

No. 842,259.

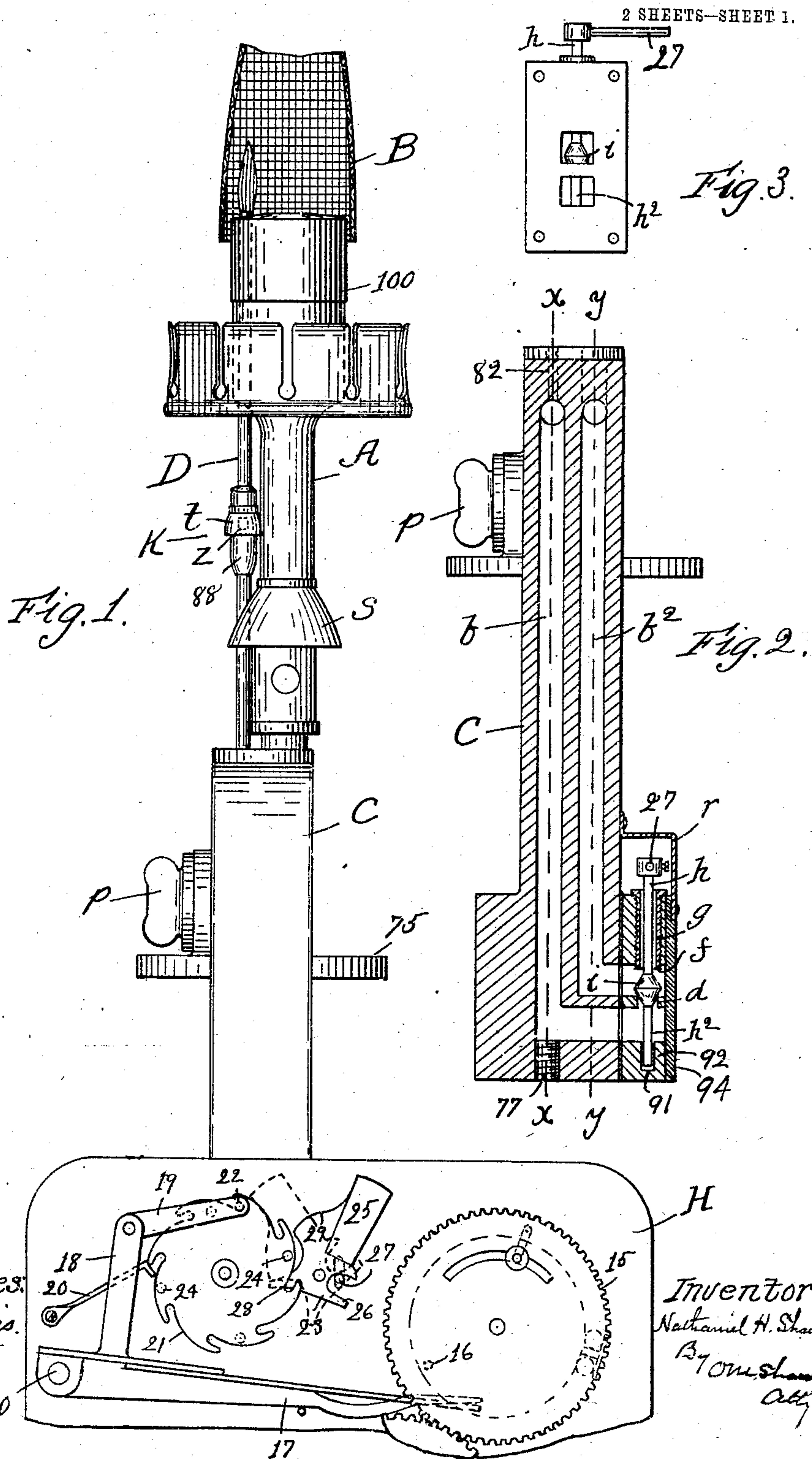
PATENTED JAN. 29, 1907.

N. H. SHAW.

AUTOMATIC GAS LIGHTING AND EXTINGUISHING APPARATUS.

APPLICATION FILED JUNE 24, 1904.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 4.

