

In witness whereof I have hereunto signed my name, at Glasgow, Scotland, this 31st day of March, 1891.

GEORGE ROSE.

Witnesses:

HUGH FITZPATRICK,  
WILLIAM FLEMING.