No. 636,333. Patented Nov. 7, 1899.

W. GUETHLER.

BOILER TUBE CLEANER.

(Application filed June 14, 1899.)

(No Model.)

Fig. 1.

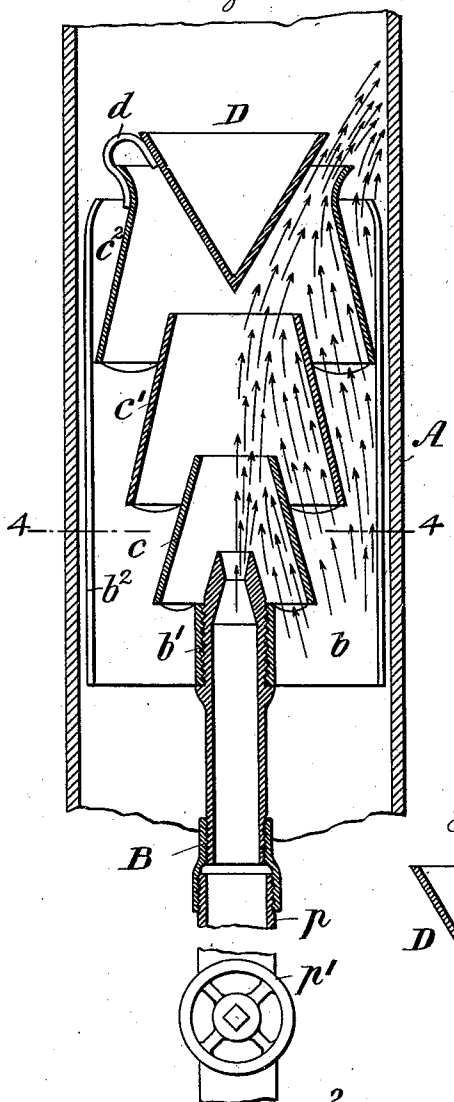


Fig. 2.

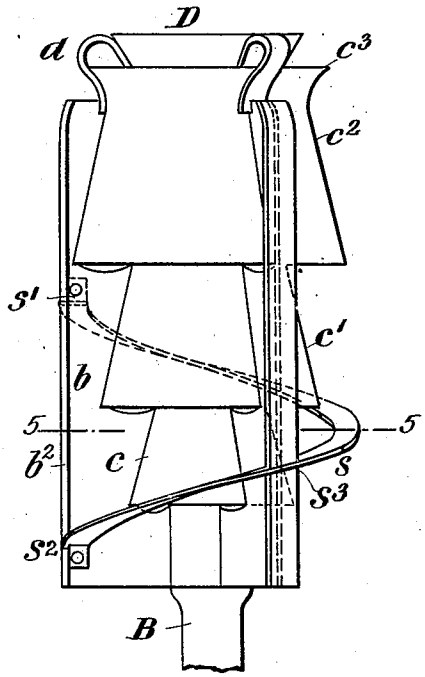


Fig. 3.

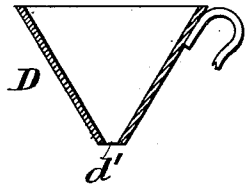


Fig. 4.

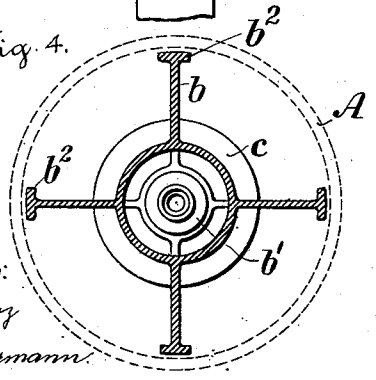
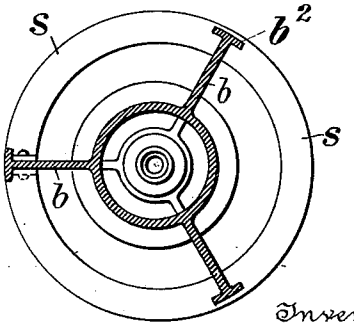


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM GUETHLER, OF PHILADELPHIA, PENNSYLVANIA.

BOILER-TUBE CLEANER.

SPECIFICATION forming part of Letters Patent No. 636,333, dated November 7, 1899.

Application filed June 14, 1899. Serial No. 720,585. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GUETHLER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Boiler-Tube Cleaners, of which the following is a specification.

My invention relates to boiler-tube cleaners in which steam is employed to remove the soot or other deposit from the interior of tubes, flues, &c.; and the object of my invention is to so construct a boiler-tube cleaner as that steam and air in suitable quantities are admitted into a tube to be cleaned and directed against the interior of said tube for its whole length—*i. e.*, the cleaner forcing the steam and air against the interior of the tube is moved into the tube any desired distance.

