No. 734,617. PATENTED JULY 28, 1903.

R. S. & C. M. RUGGLES.

FLUE CLEANER.

APPLICATION FILED FEB. 21, 1902.

NO MODEL.

Fig. 1.

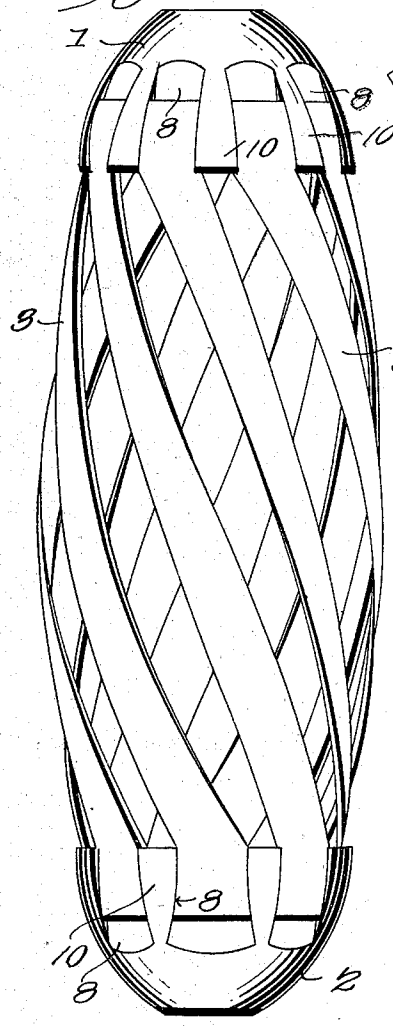


Fig. 5.

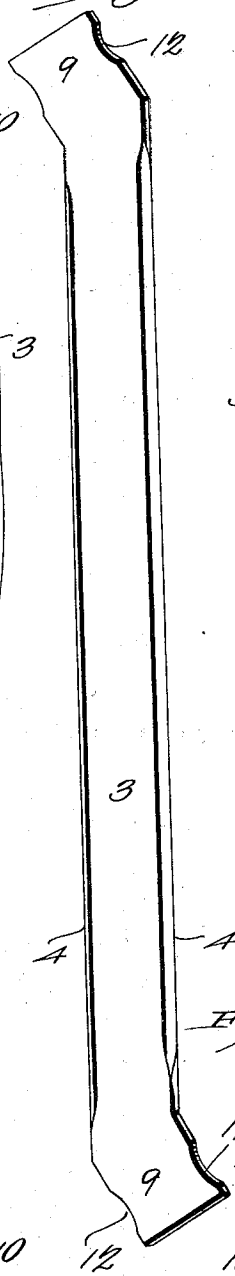


Fig. 2.

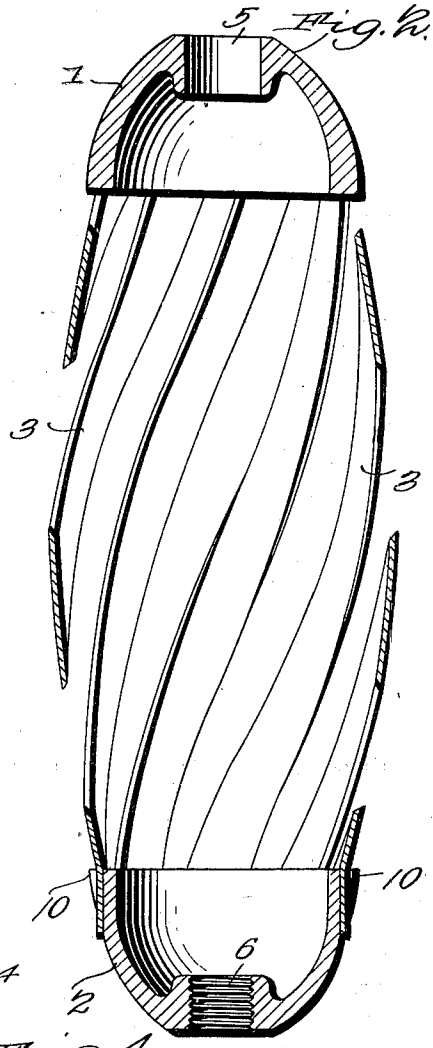


Fig. 3.

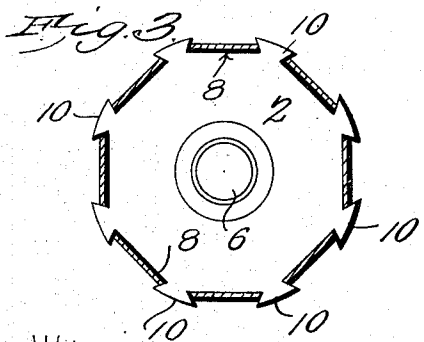
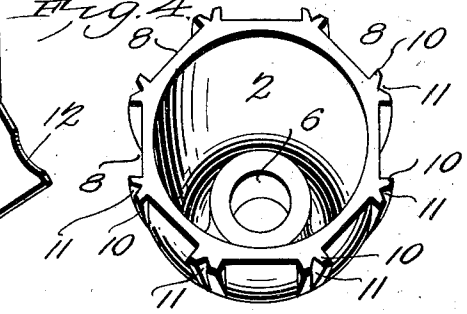


Fig. 4.



