

No. 740,253.

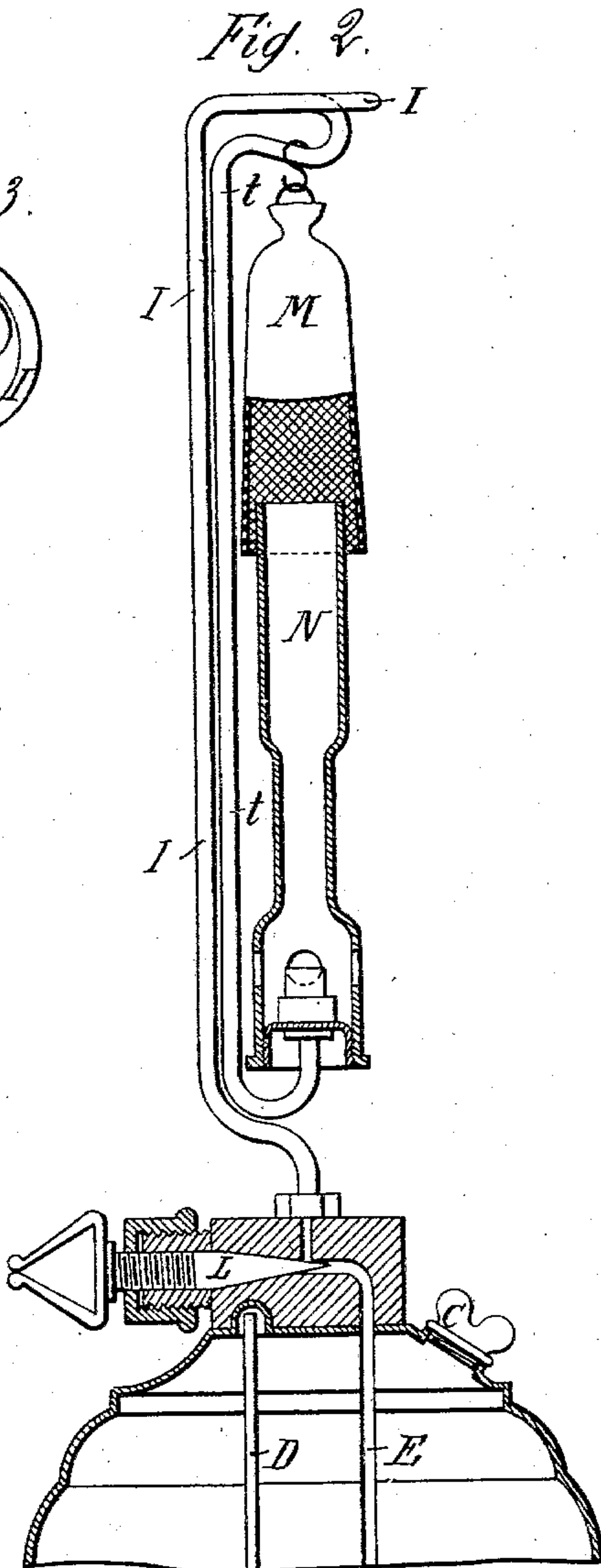
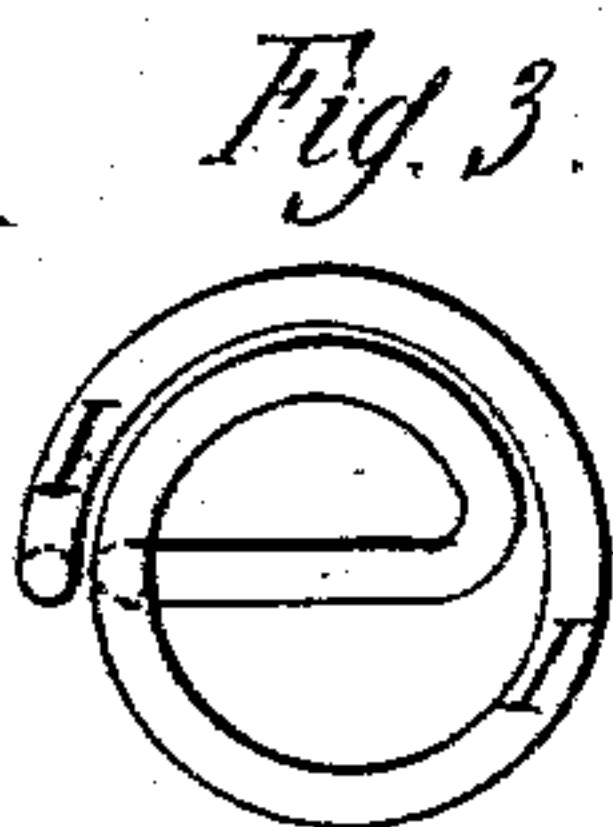
