

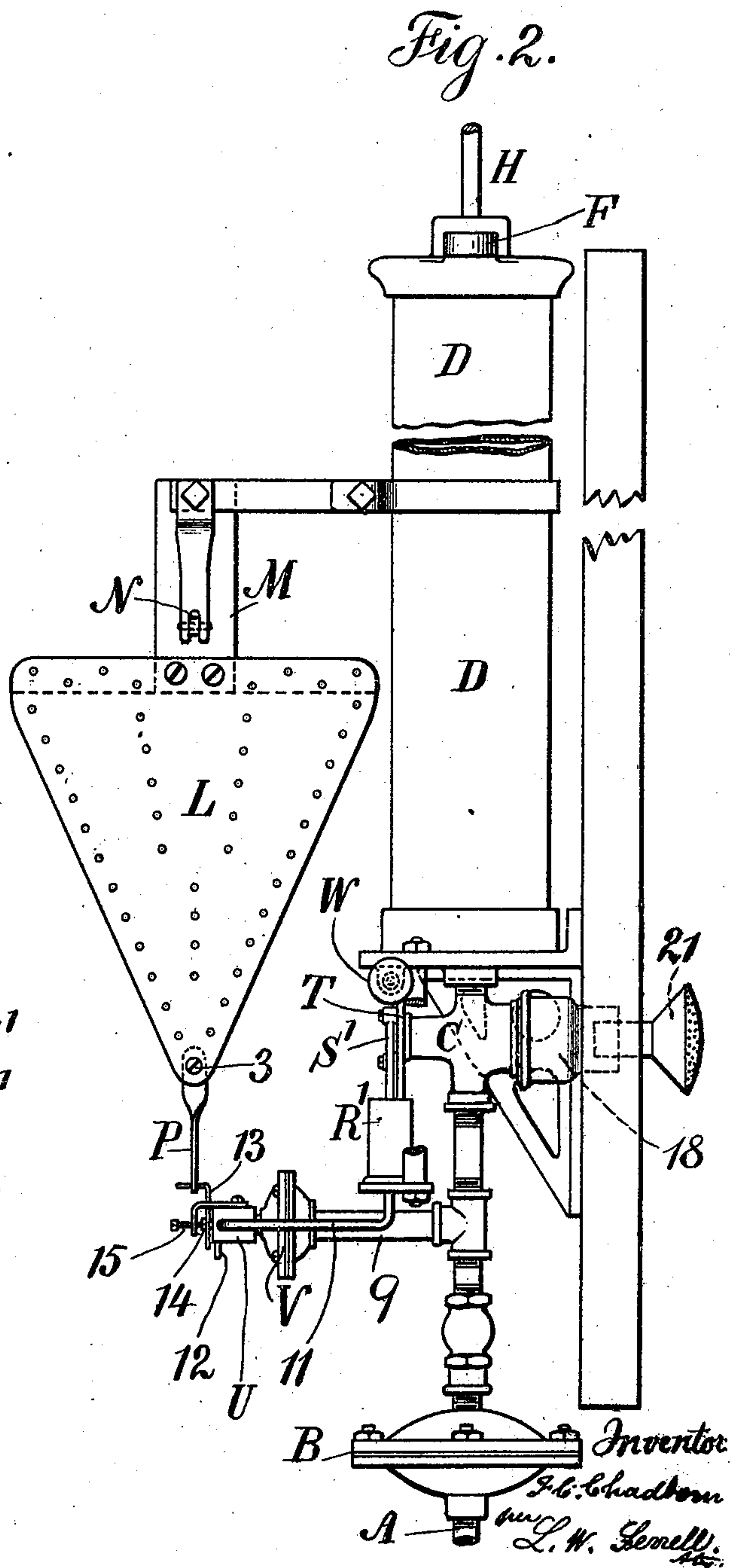
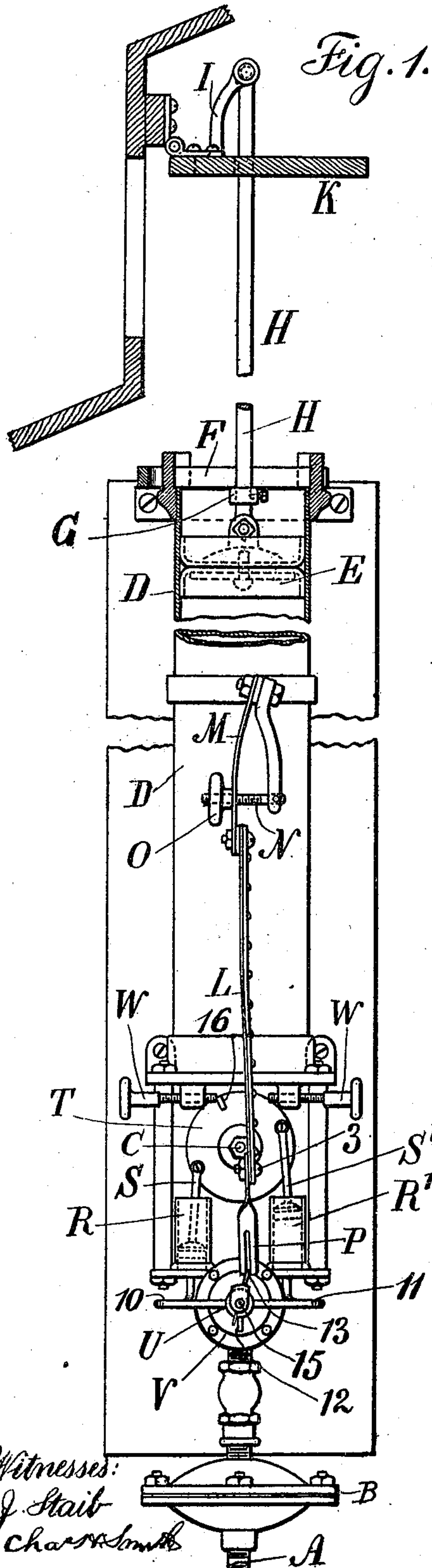
(No Model.)