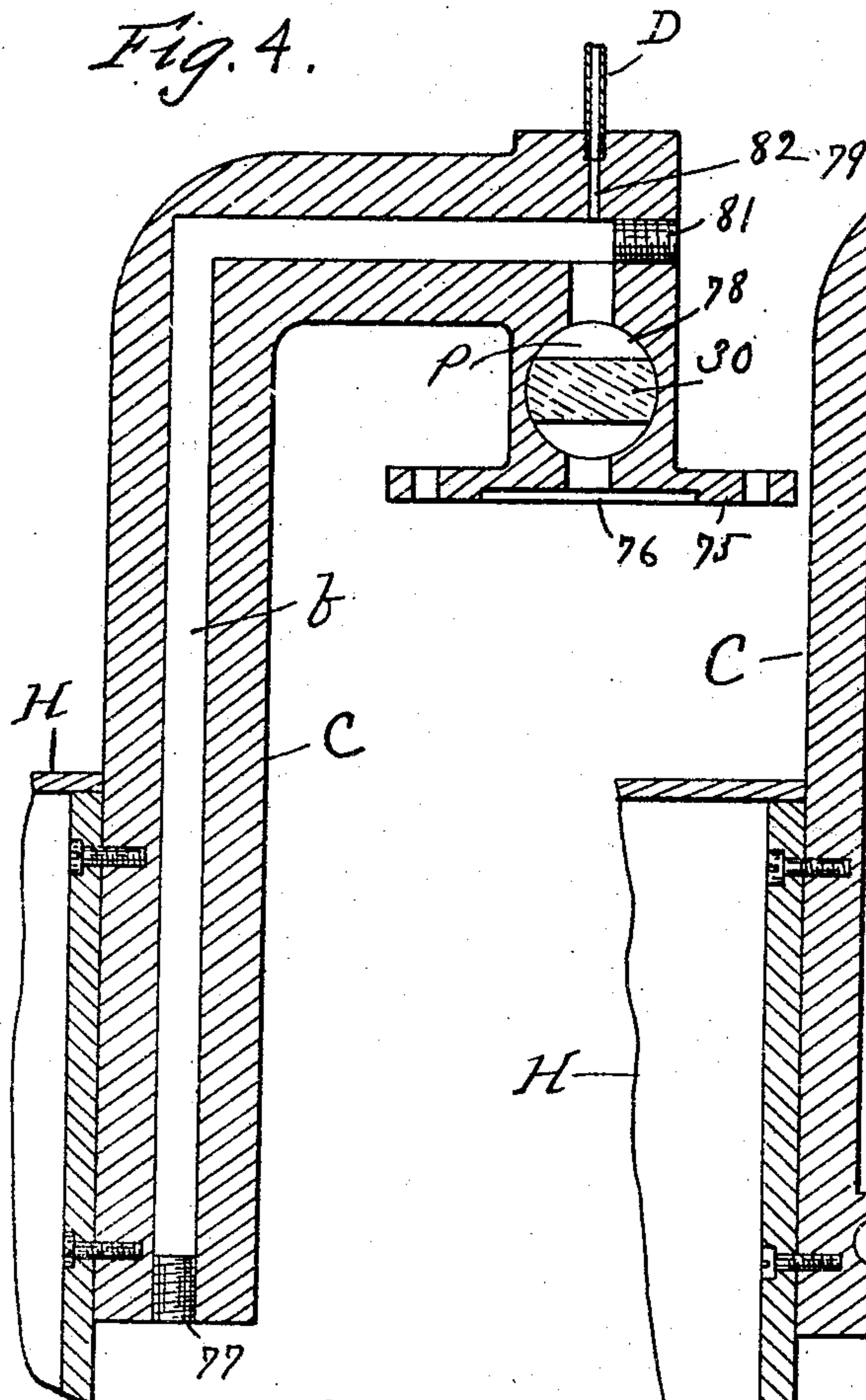


Fig. 5.

