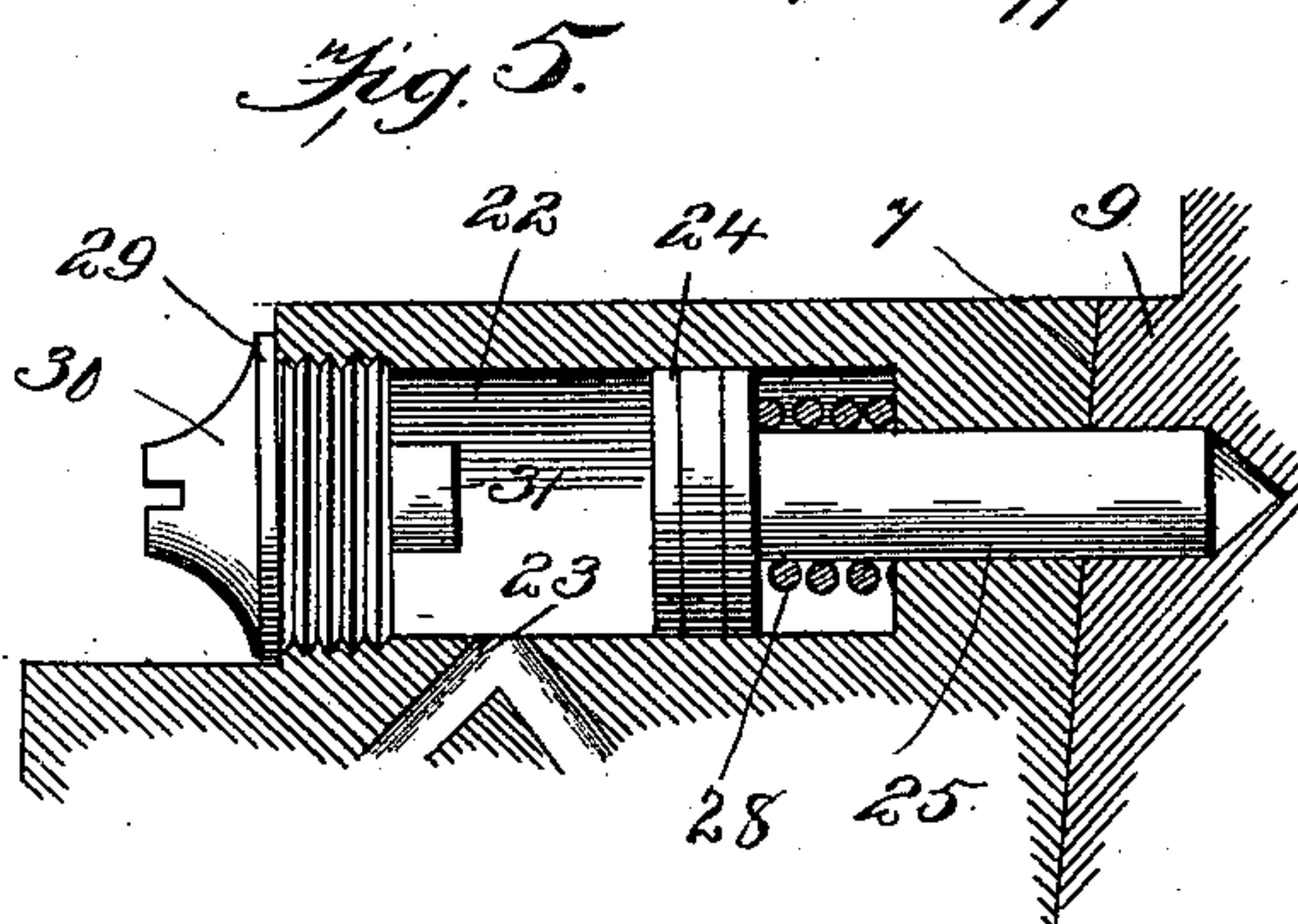
