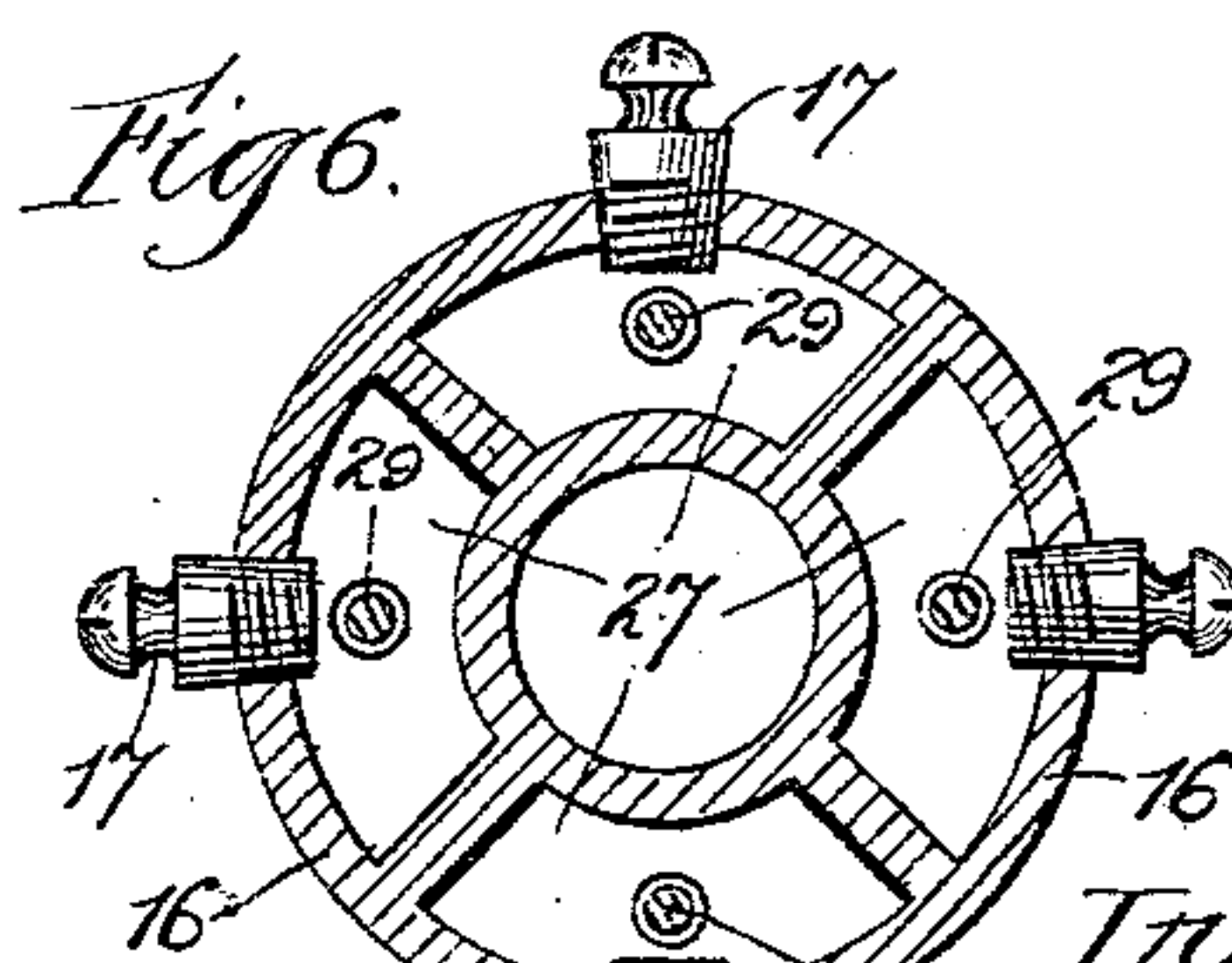
