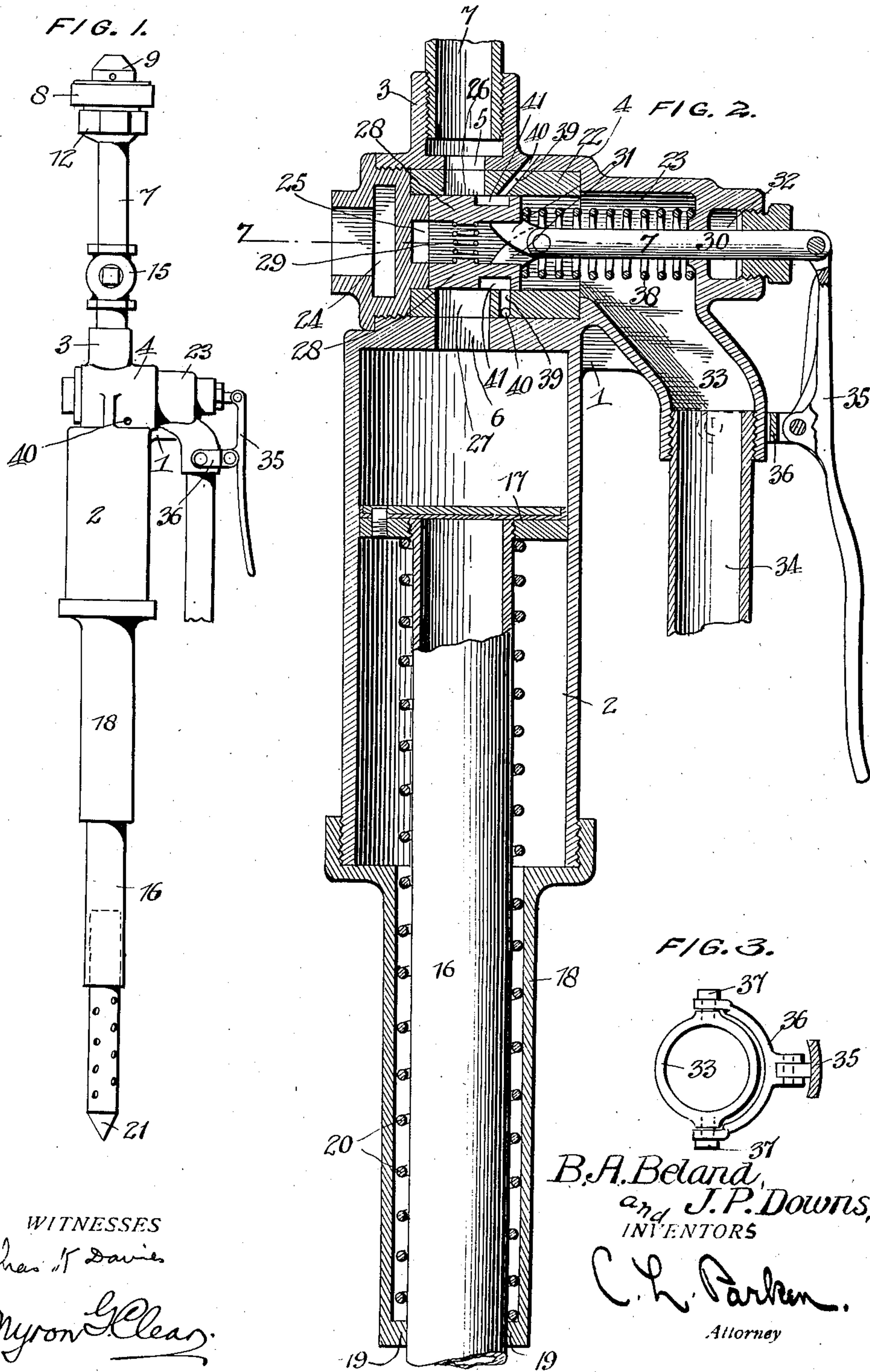


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BOILER FLUE CLEANER.
APPLICATION FILED DEC. 16, 1908.

929,377.