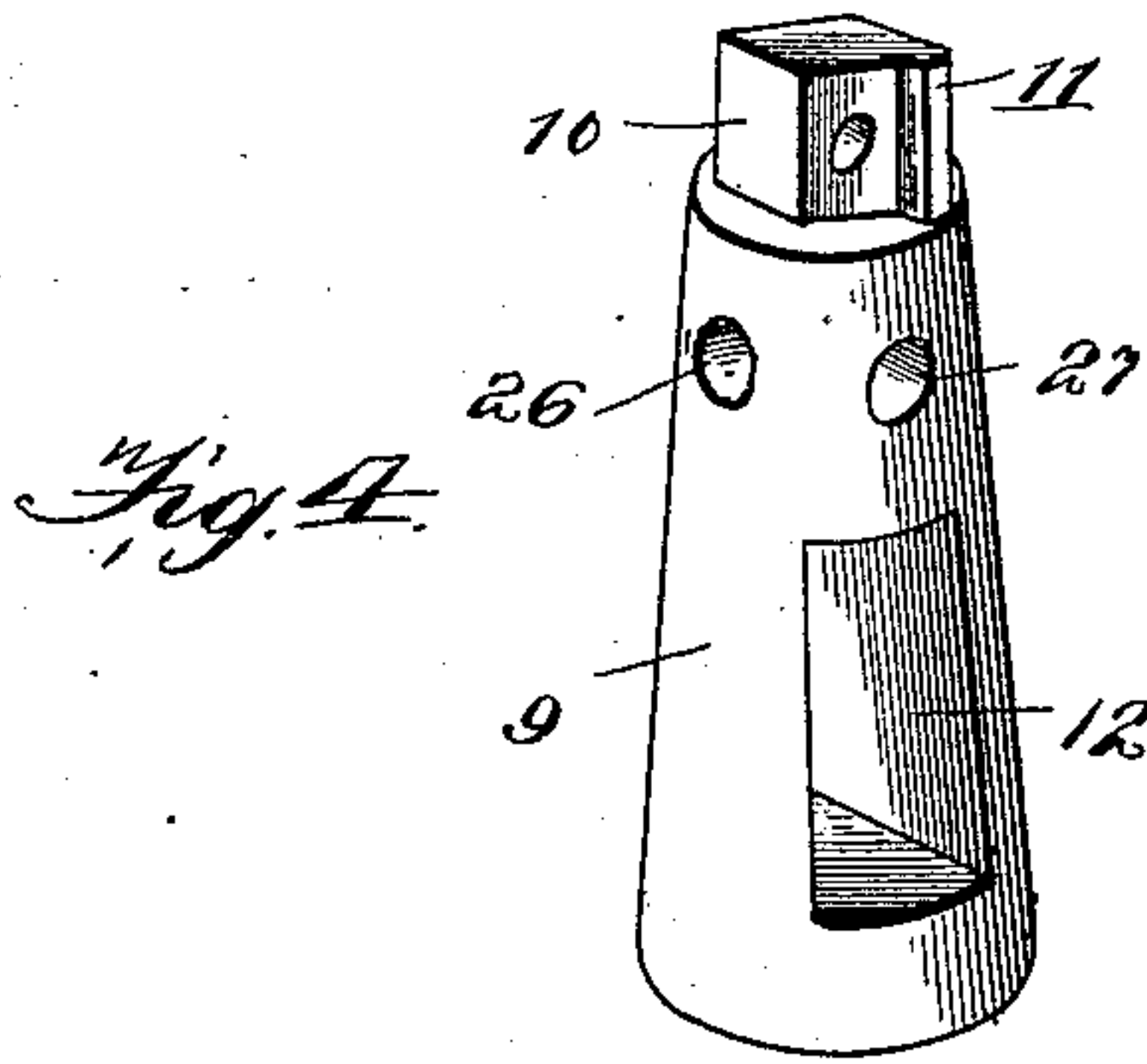
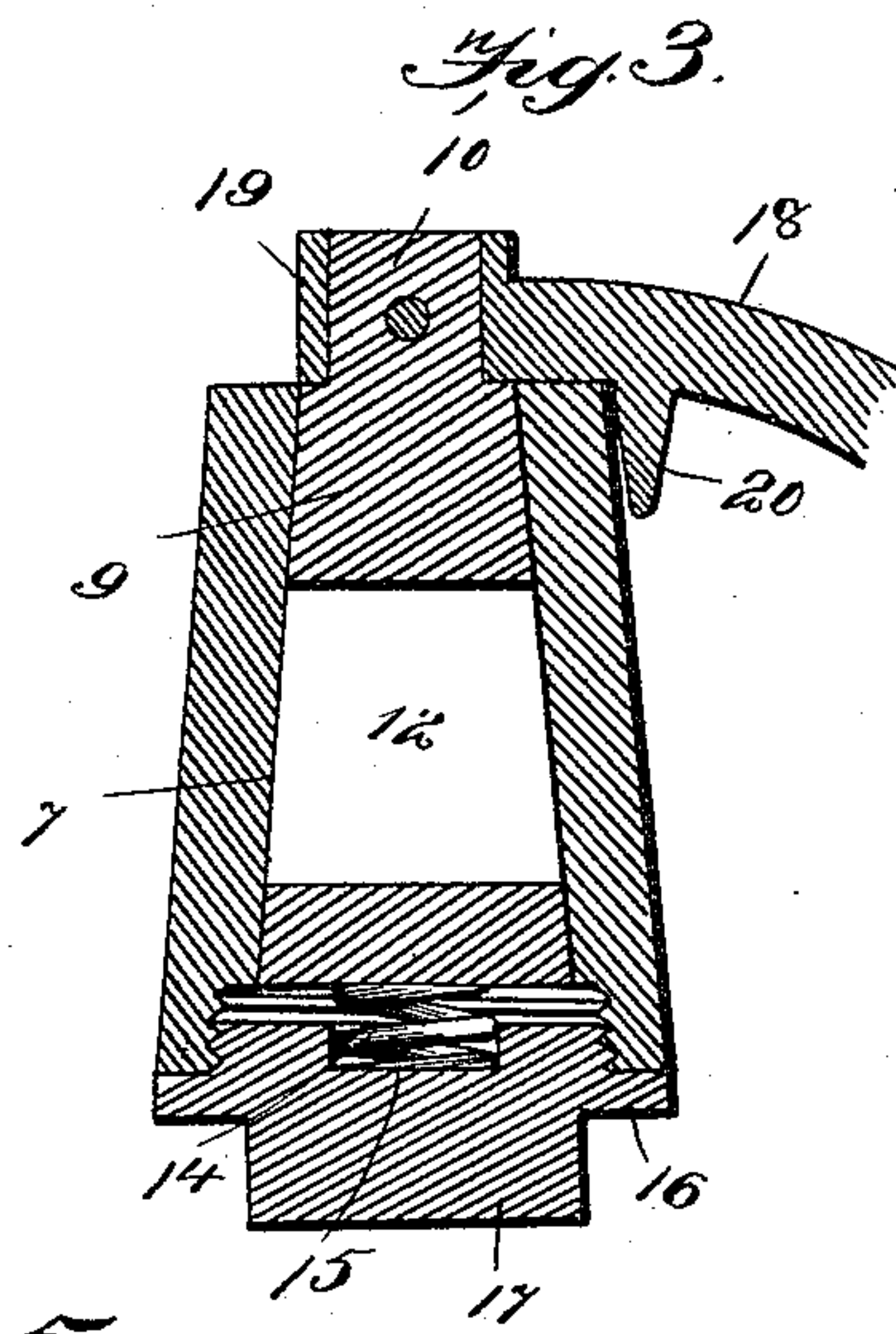
