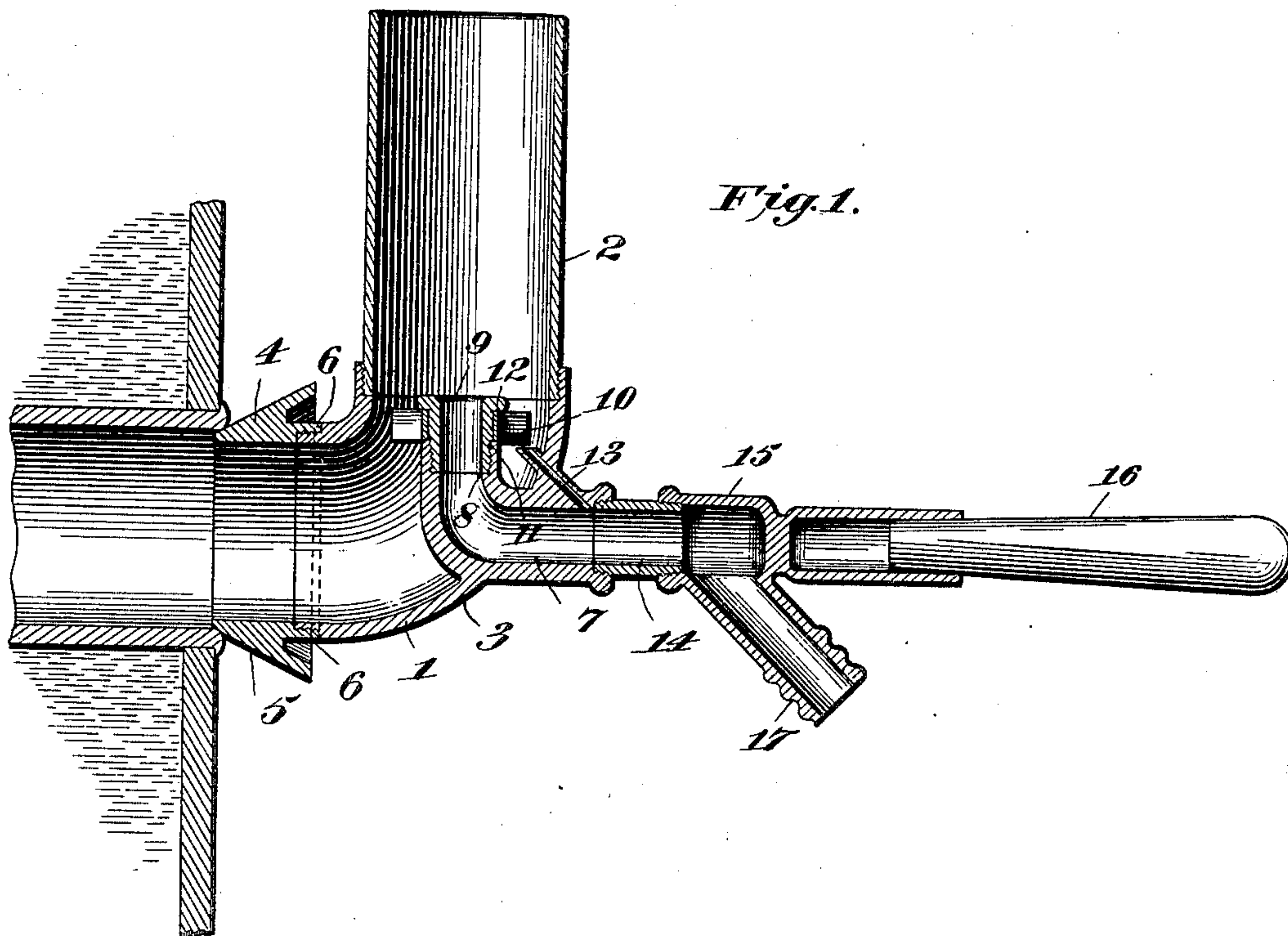


No. 681,854.