Patented July 27, 1909.
2 SHEETS—SHEET 1.



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BOILER FLUE CLEANER.

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F/G. 5.

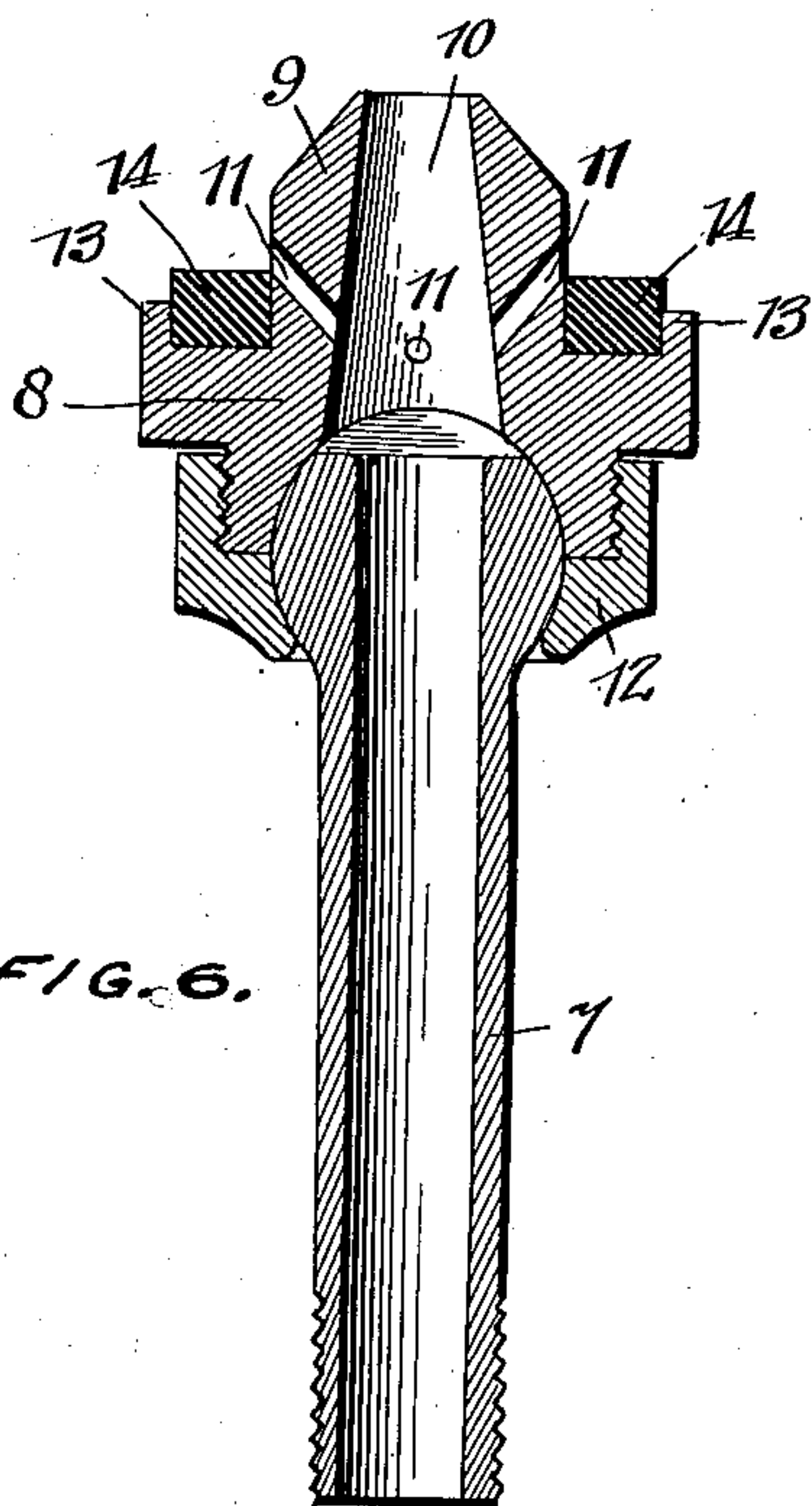