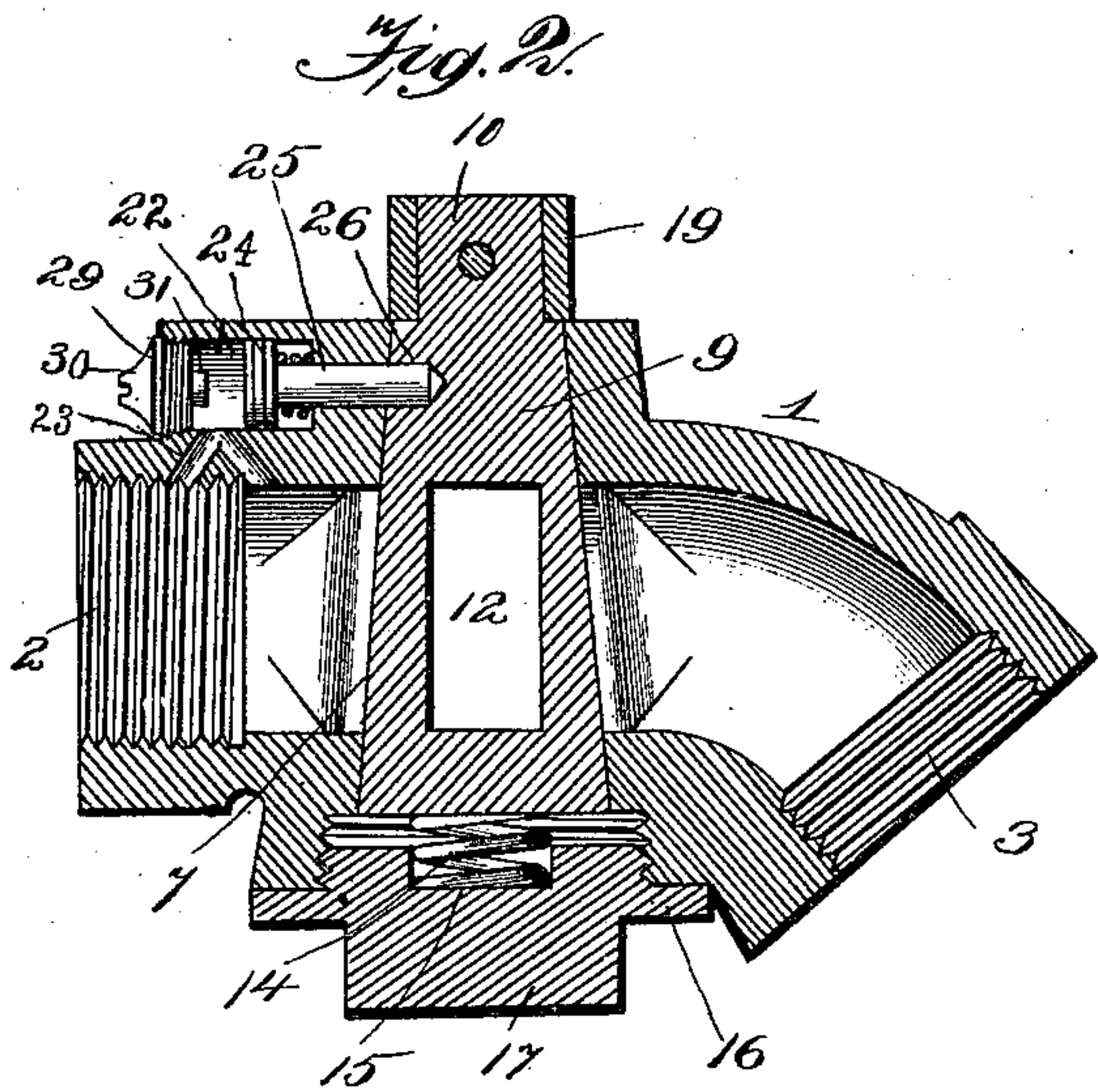
