

2 Sheets—Sheet 1.

No. 573,031.

Patented Dec. 15, 1896.

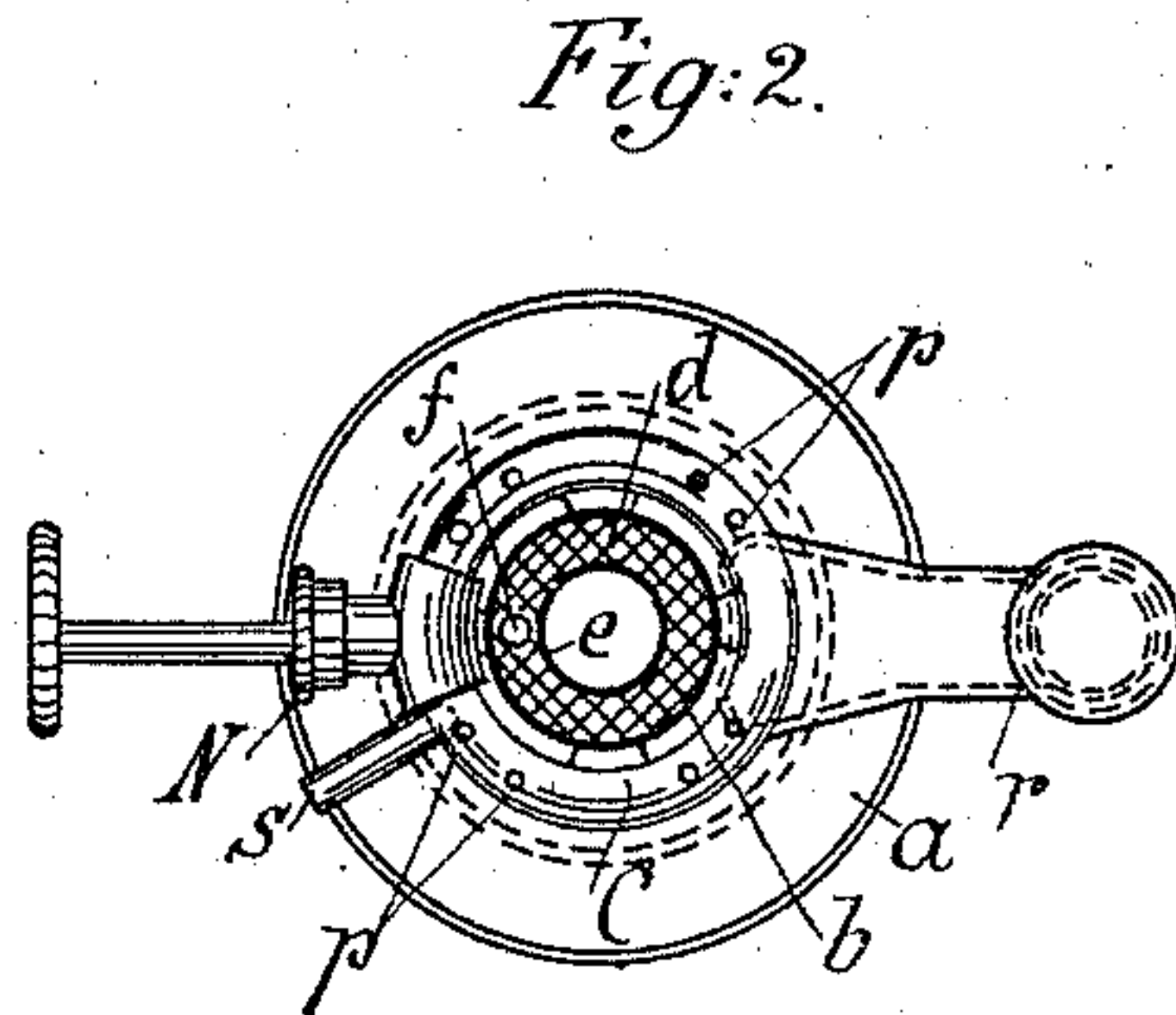


Fig: 2.