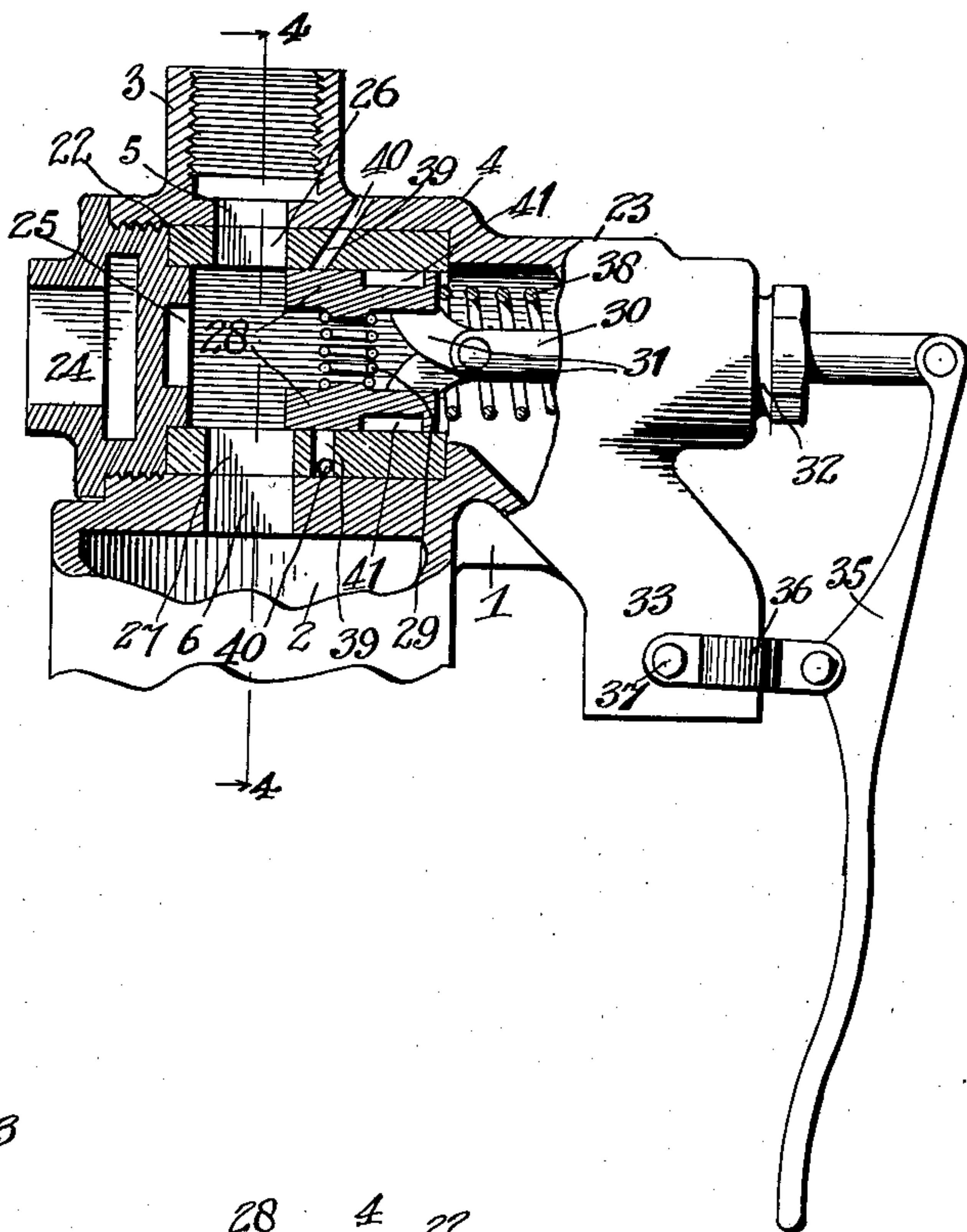
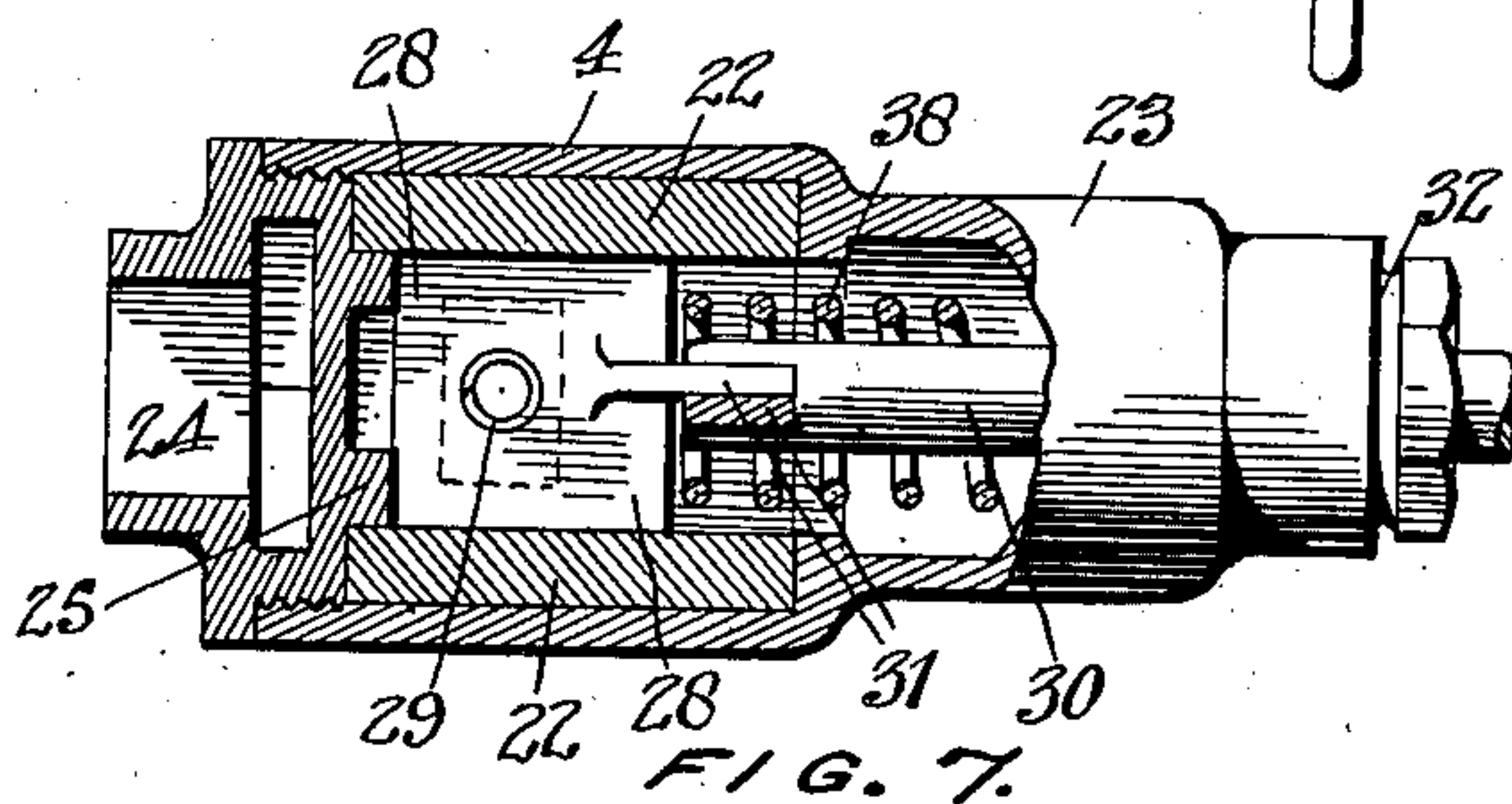