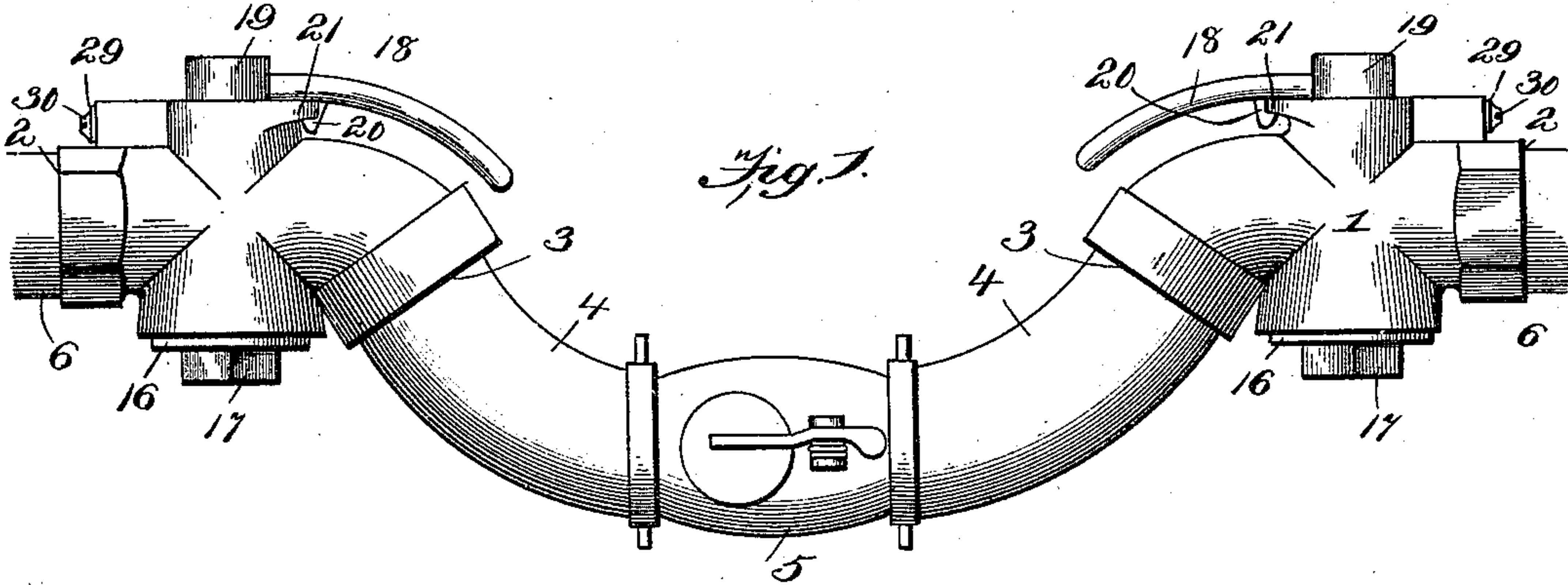


