

(No Model.)

G. D. HARRIS.
FLUID PRESSURE FLUE CLEANER.

No. 581,231.

Patented Apr. 20, 1897.

Fig. 4.

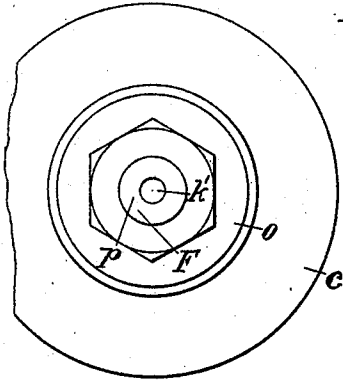


Fig. 1.

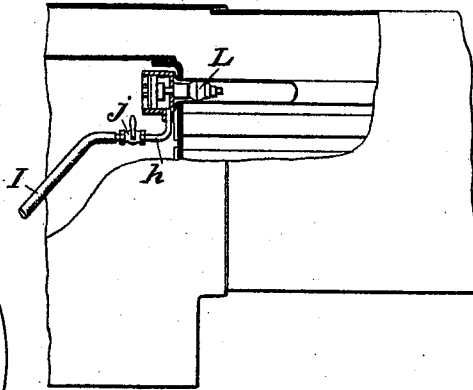


Fig. 2.

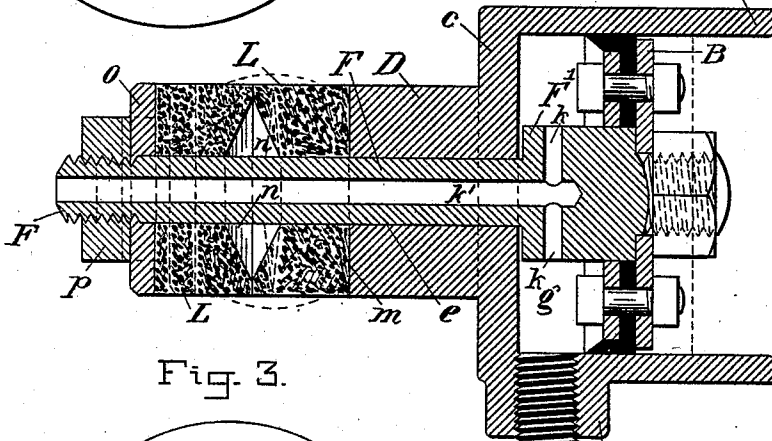
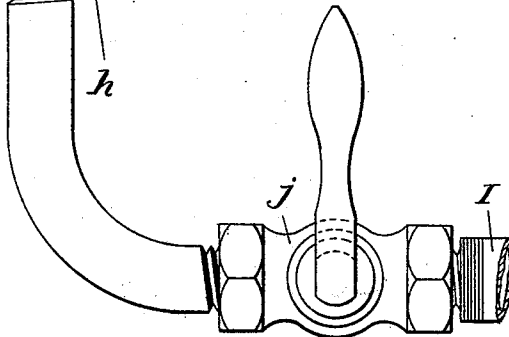
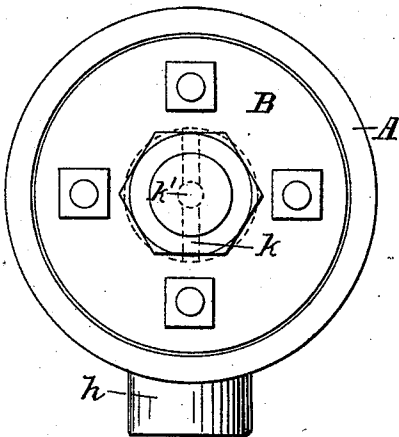


Fig. 3.



WITNESSES:

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GEORGE D. HARRIS, OF RALEIGH, NORTH CAROLINA, ASSIGNOR OF ONE-HALF TO DAVID M. KING, OF SAME PLACE.

FLUID-PRESSURE FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 581,231, dated April 20, 1897.

Application filed January 22, 1897. Serial No. 620,207. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. HARRIS, a citizen of the United States, residing at Raleigh, in the county of Wake and State of North Carolina, have invented certain new and useful Improvements in Fluid-Pressure Flue-Cleaners, of which the following is a specification.