Witnesses.

E. F. Stewart

T. A. Riley

R. S. Ruggles
C. M. Ruggles Inventors

by C. A. Snow & Co

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 734,617. Patented July 28, 1903.

UNITED STATES PATENT OFFICE.

REGINALD S. RUGGLES AND CONSTANT M. RUGGLES, OF RAVENSWOOD, ILLINOIS.

FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 734,617, dated July 28, 1903.

Application filed February 21, 1902. Serial No. 95,107. (No model.)

To all whom it may concern:

Be it known that we, REGINALD S. RUGGLES and CONSTANT M. RUGGLES, citizens of the United States, residing at Ravenswood, in the county of Cook and State of Illinois, have invented a new and useful Flue-Cleaner, of which the following is a specification.

The invention relates to improvements in flue-cleaners.

The object of the present invention is to improve the construction of flue-cleaners and to provide an exceedingly simple and inexpensive one adapted to be readily operated and capable of effectively removing the crust and other accumulation from the tubes or flues of a boiler.

A further object of the invention is to provide a flue-cleaner of this character of great strength and durability, provided with blades possessing great resiliency and permitting the cleaner to operate on both welded and thimbled flues and to remain always in direct contact with the metal of the flue.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is an elevation of a flue-cleaner constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a transverse sectional view. Fig. 4 is a detail view of one of the heads. Fig. 5 is a similar view of one of the blades.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 and 2 designate inner and outer approximately semispherical heads presenting outer convex faces and connected by spirally-curved springs forming blades 3 and extending diagonally of the flue-cleaner, whereby when the latter is moved longitudinally through a flue the side edges of the blades will be presented to the inner faces of the flues and will be set at an angle to the line of movement of the cleaner to produce a shear cut. The side edges 4 of the blades are beveled at their inner faces, and the flue-cleaner tapers from its center to its ends to present a general convex face to the flues, and the springs are compressible and are capable of expanding within a flue and of yielding to any irregularities of the surface of the same, whereby the flue-cleaner is adapted to operate with equal facility on welded and thimbled flues.

The heads may be constructed of any suitable metal, and when employed in the construction of large flue-cleaners they will preferably consist of drop-steel forgings; but they may be made of brass when used on small flue-cleaners. The inner approximately concavo-convex head is provided with a smooth central opening 5 for a rod or stem, and the other head 2 is provided with a threaded aperture of less diameter than the opening 6 to receive the threaded outer end of the stem or rod. The inner opening 5 is of greater diameter than the outer one in order to enable the rod to possess sufficient strength at the point where it is subjected to the greatest strain. The outer head enables the flue-cleaner to be readily introduced into a flue, and the inner head will permit the cleaner after being pushed through the flue to be readily drawn back into the same without injuring it.

Each head is provided with an annular series of longitudinal recesses 8 of greater depth than the thickness of the blades, adapted to receive the end portions 9 of the latter and forming intervening ribs or flanges 10. The ribs or flanges 10, as illustrated in Fig. 4 of the drawings, are provided with longitudinal grooves 11 to enable the side portions of the ribs or flanges to be readily spread over the outer faces of the ends 9 of the blades, whereby the latter are securely held in the recesses of the heads. The end portions 9 of the blades are arranged at an angle to the body portion thereof and extend therefrom in opposite directions, the end portions of the blades being arranged longitudinally of the flue-cleaner when the blades are in position. The side edges of the end portions of the blades are provided with notches 12, into which the metal of the ribs or flanges extends, whereby the blades are prevented from pulling out of the recesses. The grooves 11 of the ribs or flanges are approximately V-

shaped in cross-section before the heads are connected to the springs, and the sides of the ribs or flanges may be spread or upset against the ends of the springs in any suitable manner.

It will be seen that the flue-cleaner is exceedingly simple and inexpensive in construction, that it possesses great strength and durability, and that it is easily operated. Furthermore, it will be clear that the blades, owing to their great resiliency, are adapted to operate on both welded and thimbled flues and that the spiral arrangement of the blades sets them at an angle and enables the blades to operate with a shearing cut, whereby the crust and other accumulation may be readily removed.

What we claim is—

1. In a flue-cleaner, the combination with two heads each having a series of exterior recesses adapted to have their walls upset, of a plurality of resilient blades disposed between the heads with their ends seated in the recesses and provided with notches adapted to receive the metal of the walls of the recesses when upset.

2. A flue-cleaner comprising two approximately semispherical heads provided with annular series of exterior recesses disposed longitudinally of the flue-cleaner, and the spirally-arranged resilient blades having angularly-arranged ends disposed longitudinally of the flue-cleaner in the said recesses and provided with opposite notches, the walls of the recesses being upset against the blades and extended into the notches, substantially as described.

3. A flue-cleaner comprising two outwardly-tapered heads provided with annular series of exterior recesses extending longitudinally of the flue and the resilient blades arranged spirally and having angularly-disposed ends extending longitudinally of the flue-cleaner and secured within the said recesses, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

REGINALD S. RUGGLES.
CONSTANT M. RUGGLES.

Witnesses:
FRANK W. PARKER,
E. A. MUNGER.