2 Sheets—Sheet 1.

F. C. CHADBORN.
VENTILATING APPARATUS.

No. 502,090.

Patented July 25, 1893.



(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

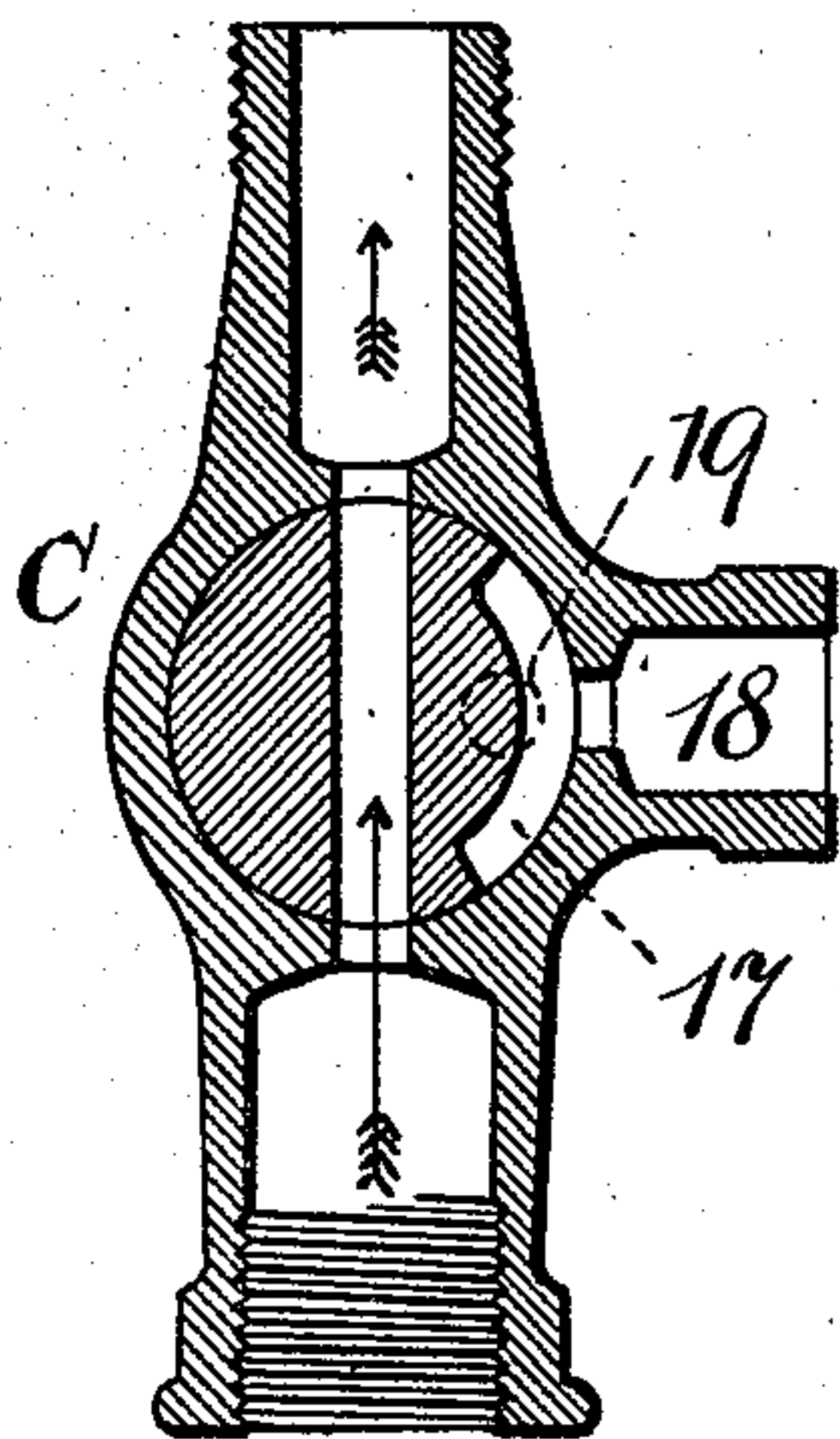


Fig. 6.

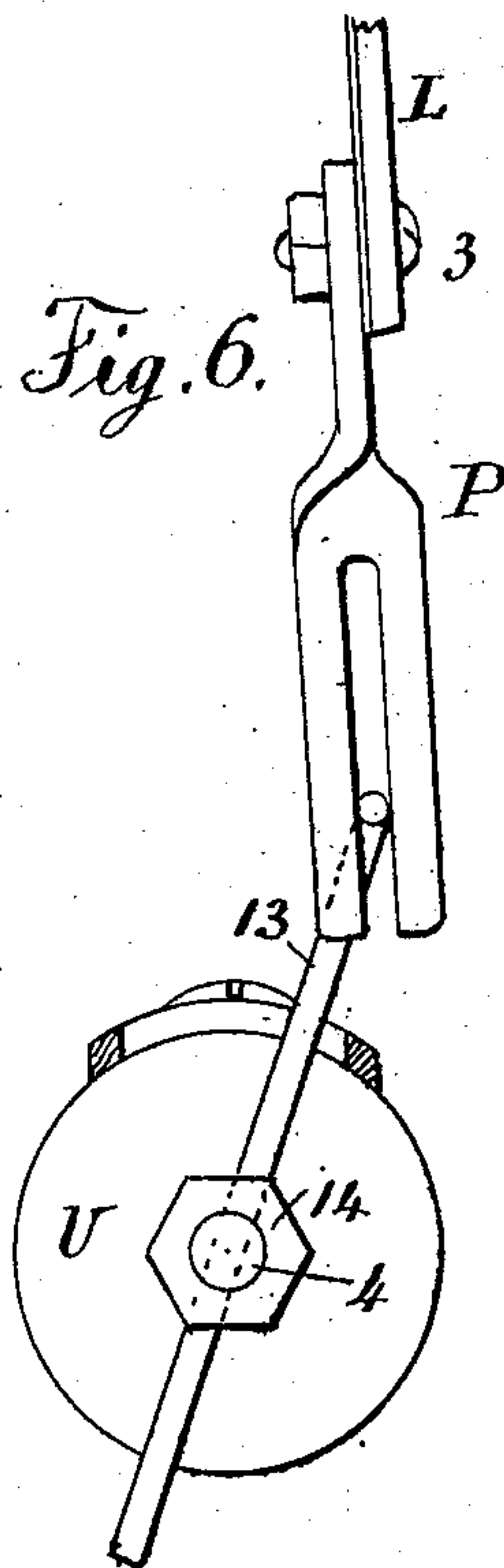


Fig. 4.

