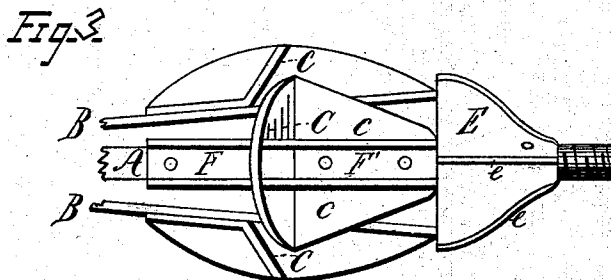
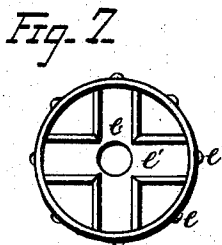
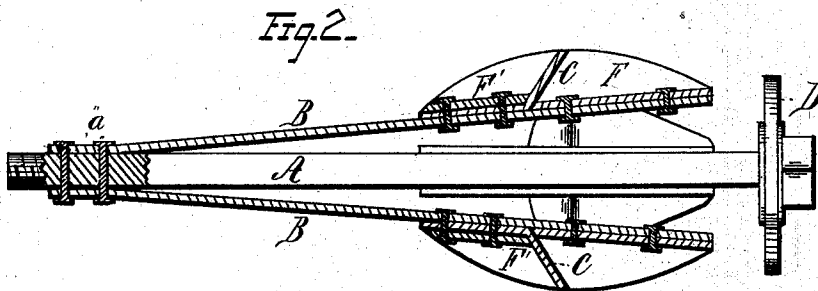
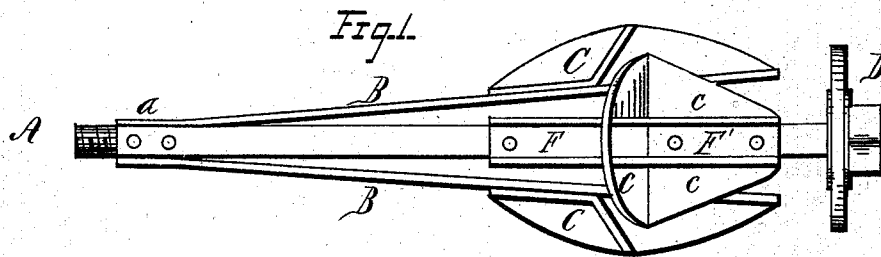


H. FREEMAN.
Flue-Cleaners.

No. 146,178.

Patented Jan. 6, 1874.



WITNESSES
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Fig. 5-

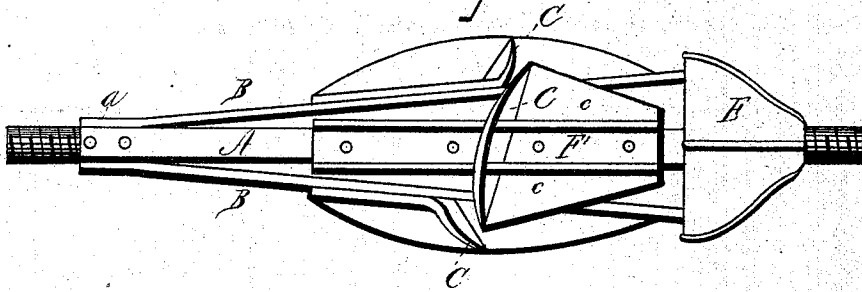
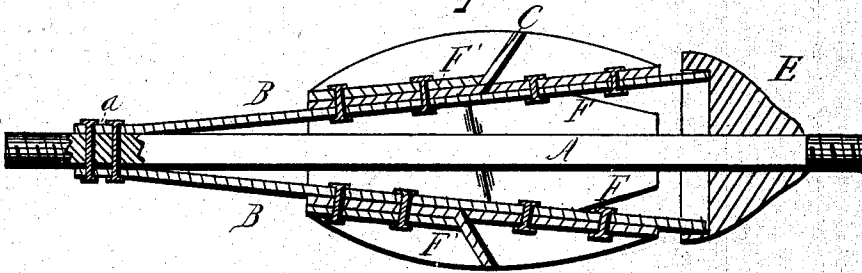


Fig. 6.



