(No Model.)

E. M. HOLDEN.

TUBE AND FLUE CLEANER.

No. 599,840. Patented Mar. 1, 1898.

Fig. 1

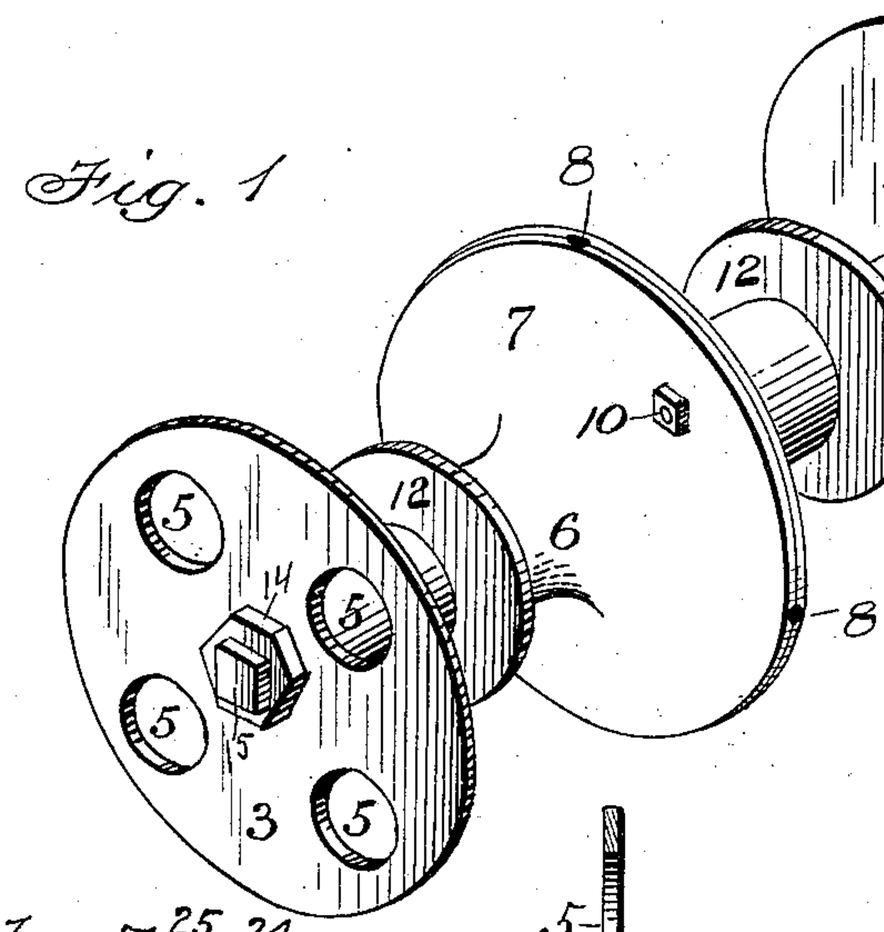


Fig. 3.

