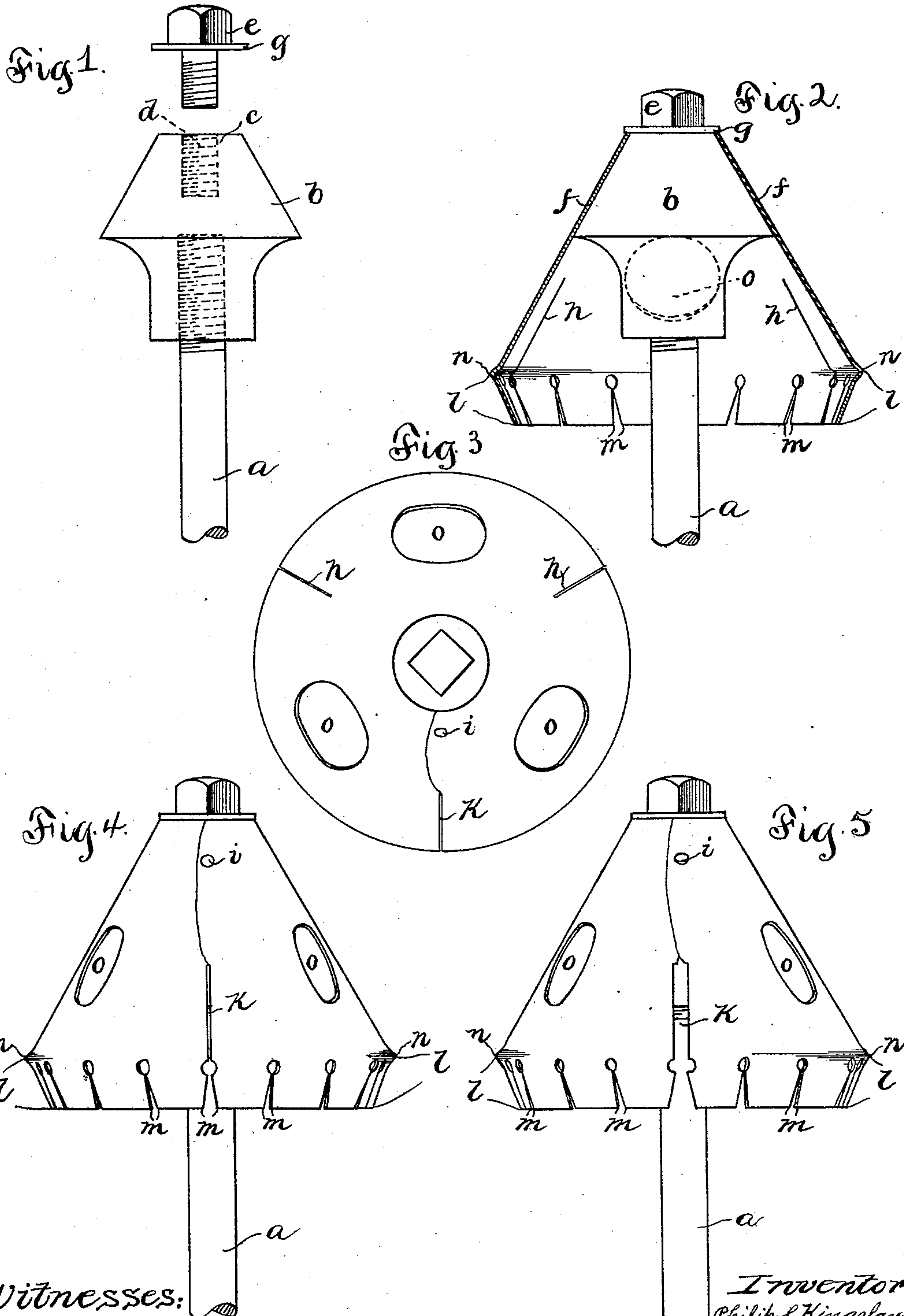


(No Model.)

P. S. KINGSLAND.
ELASTIC SCRAPER FOR FLUE CLEANERS.

No. 475,506.

Patented May 24, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

PHILIP S. KINGSLAND, OF CHICAGO, ILLINOIS.

ELASTIC SCRAPER FOR FLUE-CLEANERS.

SPECIFICATION forming part of Letters Patent No. 475,506, dated May 24, 1892.

Application filed February 4, 1892. Serial No. 420,298. (No model.)

To all whom it may concern:

Be it known that I, PHILIP S. KINGSLAND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Elastic Scrapers for Flue-Cleaners, (Case No. 3,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in boiler-flue cleaners. Its objects are, first, to produce an efficient cleaner for removing the products of combustion or other matter which collect upon the interior surface of boiler-tubes; second, to produce such a cleaner which will work equally well in either direction; third, to produce a cleaner which can readily be adapted to different sizes of boiler-flues; fourth, to produce a cleaner which in addition to the above-described characteristics can be made at slight cost and readily and cheaply replaced when worn out. These and other objects are secured by my invention, which consists, briefly, in a perforated shell of sheet-steel or other metal, said shell being in the shape of a cone, at the base of which is a frustum of a reverse cone, the bases of the cone and the frustum of the cone forming an angle, which acts as the scraper. The shell is rendered elastic by slots and is adapted to be firmly fixed upon a rod or other means for driving the scraper through the boiler-tube and withdrawing it therefrom.