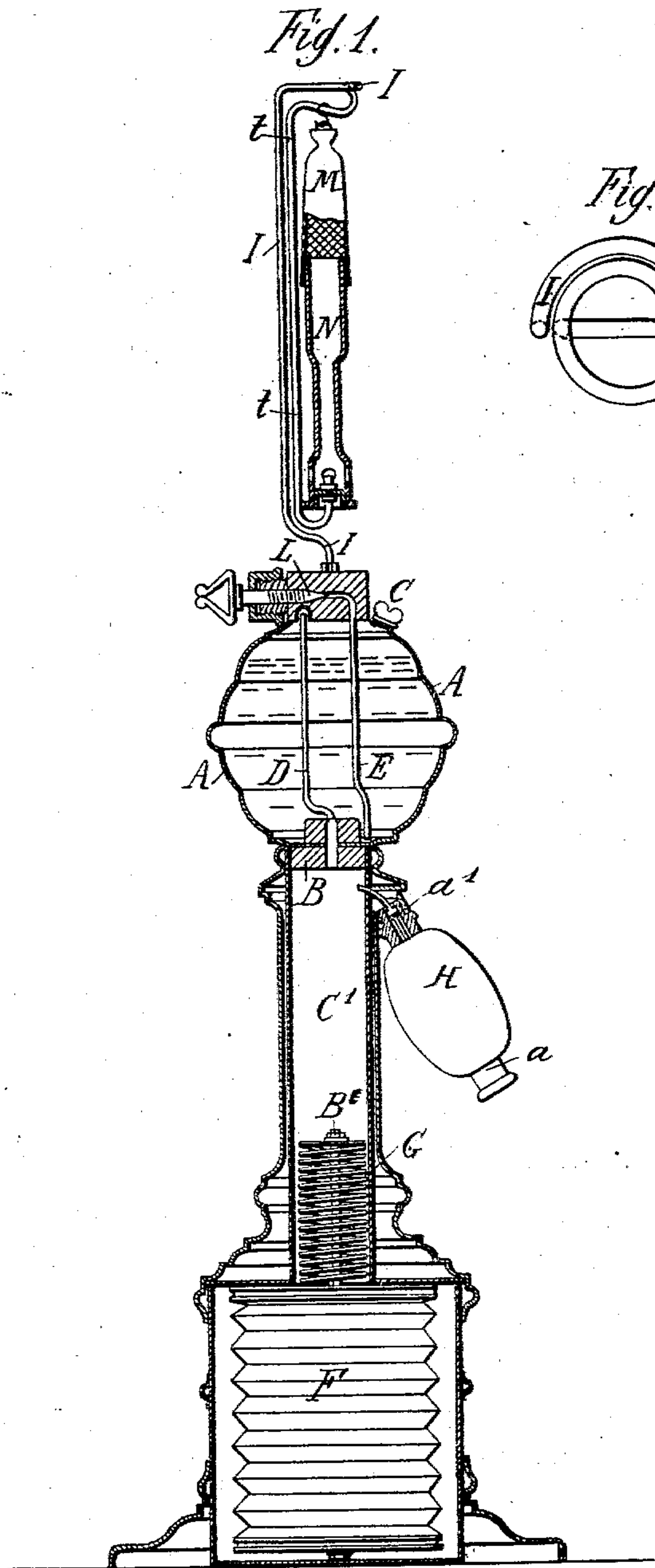
PATENTED SEPT. 29, 1903.