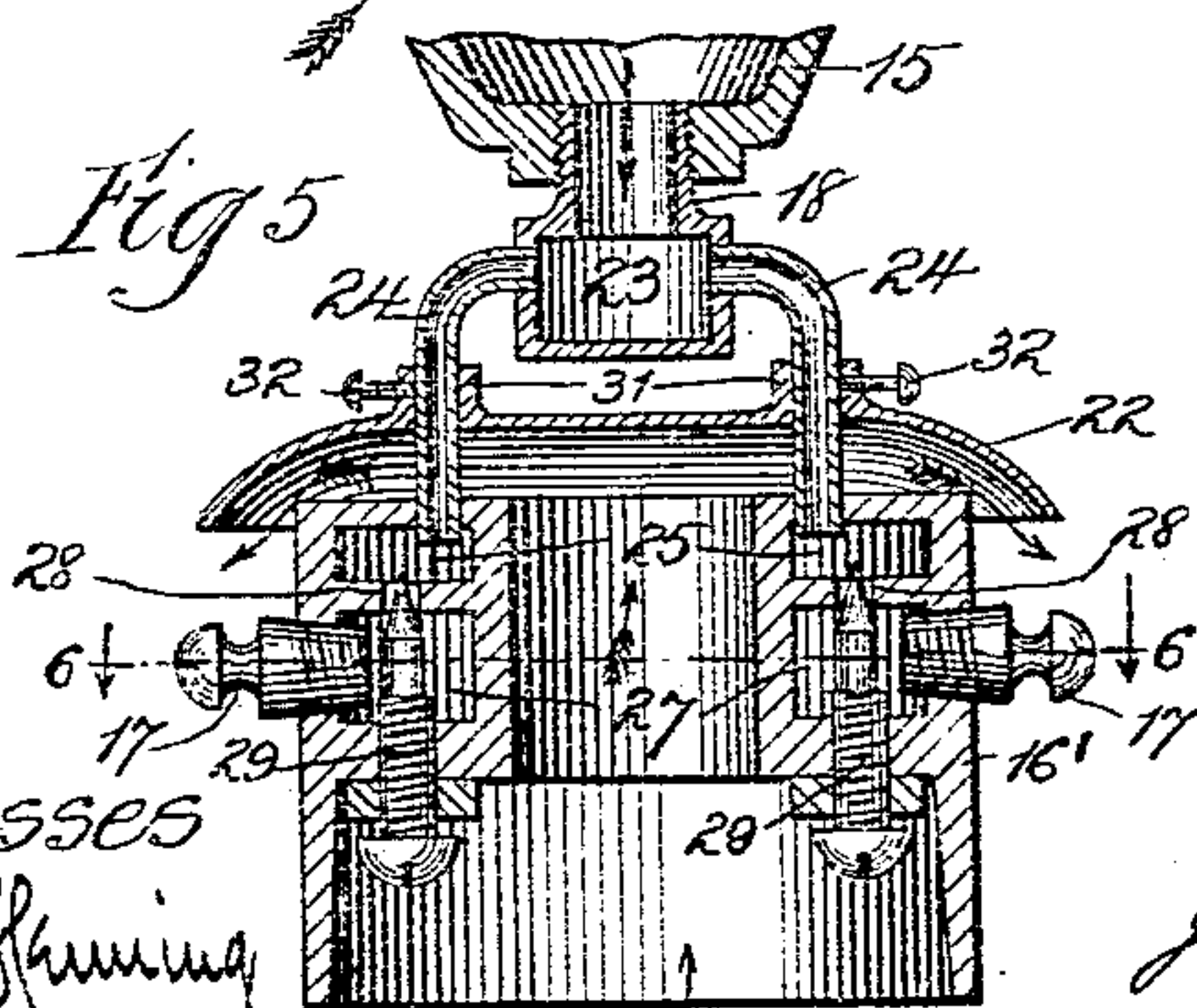