My invention further consists in means for attaching the cone-shaped scraper upon a rod or other means for driving it into and withdrawing it from boiler-tubes.

My device is represented in the accompanying drawings, of which—

Figure 1 shows a piece of the rod, upon which is mounted the support for the cone-shaped shell. The bolt, with the washer, which holds the shell in place is shown slightly removed from the threaded hole in which it is adapted to be screwed. Fig. 2 shows the same parts represented in Fig. 1, but with the fastening-bolt in place and with the cone-shaped shell in place shown in section. Fig. 3 is a top view of the device of my invention. Fig. 4 is a side elevation thereof, showing the cone-shaped

shell contracted. Fig. 5 is the same as Fig. 4, but with the cone-shaped shell expanded.

While the drawings represent the cleaner as fastened to a rod, it should be observed that it is equally applicable to any device which is adapted to thrust it into and withdraw it from the boiler-tube.

In describing the device by reference to the drawings I will use similar letters of reference to indicate similar parts in all the different views.

I preferably have the rod *a* threaded and adapted to screw into the block or head *b*, which I make, preferably, of metal. This block *b* is formed in whole or in part in the shape of a cone or of a frustum of a cone, the inclination of the sides of which is varied to suit the size of boiler-tube for which the cleaner is to be used. Into the apex or small end *c* of the block *b* is drilled or cast the hole *d*, which is tapped to fit the thread of the bolt *e*. The cone-shaped shell *f* is formed to fit evenly upon the conical surface of the block *b*. The washer *g*, which may be separate or integral with the bolt, is of such size that it projects laterally beyond the conical block a distance preferably about equal to the thickness of the shell *f*. When the bolt *e* is firmly screwed down to the block *b*, therefore the conical shell, having previously been set in place, is rigidly fixed to the block.

To supply the elasticity, which is essential or desirable in a device of this kind in order to compensate for irregularities in the form and shape of the boiler-flues and enable the cleaner to pass obstructions, such as seams or beads upon the interior surface of such tubes, I provide the slots *h h*, which I make preferably about one-half the length of the conical shell from its base to its apex. In forming the conical shell *f* I preferably place the rivet *i*, which holds the two edges together, within a short distance of the apex, whereby I secure increased elasticity of the conical shell through opening and closing of the seam *k*. To still further increase this elasticity of the shell and also to facilitate the drawing in of the base of the conical shell, so as to form a reverse frustum of a cone *l*, I make the V-shaped slots *m m m*, after which the base of the conical shell *f* is drawn in, as shown in Figs. 2, 4,

and 5, forming the angle n , which is the bearing or scraping surface of the cleaner. By drawing in the base of the conical shell the device is adapted to be worked both ways—that is, in and out—with equal facility. The perforations $o o o$, of which there may be as many as desired consistent with the requisite strength of the shell, of the conical shell permit the passage of air and also of soot or other scrapings from the interior surface of the boiler-tubes, and thus facilitate the operation of the device. The conical shell f I preferably make of sheet-steel; but it is obvious that other metals may be used.

From the foregoing description of the construction of a flue-cleaner embodying my invention its efficiency will be recognized readily. While it does the work of the more complicated and expensive devices hitherto in use with equal thoroughness and ease, it is much less expensive, and as the conical shell f is all that is subject to wear the replacing of worn-out cleaners is greatly reduced in cost. The shell may be made as a regular article of manufacture, and of sizes to fit the various sizes of boiler-tubes.

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

1. A pipe-cleaner consisting of a perforated shell of metal formed in the shape of a cone, at the base of which is a frustum of a reverse

cone, the bases of the cone and the frustum of the cone forming an angle which acts as the scraper, whereby the scraper may be driven into and withdrawn from the pipe or flue which is to be cleaned, substantially as described.

2. In a flue-cleaner, the combination, with a perforated shell in the shape of a cone and a reversed frustum of a cone, of a conical block conforming to the interior conical surface of said shell, to which said shell is adapted to be attached by means of bolts or rivets, substantially as described.

3. In a boiler-flue cleaner, the perforated shell f , in the form of a cone, and a reverse frustum of a cone made from one piece of metal, the edges of which are adapted to overlap, in combination with the block b , to which said perforated shell is attached by the rivet i , whereby the perforated shell f is made compressible by circumferential pressure.

4. In a boiler-flue cleaner, the combination of the block b , the bolt e , and the shell f , said shell having the slots $m m$ and $h h$, the perforations $o o$, the seam k , and the reverse frustum of a cone l , substantially as described.

In witness whereof I hereunto subscribe my name this 1st day of February, A. D. 1892.

PHILIP S. KINGSLAND.

Witnesses:

RALPH VANDYKE,
GEORGE L. CRAGG.