(No Model.)

G. M. TOWER & T. R. RICH.
AUTOMATIC LOCK FOR STOP COCKS OF AIR BRAKES.

No. 538,299.

Patented Apr. 30, 1895.



Inventors.

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UNITED STATES PATENT OFFICE.

GEORGE M. TOWER AND THATCHER R. RICH, OF FITCHBURG, MASSACHUSETTS, ASSIGNORS OF ONE-THIRD TO WALTER S. HUTCHINS, OF SAME PLACE.

AUTOMATIC LOCK FOR STOP-COCKS OF AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 538,299, dated April 30, 1895.

Application filed June 17, 1893. Serial No. 477,998. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. TOWER and THATCHER R. RICH, citizens of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Lock for Stop-Cocks of Air-Brakes, of which the following is a specification.

Our invention relates to fluid pressure brake mechanisms, and particularly to stop cocks for controlling the passage of fluid, such as air, through the brake pipe, or other means of communication of the fluid from one part of a train to another; and the object in view is to provide a stop cock so constructed as to be automatically locked against accidental or mischievous displacement or change of adjustment.

A further object of the invention is to provide a locking device which is concealed and inaccessible and is controlled by fluid pressure, whereby the reduction of pressure in the brake-pipe is necessary to allow change of adjustment, as opening or closing, of the stop cock.