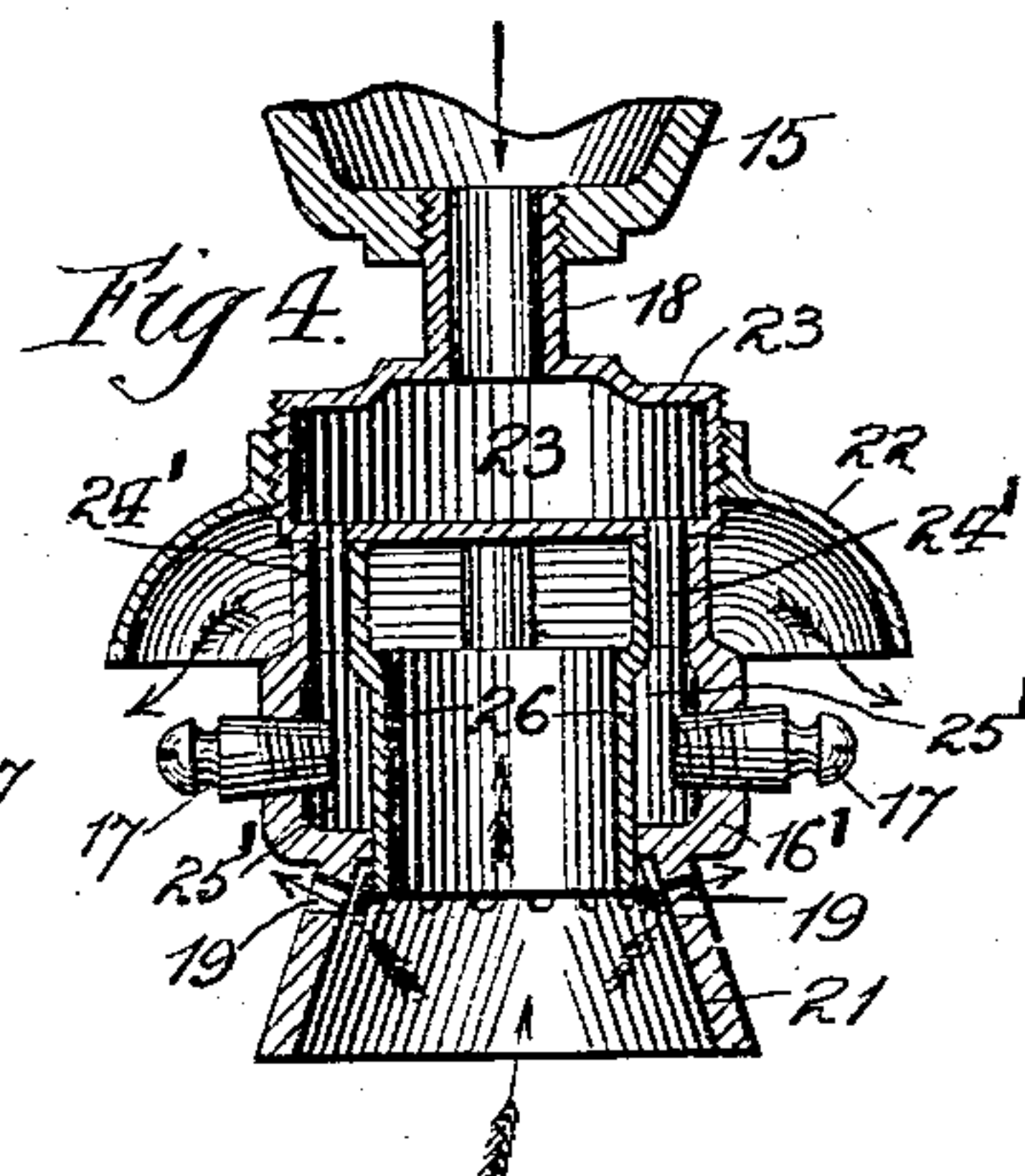
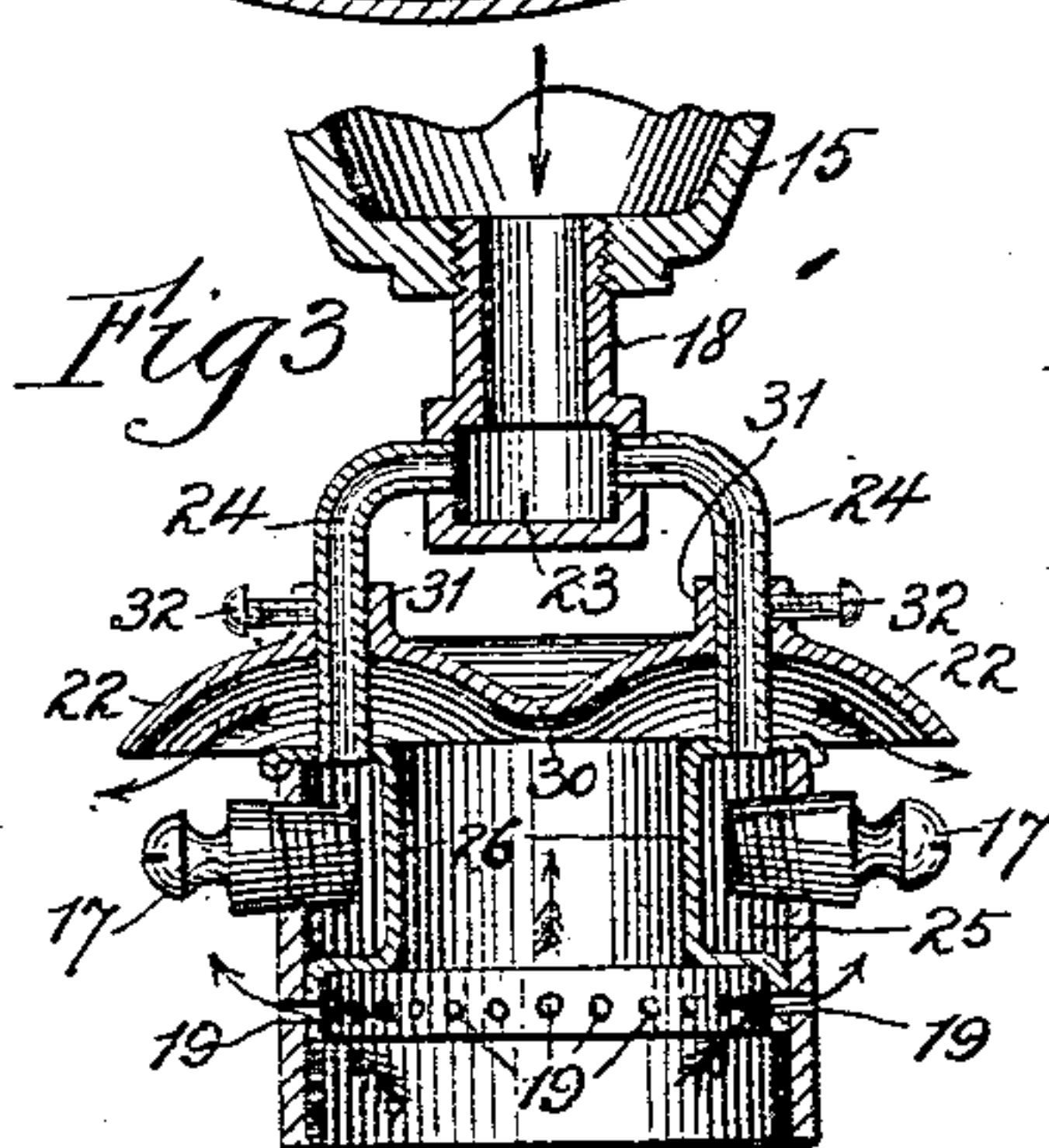