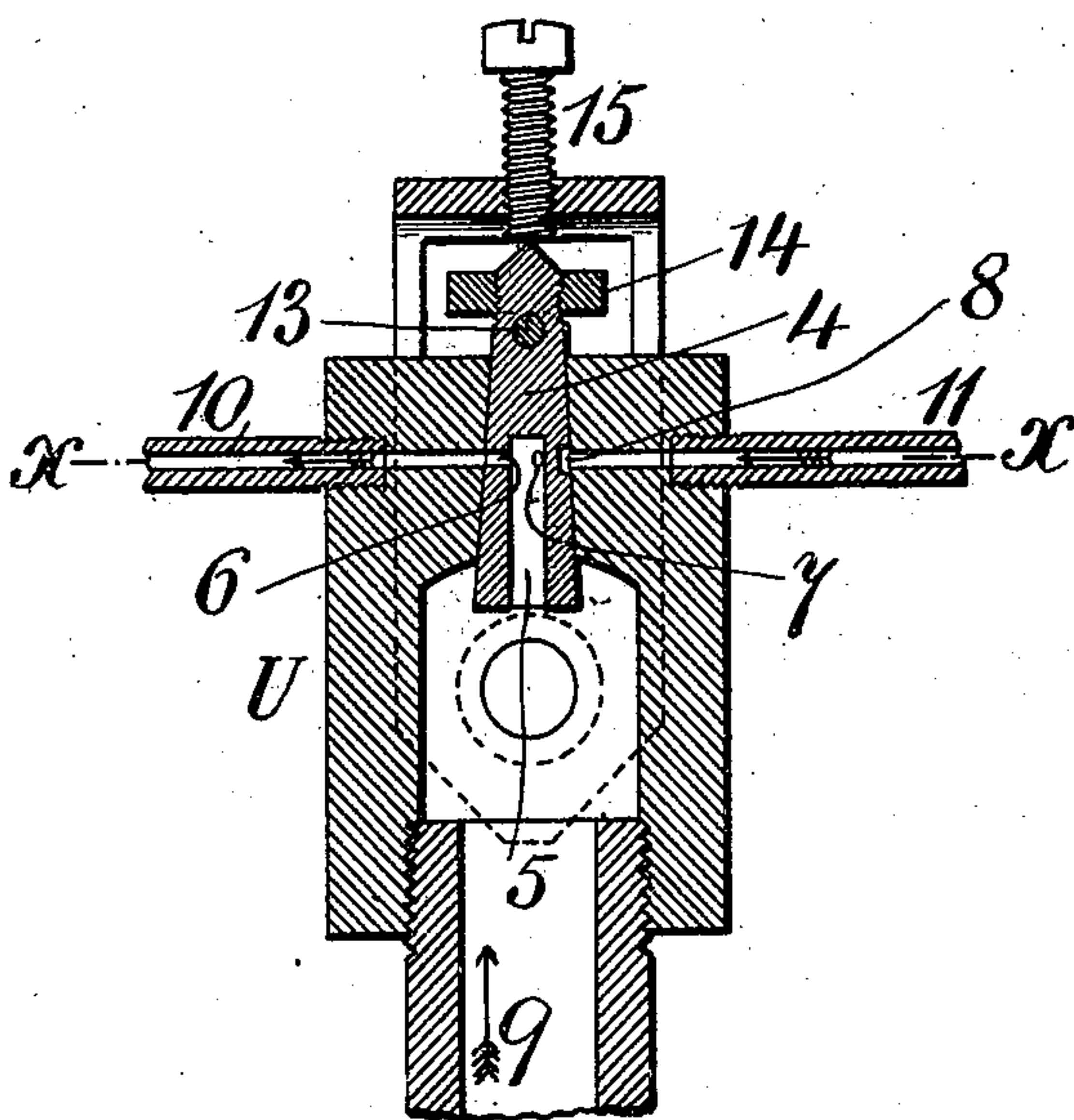