Stop-cocks of the class to which this invention belongs are employed in connection with the main or brake-pipe, and are usually located at each end of a car or coach in rear of the coupling head. When the brake mechanism is in operation, the cocks are opened, with the exception of that at the rear end of the last car, to allow the pressure to be communicated throughout the train, and when the cars or coaches are uncoupled the cocks are closed. The opening of the rear or the closing of one of the intermediate cocks deprives the engineer of the control of his train and renders an accident possible and, upon grades, imminent. The closing of the cocks is caused occasionally by the presence upon the track of obstructions of too insignificant a nature to attract the attention or be considered as serious by the engineer, such as wire, brush or sticks, barrel hoops, &c., and in addition to this the cocks are sometimes displaced or tampered with, either accidentally or maliciously, by tramps or rogues. It is, therefore, to guard against accidents arising from such

displacement of the plug of the stop-cock that we have designed the lock forming the subject matter of this invention.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a side elevation of the adjacent ends of two brake-pipes provided with stop-cocks constructed in accordance with our invention, the intermediate coupling-hose and heads. Fig. 2 is a longitudinal sectional view enlarged of one of the cocks. Fig. 3 is a vertical transverse sectional view, the cock in both figures being shown as closed and locked. Fig. 4 is a detail in perspective of the turning plug. Fig. 5 is a similar view of the locking bolt or piston.

Like numerals of reference indicate like parts in all the figures of the drawings.

The stop-cock casing 1 is provided with the usual inlet and outlet ends, designated as 2 and 3, respectively, the latter being inclined as is usual for the purpose of coupling with the hose 4 which terminates in a coupling-head 5. To the inlet end leads a brake-pipe 6 which communicates with the brake-cylinder of the coach or car. The casing is provided between its extremities with a vertical conical bore 7, the lower end of which is enlarged and provided with an internal thread. In the bore there is mounted for rotation the turning-plug 9, the same being conical and adapted to fit snugly within the bore and above the same is provided with a rectangular head 10 having a rib 11 at one side. The plug is provided, furthermore, in its body portion with a transverse port 12, which, by rotation of the plug, may be thrown into alignment with the inlet and outlet openings, or by a quarter turn given thereto, may shut off communication between the inlet and outlet openings. The plug is maintained snugly in its position within the bore by means of a coiled spring 14, which is seated in a recess 15 formed in the upper side of a cap 16, which is externally threaded and located in the bot-

tom opening of the bore, and it is provided upon its under side with a polygonal boss or wrench seat 17, to facilitate adjustment and removal. The turning-plug is rotated through the medium of a removable handle 18, the same having a rectangular eye 19 provided with a groove that fits over the upper squared end of the plug and its rib. The under side of the handle has depending therefrom a lug 20, and the same operates between two stop shoulders 21 formed on the upper side of the casing and serves to indicate when the port in the plug is in or out of alignment with the inlet and outlet openings.

Thus far we have described merely the ordinary form of a stop-cock, which is open to the above described objection consisting in becoming turned through accident, ignorance, or malice, at the wrong time, and we have therefore provided a means for automatically locking the plug in either of its positions, such means, in the construction illustrated, consisting of a locking pin arranged to engage sockets in the turning-plug, and being actuated by the fluid pressure within the brake-pipe.

In communication with the interior of the casing (and hence with the brake-pipe to which the casing is connected) is a chamber, formed in the construction illustrated, by the cylinder 22, in the outer open end of which is threaded a plug 29 having a kerfed boss or projection 30. Communication is established between the interior of the casing and the said chamber by means of a port (or ports) 23, two of which are illustrated in the drawings to reduce the risk of communication being cut off by an accumulation of dust, oil, or other foreign matter.

A locking-pin 25 is mounted in a suitable guide opening in the inner end of the cylinder and is adapted to engage one of a pair of sockets 26 and 27 formed in the turning-plug. When the pin is in engagement with one of the sockets, the plug is locked in the open position and when in engagement with the other socket the plug is locked in its closed position. The locking-pin is provided at its outer end with a piston head 24 which operates in the chamber in communication with the brake-pipe, said chamber being represented as above described, at 22, and hence when the fluid in the brake pipe is under pressure, such pressure will be transmitted to the interior of the chamber and will hold the locking-pin in engagement with one of the sockets with which the turning plug is provided. Thus, the locking-pin which is concealed in the casing of the stop-cock, is actuated and held in its locking position by the pressure in the brake-pipe and cannot be moved from the position in which it has been placed during the continuance of the pressure in the brake-pipe.