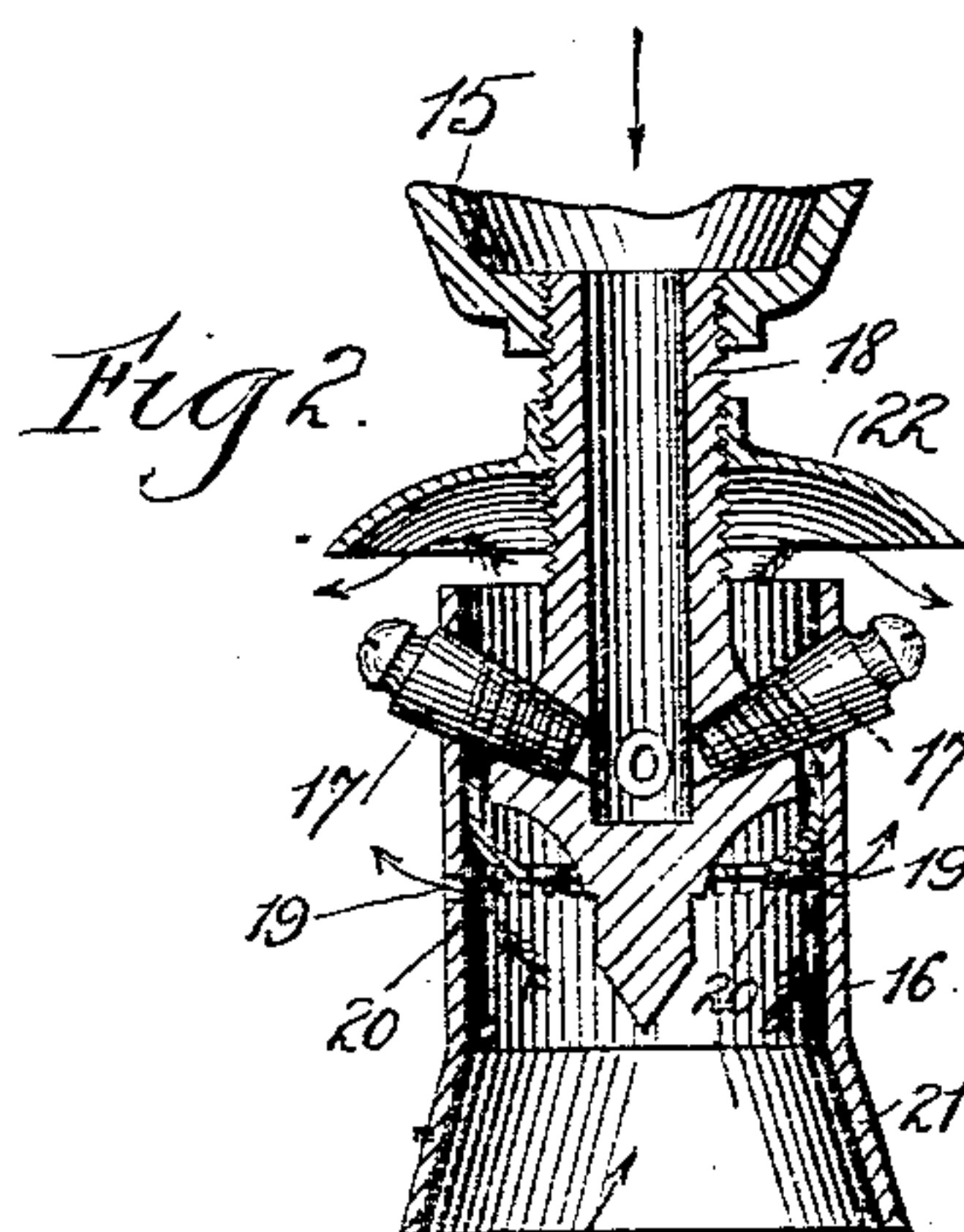