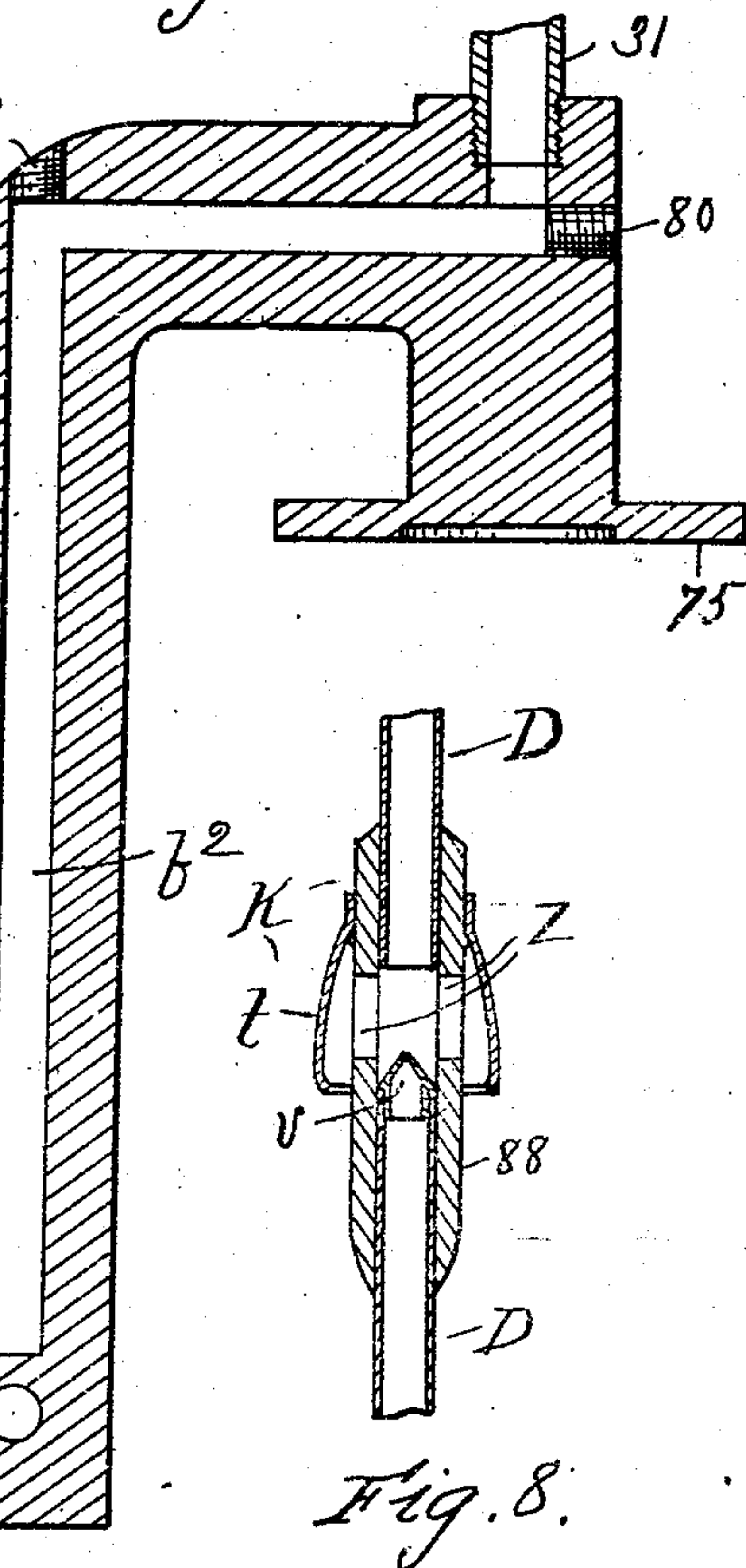


Fig. 8.