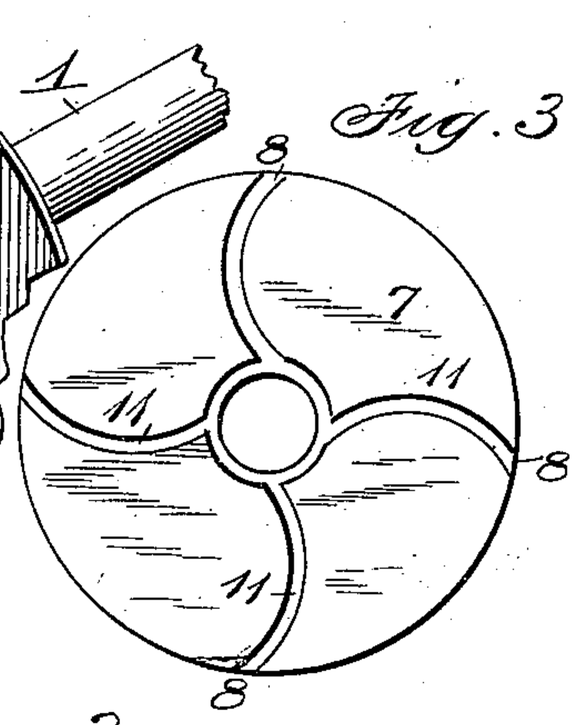


Fig. 2

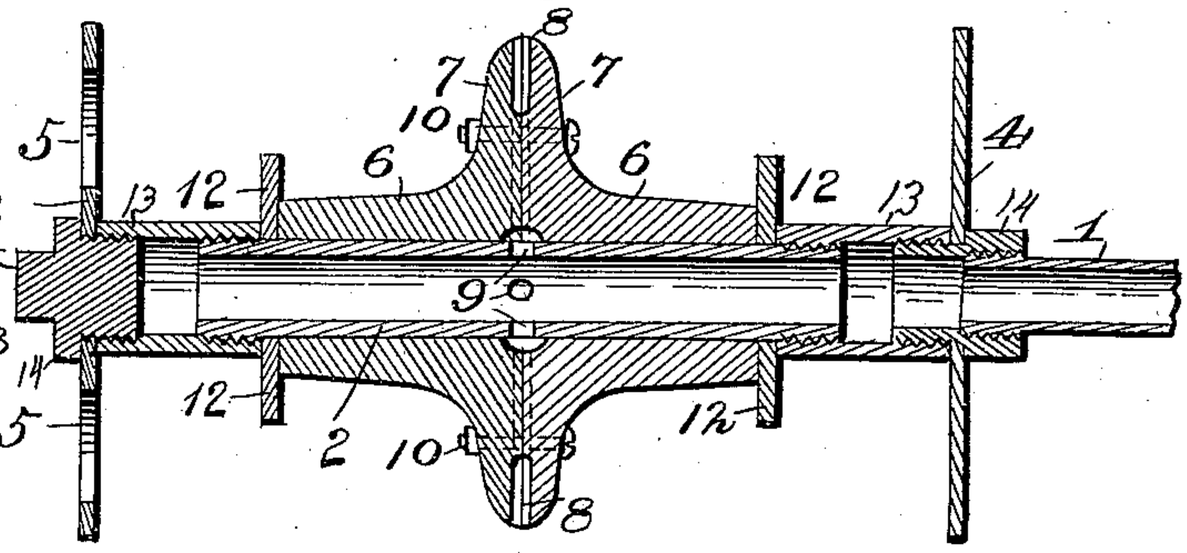


Fig. 7

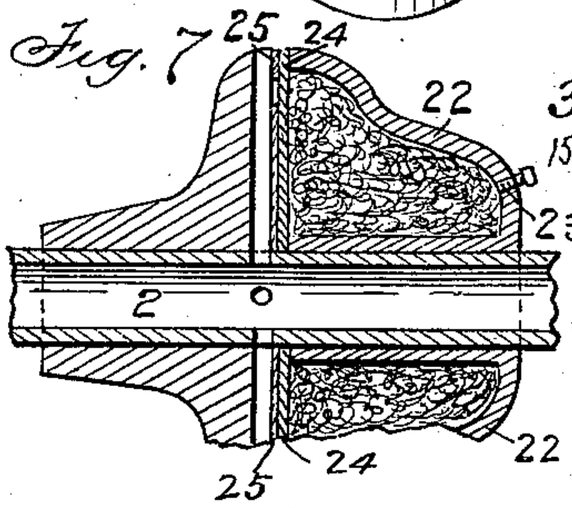


Fig. 4

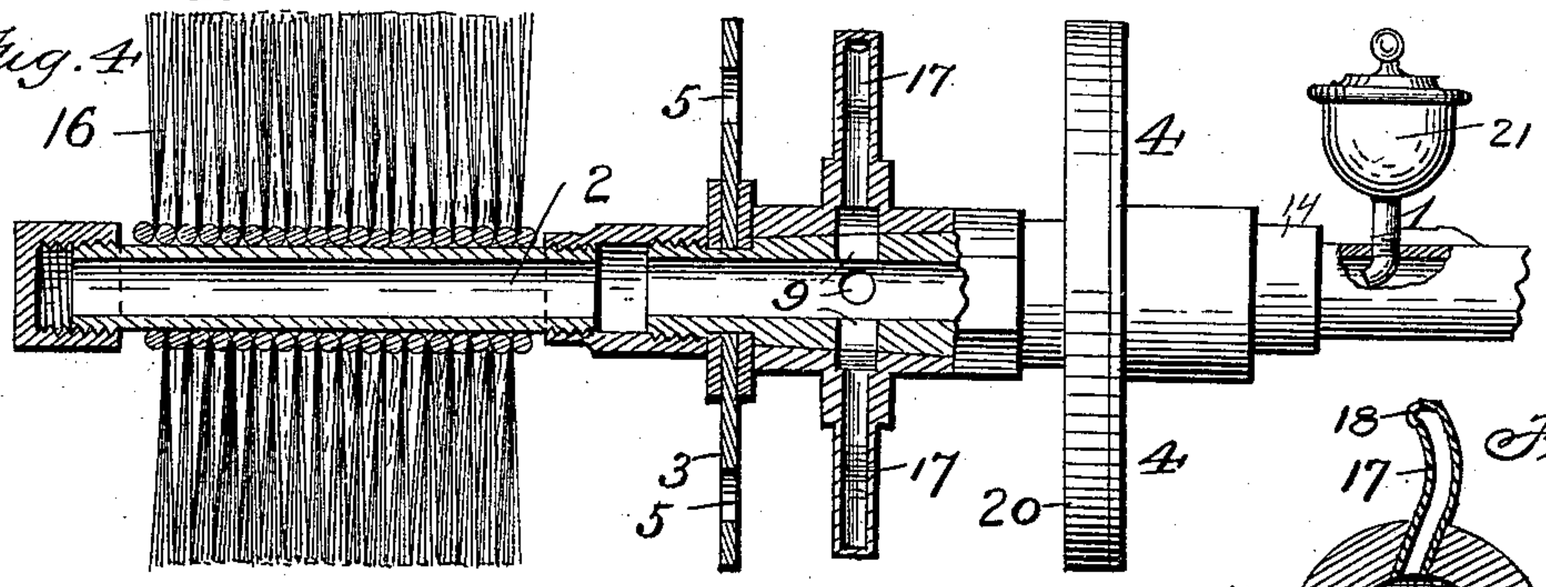