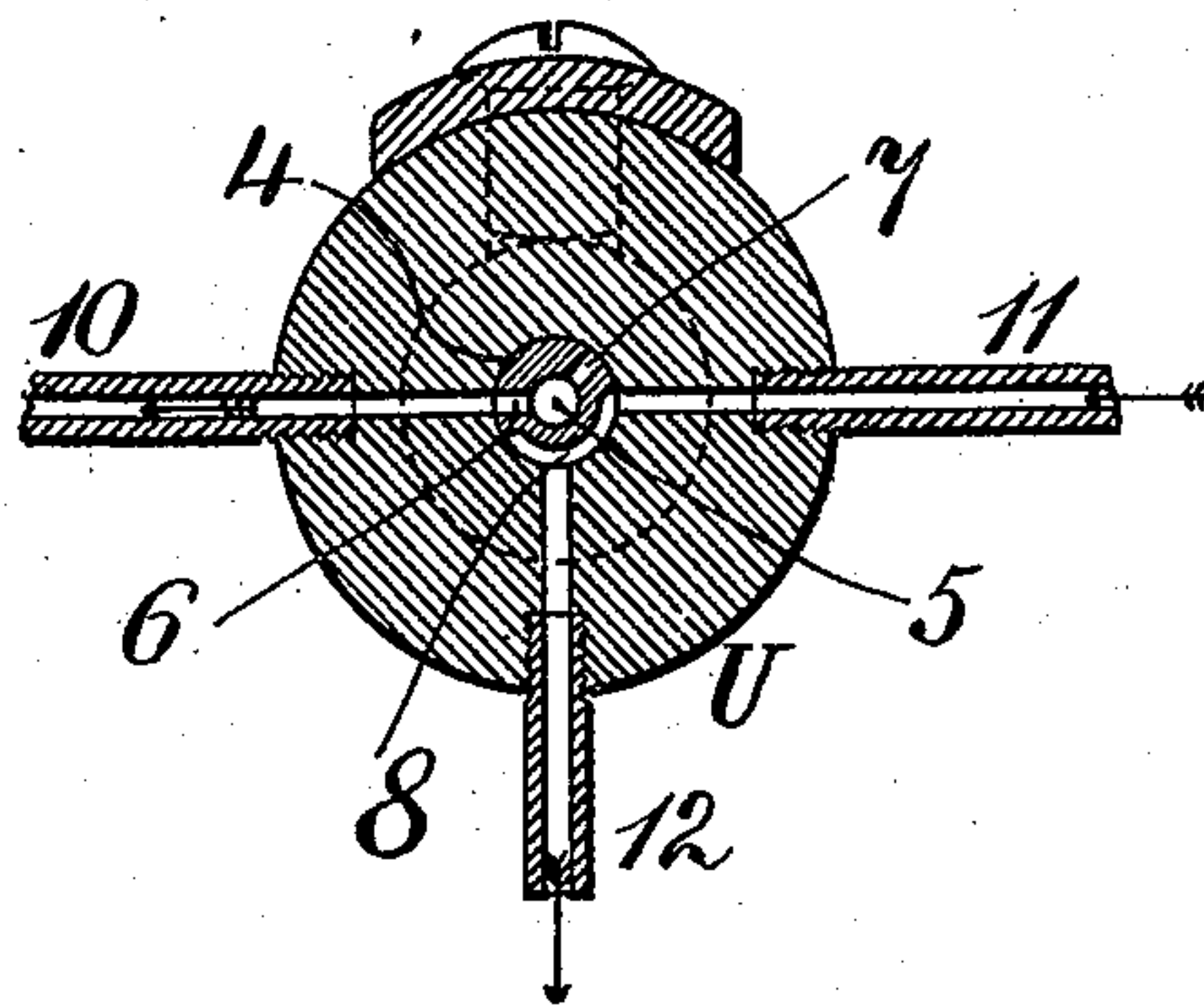


Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERIC C. CHADBORN, OF NEWBURG, NEW YORK.

VENTILATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 502,090, dated July 25, 1893.

Application filed November 1, 1892. Serial No. 450,624. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC C. CHADBORN, a citizen of the United States, residing at Newburg, in the county of Orange and State of New York, have invented an Improvement in Ventilating Apparatus, of which the following is a specification.

In green-houses and other buildings difficulty has heretofore existed in arranging the ventilators so as to maintain a uniform or nearly uniform temperature, because the ventilating apparatus was usually heavy and required considerable power for actuating the same. This also holds true in the ventilation of theaters and public buildings.

The present improvement is adapted to the ventilation of public buildings, conservatories, &c., automatically, and the apparatus employed by me is also constructed in such a manner that the ventilators can be either opened or closed by hand.

I make use of a thermostat for actuating a delicate valve that admits water or other fluid pressure to open or close a regulating cock or valve by which the motive power is brought to bear upon the apparatus that gives motion to the ventilators.

In the drawings, Figure 1 is an elevation illustrative of the manner in which the apparatus is fitted up for operation, the upper part of the cylinder being in section. Fig. 2 is an elevation at right angles to Fig. 1, one bracket supporting the motor cylinder being removed. Fig. 3 is a section in larger size of the main valve. Fig. 4 is a section in larger size of the delicate valve, and Fig. 5 is a section at the line *x, x*, of Fig. 4, and Fig. 6 is an elevation of the delicate valve lever with the support for the adjusting screw in section.