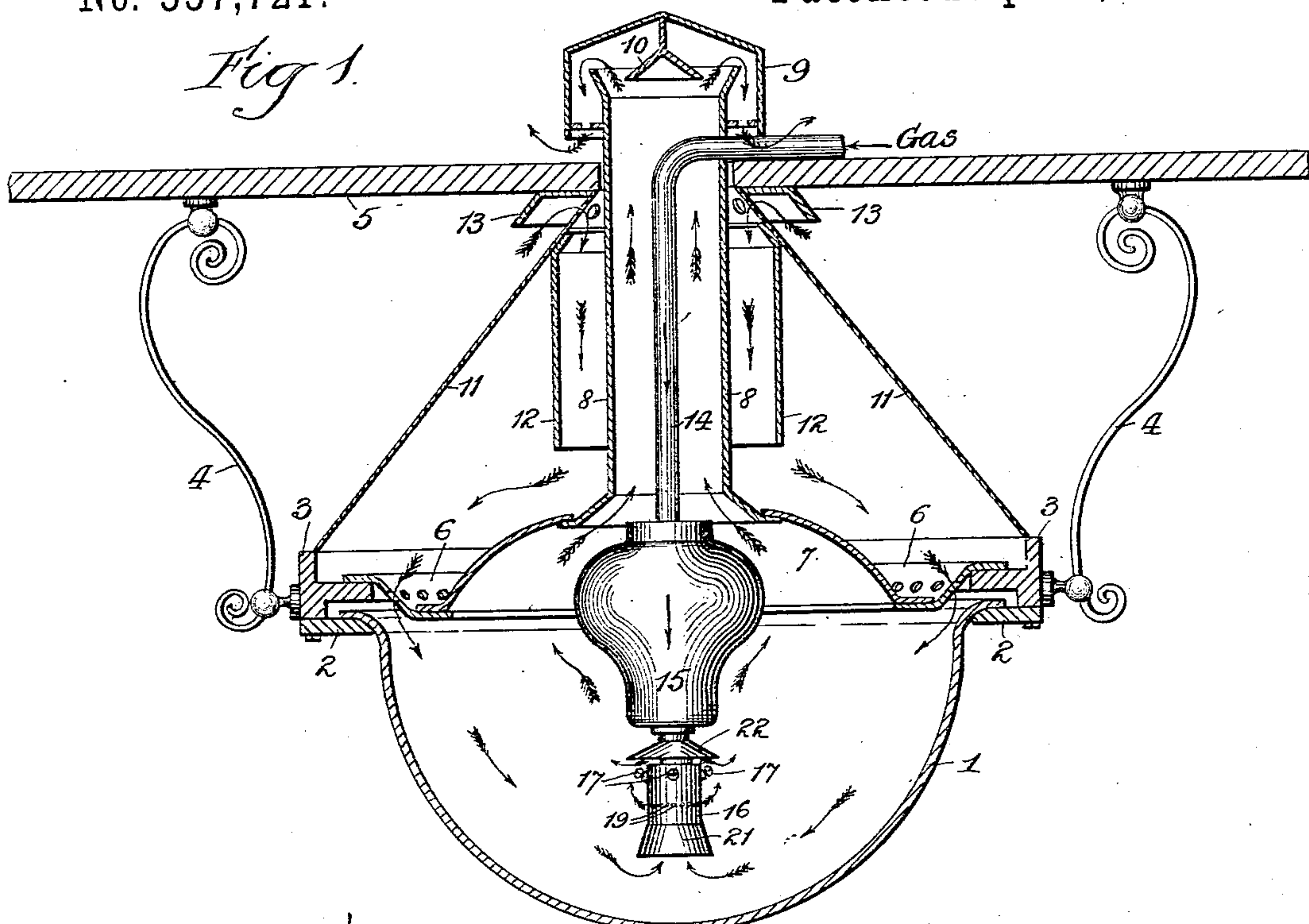