Fig. 5.

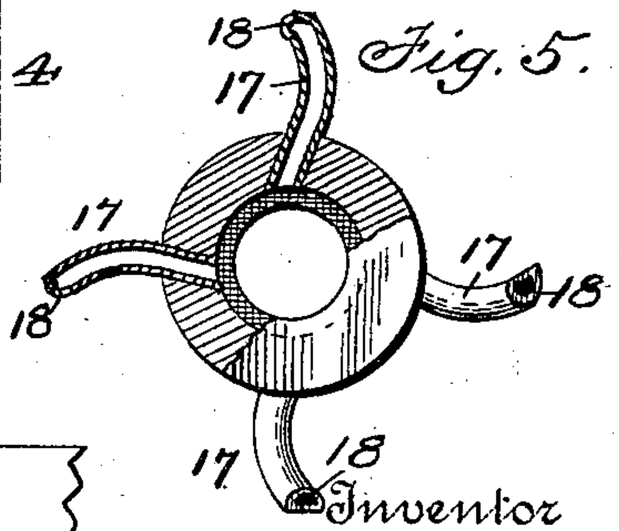
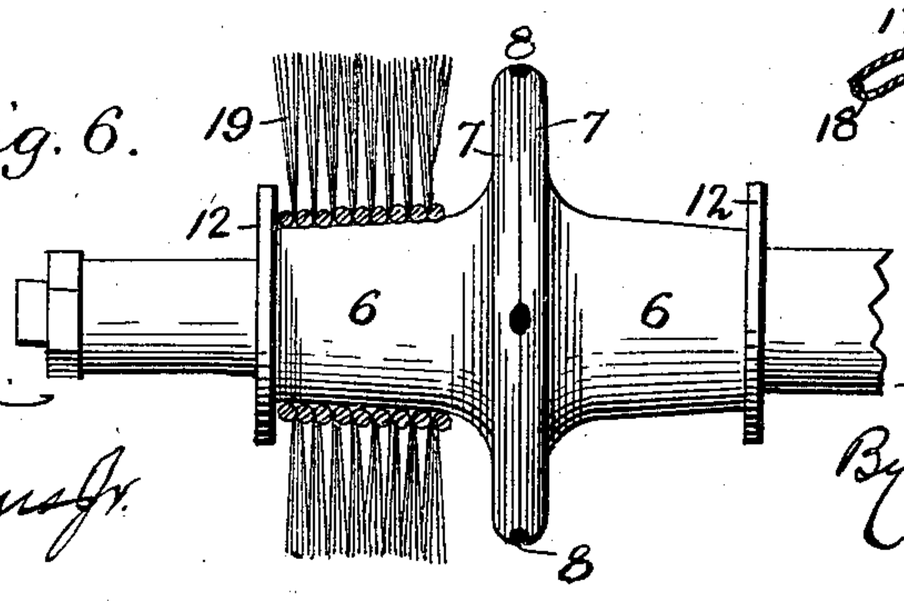


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TUBE AND FLUE CLEANER.

