

(No Model.)

H. L. CURRIER.
BOILER TUBE CLEANER.

No. 368,655.

Patented Aug. 23, 1887.

Fig. 1.

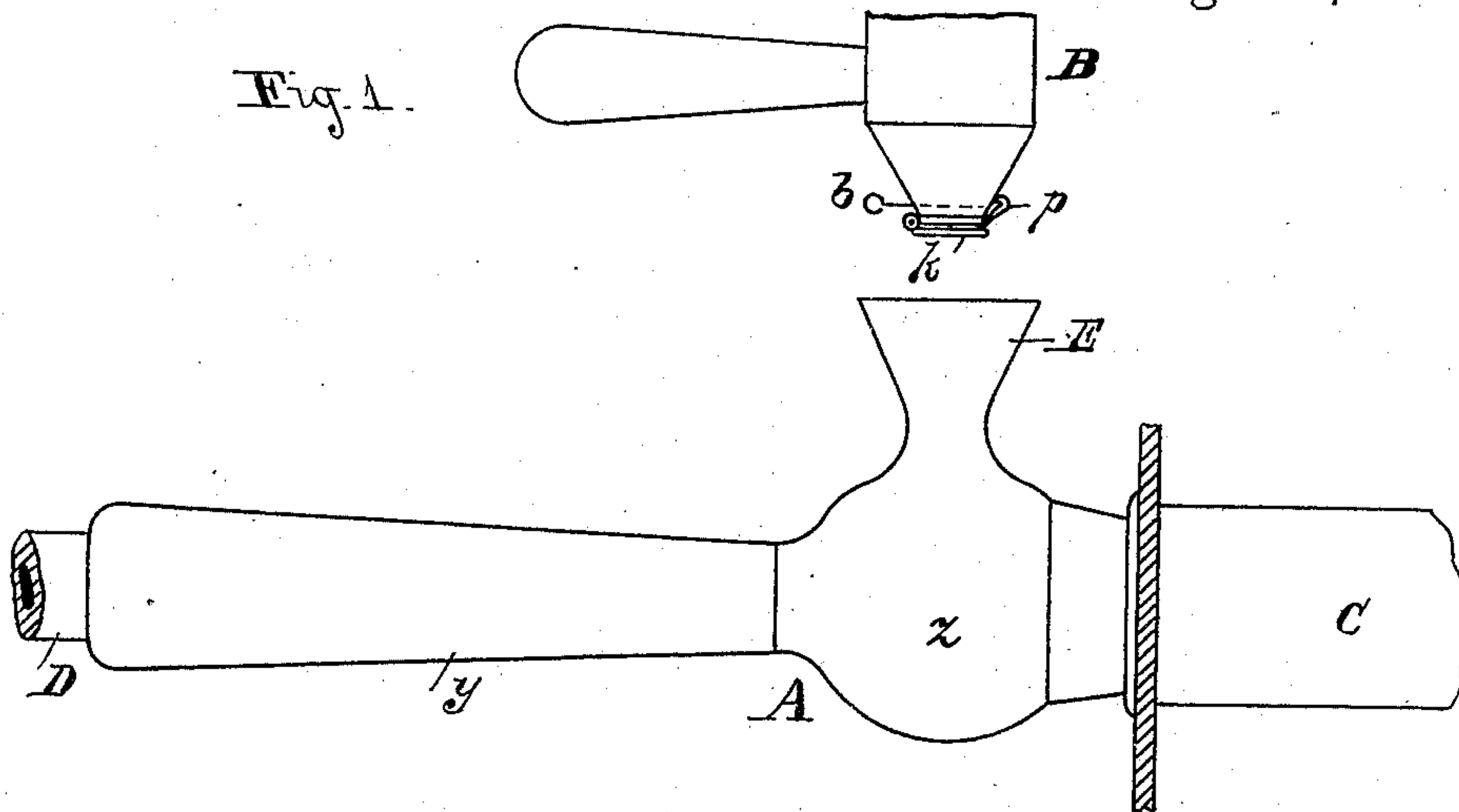


Fig. 2.