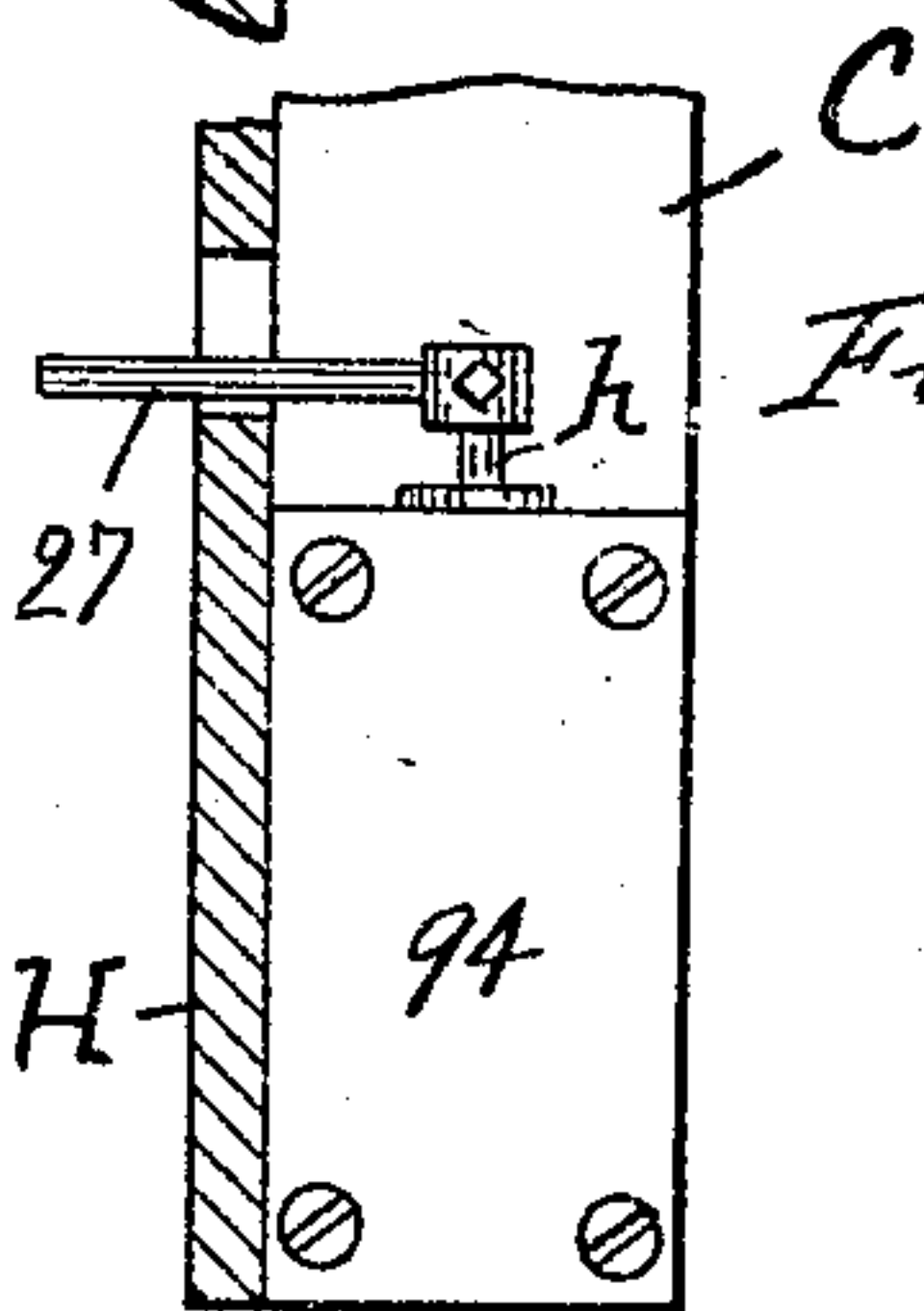