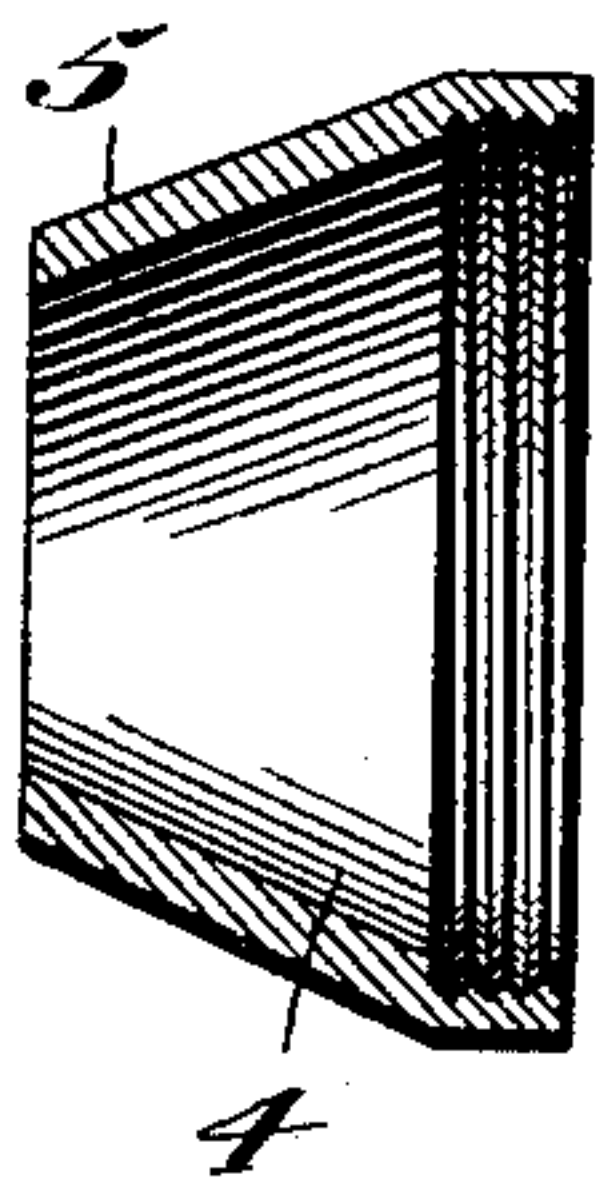
Patented Sept. 3, 1901.

W. H. HOWE.  
BOILER FLUE CLEANER.  
(Application filed May 16, 1901.)

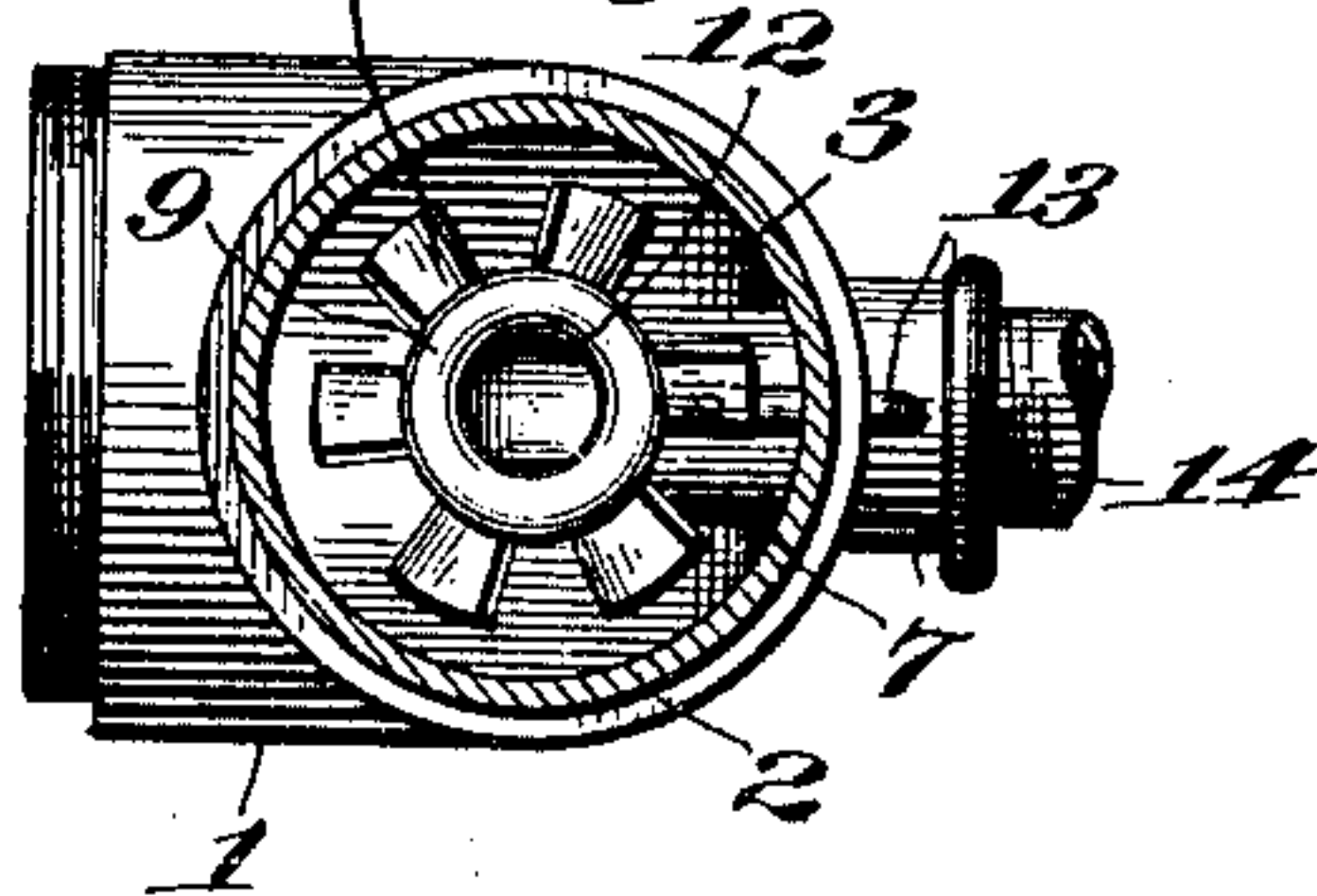
(No Model.)