(No Model.)


H. S. TEAL & W. S. HAMM.
ILLUMINATING GAS BURNER.

No. 557,721.

Patented Apr. 7, 1896.



Witnesses
Wm. J. Fleming
Geo. L. Condon


 16' 17' 16' 17' *Inventors.*
H. S. Seal and Wm. S. Hamm
by Raymond and Co. Attys

UNITED STATES PATENT OFFICE.

HARRY S. TEAL AND WILLIAM S. HAMM, OF CHICAGO, ILLINOIS, ASSIGNORS
TO THE ADAMS & WESTLAKE COMPANY, OF SAME PLACE.

ILLUMINATING-GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 557,721, dated April 7, 1896.

Application filed January 30, 1894. Serial No. 498,451. (No model.)

To all whom it may concern:

Be it known that we, HARRY S. TEAL and WILLIAM S. HAMM, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Illuminating-Gas Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to that class of illuminating-gas burners such as are generally employed in street-car, steam-railway, and similar services where the fixtures are more or less exposed, and where, consequently, provision has to be made against the effects of strong drafts of air, certain features of our invention being, however, applicable to both sheltered and exposed fixtures.

Among the primary objects of our invention is included that of producing an illuminating-gas burner having laterally-projected flames and in which a copious quantity of air shall be supplied above as well as below the flames, thus insuring complete gas-combustion, maximum illuminating power, and steadiness of light.

A further primary object of our invention is to produce an illuminating-gas burner in which the flow of air to the upper parts of the flames shall be capable of accurate variation as to direction, thereby insuring perfect combustion, full illuminating capacity, and perfect steadiness of action under all circumstances.

A still further primary object of the invention is to produce an illuminating-gas burner in which the flow of gas to each of the flames shall be readily controllable, so as to insure both effective and economical gas-consumption; furthermore, to insure heating of the gas just previous to its ignition, so as to further insure effective and at the same time economical gas-consumption.

The above-mentioned objects, together with such others as may appear from the ensuing description, are attained by the device shown in the accompanying drawings, in which—

Figure 1 is a transverse vertical section of a globe or lantern having connected therewith a burner embodying our invention, the burner

being in side elevation. Figs. 2, 3, 4, and 5 are central transverse vertical sections of modified forms of burners embodying our invention. Fig. 6 is a horizontal section taken on the line 6 6 of Fig. 5, the direction of view being downward, as indicated by the arrows applied to the section-line.

In accordance with the general principles of our invention we produce an illuminating-gas burner having a tubular body portion, through which air for supporting combustion passes upwardly, so as to be heated, and into which the illuminating-gas enters downwardly. The burner-jets open laterally from the body portion, and the air is discharged above the burner-jets as well as coming to the latter from below. A shield is provided for insuring the proper discharge of air to the upper sides of the jets or flames, such shield being either movable or stationary, and, if desired, provision may be made for feeding a portion of the heated air below as well as above the jets or flames. The illuminating-gas may also either be supplied to all of the jets alike or it may be conducted to a separate cavity or chamber for each jet, and in the latter instance a valve is desirably provided for regulating the flow of gas to each cavity or chamber, so as to control the supply of such gas to the burner connected therewith.