SPECIFICATION forming part of Letters Patent No. 599,840, dated March 1, 1898.

Application filed May 28, 1897. Serial No. 638,534. (No model.)

To all whom it may concern:

Be it known that I, ERNEST M. HOLDEN, a citizen of the United States, residing at Orlando, in the county of Orange and State of Florida, have invented certain new and useful Improvements in Tube and Flue Cleaners; and I do declare the following to be a full, clear, and exact description of the invention, such 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, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to tube and flue cleaners, and especially to that class in which a jet of steam is employed in connection with scrapers; and it has for its object to produce a device that will be simple, durable, and efficient; and it consists in the improved construction of parts of the same, as will be hereinafter more particularly set forth.

Referring to the accompanying drawings, in which the same reference-numeral indicates the same part in each of the figures in which it occurs, Figure 1 is a perspective view of one form of a cleaner embodying my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a face view of one of the parts. Fig. 4 is a longitudinal sectional view of another form of cleaner embodying my invention. Fig. 5 is a sectional view of one of the parts of the same. Fig. 6 shows a brush arranged to rotate with the hub, and Fig. 7 is a broken detail view of a modification.

Referring more particularly to the drawings, 1 indicates a hollow shaft or handle, which may be made of any suitable length or size for the insertion of the cleaner into the flue to be cleaned, and to the inner end of which the cleaner is connected.

2 is the main shaft of the cleaner, which has its outer end closed in any suitable manner to prevent the escape of the steam and also to support the operative parts of the cleaner. Two disks 3 and 4 are mounted upon the shaft in such manner as to support the shaft substantially axially within the tube. For this purpose the disks must be made of such diameter as to fit rather loosely within the tube, so that the cleaner may be moved from end to end of the flue as it is being cleaned. I have shown the disks as consisting of thin material, preferably metal, with the front one formed open, as by providing it with holes or openings 5; but they could be made expansible in any desired manner; but as this forms no part of the invention I have not shown it. Journaled upon the shaft between these two disks is a cylindrical body or hub 6, with a circular flange 7 of slightly less diameter than the diameter of the disks. Extending from the center to the periphery of this flange are a series of openings or channels 8, through which steam passes from perforations 9 in the shaft 2. The flange is uncovered or exposed and travels adjacent to the interior of the flue, and the openings of the channels are arranged tangentially to the periphery of the flange, so that as the steam escapes therefrom it will cause the hub to rotate, and the escaping steam will strike or impinge against the inner surface of the tube being cleaned in such manner as to dislodge any soot or material that has not been loosened by the disks. As the steam escapes at a high pressure and as the channels in the flange are preferably curved throughout their length, the hub is given a very rapid rotation, with the steam-jet very close to the interior of the flues.

The hub may be formed in two parts, each of which is provided with a flange and joining them together, as with bolts 10, so that the contiguous or adjacent faces will be perfectly smooth and form a steam-tight joint between them. By providing the flat faces each with a series of grooves 11 and placing them together so that the grooves of the two faces register with each other the channels 8 are formed, which lead from the openings 9 in the shaft 2 to the periphery of the flange. By making the hub of a sufficient length and placing a washer 12 at each end the escape of the steam around the hub is virtually prevented.

Stops or shoulders are formed on the ends of the shaft 2 to hold the hub in place. One very cheap and efficient means of doing this is by means of the couplings 13, against the outer ends of which the disks 3 and 4 are jour-

naled, as by means of the hollow shouldered nuts 14, the outer one of which is closed by a plug 15, while the inner one connects the device with the end of the handle 1.

If desired, a clearer, as an ordinary brush 16, may be located in front of the front disk, and the hub may be provided with hollow curved arms 17, the tips of which are each provided with an opening 18 to the rear, so that it will operate in the same manner as heretofore described, or a tool, as a brush 19, may be connected directly to the hub in front of the flange, so as to be rotated thereby. A sheet of packing 20, of any desired material, may be located in front of the rear disk to assist in preventing the escape of the steam to the rear as the device is being operated.

In operation the tube or handle 1 is connected with a steam-supply in any desired manner and the instrument is projected into and pushed through the tube to be cleaned. As the cleaner advances the front disk or brush will loosen the accumulated soot, and the jet of steam escaping from the hub will instantly force it out and expel it at the end of the tube.

As the parts of my cleaner are all very simple and can be assembled or separated by any mechanic or engineer, it is evident that the cleaner can be cheaply constructed, and in case of accident it can be quickly repaired.