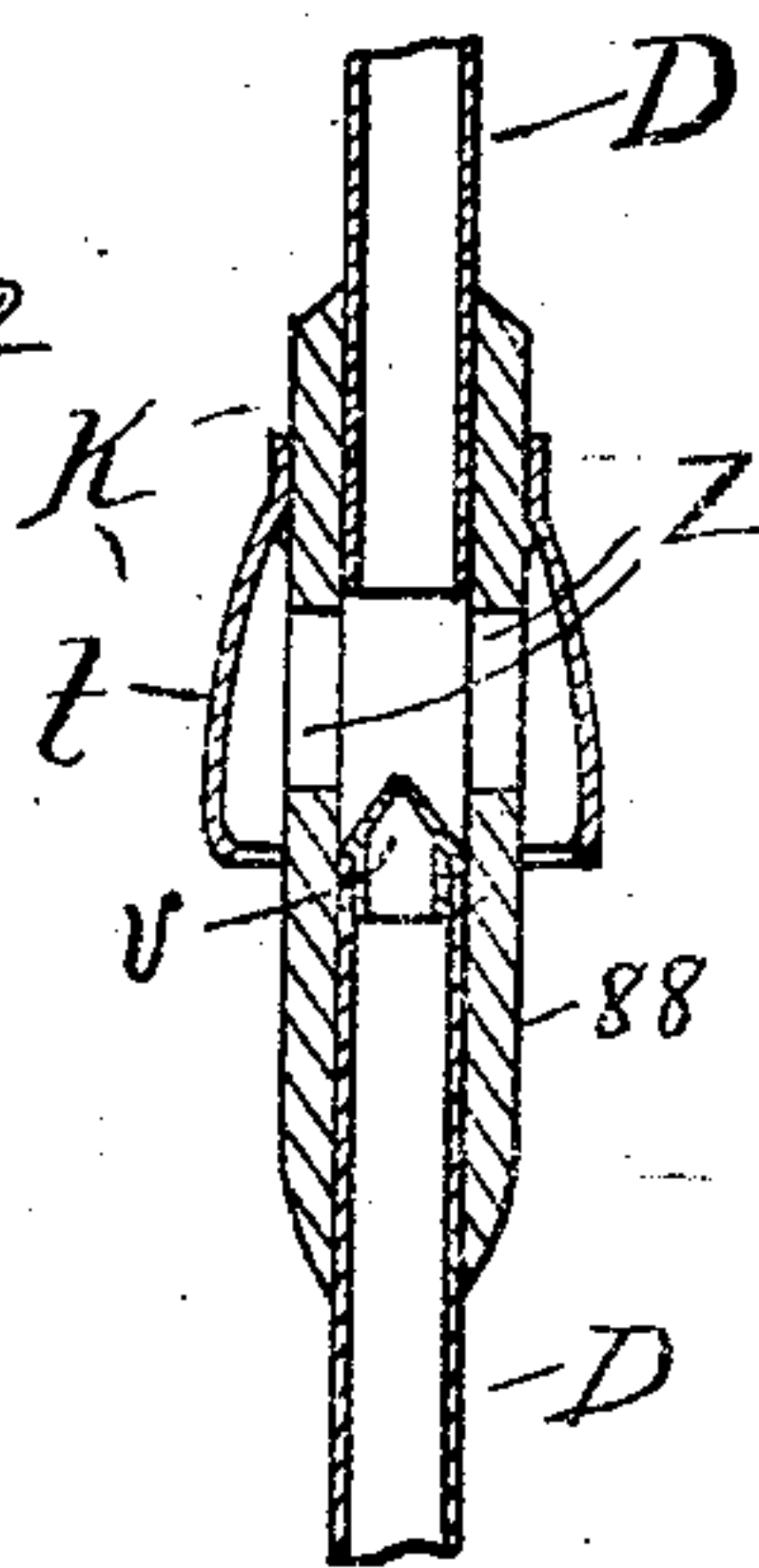