Referring now in detail to the drawings, 1 designates a glass globe, such as is commonly used with lamps or lanterns for steam-railway cars, street-cars, and similar vehicles, the upper margin of said globe resting upon a horizontal ledge 2 and the latter being riveted or otherwise suitably secured to a horizontal supporting-ring 3, which is secured to hangers 4. The hangers 4 depend from a supporting structure 5, of any kind, such as a car roof or ceiling, according to the use to which the lantern is put in any given instance.

The casing or lantern proper forms no part of our present invention, and is shown merely to identify the location of our burner when the latter is applied to this general type of lantern. However, the lantern is shown as having a dome 7, which is supported upon a perforated ring 6, the latter resting upon the ring 3. A flue or chimney 8 extends vertically upward from the dome 7 and extends at

its upper end through the roof, ceiling, or other support 5, said upper end of the flue or chimney opening into a cap 9 beneath an internal deflector 10 of said cap. A conical casing 11 rests upon the supporting-ring 3 of the lantern, and at its apex is perforated for the admission of air, such air entering beneath a deflector 13, surrounding the perforated apex of the casing 11. A tubular conduit 12 depends from the casing 11, and the incoming air descends between said conduit and the flue or chimney 8. The general courses of the entering and outgoing air-currents are indicated by the feathered arrows in Fig. 1, and no more detailed description is believed to be necessary as to the lantern, because the latter, as previously stated, forms no essential part of our invention.

14 designates a supply-pipe for illuminating-gas, this pipe being connected either directly or indirectly with any source of gas supply, and being also shown as extending downward through the flue or chimney 8 of the lantern. This pipe 14 may, however, enter the lantern from above in any suitable manner, and it may also have connected to its lower end a globular gas-heating chamber 15, or such chamber may be omitted if it is not desired. If used, the exterior surface of the chamber 15 is preferably of white polished material, to act as a reflecting surface, and this is also true of the dome 7 when used.

The burner embodying our invention is shown in the several figures of the drawings as connected to the lower end of the heating-chamber 15; but it is to be understood that the burner may be connected directly to the lower end of the supply-pipe 14 or to any other suitable supply-pipe, according to the particular use to which the burner is put in any given instance.

16 designates the body portion of our burner proper, the precise contour of such body portion being susceptible of many variations, some of which are shown, but said body portion being generally of tubular form, open at both its lower and upper ends, and connected, either directly or indirectly, to the supply-pipe. In Fig. 2 the body portion is shown as connected by a plurality of burner-tips 17 to a coupling-tube 18, the upper end of which has screw-threaded connection with the lower end of the heating-chamber 15. In this instance the lower end of the tubular coupling-piece 18 is closed and the inner ends of the burner-tips 17 are inserted into the sides of the lower end of said coupling-piece, so as to extend obliquely outward and upward from the latter.

The lower end portions of the tips 17 extend through the sides of the upper end of the body portion 16, and the deflector 19 supports at its center the body 16 upon the fitting 18. The lower end of the tubular coupling-piece 18 lies or is situated about midway of the length of the body portion 16, within the latter, and is desirably of conical form,

so as to presumably aid in deflecting part of the air (flowing upward through the lower end of the body portion) outward through a horizontal series of perforations 19, which are formed through the body 16 beneath the burner-tips 17. This outward deflection of part of the upflowing air is also assisted by an internal annular deflector 20, secured to the inner surface of the body 16 above the perforations 19 and extending obliquely downward and inward from its points of connection to the body. The bottom or center of this deflector is left open, and through said opening the remainder of the upflowing air passes, such air traveling the full length of the body 16 and passing out through the upper end of the body. The lower end of the body 16 may be formed or provided in any suitable manner with an outwardly and downwardly flared portion or skirt 21, which enlarges the air-receiving capacity of the body. Immediately above the upper end of the body 16 is located a horizontal deflector 22, which is of concavo-convex form and of such width as to more than equal the external diameter of the upper end of the body A. In the burner now being described the deflector 22 is shown as surrounding the coupling-piece 18, the latter being externally screw-threaded and passing through the middle of the deflector. The arrangement is such that by turning the deflector 22 in one or the opposite direction upon the coupling-piece 18 the deflector 22 will be moved toward or away from the upper end of the body 16. The air which has passed through the opening of the internal deflector 20 and through the upper end of the body 16 strikes the concave under surface of the external deflector 22 and is caused to escape in the form of a film laterally from beneath the deflector 22. This film of air impinges against the upper sides of the outer ends of the burner-tips 17, the upward and downward adjustability of the deflector 22 insuring this result, and consequently copiously supplies the flames with oxygen above the flames. After the burner has been in operation for a short time all of its parts become hot, and the air, as well as the gas passing through the burner, is consequently heated before reaching the burner-tips. This action insures perfect and at the same time economical combustion, and the feed of air above the flames prevents flickering, as well as aiding perfect combustion. Preferably the outer surfaces of the body 16 and deflector 22 are of white polished substance to add to the reflection of light from the tips 17.