L. DENAYROUZE.
INCANDESCENT LAMP.

APPLICATION FILED APR. 19, 1899.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 4.

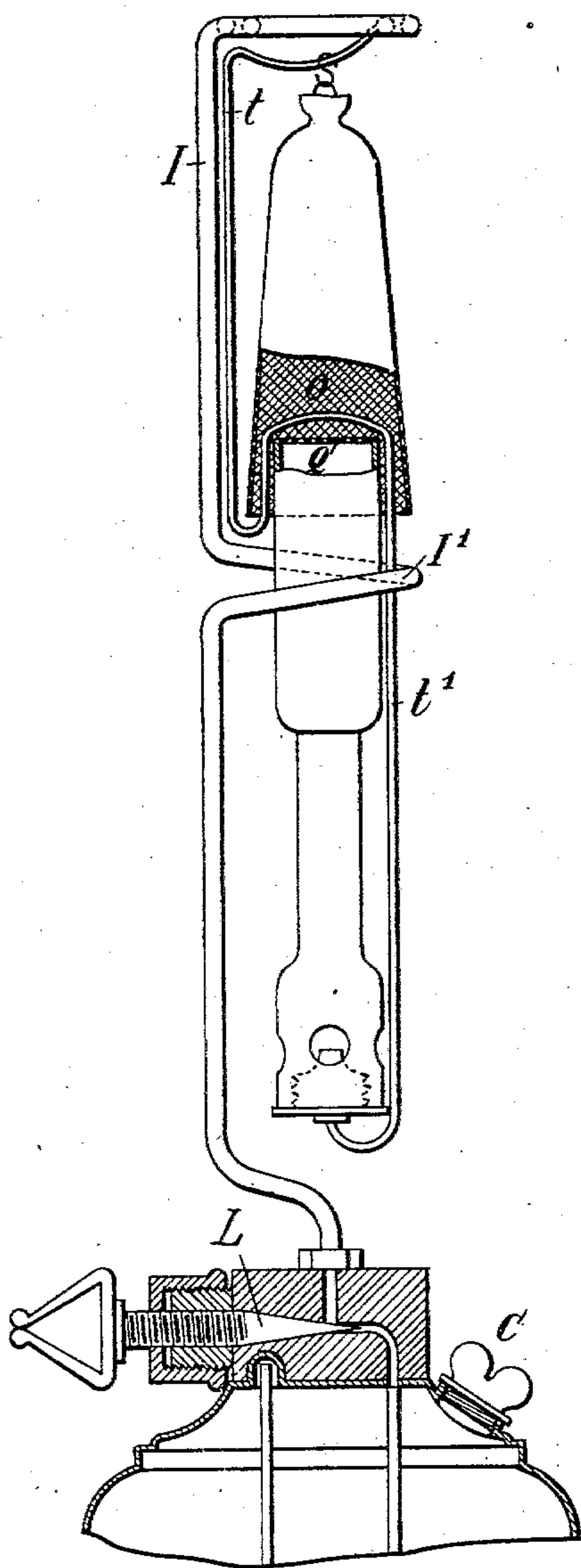
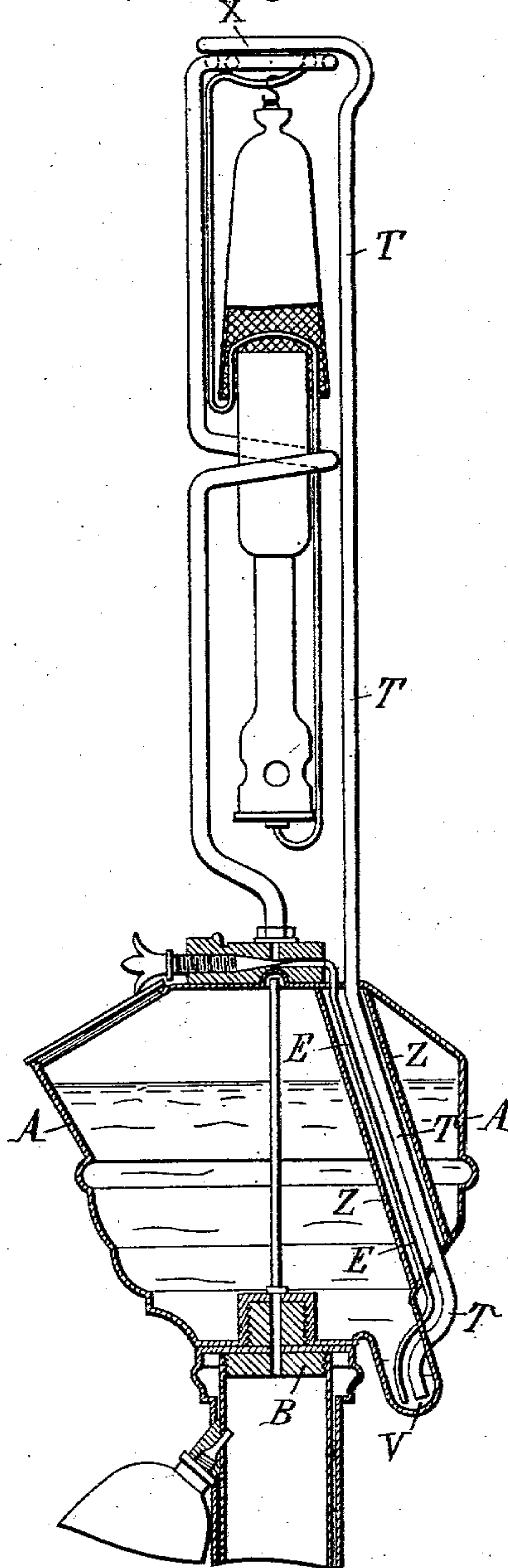