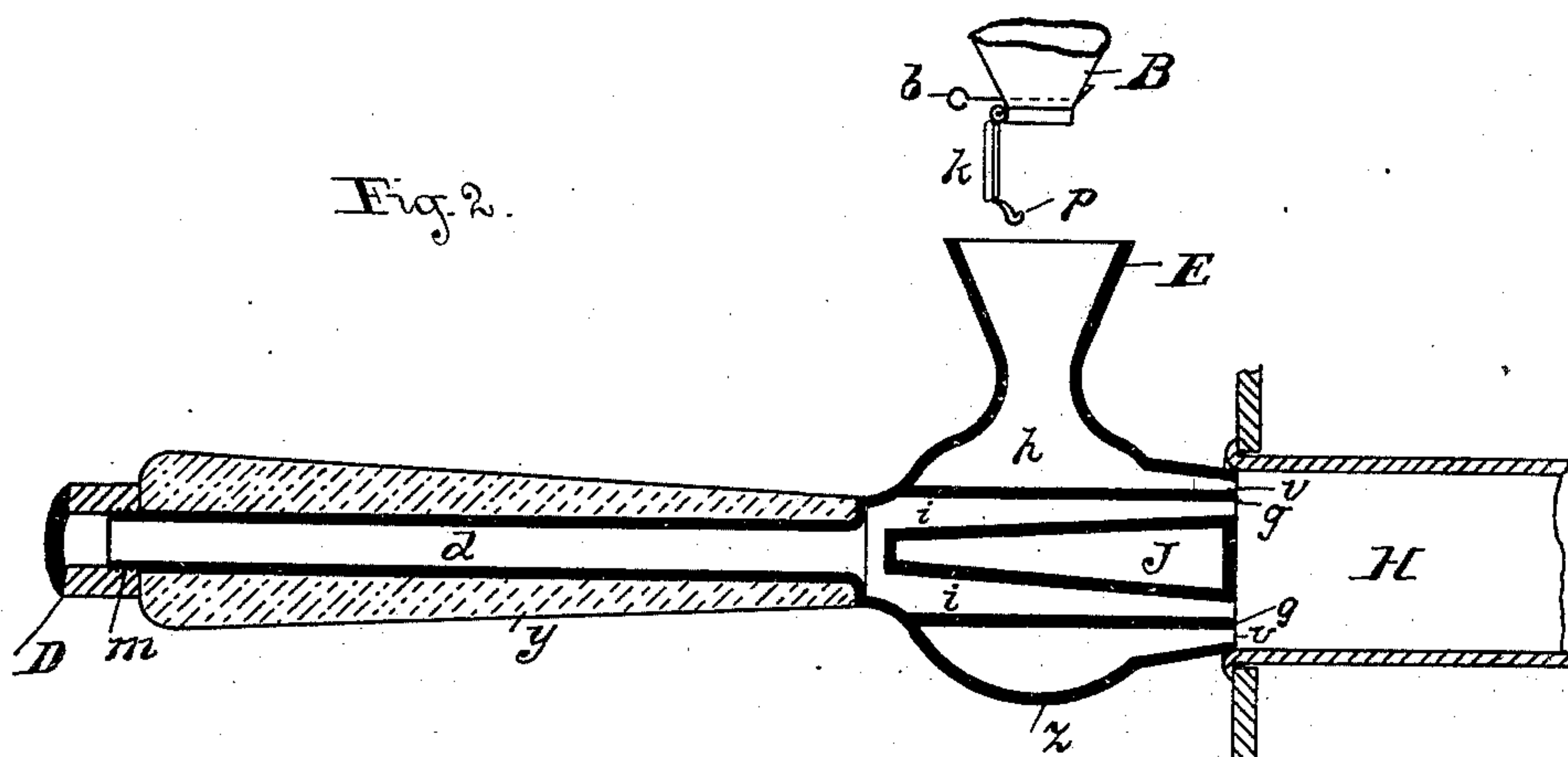


Fig. 3.