In the forms of burners shown in Figs. 3, 4, and 5 the tubular coupling-piece 18 is much shorter than that shown in Fig. 2, and the lower end of said coupling-piece is shown as provided with a gas-heating chamber 23, such chamber being either formed with the lower end of the coupling-piece, as shown, or suitably secured thereto in any desirable manner. In such instance the body 16' is

connected to the chamber 23 by tubes 24, either of inverted-J form, as shown in Figs. 3 and 5, or straight, as shown at 24' in Fig. 4, such pipes conveying the gas from the chamber 23 to the interior of the body 16'. In either event body portion 16' of the burner is provided with an internal chamber into which pipes 24 and 24' deliver, and in Figs. 3 and 4 the burner-tips 17 are shown as communicating at their inner ends directly with the chambers 25 and 25'.

In Figs. 3 and 4 the inner wall of the chambers 25 and 25' are formed by a separate tubular piece 26, which is tightly united in any suitable manner to the interior surface of the body A, the upper part of such tubular piece 26 being shown as having extensions constituting the pipes 24 and 24' and the piece being of uniformly cylindrical shape throughout, while the lower end of the tubular piece 26 in Fig. 3 is flared outwardly, so as to come into close contact with the inner surface of the body 16'.

In Figs. 5 and 6 we have shown a modified form of burner in which the chamber 25'' is formed directly within the upper part of the body 16'' by casting or otherwise, and in which the inner ends of the burner-tips do not communicate directly with said chamber. In this instance the inner end of each burner-tip 17 opens into a separate cavity 27, and each of said cavities communicates with the chamber 25'' through an opening 28 formed in the bottom of said chamber, there being as many of such openings 28 as there are cavities 27. A needle-valve 29 is screw-threaded through the bottom of each cavity 27, and the tapered upper end of said valve operates to open or close the corresponding opening 28, so as to increase or diminish the flow of gas to the cavity and burner-tip as desired, the lower end of each valve-stem being nicked or otherwise formed to receive a suitable implement by which the stem can be turned as required, and said lower ends of the stems being readily accessible through the lower end of the body 16.

It is to be understood that, if desired, the lower air-outlet openings 19 may be dispensed with, the flames being amply supplied from below by the external air in such case; also that the skirt 21 may be dispensed with. The undersurface of the external deflector 22 may be provided with a central downward projec-

tion 30, if desired, to aid in deflecting the air outward. Furthermore, the external deflector may be fixed instead of adjustable, as above described, or it may be sleeved, as at 31, and provided with retaining set-screws 33, as in Figs. 3 and 5, instead of being screw-threaded, as in Figs. 2 and 4.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. An illuminating-burner, comprising a tubular body portion open at its ends and formed of two annular tubes or pieces, one within the other, the space between the inner and outer tube or piece constituting a gas-chamber within the body portion, a separate tubular piece or pieces attached to the body portion and communicating with the gas-chamber and a gas-chamber above the said body portion, burner-tips attached to the outer piece of the body portion and laterally projecting therefrom, a detachable concavo-convex deflector located at a suitable distance above the upper end of the body portion and secured to and surrounding the said separable piece or pieces, and a skirt or end portion of the body portion serving to deflect a portion of the air through the openings below the gas-chamber and burner-tips, substantially as shown and described.

2. An illuminating-gas burner, comprising a tubular body portion open at both ends, a separate tubular piece or pieces attached to the body portion within the same, a partition in the body portion arranged to form two gas-chambers, burner-tips projecting laterally through the body portion and into the lower chamber, an adjustable deflector above the upper end of the tubular body portion, openings in the body portion below the burner-tips to receive needle-valves which latter project into the upper chamber of the body portion, and a skirt formed at the lower end of the body portion so as to draw air therethrough and deflect the same downward into contact with the jet or flame issuing from the burner-tip, substantially as shown and described.

HARRY S. TEAL.
WILLIAM S. HAMM.

Witnesses:

JNO. L. COUDRON,
M. E. SHIELDS.