FIG. 6.



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UNITED STATES PATENT OFFICE.

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BOILER-FLUE CLEANER.

No. 929,377.

Specification of Letters Patent.

Patented July 27, 1909.

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To all whom it may concern:

Be it known that we, BENJAMIN A. BELAND and JAMES P. DOWNS, citizens of the United States, residing at Springfield, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Boiler-Flue Cleaners, of which the following is a specification.

Our invention relates to boiler flue cleaners, adapted more especially, for cleaning soot and fine coal-dust from locomotive boiler flues, and the object thereof is to provide a device formed to support itself when in operation, and simply constructed in order that all parts thereof may be readily accessible for the purpose of repair.

In the accompanying drawings, illustrating our invention, wherein like numerals are used to designate like parts throughout the several figures, Figure 1 is a side elevation of our improved device. Fig. 2 is a central vertical sectional view on an enlarged scale, taken through the body portion of our device. Fig. 3 is an end view of the branch inlet pipe, illustrating the connection of the operating lever thereto. Fig. 4 is a central vertical sectional view through a portion of the device shown in Fig. 2 taken at right angles thereto, and on the line 4—4 of Fig. 5. Fig. 5 is a similar view of a portion of Fig. 2, illustrating the valve open. Fig. 6 is a central longitudinal sectional view through the nozzle and its pipe, and, Fig. 7 is a transverse sectional view of our improved device, and that portion shown in Fig. 5.

In the practical embodiment of our invention, we provide a flue cleaner adapted to the use of steam, air, or water, and comprising a body portion 1, embodying in its length, longitudinally arranged tubular extensions 2 and 3, between which is located a central tubular portion 4. The inner ends of the tubular extensions 2 and 3 are provided with openings 5 and 6, respectively, opposite to one another and communicating with the exterior of the central tubular portion 4, said tubular extension 3, being in the form of an internally threaded nipple for the reception of the threaded end of a nozzle pipe 7, provided upon its opposite end with a circular enlargement to interfit the semi-circular socket in the end of the nozzle-head 8, having a central circular projection 9, adapted to enter the flue to be cleaned, and provided with a longitudinal bore 10 communicating with the end of the pipe 7, and with

branch openings 11, extending radially through the wall thereof from said bore 10. The nozzle-head 8 is further provided with a socket-nut 12, screwed thereon to engage rearwardly of the enlarged end of the pipe 10, and with a circular edged flange 13, concentrically surrounding its projection 9 in spaced relation to provide for the reception of a resilient gasket 14 to abut the end of the boiler flue when the projection 9 enters therein. The said nozzle pipe 7 may be provided with a reducing valve 15, as shown in Fig. 1, if the same is deemed necessary. The opposite tubular extension 2 is greatly enlarged in comparison with the aforementioned extension 3, and is in the form of a piston chamber for the reception of a piston having its rod 16 provided with a piston-head 17 upon its inner end within said chamber, and extending outwardly to the outer end of the same. The said extension 2 forming the piston chamber, is provided with an extension 18 threaded upon the outer end thereof, and provided upon its outer end with an external flange 19 closely surrounding the piston rod 16 and providing a shoulder against which one end of a coil spring 20 abuts, said spring surrounding said piston head 16 between the outer end of said socket tube 18 and its headed inner end 17.

The piston rod 16, extends outwardly through the outer end of the socket tube 18, and is provided with a sharpened or pointed outer end 21 for engagement with a suitable support, when the device has been longitudinally alined with the flue to be cleaned, and its nozzle head projected therein, to support the same in position, the said piston being operated to securely engage the support by the means employed to clean the flue, as will be hereinafter described.

The central tubular portion 4 of the body portion 1, is provided with a valve-holding sleeve 22, fitting therein, and a reduced tubular extension 23, against the inner end of which one end of said sleeve 22, abuts. The sleeve 22 is provided with a square bore, and is held in place by a cap nut 24 threadedly engaging within the end of the tubular portion 4 and provided with a reduced squared portion 25, engaging for a short distance within the square bore of said sleeve 22. The sleeve 22 is further provided with openings 26 and 27 respectively through diametrically opposite points thereof, and communicating with the openings 5 and 6