It is to be understood that this ventilating apparatus may be actuated by any suitable fluid pressure, such for instance as the water pressure generally found in green-houses and conservatories, but air or any other suitable fluid may be employed.

The pipe A leads water or other fluid to this apparatus under a proper pressure, and I have represented a strainer at B for retaining any foreign substances that might otherwise interfere with the working of the valves of the apparatus, and C represents the main valve or three-way cock to the motor cylinder D, in

which cylinder is a piston E and a connection therefrom to the ventilator.

When this ventilator is fitted to swing such as with sashes in a green-house it is advantageous to employ a cross key F that becomes a guide for the piston rod leading to the ventilators and also a stop for the movable collar G clamped by a screw upon the piston rod H so that the ventilators can be opened to the desired point and a continuance of the pressure will give no further movement to such ventilators.

I have represented the piston rod H as connected with the arm I upon the ventilating sash or damper K; and it is to be understood that this ventilating sash, damper or other device that controls the movement of the air for ventilating purposes, may be of any desired character and that the device represented is simply illustrative.

When the main valve C is turned to admit the fluid pressure into the motor cylinder D the piston E receives motion until the supply of water or fluid under pressure is arrested, and it is usually preferable to employ the fluid pressure for opening the ventilator when the heat becomes excessive, and when the ventilator is to be closed the main valve C is to be turned for allowing the water to pass off by a waste pipe or opening as usual in three-way cocks; and I remark that this main valve or cock can be of any desired character and does not require further description.

The waste water running away from the motor cylinder as the ventilator descends may be conveyed away by a pipe to any desired place or receptacle, or a pipe may convey the same to a rose or sprinkler 21 to discharge the water upon the plants in the green-house.

In Fig. 3 I have shown the main cock or valve C with a discharge water way 17 to a waste pipe 18, at one side, but where there is a hole passing longitudinally of the plug, as seen at 19 and connecting with the way 17, the waste water may pass off at the end of the plug, as illustrated in Fig. 2.

The thermostat employed by me is of any suitable character. I prefer to make use of the one represented, in which L is the blade of the thermostat to one end of which the stock M is affixed and which is preferably in the form of a spring through which passes

the screw N which is provided with a nut O for adjusting the position of the thermostat, the distant end being adapted to move by change of temperature acting upon such thermostat, one side of the thermostat being of hard rubber, and the other of sheet metal as common in thermostats, and at the moving end of the thermostat is a fork P which may be raised or lowered as desired, such fork being attached to the thermostat by the screw 3, and the fork of the thermostat acts upon the delicate valve or cock that controls the fluid pressure in acting upon the mechanism that turns the main valve or cock C either in one direction or in the other.

To give motion to the main valve C, I employ the cylinders R R' containing pistons and piston rods S S' acting upon crank pins at opposite sides of the disk T, which disk is upon the axis of the main valve C, and the delicate valve or cock U which is acted upon by the thermostat is constructed with a tapering plug 4 having a central water-way 5, two lateral water-ways 6, 7, and a peripheral channel 8, and there is a pipe 9, leading water or other fluid under pressure to the barrel of the delicate valve or cock and thence to the central water-way 5, and there are pipes 10 and 11 leading to the respective cylinders R and R'. Hence when this tapering plug 4 is turned so that the lateral water-way 6 opens to the pipe 10 the fluid pressure will be active in the cylinder R and the fluid will escape from the cylinder R' by the channel 8 and bib 12 and this will move the main valve C in one direction, but when the plug 4 is turned in the other direction and the lateral water-way 7 coincides with the pipe 11, the fluid pressure will act in the cylinder R' and the liquid will escape from the cylinder R through the channel and bib 12.

For giving motion to the tapering plug 4 by the fork P of the thermostat, it is advantageous to employ the movable crank 13, the horizontal end of which passes into the fork P and the vertical portion thereof passes through a hole across the tapering plug 4, and there is a nut 14 to clamp the movable crank at any position to which it may be adjusted, and by varying the distance between the horizontal crank portion of the movable crank and the axis of the tapering plug, so the speed of the apparatus will be regulated, because when the crank arm is nearest to the axis of the tapering plug such tapering plug will receive a larger motion by the same change in temperature acting through the thermostat than it will when the movable crank is more distant from the axis of the tapering plug. Hence by this means the thermostatic ventilating device can be made to act with greater or less speed under given changes in temperature, and it is advisable to employ a set screw 15 at the end of the tapering plug 4 to prevent the plug being forced too firmly upon its seat by the pressure of the water or other fluid acting upon the same, and it is advis-

able to introduce a fine screen V in the water pipe that leads to the tapering plug. By this improvement I am enabled to adjust the ventilating apparatus to work more or less rapidly and to bring the ventilating mechanism into play under any desired conditions of temperature.

