J. S. SMITH.

BOILER FLUE CLEANER.

No. 189,666. Patented April 17, 1877.

Fig. 1.

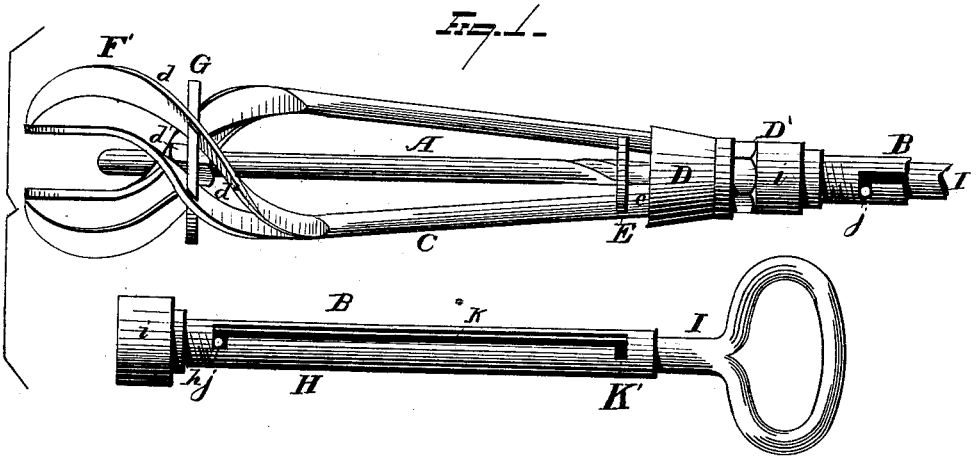


Fig. 2.

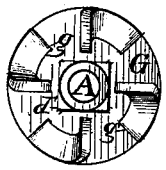
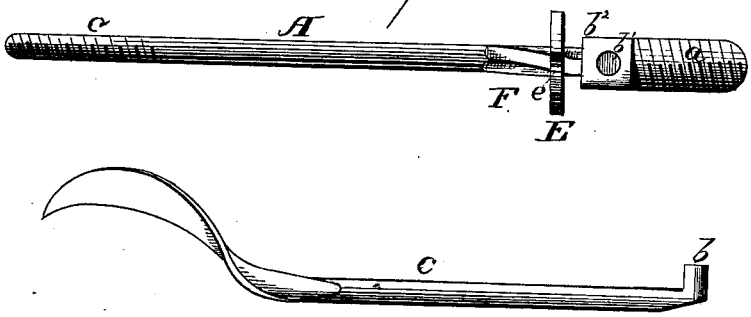


Fig. 3.



WITNESSES

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IMPROVEMENT IN BOILER-FLUE CLEANERS.

Specification forming part of Letters Patent No. **189,666**, dated April 17, 1877; application filed December 13, 1876.

To all whom it may concern:

Be it known that I, JOHN S. SMITH, of Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Flue-Cleaners; and I do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improved flue-cleaner.

Figure 1 represents a side elevation of my improved flue cleaner, and Fig. 2 is an end view of the same. Fig. 3 shows the several parts of the device in a detached view.

My invention consists, first, in the combination, with a central supporting-rod, of a series of spring-bars, secured at one end to the central rod, while their free ends are provided with spiral cutters or scrapers; second, in the combination, with a central supporting-rod, of a series of spring-bars secured thereto, their free ends provided with spiral cutters, and a slotted disk constructed to receive and retain the springs in position, and serving to force the scrapings out of the flues; third, in the combination, with a central supporting-rod, of a series of spring-bars secured thereto, their free ends provided with spiral cutters, of a slotted disk or guide secured between nuts placed on the outer end of the central rod, whereby the cutting-edges of the bars may be adjusted as desired; fourth, in the combination, with a central supporting-rod, of a series of round spring-bars, provided at their free ends with flat spiral cutters or scrapers, and a slotted disk or guide; fifth, in the several combinations of parts hereinafter described, and pointed out in the claims.

In the drawings, A represents the central supporting-rod, of any desired length, one end of which is enlarged, and screw-threaded at *a*, for the attachment of a handle, B. Spring-bars C have their inner ends provided with studs or hooks *b*, which fit in holes b^1, formed in the square shoulder b^2 of the central supporting-rod. The bars C are flattened at their inner ends, to allow the conical sleeve D to fit snugly against their outer surfaces, the sleeve D being held in place by a nut, D′. Should one of the spring-bars C become worn or broken, a new bar may be readily inserted by loosening the nut D′, removing the sleeve D, and detaching the stud or hook *b* of the bar from the central supporting-bar A.