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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. **146,178**, dated January 6, 1874; application filed February 28, 1873.

CASE A.

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 improvements in the cleaning mechanism of the flue-cleaner used to clear impeding matter from the pipes or flues of boilers, &c.

In the drawings, Figure 1, Sheet 1, is a view of a flue-cleaner embodying my invention. Fig. 2, Sheet 1, is a section of same. Fig. 3, Sheet 1, is a view of Fig. 1 with a guide-cap confining the ends of the loose spring-arms. Said guide-caps are applicable to all the flue-cleaners of my invention. Fig. 7 is an inside elevation of one of the guide-caps shown in Fig. 3. Figs. 5 and 6, Sheet 2, show variations of my invention.

My invention consists in so forming the scraping or cutting plates that they may always wear to a cutting-edge, and present their sharp edges to the surfaces of the flue when the cleaner is being forced in either direction; also, in so arranging these cutting-edges or cleaning-plates that they may close together to suit flues of various sizes, and present edges to all parts of the flue.

This I effect as follows: A, Fig. 1, is a rod or shaft bearing the cleaner. At a suitable distance back from the end of the cleaner, at *a*, are riveted to the shaft A, four springs, B, which bear the scrapers C, and on the continuation of the shaft A may be placed a wiper, D; or, instead, thereof, the cap E, Fig. 3, may be fastened so as to inclose the ends of the springs, permitting them to have a free motion, but preventing their catching upon the edges of the flues in entering; or, if necessary, the cap may be used at the same time with the wiper D.

I construct the cleaning-plates as follows: The plate C is flattened along the portion *c*, c,

so that it can be riveted to the spring B. That edge near the middle of the cleaner is bent up so as to stand inclined to the spring B at such an angle as readily to chisel off any scale or sediment, and continually wear to a cutting-edge. Upon two of the springs, opposite to each other, these scrapers stand inclined toward the front, while upon the other two they incline in an opposite direction, so that the cutting will take place equally well in either direction. Under the inclined portion C, and extending along the spring for a short distance, is a brace, F, of U shape in a cross-section, which is fastened to the spring, and serves as a cup to carry out the scrapings. Upon the opposite side of the inclined cutter C is a similar brace, F', and these two plates or braces serve to hold the inclined cutters firmly and rigidly in position, and their upper edges, which incline gradually up to the circular edge of the cutter C, act as guides to direct the cutters into the end of the flue.

It will be observed that the pieces attached to the different springs are exactly alike, except upon two of the springs they are reversed in relative position.

When desirable, I propose to make use of a guide-cap, E, Fig. 3. This may or may not be provided with ribs *e* upon the outside; but upon the inside are slots *e'*, crossing at right angles, and in which the ends of the springs have free play when compressed. The cutting-edges C, inclined to the springs B, may also be inclined to the shaft, as shown in Figs. 5 and 6, Sheet 2, so as to give a glancing or shearing cut, at the same time wearing to a cutting-edge.

I am aware that a somewhat similar guide-cap has been used, but not with a similar arrangement of springs.

I do not limit myself to having the direction of the inclined cutters C alternating to the front and rear, as shown; but they may all incline either to the front or rear, if desired.

The cutters C are made long enough to lap over the adjacent cutters, and they are so adjusted as to spring past each other without touching.

By this arrangement all parts of the flue are scraped, which is impossible in a flue-scrapers

bearing but two semicircular cutters, as such a scraper could only be adapted to one particular size of flue.

A greater number of springs bearing a greater number of cutters could be employed; but four springs perform the required work, and are less expensive.

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

The flue-scraper herein described, composed of the shaft A, springs B B', bearing the in-

clined chisel-shaped cutters C, and with or without the caps E and wiper D, all constructed, arranged, and operating substantially as set forth.

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

HIRAM FREEMAN.

Witnesses:

WELLS W. LEGGETT,
EDM. F. BROWN.