Fig. 7.

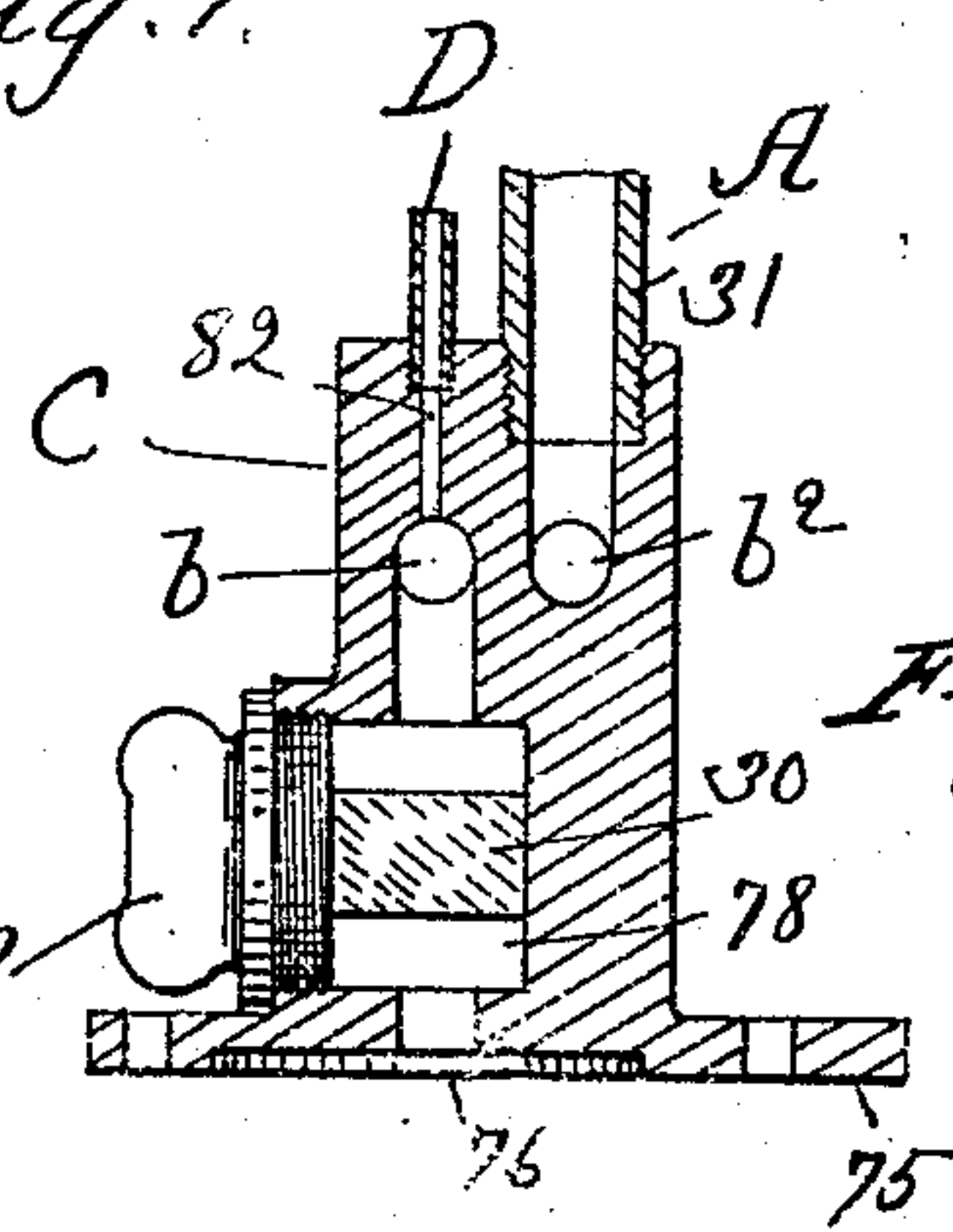


Fig. 6.

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AUTOMATIC GAS LIGHTING AND EXTINGUISHING APPARATUS.

No. 842,259.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed June 24, 1904. Serial No. 213,987.

To all whom it may concern:

Be it known that I, NATHANIEL H. SHAW, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Automatic Gas Lighting and Extinguishing Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a gas-burner of the "Welsbach" or mantle type, and its object is to provide a novel burner of this construction which can be efficaciously used in connection with an automatic time mechanism for lighting and extinguishing the burner.

The particular features wherein my invention resides will be hereinafter described and then pointed out in the claims.

In the drawings, Figure 1 is a front elevation of my improved gas-burner. Fig. 2 is a vertical transverse section through the gas-conduit. Fig. 3 is a side view of the valve-casing. Fig. 4 is a vertical section on the line $x x$, Fig. 2. Fig. 5 is a view on the line $x' x'$, Fig. 3, looking to the left. Fig. 6 is a vertical section through the filter in Fig. 4. Fig. 7 is a side elevation showing the valve-casing and the rod connecting the valve with the actuating mechanism, and Fig. 8 is a section through the air-inlet ports of the pilot-burner.

The device herein illustrated is in some respects similar to that illustrated and described in my former patent, No. 755,060, dated March 22, 1904, in that it comprises a mantle-burner of some suitable type supported by a member which in turn is secured to the lamp-post or other gas-supply, said member having a gas-conduit which connects with the main supply and with the burner and being of such a shape that the conduit projects laterally and downwardly to a valve mechanism and thence upwardly and laterally back again to the burner.