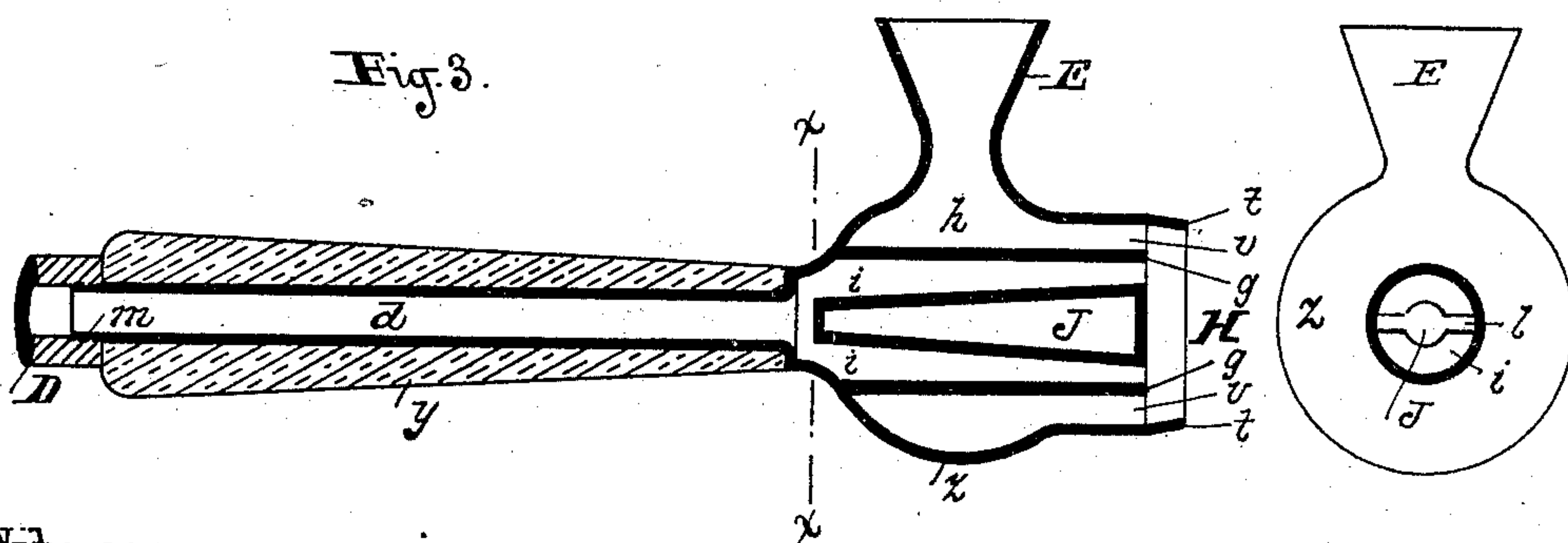


Fig. 4.

Witnesses:
Robt W. Matthews
C. L. Sawyer.

Inventor:
Herbert L. Currier
per C. A. Shaw & Co.
Attys.

UNITED STATES PATENT OFFICE.

HERBERT L. CURRIER, OF LYNN, MASSACHUSETTS, ASSIGNOR TO FRANK B. GRAVES, OF SAME PLACE.

BOILER-TUBE CLEANER.

SPECIFICATION forming part of Letters Patent No. 368,655, dated August 23, 1887.

Application filed April 16, 1887. Serial No. 235,015. (No model.)

To all whom it may concern:

Be it known that I, HERBERT L. CURRIER, of Lynn, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Boiler-Tube Cleaners, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved device in position for use, the tube and steam pipe being shown as broken away and a portion of the boiler-head represented in section; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a like view showing a modification of my improvement, and Fig. 4 a vertical transverse section taken on the line *x x* in Fig. 3.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to means for removing the scale and other deposits from either the inner or outer side of boiler-tubes; and it consists in a novel construction and arrangement of parts, as hereinafter more fully set forth and claimed, the object being to produce a more effective device for this purpose than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the nozzle, considered as a whole; B, the sand tank or holder, and C the boiler-tube.

The nozzle consists of a metallic pipe, *d*, screw-threaded at its outer end, as shown at *m*, to receive the steam-pipe D, and provided with an insulating-covering, *y*, preferably composed of wood, by means of which it can be readily handled when heated. The forward end of the pipe D is expanded to form the bulb or chamber *z*, which is open at the outer end and provided at its top with an upwardly-projecting funnel-shaped opening or hopper, E, by means of which sand is introduced into the bulb.