*Fig. 2.*



*Fig. 3.*



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM H. HOWE, OF TOLEDO, OHIO.

## BOILER-FLUE CLEANER.

SPECIFICATION forming part of Letters Patent No. 681,854, dated September 3, 1901.

Application filed May 16, 1901. Serial No. 60,489. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. HOWE, a citizen of the United States of America, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Boiler-Flue Cleaners, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to improvements in boiler-flue cleaners of the type shown in Letters Patent No. 566,763, issued September 1, 1896; and it consists in certain novel features hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical section of the improved flue-cleaner in its operative position, and Fig. 2 is a detail sectional view of a different form of nozzle-ring from that shown in Fig. 1.

In carrying out my present invention I employ an elbow 1, to the upper end of which I secure the vertical discharge-tube 2, as clearly shown. This elbow is formed on an arc of a circle, so that its under side 3 will be curved and free of angles, and consequently the soot and other impurities drawn from the tubes of the boiler cannot find lodgment therein, but will be positively carried out through the discharge-tube. To the side end of the elbow I secure a nozzle-ring 4, having a beveled outer face 5, adapted to fit in the end of the flue, as shown in Fig. 1. This ring is secured to the elbow by screw-threads, so that it may be readily removed, and I provide a number of rings of different sizes, so that the device may be easily fitted with a ring which will accurately fit in the boiler-flue. The smaller rings have the threads formed on their inner annular surfaces; but the larger rings are formed with internal ribs or flanges 6 to receive the threads and extend beyond the said ribs, this construction being lighter than if the wall were solid.

Formed integral with the elbow 1 and entering through the curved wall of the same is a jet-nozzle 7, which is turned upward within the elbow and has its end in axial alinement with the discharge-tube. This inner end of the jet-nozzle is provided with an

internal annular shoulder 8 and is internally threaded above said shoulder, so as to receive and hold a nipple 9, on which is mounted a wheel or rotary stirrer 10. The nipple is provided with an external annular shoulder 11, adapted to impinge upon the upper end of the jet-nozzle, and thereby prevent the nipple being drawn down so tight as to prevent the rotation of the wheel, and at its upper end it is provided with a second annular shoulder 12, which holds the wheel in place. Formed integral with the jet-nozzle and extending from the upper side of the same at an angle is a small tube 13, which terminates adjacent to the said wheel and is adapted to throw a needle-jet of steam against the same, so as to rotate it. In the outer end of the jet-nozzle is secured a coupling 14, to the outer end of which is secured a union 15, having its outer end closed by a handle 16. From the lower side of the union and extending outward is a nipple 17, on which is fitted the end of a hose or other pipe leading to the steam-chest or other source of steam-supply.

In the operation of the device steam is admitted to the jet-nozzle from the hose and escaping into the discharge-pipe passes out through the same and the smoke-stack of the boiler-furnace with such force and speed as to create a partial vacuum in the discharge-pipe around the jet-nozzle and the end of the flue. A suction is thus created which will draw all soot and other impurities from the flue into and up through the discharge-pipe. The shape of the elbow is such that the soot cannot collect therein, and the fan or wheel on the end of the jet-nozzle will by its rotation serve to break up the soot and create a current which will carry it out through the discharge-pipe.

By the use of the interchangeable rings with beveled faces I am enabled to use the same cleaner on tubes or flues of various diameters, the beveled faces providing for a limited range of adjustment and further adjustment being accomplished by the substitution of a larger or smaller ring. The outer faces of all the rings are smooth and unbroken, so that when a ring is fitted in the end of the flue it will entirely close the same, and consequently when the cleaner is in op-



eration the draft will be entirely through the discharge-pipe and cannot be divided. Therefore all matter drawn from the flue must necessarily pass through the discharge-pipe and none of it can escape around the sides of the ring. The end of the jet-nozzle and the wheel thereon are about in the same horizontal plane as the nozzle-ring. Were they carried up into the discharge-pipe they would lose their effectiveness, as greater difficulty would be experienced in creating the vacuum necessary to the successful operation of the cleaner.

The device is very simple and broken parts can be easily replaced without necessitating the procurement of an entire cleaner.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a boiler-flue cleaner, the combination with the discharge-tube, of a jet-nozzle ar-

ranged in axial alinement therewith and having a rotary wheel mounted on its end.

2. In a boiler-flue cleaner, the combination with the discharge-tube, of a jet-nozzle arranged in axial alinement therewith, a nipple secured in the end of the jet-nozzle, and a wheel rotatably mounted on said nipple.

3. In a boiler-flue cleaner, the combination with the discharge-tube, of a jet-nozzle arranged in axial alinement therewith, a rotary wheel mounted on the end of the jet-nozzle, and a tube leading from the jet-nozzle and terminating adjacent to the said wheel.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. HOWE.

Witnesses:

CHAS. S. NORTHUP,  
ALONZO G. DUER.