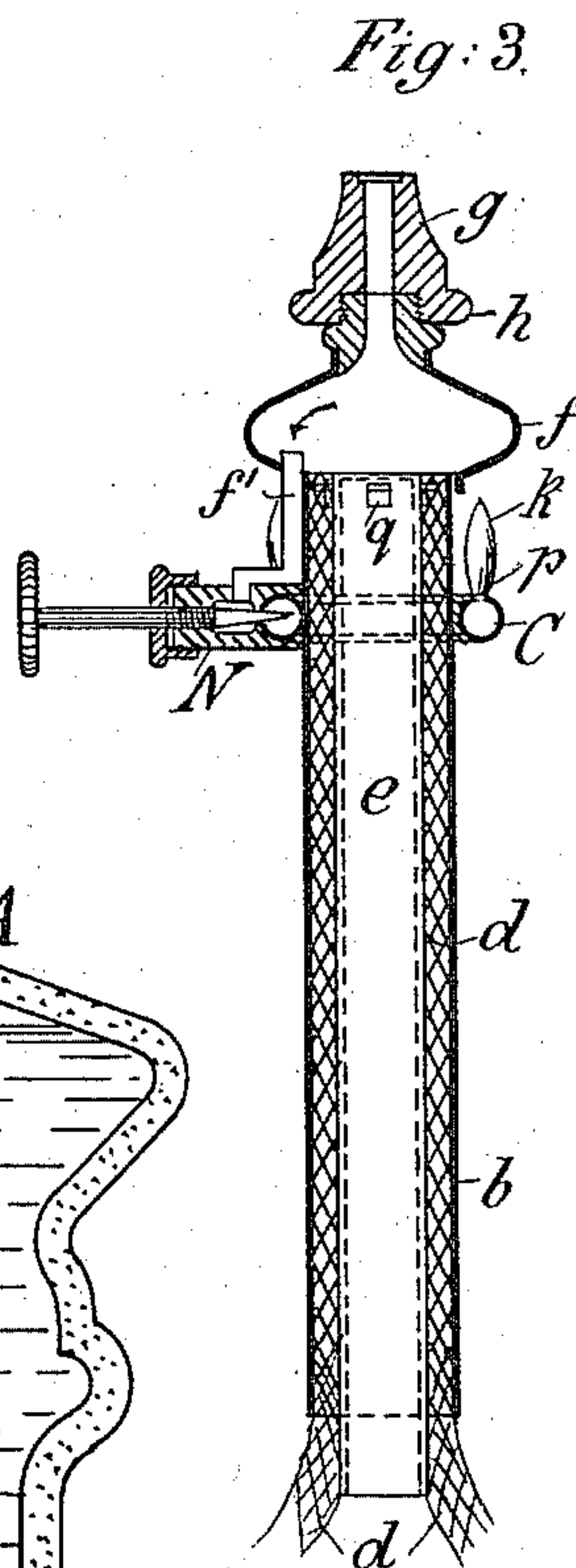


Fig: 3.

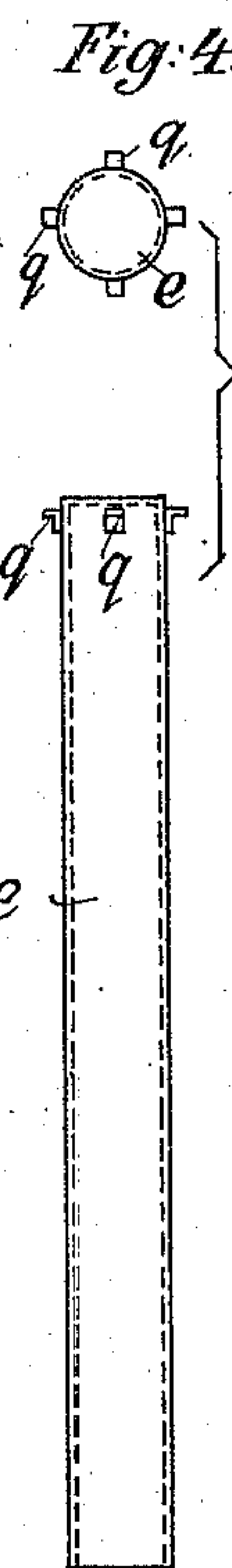


Fig: 4.