The bulb *z* is divided into two annular chambers, *h i*, by a horizontally-arranged tube, *g*, which is slightly larger in diameter than the pipe *d*, and secured at its inner end to the sides of said bulb, its outer end being open and terminating at the mouth of the nozzle.

A metallic guide, J, in the shape of a truncated cone, is arranged horizontally within the tube *g*, being centrally secured at its smaller end to the walls of the bulb *z*, directly opposite the pipe *d*, by means of braces *l*, (see Fig. 4,) in such a manner that the base of the cone is in the same vertical plane as the mouth H of the nozzle. The purpose of the guide J is to deflect and direct the steam or air passing through the pipe *d* against the inner surface of the tube C, as hereinafter more specifically set forth.

The sand tank or holder B consists of a portable can, preferably made of tin, and provided with a hinged bottom or trap, *k*, having a spring-catch, *p*, for fastening the bottom to the body of the can, and with a slide, *b*, for regulating the flow of the sand. I do not, however, confine myself to the use of the sand-holder herein shown, as a receptacle of any suitable description from which sand can be poured into the opening E may be used.

I preferably form the nozzle A with its hopper E, bulb *z*, partition *g*, guide J, braces *l*, and pipe *d* integral or cast in one piece, but do not confine myself to so doing, as the parts named may be made separately and united by any suitable means.

In the use of my improvement the nozzle is attached to a steam-pipe, D, which connects with any suitable apparatus for supplying and forcing steam into the tube *d*. The operator then grasps the handle *y* and holds the mouth H of the nozzle firmly against the opening or mouth of the boiler-tube C.

Steam being admitted into the pipe D, it passes through the pipe *d* into the chamber *i*, and is directed by the guide J outwardly against the inner surface of the boiler-tube C. The steam passing the opening *v* of the chamber *h* tends to create a vacuum in said chamber, thereby causing a strong draft downwardly through the hopper E when the nozzle is applied to the end of the boiler-tube C. Coarse sand is then poured into the hopper from the

holder B, or by any other suitable means, and is at once carried by the draft into the chamber *h* and out through the opening *v*, where it is caught by the annular jet of steam issuing from the chamber *i* and thrown against the walls of the boiler-tube C with great force, the jet and sand forming a "sand-blast," which removes the scale collected on the interior walls of said tube and carries it forward until it falls out at the other end of the tube.

In the modification shown in Fig. 3 the outer wall of the nozzle at the mouth H is extended beyond the end of the tube *g* and guide J and inclined slightly inward, as shown at *t*, the purpose of said extension being to enable the blast to be used for removing the scale on the outer surface of boiler-tubes.

It will be readily understood that if the extension *t* were not added to the mouth of the nozzle the steam in passing from the chamber *i* would fail to create as strong a draft in the chamber *h*, and the blast become partially inoperative for that reason, the extension taking the place to a certain extent of the tube C. I do not confine myself to the use of steam for creating the sand-blast, as air forced with sufficient power through the nozzle will serve the purpose as well.

Having thus explained my invention, what I claim is—

1. The improved nozzle herein described,

the same consisting of the pipe *d*, having an insulating-covering, *y*, said tube being provided with the bulb *z*, having the tubular partition *g*, cone-shaped guide J, and hopper E, substantially as described.

2. In a device of the character described, the bulb *z*, provided with a hopper, E, for admitting sand thereto, and interiorly divided into the chambers *h i* by a horizontally-arranged tubular partition, *g*, in combination with the cone-shaped guide J, horizontally disposed within the chamber *i* and secured at its smaller end to the walls of said bulb, the tube *d* opening into said bulb, and being screw-threaded at its outer end to receive a steam or air pipe, substantially as shown and described.

3. In a device for cleaning boiler-tubes, the combination of the following instrumentalities, to wit: a tubular body, a bulb secured to said body and divided into two chambers by a horizontally-arranged tubular partition, a hopper opening into the outer chamber in said bulb for admitting sand, and a cone-shaped deflecting-guide horizontally disposed within the inner chamber and secured at its smaller end to the walls of said bulb, substantially as set forth.

HERBERT L. CURRIER.

Witnesses:

O. M. SHAW,
E. L. SAWYER.