My improved cleaner consists of a series of frustrated hollow cones secured together and to a skeleton frame comprising a steam-supply pipe as center and two or more radiating-ribs, the whole forming a blower, and an inverted cone to direct the blast of steam and air against the interior of the tube under a suitable angle; and my invention further consists of the improvements hereinafter more fully described, and pointed out in the claims.

My invention will be more fully understood when taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a longitudinal section of my improved cleaner, showing the blower, the inverted blast-directing cone, and the tube to be cleaned. Fig. 2 is an elevation of the improved cleaner, showing a scraper which may be attached to the circumference of the device. Fig. 3 is a view of the inverted blast-directing cone with an opening at its apex to admit steam directly into the tube to be cleaned and to avoid a partial vacuum in front of the cleaner. Fig. 4 is a cross-section on the line 4 4 of Fig. 1, and Fig. 5 is a cross-section on the line 5 5 of Fig. 2.

Referring now to the drawings for a further description of my invention, A is the tube or flue to be cleaned.

B is the steam-pipe, of any desired length, of my improved cleaner, to which the radial ribs *b* are secured at *b'*.

c, *c'*, and c^2 are frustrated hollow cones gradually increasing in size, as shown, and secured to or formed integral with the ribs *b*. The largest of the cones c^2 is provided with an upper rounded-off edge c^3 for the purpose of forming a suitable outlet for the steam and air.

D is an inverted cone held by lugs *d* to the upper cone c^2, and this cone D is provided to direct the steam and air against the interior of the tube A, in order to loosen and remove the soot or other matter collected therein. If desired, the apex of the inverted cone D may be provided with an opening *d'*, as shown in Fig. 3, to allow steam to enter the tube A directly in order to avoid partial vacuum in front of the cleaner when the same is being operated. The radial ribs *b* are of such width as that they form guides b^2 for the cleaner—*i. e.*, they are so proportioned as that the cleaner can be readily inserted into and pushed through the tube A to be cleaned.

It is not essential, but in some cases it may be desirable, to provide a scraper on the circumference of the cleaner, which may be of any desired construction or shape, provided it does not obstruct the passages for the steam and air. In Figs. 2 and 5, however, I have shown a scraper applied to my improved cleaner, and it consists of a spiral blade *s*, fastened at its ends *s'* and s^2 at the top and bottom of one rib *b* in such a manner that it is resilient between the two points of fastening. At intervals, or rather at every rib *b*, are provided notches s^3, adapted to hold the blade *s* in place, but allow of a radial expansion or compression, as will be readily understood by those skilled in the art.

The application and operation of my improved cleaner are as follows: The cleaner is screwed onto a suitable steam-pipe *p*, provided with a valve *p'* and connected by a flexible tubing to a steam-generator. The cleaner is then inserted into a flue or tube A, and steam is then turned on by opening the valve *p'*. The steam entering the cones *c*, *c'*, and c^2 draws the air from the outside, as in a common blower, and this, together with the steam, forms a blast, which is directed by the inverted cone D against the interior of the tube A, so that all the soot is loosened and blown forward. The cleaner is then

gradually and steadily pushed forward into the tube A by means of the steam-pipe *p* until the end of the tube A is reached. The partial vacuum produced at the back of the cleaner by the steam causes the collection of particles of soot and other material, and these are carried by the rush of air into the blast and discharge at the far end of the tube A.

Having thus fully described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A boiler-tube cleaner comprising a steam-pipe, a series of frustrated hollow cones arranged at the end of said pipe, and an inverted cone at the end of said frustrated hollow cones adapted to direct a blast of steam and air against the interior of the tube to be cleaned, substantially as and for the purposes set forth.

2. A boiler-tube cleaner comprising a steam-pipe, a series of frustrated hollow cones arranged at the end of said pipe, a valve on said steam-pipe, an inverted cone at the end of said series of frustrated cones adapted to direct a blast of steam and air against the interior of a tube to be cleaned, and means for pushing said cleaner into said tube, so that the total length of said tube is cleaned, substantially as and for the purposes set forth.

3. A boiler-tube cleaner comprising a steam-pipe, a series of frustrated hollow cones arranged at the end of said pipe, and an inverted frustrated hollow cone at the end of said series of cones adapted to direct a blast of steam and air against the interior of the tube to be cleaned, substantially as and for the purposes set forth.

4. A boiler-tube cleaner comprising a steam-pipe, a series of frustrated hollow cones arranged at the end of said pipe, and an inverted cone at the end of said series of frustrated hollow cones adapted to direct a blast of steam and air against the interior of a tube to be cleaned, in combination with a scraper comprising a blade loosely wound about and secured to the cleaner whereby it is yieldingly held in place, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM GUETHLER.

Witnesses:
G. PERCY FOX,
HERMANN BORMANN.