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(No Model.)

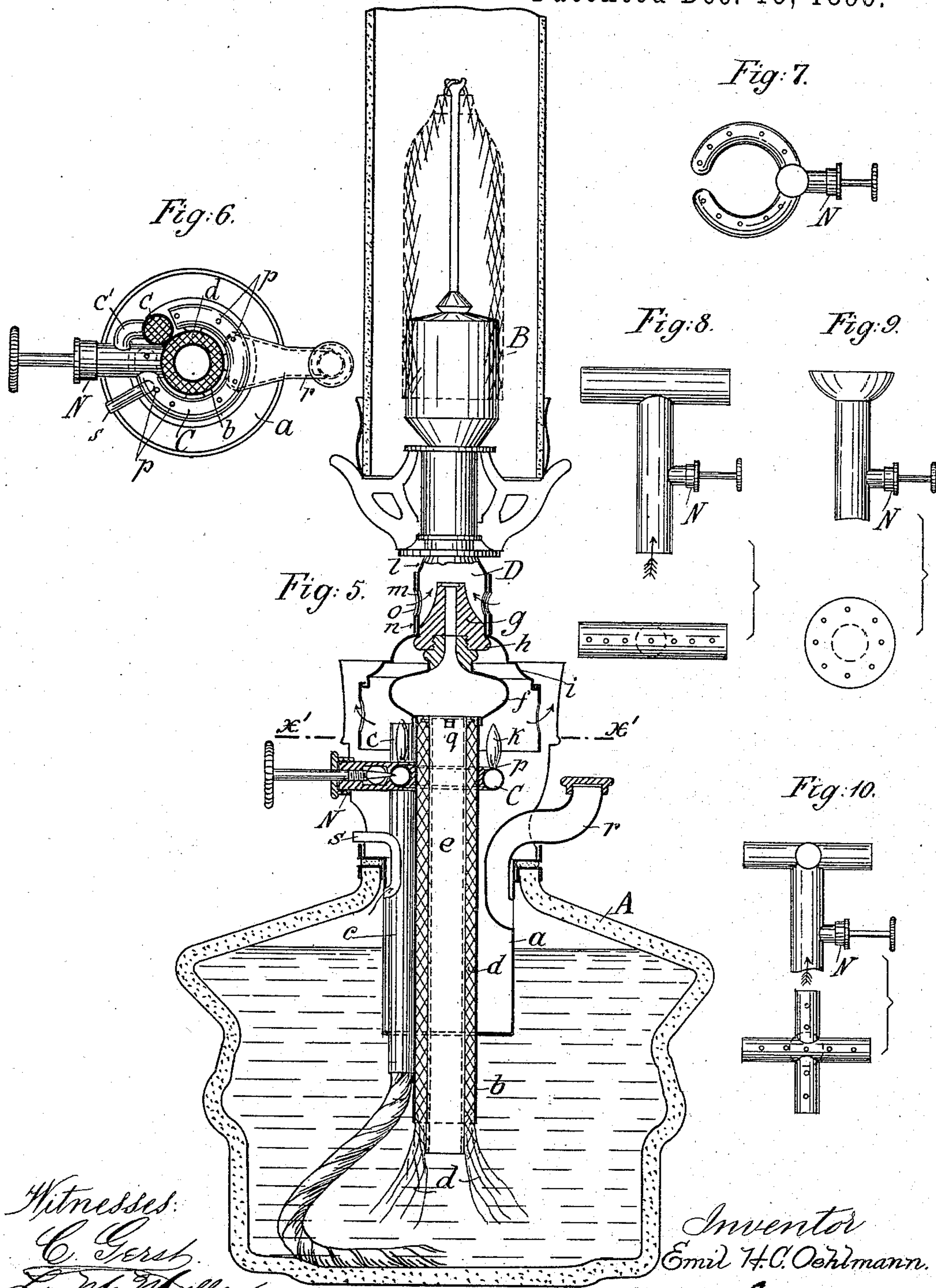
2 Sheets—Sheet 2.