Fig. 5.



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UNITED STATES PATENT OFFICE.

LOUIS DENAYROUZE, OF NEUILLY-SUR-SEINE, FRANCE.

INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 740,253, dated September 29, 1903.

Application filed April 19, 1899. Serial No. 713,538. (No model.)

To all whom it may concern:

Be it known that I, LOUIS DENAYROUZE, a citizen of the Republic of France, residing in Neuilly-sur-Seine, Seine, France, have invented certain new and useful Improvements in Incandescent Lamps, of which the following is a specification.

My invention relates to improvements in incandescent lamps whereby I am enabled first to convert into combustible vapor or gas all kinds of alcohol and other volatile liquids, oils, fats, and resins by the waste heat of the incandescent burner, such vapors or gases being then led to the mixing-chamber of the burner to be mixed with the air requisite for combustion within the incandescent mantle. For this purpose I employ in the case of volatile liquids—such as alcohol ether, volatile oils, &c.—a vaporizing device in addition to the burner. In the case of liquids that require in addition to vaporization the application of a higher heat before being fed to the burner I employ in addition to the burner both a vaporizer and a gasifying device. In the case of solid combustibles that require first to be liquefied or of liquids that are volatilized with difficulty I employ in addition to the burner and vaporizer and, if necessary, the gasifier a melting appliance.

Figure 1 of the accompanying drawings shows a vertical section, to a small scale, of a lamp arranged to burn gas from alcohol or volatile essences. Fig. 2 shows, to a larger scale, the upper part of the lamp. Fig. 3 is a plan view of the tube I. Fig. 4 is a sectional elevation showing the upper part of a lamp adapted to burn liquids which it is desirable should be subjected to a considerable degree of heat. Fig. 5 is a view similar to Fig. 4 of a form of my invention adapted to burn solid combustibles which are capable of liquefaction.

This is composed of a reservoir for alcohol A, which is filled through the orifice C, capable of hermetic closure. A tube D, passing through the bottom B of the reservoir and rising up to the top, serves for the admission of compressed air to the upper surface of the alcohol, and the tube E, which passes down to the bottom B of the reservoir A, serves to force the liquid under the action of the air, which is forced by the bellows F, of caout-

chouc or other flexible material. This is operated by a coiled spring G for forcing the air, the rod B' of which spring connects the bottom of the bellows with the top of the spring. The spring G is placed in a hermetically-closed tube C', from which the compressed air from the bellows is led through tube D to the reservoir A. This reservoir is simply screwed on the threaded part forming the cap of the tube C'. A caoutchouc pump H, provided with two check-valves *a a'*, serves for charging the bellows F when required. The tube E, through which the air is forced, has a screw plug-cock L with coned end, on which is branched the vaporization-tube I. This tube may be filled with wire or pieces of silver or other good heat-conducting material. It rises to the burner N and thence to above the incandescent mantle M, where it is formed into a spiral coil of, preferably at least, a complete ring. For example, the coil may contain substantially two complete rings, as shown in Fig. 3. From the center of this spiral a tube *t* descends to the base of the burner. Instead of using pure alcohol as combustible liquid alcohol enriched with other substances rich in combustible elements, which cannot burn alone, may be used. Such are vegetable or animal hydrocarbons—such as potato-spirit, glycerin, essence of turpentine, camphor, resins, gums, waxes, vegetable oils—such as olive, nut, colza oils, and the like—animal oils, fish-oils, grease, tallow, fatty acids. The alcohol serves as solvent of the whole or of component parts of these substances and forms the vehicle thereof in conveying the same from the lamp to the burner. When the liquid to be vaporized is not alcohol or essences, but petroleum, the vaporizing-tube forms one or more convolutions I', Fig. 4, around the burner. The tube *t*, which descends from the spiral at top of the mantle, is soldered to a platinum tube O, (preferably of a diameter which equals or is smaller than that of the tube *t*,) which forms a bridge over the wire-gauze or perforated disk Q. The tube O constitutes more particularly the gasifier. The tube *t* descends at *t'* to the base of the burner.

