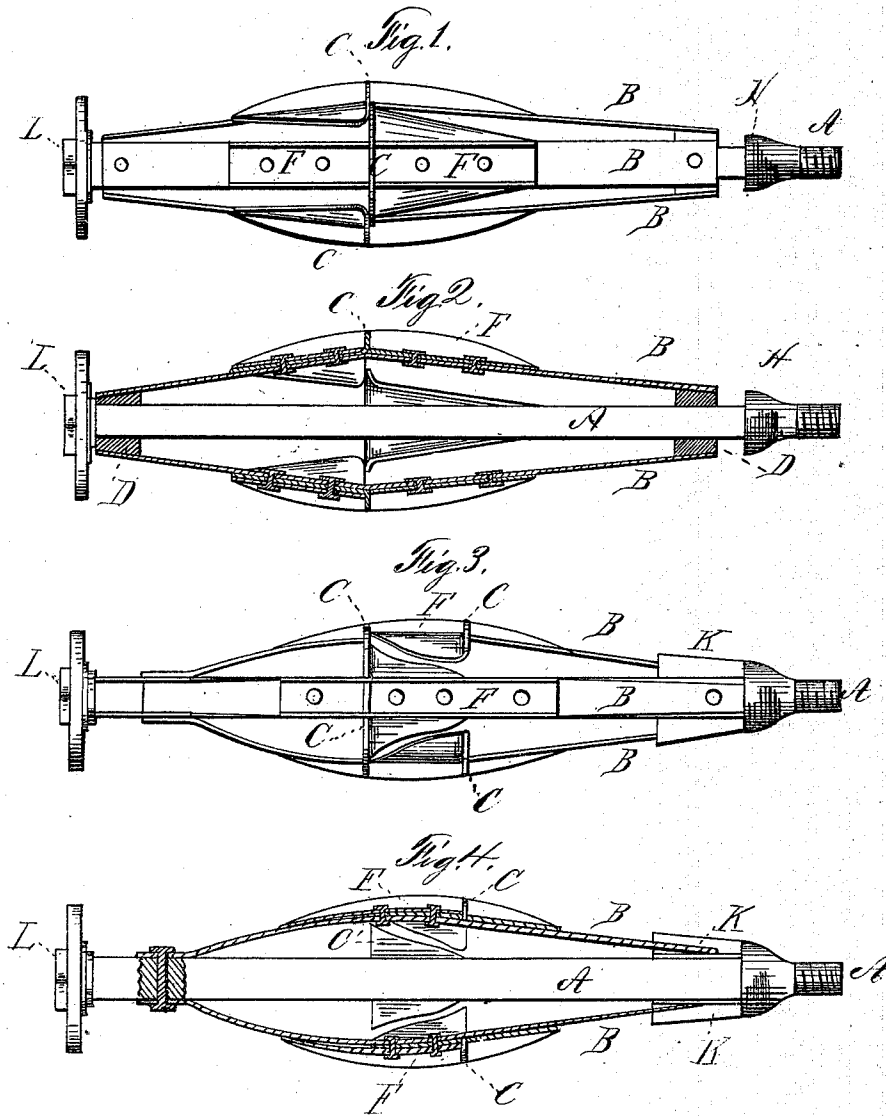


**H. FREEMAN.
Flue-Cleaners.**

No. 146,176.

Patented Jan. 6, 1874.



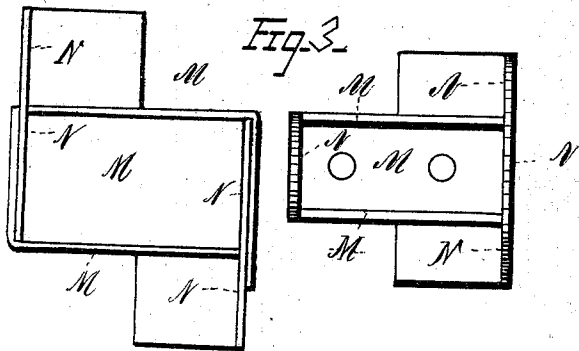
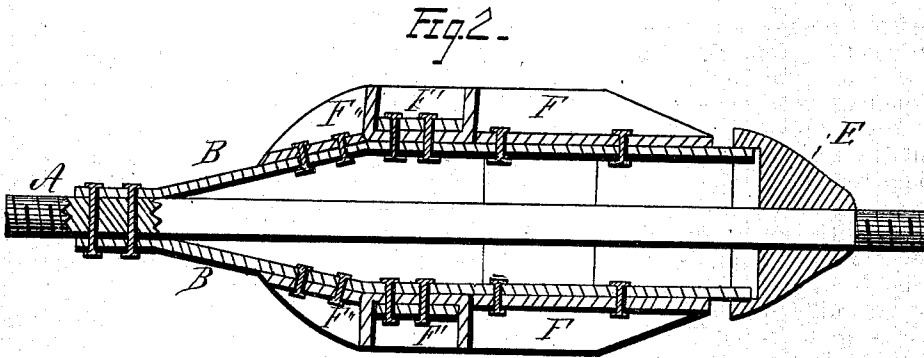
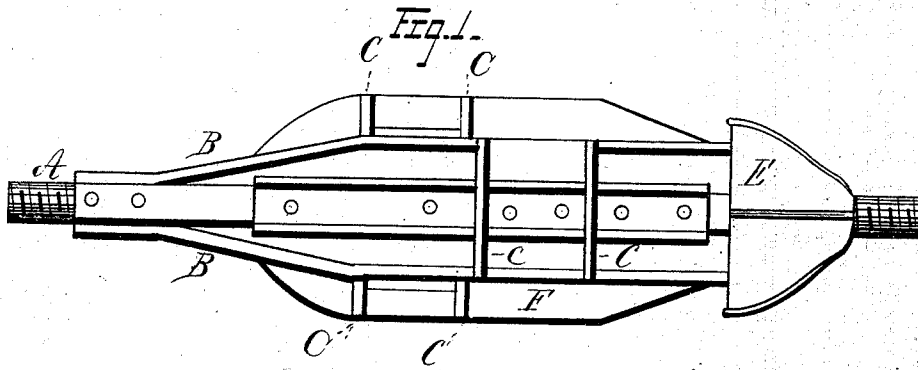
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UNITED STATES PATENT OFFICE.

