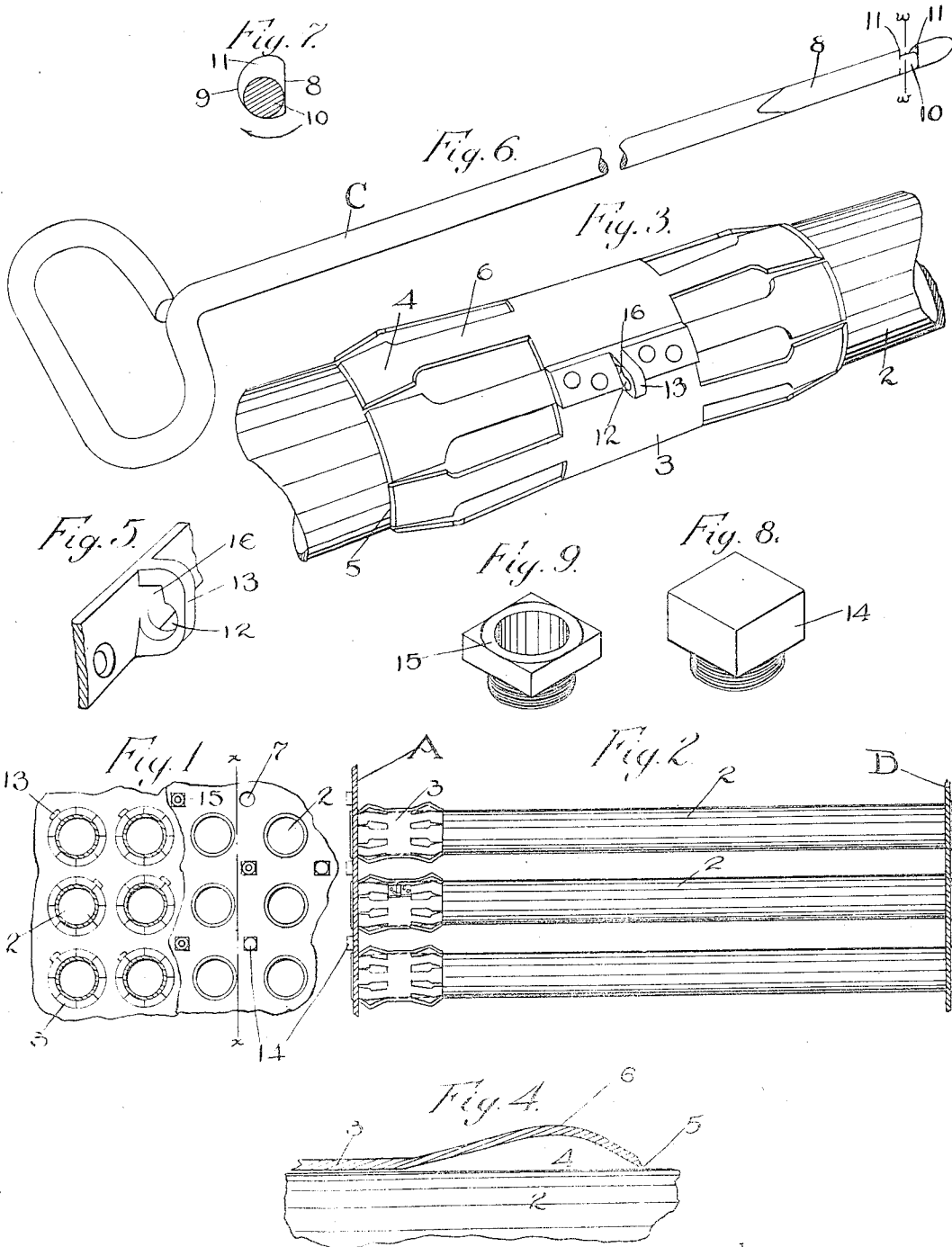


C. MAIER.
FLUE CLEANER.
APPLICATION FILED JUNE 20, 1912.

1,134,342.

Patented Apr. 6, 1915.



WITNESSES

Walter D. Smith
J. D. Smith

INVENTOR

Charles Maier

BY

Bothrop & Johnson
his Attorneys

UNITED STATES PATENT OFFICE.

CHARLES MATER, OF CANBY, MINNESOTA.

FLUE-CLEANER.

1,134,342.

Specification of Letters Patent.

Patented Apr. 6, 1915.

Application filed June 20, 1913. Serial No. 704,342.

To all whom it may concern:

Be it known that I, CHARLES MATER, a citizen of the United States, residing at Canby, in the county of Yellow Medicine and State of Minnesota, have invented certain new and useful Improvements in Flue-Cleaners, of which the following is a specification.