The lamp operates as follows: The hermetic stopper C is unscrewed, and the reservoir A is filled three-quarters full with com-

bustible liquid. After screwing on the stopper again the pump H is actuated so as to force air into and distend the bellows F, thereby compressing the spring, the plug-cock L is opened, and the burner is lighted. It is extinguished by closing the cock L. When fatty bodies are to be burned which require first to be brought to a liquid state or oils that are only slightly volatile, the apparatus is modified, as shown at Fig. 5, by the addition of a melting appliance consisting of a cup V, soldered to the bottom B of the reservoir A, so as to form a small recipient for the liquefaction of a small quantity of the fatty or resinous body employed. Into this space penetrates a rod T, of good heat-conducting metal, which passes up through the reservoir A and up to the top of the coil I, where it is enlarged to a disk form X. A tube Z passes through the reservoir, forming a channel inclosing the rod T and the forcing-tube E for preventing the absorption of the heat by the whole mass of combustible in the reservoir A. The bellows of the lamp may be separate from the body and constitute a compressor for feeding the air from a distance either to one or to a number of lamps situated in the different localities or in the streets. The air stored in the compressor under slight pressure is conveyed to the lamps through a very small tube or channel, from which branch tubes lead to the separate lamps.

Having thus described this invention and the best means for carrying the same into effect, I claim—

1. The combination with a lamp-burner comprising a Bunsen tube and a refractory incandescing-mantle, of a receptacle for hydrocarbon fuel, means for causing a pressure on the fuel in said receptacle, and a discharge-tube from said receptacle through which the hydrocarbon is forced by the pressure, said discharge-tube extending vertically in proximity to the mantle so as to produce an initial heating of the fuel therein, being formed into a substantially horizontal coil of at least one com-

plete ring immediately above the mantle so as to receive directly substantially the entire column of heat arising therefrom and to produce a substantially complete vaporization of the fuel, extending thence in close proximity to the mantle to additionally heat the vapor, thence to a gasifying-tube of platinum situated immediately over the Bunsen tube to completely gasify the fuel, and extending finally to the Bunsen tube to conduct the vapor thereto.

2. A lamp adapted to burn fatty fuel solid at ordinary temperatures, and comprising in combination a lamp-burner including a Bunsen tube and a refractory incandescing-mantle, a receptacle for the fuel, means for causing a pressure on the fuel in said receptacle, a discharge-tube from said receptacle through which liquid fuel may be forced by pressure, said discharge-tube extending vertically in proximity to the mantle so as to produce an initial heating of the fuel therein, being formed into a substantially horizontal coil of at least one complete ring immediately above the mantle so as to receive directly substantially the entire column of heat arising therefrom and to produce a substantially complete vaporization of the fuel, extending thence in close proximity to the mantle to additionally heat the vapor, thence to a gasifying-tube of platinum situated immediately over the Bunsen tube to completely gasify the fuel, and extending finally to the Bunsen tube to conduct the vapor thereto, and means for liquefying the solid fatty matter in the vessel, comprising a conducting-rod extending from a point adjacent to the burner into said vessel and adapted to conduct sufficient heat thereinto for such purpose.

In witness whereof I have hereunto signed my name, this 4th day of April, 1899, in the presence of two subscribing witnesses.

LOUIS DENAYROUZE.

Witnesses:

JULES ARMENGAUD, Jeune,
EDWARD P. MACLEAN.