It is desirable to provide means for disengaging the locking-pin from the turning-plug when the pressure in the brake-pipe is re-

duced or relieved entirely, and in the construction illustrated, we have shown a retracting device consisting of a spring 28 which is interposed between the piston head and the inner end of the chamber. The strength of this spring may be gaged to cause the retraction or disengagement of the locking-pin when the pressure in the brake-pipe has been reduced beyond a certain point, or it may be sufficiently light to necessitate the exhaust of the brake-pipe before the turning-plug will be released. Thus, before the admission of fluid under pressure to the brake-pipe the turning-plugs of the various stop-cocks are adjusted, those of the intermediate portion of the train being open, while that at the rear end of the last car or coach is closed, and when pressure is admitted to the brake-pipe it is transmitted to the various locking devices, and the pins are projected to engage the various sockets in alignment therewith. The parts retain these relative positions as long as the pressure in the brake-pipe is maintained, and in order to change the adjustment of one of the turning-plugs it is necessary to reduce the pressure in the brake pipe.

In order to prevent the locking-pin from being retracted by the spring 28 to such a point as to close the port 23, we employ a stop-stud 31 which limits the outward movement of the piston head.

It is obvious that our invention is susceptible of numerous modifications of construction and arrangement to suit different styles of stop-cocks used upon different brake systems, and that in thus adapting the device to its several uses various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention; and, therefore, we do not limit our invention to the precise construction herein shown and described, but hold that we may make such variations as may suggest themselves and be found necessary in practice within the scope of the skill of the ordinary mechanic familiar with this class of inventions.

Having described our invention, what we claim is—

1. In a brake system, the combination with a stop-cock having a turning-plug, of a locking device adapted to be thrown into engagement with the turning-plug through the medium of the pressure in the brake-pipe, substantially as specified.

2. In a brake system, the combination with a stop-cock having a turning-plug, of a concealed locking device seated in a cavity in the stop-cock casing and adapted to be thrown into engagement with the turning-plug through the medium of the pressure in the brake-pipe, substantially as specified.

3. In a brake system, the combination with a stop-cock having a turning-plug, of a locking device controlled by the fluid pressure in the brake-pipe, and means for disengaging

the locking device when the pressure is reduced, substantially as specified.

4. In a brake system, the combination with a stop-cock having a turning-plug, the latter being provided with spaced openings, of a locking bolt mounted for movement in the stop-cock casing and adapted at one end to engage either of said openings, the other end of said bolt being exposed to fluid pressure in the brake-pipe, and means for retracting the bolt upon the reduction of pressure in the brake-pipe, substantially as specified.

5. In a brake system, the combination with the stop-cock having a turning-plug, the latter having openings in line and at variance with its ports, of a cylinder arranged adjacent to the turning plug and communicating with its receiving bore, a piston head having a locking bolt arranged in the cylinder, means of communication between the cylinder in rear of the head of the piston and the brake-pipe, and means for retracting the piston and bolt when not influenced by the pressure thereagainst, substantially as specified.

6. In a brake system, the combination with the stop-cock having a plug-receiving bore, a turning-plug arranged therein, the latter provided with openings in line and at variance with its port, of a cylinder arranged in rear of the turning-plug and having a perforation at its inner end leading to the plug-receiving bore of the cock, a port formed in the side of

the cylinder and communicating with the air passage in the stop-cock near the outer end of the cylinder, a piston arranged in the cylinder in front of the port, a bolt carried by the head and located in the perforation in the inner end of the cylinder and adapted to engage the openings in the turning-plug as they are brought opposite the same, and a spring interposed between the piston and inner end of the cylinder for pressing the bolt outward when not otherwise influenced, substantially as specified.

7. In a brake system, the combination with the stop-cock having the bored plug provided in line and at variance with its port with openings, of a cylinder arranged on the inlet side of the stop-cock and having the outer threaded end, and an inner perforated bottom, a piston head and bolt arranged in the cylinder, a spring interposed between the head and bottom of the cylinder and encircling the bolt, a threaded cap seated in the outer end of the cylinder and provided with a stop-stud and its outer side with a kerfed stud, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

GEORGE M. TOWER.

THATCHER R. RICH.

Witnesses:

CHARLES C. WOODWORTH,
WILLIAM CAHILL.