In the drawings, A represents a mantle gas-burner of any ordinary construction, and B the mantle, which is rendered incandescent by the flame from the burner.

C represents the right-angular member which contains the gas-conduit and supports the valve and also supports the time mechanism for operating the valve. This member C is adapted to be secured to the top of the lamp-post over the mouth of the gas-

supply, and is provided with a flange or foot 75 for attachment to the lamp-post. The member C has an inlet-opening 76, which communicates with a laterally and downwardly extending conduit b , leading to the valve hereinafter described, and it also has another conduit b^2 , leading from the valve and to the burner. H designates the casing in which is contained the time mechanism for opening and closing the valve for the conduit $b b^2$. This construction of the gas-conduit member C has been adopted in order that the burner may be placed directly over the main gas-supply, and the automatic time mechanism within the casing H may be placed at one side thereof.

The valve for controlling the supply of gas to the main burner is shown in Figs. 2, 3, and 7. It is received within a suitable valve-casing 92, which is shown as separate from and detachably secured to the conduit member C. This valve-casing 92 has a port d , constituting a valve-seat for the valve i , said port communicating with each of the conduits $b b^2$. The valve has a guiding-stem h^2 , which operates in a suitable recess 91 in the valve-casing, and the stem h of the valve extends loosely through a bushing g in the valve-casing. The upper end of the stem has secured thereto an arm 27, which extends through a removable cap r above the valve-stem and into the casing H for attachment to the time mechanism presently to be described.

The valve i is a double conical valve, and when it is closed one face thereof rests against the valve-seat of the port d , and thus closes the inlet-conduit b from the outlet-conduit b^2 . When the valve is opened, the other face thereof engages the lower end f of the sleeve g , and thereby prevents the escape of gas from around the valve-stem. In a device of this class it is very essential that the valve should work freely and also that the valve should be non-leakable. The valve herein shown meets both of these requirements. There is no packing to bind and prevent it from working freely, and by making the valve a double one the gas is prevented from leaking around the valve-stem when the valve is opened. The valve is also a self-centering valve.

I employ in connection with my regular burner A a pilot-tube D, which extends through the mixing-chamber 100 of the main burner and terminates in a pilot-burner lo-

cated exterior to the main burner and within the mantle B. I propose to have the pilot-tube D constantly open to the gas-supply, so that the pilot - burner will be constantly
5 burning.

It is important, as will be obvious, to keep the mantle B free from smoke or soot, and if a continuously-operating pilot-burner of ordinary construction is employed the mantle
10 will in a short time become so blackened by smoke from the pilot-burner as to be unfit for use. In order to obviate this difficulty, I make the pilot-burner of the Bunsen type, so that the flame thereof will be invisible and
15 combustion at the burner will be absolutely complete. For this purpose the tube D is formed in two parts connected by a sleeve 88, and in the mouth of its lower member is a conical tip *v*, provided with a port of the
20 proper size. Just above this tip the sleeve is provided with lateral air-ports *z*, surrounded by a pendent hood K. This forms a Bunsen attachment for the pilot, which causes a blue flame that will not smoke the
25 mantle.

The pilot-tube D is tapped into the inlet-gas conduit *b* at the upper end of the member *c*, as best shown in Fig. 4.

It will be noted that the valve *i* is at the
30 point where the two conduits *b* and *b*² connect, and therefore the pilot-tube D is connected to the gas-main between the gas-supply and the valve, and the pilot-burner therefore is continuously burning.

Since the tip of the pilot-burner is exterior to the main burner and since the pilot-tube D is provided with air-ports *z* and is therefore a burner of the Bunsen type and also since the pilot-burner is a continuously-operating one it will be obvious that when the
40 main burner is lighted said pilot-burner becomes an auxiliary burner, and the heat therefrom augments that generated by the main burner. The pilot - burner therefore
45 performs two functions—first, it acts as a means for igniting the main burner when the valve is opened, and, second, it assists the main burner in heating the mantle to incandescence.