Upon the disk T is a lug or stop 16 and the limiting screws W pass through stationary nuts and in opposite directions to limit the movement of the disk and the main valve C by such screws W. Hence by this means the main valve can be opened to any desired extent by the action of the delicate valve and the water supply passing through the same, and it is often advantageous to set these limiting screws in such a manner that the ventilator will open comparatively slowly as the temperature rises and close with greater rapidity as the temperature falls, this object of course being effected by the extent of movement given in either one direction or the other to the main valve or cock.

By loosening the screw of the fork P and moving such fork out of the way the crank 13 can be turned by hand in either direction to open or close the ventilators, regardless of the temperature, or the main valve C may be moved directly by hand if so desired. This of course will be a great convenience, especially in green-houses where the ventilating sashes are heavy and can only be moved by exerting considerable force.

I claim as my invention—

1. The combination with the ventilator, of a cylinder, piston and connections to the ventilator, a main cock by which liquid under pressure is admitted to the cylinder or allowed to escape, cylinders and pistons acting to turn the main cock in either one direction or the other, a thermostat and a three-way cock actuated by the thermostat to admit liquid under pressure to either of the cylinders and pistons that move the main cock and to allow the escape of liquid from the other of said cylinders, substantially as specified.

2. The combination with the ventilating devices, of a motor cylinder and piston, a rod connected with the ventilator, a removable cross key at the end of the cylinder and through which the piston rod passes, and an adjustable collar on the piston rod for regulating the position of the parts when the ventilator is opened and a cock or valve for admitting fluid pressure to act upon the piston, substantially as set forth.

3. The combination with the thermostatic blade having one end held firmly and adjustably, of a fork at the moving end of the blade, a cock with the lever arm engaging and turned by the fork of the thermostat, a ventilator, a cylinder and piston for moving the same, a supply pipe for liquid under pressure and a main cock for regulating the admission of liquid to and discharge from such cylinder, cylinders and pistons acting in opposite directions to turn said main cock, and supply pipes

for liquid under pressure and regulated by the thermostatic cock for admitting the liquid to either of the cylinders for moving the main cock substantially as specified.

5 4. The combination with the thermostatic blade having one end held firmly and adjust-
ably, of a fork at the moving end of the blade,
a cock with a lever arm engaging and turned
by the fork of the thermostat, a ventilator, a
10 cylinder and piston for moving the same, a
supply pipe for liquid under pressure and a
main cock for regulating the admission of liq-
uid to and discharge from such cylinder, stops
for arresting the movement of the main cock,
15 cylinders and pistons acting in opposite di-
rections to turn said main cock, and supply
pipes for liquid under pressure and regulated
by the thermostatic cock for admitting the
liquid to either of the cylinders for moving
20 the main cock substantially as specified.

5 5. The combination in a thermostatic ven-
tilating apparatus, of a thermostatic blade
fastened at one end and provided with a fork
at the other end, a cock having pipes for a
25 fluid under pressure to act in regulating the

ventilating apparatus, a turning plug for said
cock and an adjustable crank arm to such
plug and means for holding the same when
adjusted to vary the leverage of the crank
arm and the movement of the plug by given 30
changes of temperature to regulate the speed
of movement of the ventilating apparatus sub-
stantially as specified.

6. The combination with a thermostat, a
ventilating apparatus, a motor cylinder and 35
a supply for liquid under pressure, of a deli-
cate cock or valve, an adjustable crank arm
between the thermostat and the cock for regu-
lating the action of the thermostat, in open-
ing and closing said cock, and an adjusting 40
screw to prevent the pressure of the fluid pro-
ducing undue friction of the delicate thermo-
static cock on the seat, substantially as set
forth.

Signed by me this 25th day of October, 1892. 45

FREDERIC C. CHADBORN.

Witnesses:

WILLIAM G. MOTT,
A. M. OLIVER.