HIRAM FREEMAN, OF PETROLEUM CENTRE, PENNSYLVANIA.

IMPROVEMENT IN FLUE-CLEANERS.

Specification forming part of Letters Patent No. **146,176**, dated January 6, 1874; application filed February 28, 1873.

CASE C.

To all whom it may concern:

Be it known that I, HIRAM FREEMAN, of Petroleum Centre, in the county of Venango and State of Pennsylvania, 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 flue-cleaners for removing obstructions from the flues or tubes of boilers, &c.; and it consists in peculiar effective constructions and arrangements of the springs, the cutting-edges, their braces or guides, and in mechanism for loosening a flue-cleaner when fastened in a flue.

In the drawings, Figure 1, Sheet 1, is a view of a cleaner, with device for loosening the same; Fig. 2, Sheet 1, same in longitudinal section; Fig. 3, Sheet 1, another view wherein the cutters are differently arranged, and two of the springs are fastened at their rear ends to the shaft, while their other ends slide in shoes, and the other two springs are fastened at their front ends to the shaft, with their rear ends sliding in shoes; Fig. 4, Sheet 1, section of Fig. 3. Fig. 1, Sheet 2, is a view of a variation of my invention, wherein the ends of the flaring springs work within a head or guide, and the cutters are double; Fig. 2, Sheet 2, section of the same; Fig. 3, Sheet 2, variations of my cutting or scraping plates.

The following is a description of my invention:

In Figs. 1 and 2 of Sheet 1, A is a shaft or rod, provided with a head, L, and a shoulder, H, between which are the springs B. These springs B are attached to sliding collars D, which, operating on the rod A, permit of cramping the cleaner into a flue, and sufficient space is left between the head L and shoulder H to allow of shaking the scrapers loose should they get fastened in the flue or tube. C are plates, which are bent up, and have a circular edge, which acts to scrape the flue. This scraping-edge is braced by braces F, the edges of which, being turned up, serve to guide the cutters C' into the tubes or flues.

It will be seen that the plates C are similarly situated upon opposite springs, but that

they are reversed in position alternately. By this arrangement, the springs are enabled to close in against the shaft, carrying the faces of the cutters C' past each other without touching, and presenting a circular cutter to the whole surface of the flue.

In Figs. 3 and 4, Sheet 1, the springs are differently arranged. The rear ends of two of them are riveted to the shaft, their other ends being free to slide in shoes K, while the remaining two springs are fastened in exactly the reverse order. The plates C and braces F in this case are so arranged as to close past each other, but not in the same circle, presenting cutting-edges to the entire surface of the flue.

Figs. 1 and 2, Sheet 2, show still another style of cleaner, in which the springs B are all secured to the shaft at one end, their other ends operating in the ribbed head E, which serves as a guide. The cutting-edges C' are double, and the brace or guide-plates F, F', and F'' are so adjusted as to form cups to convey away the debris from the flue, and two circular cutters are presented to every part of the flue.

Fig. 3, Plate 2, shows a very neat and economical method of forming the cutter-plates, with their braces, out of but two pieces, M and N, that, when placed on four springs, will close into each other, and form an excellent cleaner, and these plates can be placed on any of the springs, as shown in these drawings.

All of these devices may or may not be provided with a wiper, as shown in Figs. 1, 2, 3, and 4 of Sheet 1.

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

The flue-scrapers herein described, composed of shaft A, springs B attached to sliding collars D, cutters C', and braces F, constructed and united, as set forth, so as to close together freely and scrape the entire flue, substantially as described and shown.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of February, 1873.

H. FREEMAN.

Witnesses:

WELLS W. LEGGETT,
JOHN H. JOHNSON.