The gas member C is shown as provided with a chamber 78, which is bored laterally in the said member C and intersects the conduit *b*. This chamber is normally closed by a removable plug *p*, and within the chamber
55 is placed some suitable filtering material 30, preferably felt soaked in oil. This filter, it will be noted, is placed between the gas-supply and both the valve *i* and the pilot-tube D, and therefore the gas which is burned in
60 either burner has to pass through the filter. I regard this position of the filter as of some importance, because by this means any foreign material in the gas which would be liable to clog the constantly-burning pilot-burner
65 may be removed.

The member C is tapped into the lower end of the conduit *b*, as at 77, and into the upper end of the conduit *b*², as at 79, and the laterally-extended portions of each conduit are also tapped into, as at 80 and 81, screw-
70 threaded plugs being provided to normally close these openings. By means of this construction any deposits which accumulate in the conduits may be readily removed.

The time attachment I have herein shown
75 for opening and closing the main valve *i* at predetermined times is sufficiently illustrated in Fig. 1. I have not attempted to show the complete time mechanism, which comprises the usual clock-train, as this may be of any
80 suitable or usual construction. 15 designates a wheel which is driven by the clock-train and is provided with a series of pins 16, designed to lift the free end of a weighted lever 17, pivoted at 19 within the casing H.
85 On this lever there is a rigid vertical arm 18, to the upper end of which is pivoted a pallet 19, which engages in a toothed wheel or ratchet 21. A stop 20 is employed to prevent backward rotation of the ratchet. Pro-
90 jecting from the ratchet are a plurality of pins 24, there being one-half as many pins as there are teeth in the ratchet. 23 is a cam-lever pivoted to the case H and provided with two cam-faces 28 and 29, said faces be-
95 ing in position to be alternately engaged by the pins on the ratchet 21. The cam-lever 23 is provided with a counterbalance 25, situated above its pivotal point, so that the counterbalance is thrown first to one side
100 and then to the other of said pivotal point. Said cam-lever is also provided with a fork 26, which embraces the arm 27, projecting from the valve-stem. Each time that a pin 16 engages the lever 17 during the rotation
105 of the wheel 15 said lever is raised and the arm 19, carrying the pin 22, is retracted to engage a ratchet-tooth of the wheel 21. As the pin 16 is freed from the lever 17 the latter falls and the ratchet-wheel 21 advances one
110 step. During the first step forward one of the pins 24 engages the cam-surface 28 and throws the cam-lever 23 from the full to the dotted line position, Fig. 1, thereby opening the valve *i*. When the pin 16 again lifts the
115 lever 17 and then releases the latter, the cam 21 is moved a second step forward, and this time a pin 24 engages the cam-surface 29, thereby throwing the cam-lever 23 and permitting the valve to close.
120

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

1. A gas-burner comprising a member, having a gas-conduit and a laterally-extending filter-chamber communicating with the
125 conduit, a filter within the chamber, a removable plug to close the open end of the chamber, and a burner connected with the gas-conduit.
130

2. A gas-burner, a gas-conduit leading thereto and provided with a valve-seat, a valve on the outlet side of said valve-seat and having a stem extending loosely through an aperture in the wall of the conduit on the outlet side of the valve-seat, said valve having two faces one to cooperate with said valve-seat and the other to close the aperture through which the stem extends when the valve is open.

3. A gas-burner, a conduit leading thereto and provided with a valve-seat, an automatically-closing valve on the outlet side of said valve-seat, said valve having a stem extending loosely through an aperture in the wall of the conduit on the outlet side of the valve-seat, and having a face to close said aperture when the valve is open.

4. A gas-burner, a conduit leading thereto and provided with a valve-seat, an automatically-closing valve on the outlet side of said valve-seat, said valve having a stem ex-

tending loosely through an aperture in the wall of the conduit on said outlet side of the valve-seat, and having a face to close said aperture when the valve is open, and means to act on the end of the stem to open the valve.

5. A main gas-burner, a gas-conduit leading thereto and provided with a valve-seat, a valve on the outlet side of said valve-seat, said valve having a stem extending loosely through an aperture in the wall of the conduit on said outlet side of the valve-seat, and having a face to close said aperture when the valve is open, a pilot-burner, a continuously-open pilot-tube connecting said pilot-burner to the gas-conduit between the gas-supply and said valve.

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

NATHANIEL H. SHAW.

Witnesses:

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A. H. EATON.