through the inner ends of the tubular body extensions 2 and 3, and is adapted to receive relatively flat valve casings 28, pressed apart and against the faces of its bore, through which said openings 26 and 27 are connected by means of an intermediate coil spring 29, and operated by a valve stem 30 connected thereto by connecting links 31, and extending axially through the tubular extension 23, and outwardly through a fluid-tight gland 32, at the end thereof. The tubular extension 23, of the central tubular portion 4, is provided with an angular inlet extension 33, threaded for the reception of the inlet pipe 34, leading from a suitable source to convey steam, air, water or other cleansing liquids thereto. The valve pieces 28 are controlled in each movement to close, or open connection between the inlet 33 and the tubular extensions 2 and 3, by means of a lever 35, pivotally connected at its end to the outer end of said valve stem, and centrally pivotally mounted upon a yoke arm 36, partially surrounding the angular inlet extension 33, and having its end secured thereto by bolts 37, as shown particularly in Fig. 3. Thus, by rocking the free end of the lever 35, toward the inlet pipe 34, the valve stem 30 will be reciprocated outwardly, to draw the valve pieces 28 away from the openings 26 and 27 of their sleeve 22, while upon release of said lever, said valve will be moved in the opposite direction, to the position shown in Fig. 2 by means of a coil spring 38, extending between the same and the gland 32 and surrounding said valve stem. Thus, when the valve pieces 28 are moved away from the openings 27 of the sleeve 22, the cleansing fluid is admitted therebetween and through said openings and into the tubular extensions 2 and 3 of the body 1. The body 1 having first been placed in alinement with the tube to be cleaned, and in such position that the nozzle-head-extension 9 enters therein, and a suitable support having been placed slightly to the rear of the sharpened end 21, of the piston-head 16, the valve is opened as just described, and the cleansing fluid at once enters both the nozzle pipe 7, and the piston-chamber formed by the tubular extension 2, forcing the piston-head 17 and its rod 16 outwardly until the pointed end 21 thereof, firmly engages the support placed to receive the same, thus rigidly maintaining the device in its alined position between the end of the flue being cleaned, and the said support. It will be understood that the cleansing fluid admitted within the nozzle pipe 7, will be juttred through the nozzle-head openings 10 and 11.

In order that the device may be removed from the flue after the same has been cleaned, it is necessary that the pressure within the tubular extension 2, be reduced to atmosphere, to allow the spring 20 to force the

piston-head inwardly and withdraw the sharpened end 21 of the rod 16, away from its support. To accomplish this, we provide the valve sleeve 22 with a plurality of transverse openings 39, extending through its wall and communicating with openings 40 leading through the wall of the central tubular portion 4. We also provide the valve pieces 28 with cut out portions 41 in their outer faces, adapted to register and open communication between the said openings 39, and the openings 26 and 27 of the valve sleeve 22, when said valve pieces 28 are in the closed position as shown in Fig. 2, to allow the pressure within the tubular extension 2, and within the nozzle pipe and the clean flue, to escape to the atmosphere.

Having described our invention, we claim:

1. In a flue cleaner of the character described, a body portion for longitudinal alinement with the flue to be cleaned, a nozzle carried at one end thereof, and communicating therewith, a longitudinally movable piston mounted in the opposite end of said body and having a pointed rod extending outwardly therefrom, means communicating with said body between said nozzle and said piston, to convey a cleansing liquid thereto, means to cut off communication between said body and said nozzle and piston, and means for operating said last named means for reducing the pressure upon said piston and said nozzle when the communication therewith is cut off, substantially as described.

2. In a flue cleaner of the character described, the combination of a body portion comprising a central valve casing provided with an inlet for the reception of the cleansing fluid, and having concentric tubular extensions from opposite sides thereof, provided with openings at their inner ends, communicating therewith, a nozzle secured to one of said extensions, a piston mounted within the other of said extensions, and provided with a rod extending outwardly through the outer end thereof, for engagement with a suitable support, said valve casing having openings through its wall, and a valve slidably mounted within said casing to close said communication openings, and provided with cut out portions to register between said communicating openings and said casing openings, when the same are closed, to reduce the pressure within said extensions, substantially as described.

In testimony whereof we affix our signatures in presence of witnesses.

BENJAMIN A. BELAND.
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Witnesses:

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