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INCANDESCENT BURNER FOR FLUID COMBUSTIBLES.

No. 573,031.

Patented Dec. 15, 1896.



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UNITED STATES PATENT OFFICE.

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INCANDESCENT BURNER FOR FLUID COMBUSTIBLES.

SPECIFICATION forming part of Letters Patent No. 573,031, dated December 15, 1896.

Application filed February 4, 1896. Serial No. 578,055. (No model.)

To all whom it may concern:

Be it known that I, EMIL HEINRICH CONRAD OEHLMANN, a subject of the King of Prussia, German Emperor, and a resident of Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Incandescent Burners for Fluid Combustibles, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to burners for vaporized liquid hydrocarbons, spirits or alcohol, for instance, such as are used for heating incandescent mantles or bodies; and it consists in improvements chiefly in or connected with the part in which the liquid is vaporized and supplied to the orifice of the burner, and the object of my invention being principally to obtain a regular, hot, and steady flame for heating the incandescent body or for other purposes.

The improvements consist, chiefly, in using hydrocarbon vapors for supplying the auxiliary heating or evaporating burner or burners instead of liquids, as hitherto, combined with regulating devices, with the object of obtaining an exact regulation of the auxiliary heating-flames, so as to effect a regular evaporation proportional to the consumption of the main burner, and, further, in arrangements for superheating the vapor and supplying the main burner with a strong current of mixed air and hot vapor.

In the specification hereinafter spirits only are referred to in connection with the burner and improvements, but it must be understood that other liquid hydrocarbons of a similar character in respect to evaporation and combustion may be used.

In the improved burner for vaporized spirits the vapor required for the auxiliary or heating burner is first produced by warming by means of a separate spirit-lamp the spirits either in the main wick-tube, which in this case is connected by a tube with the auxiliary burner, or in a separate wick-tube connected with the auxiliary burner, and when the auxiliary heating-flames have been lighted and started the vapor for the main burner is generated in the main wick-tube and super-

heated by means of the special arrangement of the same, and issuing from the tube under pressure is mixed with air, so that a hot mixture of air and vapor arrives at the main burner, and only the volume of air entering into the mixing-chamber needs to be regulated.

For the purpose of generating and superheating the vapor for the main burner proportionally to its consumption it is generated by means of the auxiliary burner under a certain pressure by the employment of a main wick-tube, the upper end of which is formed or surmounted by a superheating retort-shaped vessel carrying the vapor-nozzle at the top, while the lower end of the wick-tube is packed tight by the wick in such a manner that a suction of the liquid for evaporation is possible, but the entry of the vapors developed in the wick-tube into the liquid-reservoir is prevented.

The superheating of the vapor evaporated by means of the auxiliary burner from the main wick for the purpose of obtaining a uniform and bright incandescence of the incandescent hood or body is, as mentioned before, effected in a retort or retort-shaped vessel of larger diameter surmounting the main wick-tube, which, like the wick-tube, is heated by the auxiliary burners and carries at its top the vapor-nozzle.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which like letters of reference designate similar or equivalent parts wherever found throughout the several views, and in which—

Figure 1 is a vertical central section of my improved lamp in which the auxiliary heating-burner is supplied with vapor from the main wick-tube, the general construction of the burner being adapted for its application to existing incandescent spirit-lamps; Fig. 2, a section along the line *xx* of Fig. 1. Fig. 3 shows a modification of the vapor conduction to the auxiliary burner. Fig. 4 shows in top and side view the stopper used for packing the main wick-tube by compressing the wick, the stopper being also available for carrying or holding the wick. Fig. 5 is a vertical section of a burner in which the auxiliary heating-burner is supplied by means of a

separate wick. Fig. 6 is a horizontal section along the line $x'x'$ of Fig. 5, and Figs. 7, 8, 9, and 10 show different modified forms of auxiliary burners with pin-valves.