An expanding or adjusting disk, E, having slots *e* corresponding in number and shape to the spring-bars used, is fitted to the twisted square portion F of the central rod A, the disk serving to expand or contract the scrapers, as desired. When the disk is forced toward the outer end of the cleaner, it will in its part revolution serve to force the ends of the spring-bars farther apart, and thus adapt the flue-cleaner for use in larger-size flues. By forcing the disk E in the opposite direction, the spring-bars are contracted or drawn toward the central bar. The spring-bars C, while they may be made of square or diamond rod steel, are preferably formed of round steel rods, as a given amount of metal disposed in this form secures the greatest resiliency and strength for the desired purpose.

Upon the free ends of spring-bars C are formed or secured thereto the cutters F′, which are constructed and arranged so that their cutting-edges *d* are located on one side the line of direction of the length of the spring-bars, and are twisted spirally, whereby the cutters in operation have a shearing action on the interior of a flue, and as the cutters of the series of spring-bars employed overlap each other, every portion of the inner surface of a flue is subjected to the scraping action of the cutting-edges of the cleaner. By reason of locating the cutters at one side of the spring-bars a double resiliency of the spring-bars is secured, as the outward tendency of the spring-bars is assisted, by the torsional power of the spring-bars, to retain the cutters snugly against the flues. The cutters by reason of their spiral form are self-sharpening, and operate effectually to remove incrustations on the flue, either in their forward or backward movement. The forward end of the central supporting-rod A is screw-threaded at *c*, and provided with nuts d^1 d^2, between which latter is secured the disk G, formed

with slots *g* corresponding in number to the cutters employed. The slots *g* are of sufficient depth to allow nearly the full width of the cutters therein; hence, when the cleaner is inserted in a flue the cutters are contracted, and recede into the slots *g*, thus presenting a disk of nearly the size of the flue, which serves to remove the scrapings as they are removed by the cutters.

Handle B consists of a tube, H, screw-threaded at *h*, for the attachment of a coupling-nut, *i*, which latter is secured to the screw-threaded end *a* of the central supporting-rod A. Within the tube H is placed one end of a sliding rod, I, which is retained within the tube by means of a pin or stud, *j*, on the rod, engaging in a slot, *k*, formed in the tube. Slots K′, at right angles to the longitudinal slot *k*, serve to allow the sliding rod I to be locked to the tube at either end of the same, thereby constituting a long or short handle, as may be desired. It is evident that the tube H may be provided with any number of transverse slots or notches, K′, and thus allow of as many different adjustments of the handle.

The extensible handle is an important feature of my invention, as it is often the case that the boiler is so situated that it is impossible to insert a rigid handle of a length sufficient to enable the entire length of the flues to be scraped, as the space between the end of the boiler and the wall of the building may be much less than the length of the flues. This difficulty is obviated by the use of my invention, as the handle may be contracted for insertion into the flue, and when the cleaner is forced inwardly as far as the handle, in its contracted state, will admit of, the sliding rod I is given a part revolution, releasing the locking-pin from its engaging-slot, and the handle drawn outwardly and locked in the rear transverse slot, thus enabling the cleaner to be forced the entire length of the flue.

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

1. In a flue-cleaner, the combination, with a central rod, of a series of spring-bars, secured at one end to the central rod, and provided at their free ends with spiral cutters or scrapers, substantially as and for the purpose set forth.

2. In a flue-cleaner, the combination, with a central rod, of a series of spring-bars, secured at one end to said rod, the spring-bars provided at their free ends with spiral cutters, and a slotted disk, located on the central rod between the spiral cutters, substantially as and for the purpose set forth.

3. In a flue-cleaner, the combination, with a central supporting-rod, screw-threaded at its outer end, of a series of spring-bars secured at one end to said rod, the spring-bars provided at their free ends with spiral cutters, and a slotted disk adjustably secured to the central rod by means of nuts d^1 d^2, substantially as and for the purpose set forth.

4. In a flue cleaner, the combination, with a central supporting-rod, of a series of round spring-bars secured to said rod, the free ends of said spring-bars provided with spiral cutters or scrapers, and a slotted disk or guide, substantially as and for the purpose set forth.

5. A flue-cleaner consisting of a series of spring-bars secured to a central supporting-bar, the said spring-bars provided at their free ends with spiral scrapers located at one side of the plane of the bars, whereby the latter have a torsional and lateral resiliency to force the cutters against the flues, substantially as and for the purpose set forth.

6. In a flue-cleaner, the combination, with the central supporting-rod, formed with enlarged end and with perforated faces, of spring-bars provided with hooked ends, and a conical sleeve to secure the several parts in position, substantially as and for the purpose specified.

7. In a flue-cleaner, the combination, with the central supporting-rod, a portion formed with an angular-twisted surface, of the spring-bars, and a slotted adjusting-disk, substantially as and for the purpose set forth.

8. The combination, with a flue-cleaner, of an extensible handle, substantially as and for the purpose set forth.

9. The handle of a flue-cleaner consisting of a slotted tube provided with a sliding rod and means for locking the tube and rod together, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of December, 1876.

JOHN S. SMITH.

Witnesses:
CHAS. G. COLLINS,
JOEL SMITH.