When it is desired to oil the interior of the tubes or flues for the purpose of loosening the scale and preventing the formation of additional scale, I prefer to provide my invention with means for depositing a thin coating of oil upon the interior of the flues or tubes as they are being cleaned. For this purpose a small-sized oil-cup or lubricator 21 may be connected with the end of the shaft 1, with its nozzle or spout projecting into the interior of the shaft in such manner that the passage of the steam will carry the oil with it and force it out through the openings 8, whereby it will be deposited upon the interior of the tube or flue in a thin skin or film. The oiler may be small enough to be passed into the tube with the cleaner; but where this is not possible it may be connected with the shaft at such a distance from the cleaner that the cleaner may be passed entirely through the flue without having the oiler interfere with the end of the flue through which the cleaner is introduced.

Instead of providing a separate oil-chamber one of the disks may be provided with a cavity 22 upon its inner face, into which oil may be introduced through an opening 23, and the face of the other disk may be provided with the channels for the escape of the steam. A piece of canvas 24 is clamped tightly over the cavity 22 by means of a thin metallic disk 25. Openings may be made in the packing opposite the grooves in the other disk, so that the oil may be thrown into the mouths of the channels and conveyed from there to the surface of the tube by the escaping steam in the same manner as though the oil had entered the shaft 1, or it may escape through the canvas and be thrown against the interior of the tube by centrifugal force.

If desired, ordinary stuffing-boxes may be provided at the ends of the hubs of the disks instead of the washers to prevent the escape of the steam and oil, and, if desired, ordinary ball-bearings may be also introduced at the ends of the hubs to prevent friction in the well-known manner.

Having thus described my invention, I claim—

1. In a flue-cleaner, the combination with a tube provided with means for passing it through a flue and for removing soot or other deposits, of a support thereon, an exposed or uncovered rotary body mounted on the tube, said rotary body being provided with radial passages communicating with the tube and having their exits adjacent and tangential to the interior of the flue, whereby the escape of the steam rotates the body and cleans the flue, substantially as set forth.

2. In a flue-cleaner, the combination, with a tube provided with means for passing it through a flue and for removing soot or other deposit, of a support thereon, an exposed or uncovered rotary body mounted on the tube, the front of which is provided with a tool, said rotary body being also provided with radial passages communicating with the tube and having their exits adjacent and tangential to the interior of the flue, whereby the escape of the steam rotates the body and cleans the flue, substantially as set forth.

3. In a flue-cleaner, the combination, with a perforated tube, of disks thereon, the front one of which is open, and a hub journaled upon the tube and provided with channels, the inner ends of which channels register with the openings in the tube, and the exits of which are at a tangent to the periphery, substantially as set forth.

4. In a flue-cleaner, the combination, with a perforated tube, one end of which is closed, of disks thereon the front one of which is open, a two-part hub journaled between the disks, the adjacent faces of said hub being provided with curved channels, the inner ends of which channels register with the perforations in the tube, and the exits of which are at a tangent to the periphery, and a washer at each end of the hub, substantially as set forth.

5. In a flue-cleaner, the combination, with a perforated tube, of a support thereon, a hub on the tube in front of the support provided with radial openings, the inner ends of which register with the perforations in the tube, and a brush secured to the hub in front of said openings, substantially as set forth.

6. In a flue-cleaner, the combination, with a perforated tube, the outer end of which is closed, and provided with a cylindrical brush,

of a support on the tube, and a body rotatably secured upon the shaft between the support and the brush, said body being provided with channels, the inner ends of which register with the perforations of the tube and the outer ends are arranged tangentially, substantially as set forth.

7. In a flue-cleaner, the combination, with a tube, each end of which is screw-threaded, and the intermediate portion is perforated, of a coupler at each end of the tube, a nut in each coupler, one of which is hollow, a disk between the head of the nut and the coupler, and a body rotatably secured upon the shaft between the inner ends of the couplers, said body being provided with a flange, said flange being provided with channels, the inner ends of which register with the perforations in the tube, and the outer ends are tangential, substantially as set forth.

8. In a flue-cleaner, the combination, with a body provided with means for passing it through the flue, of a support and a rotary body mounted thereon, said body being provided with passages communicating with the tube and having their exits arranged tangentially, an oil-reservoir, and means for delivering the oil from the reservoir to the exits, substantially as set forth.

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

ERNEST M. HOLDEN.

Witnesses:
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J. L. BRYAN.