5 Referring now to the drawings, into the reservoir A the wick-tube carrier a is screwed, which contains the wick-tube b for the main burner B, and in the arrangement shown by Fig. 5 also the wick-tube c for the heater or
10 auxiliary burner C, and is further provided with a filling-tube r and an air-outlet tube s , in order to be able to fill the reservoir without removing the burner and to render existing-lamp reservoirs applicable for incandescent-lamp burners.

For the purpose of compressing the wick-strands d , dipping into the reservoir at the bottom, with the object of packing the lower part of the wick-tube b a stopper e , closed at
20 its upper end, is pushed into the tube b .

The upper end of the wick-tube, as mentioned hereinbefore, is enlarged or surmounted by a retort-shaped superheater f , which terminates in the vapor-nozzle g or is closed
25 by it. The lower rim h of the nozzle g serves as a carrier for the cover or hood i , which surrounds the heating-flames k , the superheater f , and the bottom of the nozzle g in such a manner that the upper part of the wick-tube
30 b , the superheater f , and the bottom of the nozzle g are touched by the heating-flames k and the combustion-gases and heated, so that in the upper part of the wick-tube b vapors are generated under a certain pressure, which vapors are superheated in the superheater f and pass through the likewise-heated nozzle g into the mixing-chamber D in a superheated state.

The tube l , forming the mixing-chamber
40 and provided with air-inlets m , serves, as shown in Fig. 1, also to fix the hood i upon the rim h of the nozzle g . The lower enlarged part of the mixing-chamber D, containing the air-inlets, is surrounded by a hoop n , likewise formed with air-inlet openings o . By
45 turning this hoop n the inlets m can be more or less closed or opened and the flow of air to the mixing-chamber regulated thereby, which is advantageous for obtaining a uniform and steady flame at the main burner B when evaporating spirits and superheating the spirit-vapors.

While in the incandescent spirit-lamps hitherto made the generation of the spirit-vapors required for feeding the main burner has been effected by heating the principal wick-tube with auxiliary flames produced by the directed combustion of spirits, which rendered the production of a lamp free from smell impossible, in the improved burner spirit-vapors are used for the auxiliary heating-flames as well as for the main flame. This is produced at the start in the lamp-burner constructed according to Fig. 1 in the main wick-tube b ,
60 in the modified construction shown by Fig 5 in the auxiliary wick-tube c , by letting a spirit-flame, which is most conveniently ob-

tained by means of a separate spirit-lamp, play upon the wick-tube b or the auxiliary wick-tube c . The vapor thus produced passes
70 in the arrangements shown in Figs. 1 and 3 through the passage f' from the superheater f , through a pin-valve N, into the auxiliary burner C, which is provided with small outlets p for producing the heating-flames. In
75 the arrangement shown in Figs. 5 and 6 the vapor generated in the auxiliary wick-tube c passes through a rack-tube c' , and likewise through a pin-valve N, into the auxiliary burner C. It will be evident that by using
80 spirit-vapors passing through a regulating device, for instance, a pin-valve, an exact regulation of the auxiliary heating-flame, and consequently of the vapor or gas production for the main burner, can be readily made,
85 which is impossible when, as hitherto done, the auxiliary burner is supplied with liquid spirits, as a supply of liquid cannot be regulated in such minute quantities as can be done in the case of vapor.