This invention relates to a new and improved flue-cleaner.

The object of the invention is to provide a device with an expanding nozzle that may be inserted in a tube or flue and quickly made tight therein by expansion through the agency of fluid-pressure, and then the utilization of the same fluid-pressure for creating a blast through the tube or flue.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of part of a boiler with flues and showing the improved device applied to one of the flues. Fig. 2 is a sectional view of the improved flue-cleaner, and Figs. 3 and 4 are end views of same.

The letter A designates a cylinder containing a piston B or its equivalent, a diaphragm. The cylinder is closed at one end *c*, and from this end a nozzle D projects. A passage *e* extends longitudinally through the center of the nozzle and a tubular piston-stem F fits in said passage and is movable lengthwise thereof. This stem has an enlargement or abutment F' where it adjoins the piston, the abutment being in the cylinder and not capable of entering the said passage. The abutment normally seats against the closed end *c* of the cylinder and thereby an open space *g* is maintained between said closed end and the piston B. An inlet connection *h* for a pipe or hose is formed on the cylinder to provide for the entrance of steam or compressed air into the said open space *g*. A hose I is attached to the inlet connection *h* and has a valve *j* for controlling the flow of fluid-pressure, either steam or air. The abutment has passages *k*, which open into the space *g* and communicate with a central passage *k'*, extending entirely through the stem F. It will thus be seen that a blast of fluid under pressure may enter the cylinder-space *g* and thence flow through passages *k* and *k'* into the flue to be cleaned.

I provide on the nozzle D an expanding part, which will be expanded by the fluid-pressure in the cylinder-space acting on the piston B and drawing the piston-stem F. In the form shown in the drawings two rubber washers L are employed, which surround the stem F. Each washer has a flat side *m* and a concaved side *n*. The two washers are in contact at their rims, the concaved sides confronting each other and forming a cavity. The flat side *m* of one washer is backed against the metal part of nozzle D, and a metal washer *o* is on the flat side *m* of the other rubber washer. A nut *p*, screwed on the end of the stem F, presses against the said metal washer.

The capacity or size of the passage *k*, which gives the blast, is relatively much less than that of the inlet connection *h*. Consequently the fluid-pressure will accumulate in the cylinder-space *g* and will act with full effect on the piston B.

It will now be seen that when fluid-pressure is admitted to the cylinder the piston B will be forced outward and thereby draw the stem F, which will compress the two rubber washers and cause them to expand and bulge, as indicated by broken lines, and so fill a flue and form a tight joint therein. At the same time the same fluid-pressure will pass through the tubular stem and discharge as a blast, which will blow the dirt out of the opposite end of the flue.

Having thus described my invention, what I claim is—

1. In a device for cleaning flues, the combination of an expanding-nozzle; a cylinder attached to said nozzle and having a piston connected with the expansion part of said nozzle; a tubular stem through the nozzle; and an inlet into the cylinder to admit fluid-pressure to the stem side of said piston, whereby the fluid-pressure will move the piston and expand the nozzle to cause it to fit tightly into a flue or tube.

2. The combination of a cylinder having a piston and an inlet connection; a nozzle attached to the cylinder; a tubular stem connected with the piston and extending through the nozzle; and a rubber washer surrounding the said stem and backed against the nozzle,

whereby when fluid-pressure is admitted to the cylinder the stem will be drawn and the rubber washer bulged or expanded to make a tight joint in the flue or tube.

5 3. The combination of a cylinder having a piston and an inlet connection; a nozzle attached to the cylinder; a tubular stem connected with the piston and extending through the nozzle; and two rubber washers surrounding the stem each washer having a concaved side and the two concaved sides confronting each other, as set forth.

10 4. The combination of a cylinder having a piston and an inlet connection; a nozzle at-

tached to the cylinder and having an expanding part, which is connected with said piston; and a nozzle-passage for fluid-pressure which leads from the cylinder, said passage having a capacity or size which is less than that of the said inlet connection of the cylinder, as set forth. 15 20

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE D. HARRIS.

Witnesses:

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A. W. DYE.