My invention relates to improvements in flue cleaners designed particularly for scraping from boiler flues the scale and accretions which become encrusted thereon in use, its objects being, among other things, to provide an improved scraper which can be easily operated from the outside of the boiler without removing or loosening the flues from the flue sheets, and which will effectually cut the accretions from the flues.

With these and other objects in view the invention consists in the construction, combination, and arrangement of parts herein-after described and claimed.

In the accompanying drawings forming part of this specification, Figure 1 is a front elevation of a fragment of a boiler containing the invention with the front flue-sheet partly broken away to show the flues and scrapers; Fig. 2 is a vertical section through the same on line $x-x$ of Fig. 1; Fig. 3 is a perspective view of the improved scraper in place upon a flue; Fig. 4 is a detail showing a fragment of the flue with one of the spring fingers of the scraper in longitudinal section; Fig. 5 is a perspective detail of the slotted lug upon the scraper; Fig. 6 is a perspective view of the operating rod or tool, partly broken away; Fig. 7 is a cross section through the key end of the tool on line $w-w$ of Fig. 6; Fig. 8 is a perspective view of one of the threaded closures for the tool opening in the flue-sheet; and Fig. 9 is a perspective view of one of the protective tubular plugs used in the tool opening when the scraper is being operated.

In the drawings A and B represents the front and rear flue-sheets, respectively, of a tubular boiler, in which are secured in the usual way a number of flues 2. Upon each of these flues is slidably supported one of the scrapers 3 which form the subject of the present invention. The scraper consists of a tubular shell of sheet metal having at one, and preferably both, of its ends a row of separated outwardly bowed scraping fingers 6, each of which terminates in a knife 4 hav-

ing an edge 5 conforming to the curvature of the flue. In the form shown in the drawings the ends of the shell are slit longitudinally to form these fingers. The knives are so constructed that their cutting edges 5 will lie closely together so as to form an almost continuous annular cutting knife. The fingers are bowed out from the flue in order to press their cutting edges elastically against the flue and are cut away at the sides to increase their resilience. The scrapers are sprung over the flues before the flues have been secured in the flue-sheets.

The front flue-sheet A is formed near each flue with a threaded hole 7 through which the tool C can be inserted to operate the scraper. This tool is a long rod terminating in a plano-convex key-end having a flat-side 8 and a round side 9. In the key-end is a neck 10 of reduced diameter, eccentric to the axis of the rod, having on either side a shoulder 11. The key-end of the rod is adapted to be inserted through the key hole opening 12 in an ear or lug 13 which projects radially from the shell of the scraper.

The holes 7 in the flue-sheet are normally closed by means of threaded plugs 14, but when the rod is to be inserted through the hole these plugs are removed, and preferably replaced by threaded tubular plugs 15, as shown in Fig. 9, which can be screwed into the holes to protect the threads in the flue-sheet from being crushed or damaged by the tool as it is worked back and forth.

In use the tool C is inserted through one of the holes 7, protected, if desired, by means of a tubular protective plug 15, until its end passes through the slot 12. In order that it may enter the slot the tool must be turned to bring its convex side 9 adjacent to the scraper. It can then be thrust through the slot until its neck portion 10 is lodged within it. The tool is then turned in the direction of the arrow in Fig. 7 to bring its flat side 8 toward the body of the scraper. In this position the neck 10 will be thrown eccentrically up into the narrow portion 16 of the key-hole slot, while the shoulders 11 will lodge against the lug 13, one upon each side thereof, so that, when the rod is thrust back and forth, it will carry the scraper with it. It will be evident that the scraper can be thrust or drawn, as the case may be, the entire length of the flue, and the knives will effectually cut and scrape off any scale

or other matter that may be encrusted on the outside of the flue.

By having the fingers separated from one another, and outwardly bowed, the scraper
5 can be sprung over flues of different sizes, and the knife edges will always rest elastically against the flue. As shown in the drawings these knives are preferably curved to conform to the flue and extended trans-
10 versely to form a practically continuous cutting edge.

It will be understood that the structure here shown and described is only the preferred embodiment of the invention, and
15 that the same can be modified in various ways without departing from the principle of the invention, the scope of which is defined in the claims.

I claim as my invention:

20 1. A flue cleaner comprising a tubular shell adapted to fit slidingly over a flue and having outwardly bowed spring fingers ter-

minating in contiguous knives encircling the flue and conforming to the curvature thereof.

2. The combination with a tubular shell 25 adapted to fit slidingly about a flue, said shell having terminal spring knives and a radial lug formed with a key-hole slot, of an operating rod formed with a key-end coacting with said slot to lock the rod to 30 the shell, whereby to move the same endwise.

3. A flue cleaner comprising a tube of resilient sheet metal having a rigid tubular middle portion, and being horizontally slit and transversely bowed on each side of said 35 middle portion to form mutually independent barrel-shaped spring scraping fingers.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES MAIER.

Witnesses:

H. SMITH,
ARTHUR P. LOTHROP.