The stopper e , as shown in Fig. 4, may be provided with angular projections q , which center it in the wick-tube and at the same time serve to attach the wick-strands d , so that these can be pushed comparatively
95 tightly into the wick-tube b from the bottom for the purpose of preventing the vapor from entering the spirit-reservoir A and obtaining an overpressure in the superheater without impeding the suction of the wick.

When the vapor has been generated at the start by means of a separate spirit-lamp, as hereinbefore described, the vapor issues out of the fine holes p of the auxiliary burner and is ignited, the flames k heat the upper part
105 of the wick-tube b , the superheater f , and the nozzle g and are adjusted by means of the pin-valve N most accurately, so as to obtain an evaporation of spirits uniformly and continuously exactly proportional to the consumption of the main burner. The vapor required for the main burner is then generated and superheated in a short time, and an effective and constant incandescent light is produced by supplying the main burner with
110 a combustible mixture of superheated spirit-vapors and air in consequence of the strong and uniform current of superheated spirit-vapors issuing under pressure from the nozzle.

The auxiliary heating-burners, which are
120 provided with means for regulating their flames, for instance, with a pin-valve, may be variously shaped without altering their effect, and Figs. 7 to 10 show various arrangements of such auxiliary burners adaptable
125 partly to the form of main burners shown herein, and partly to other forms of main burners.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed,
130 I declare that what I claim is—

1. In an incandescent lamp for burning vaporized hydrocarbons, the combination with a suitable reservoir, of a burner, consisting of a

wick-tube carrier detachably connected with said reservoir, a wick-tube passing vertically therethrough, a supplemental tube which is adapted to be inserted through the wick, and
5 by which said wick is held in said wick-tube, a retort mounted on the upper end of said wick-tube, a vapor-nozzle mounted on said retort, a supplemental vapor-burner surrounding the upper end of said wick-tube below
10 said retort, and provided with a regulating-valve, a hood supported by said vapor-nozzle, and inclosing said retort, a tube surrounding said nozzle, and forming a mixing-chamber, and provided with means for regulating
15 the admission of air thereto, and an incandescent burner mounted above said mixing-chamber, substantially as shown and described.

2. An incandescent lamp for burning vaporized hydrocarbons, the combination with a suitable reservoir, of a burner, consisting of a wick-tube carrier detachably connected with said reservoir, a wick-tube passing centrally
20 therethrough, a supplemental tube which is adapted to be inserted through the wick, and by which said wick is held in said wick-tube, a retort mounted on the upper end of said wick-tube, a vapor-nozzle mounted on said retort, a supplemental vapor-burner surrounding
25 the upper end of said wick-tube below said retort, and provided with a regulating-valve, a hood supported by said vapor-nozzle, and inclosing said retort, a tube surrounding said nozzle, and forming a mixing-chamber, and provided with means for regulating
30 the admission of air thereto, and an incan-

descent burner mounted above said mixing-chamber, said supplemental burner being also provided with a tube, which communicates with said retort, substantially as shown and
40 described.

3. An incandescent lamp for burning vaporized hydrocarbons, the combination with a suitable reservoir, of a burner, consisting of a wick-tube carrier detachably connected with
45 said reservoir, a wick-tube passing vertically therethrough, a supplemental tube which is adapted to be inserted through the wick, and by which said wick is held in said wick-tube, a retort mounted on the upper end of said
50 wick-tube, a vapor-nozzle mounted on said retort, a supplemental vapor-burner surrounding the upper end of said wick-tube below said retort, and provided with a regulating-valve, a hood supported by said vapor-noz-
55 zle, and inclosing said retort, a tube surrounding said nozzle, and forming a mixing-chamber, and provided with means for regulating the admission of air thereto, and an incan-
60 descent burner mounted above said mixing-chamber, said supplemental burner being also provided with a tube which communicates with said retort, and said supplemental burner being located within the upper end of the wick-tube carrier, substantially as shown
65 and described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

EMIL HEINRICH CONRAD OEHLMANN.

Witnesses:

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