

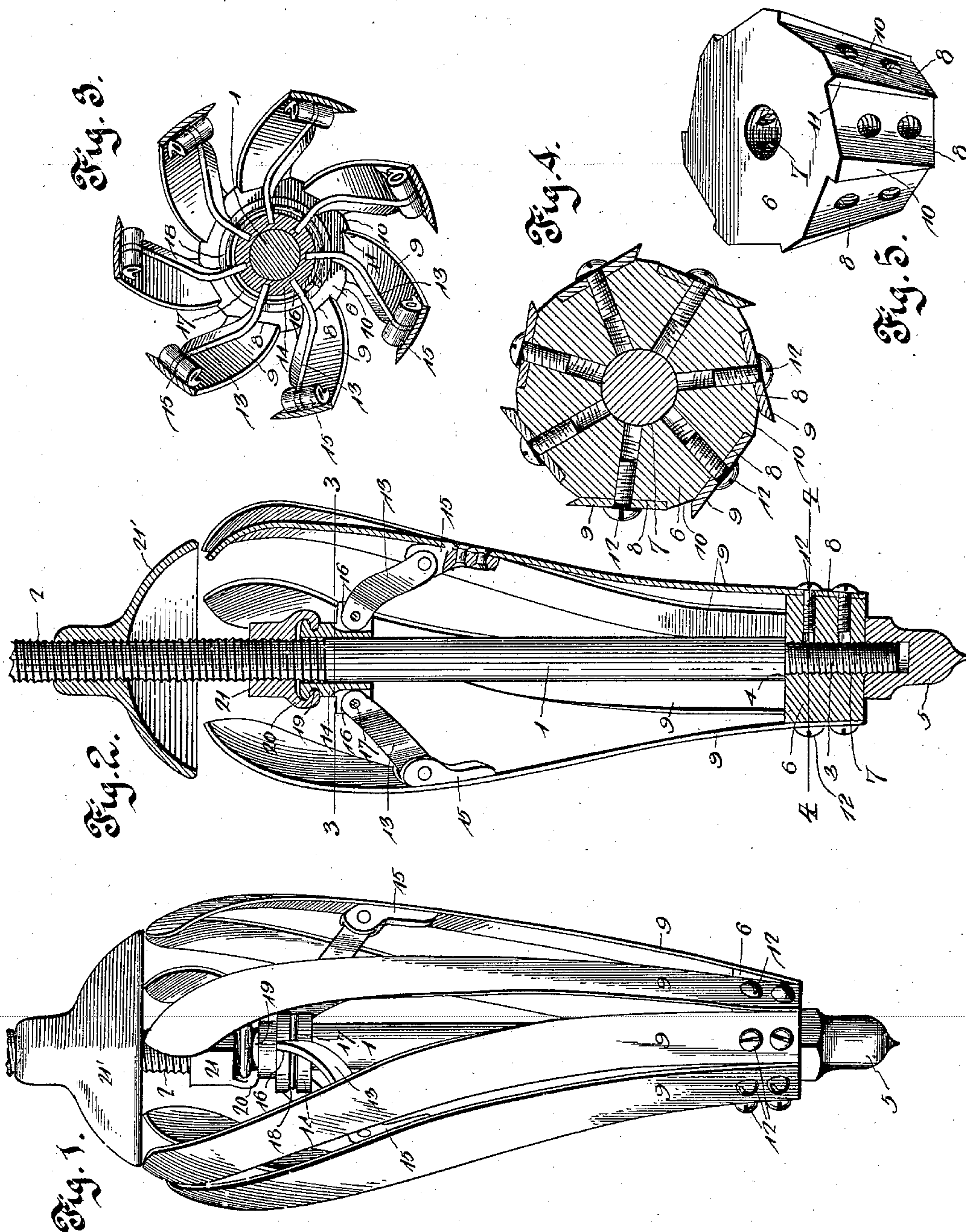
No. 628,611.

Patented July 11, 1899.

H. A. RUGGLES.
FLUE CLEANER.

(Application filed Oct. 13, 1898.)

(No Model.)



Witnesses

J. H. Bulverwell,

J. H. Riley

By his

Attorneys.

Harry A. Ruggles, Inventor.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

HARRY A. RUGGLES, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE
WERNER-SCHENCK COMPANY, OF SAME PLACE.

FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 628,611, dated July 11, 1899.

Application filed October 13, 1898. Serial No. 693,423. (No model.)

To all whom it may concern:

Be it known that I, HARRY A. RUGGLES, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Flue-Cleaner, of which the following is a specification.

The invention relates to improvements in flue-cleaners.

10 The object of the present invention is to improve the construction of flue-cleaners and to provide a simple, inexpensive, and efficient one adapted for cleaning either water-tubes or smoke-flues without injuring the same and
15 capable of being operated either by hand or by steam.

The invention consists in the construction and novel combination and arrangement of parts, as hereinafter fully described, illustrated in the accompanying drawings, and
20 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. Figs. 3 and 4 are
25 transverse sectional views on lines 3-3 and 4-4 of Fig. 2. Fig. 5 is a detail perspective view of the head to which the blades are secured.

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

1 designates a shaft provided with inner and outer threaded portions 2 and 3, the outer threaded portion 3 being reduced to form a
35 shoulder 4 and receiving a cap-nut 5, which clamps a head 6 against the shoulder 4. The head 6, which is constructed of brass or copper similar to the shaft, has a general circular shape and tapers toward the outer end of
40 the shaft slightly. The central opening 7 of the head 6 is threaded to engage the threads of the shaft, and the periphery of the head is provided with an annular series of flat blade-supporting faces 8, arranged at an angle to
45 the shaft and converging toward the front end of the same to cause an annular series of blades or knives 9 to diverge rearwardly. The convergence of the faces 8 forms tapering
50 intervening portions 10, and the inclination of the said faces provides radially-arranged shoulders 11. The front ends of the knives

or blades 9 are secured to the flat faces of the head by screws 12 or other suitable fastening devices, and their outer longitudinal edges, which are beveled at the inner faces of the
55 knives or blades to form cutting edges, project beyond the outer edges of the said faces 8, while the inner edges of the knives or blades are supported by the radial shoulders
11. The cap or nut 5, which operates in the
60 nature of a jam-nut, has a tapering outer portion to facilitate the introduction of the device into a tube or flue.

The knives or blades, which are constructed of steel, are arranged at an angle to the
65 central shaft and are slightly curved laterally, the curve increasing toward their rear ends, as clearly illustrated in Fig. 1 of the accompanying drawings, and the rear terminals of the blades are curved inward. By this construction a tapering cleaner is provided, and
70 the blades or knives are set at a sufficient angle by the head to throw the cutting edges outward.

The blades or knives are adapted to be
75 sprung outward and drawn inward to vary the diameter of the cleaner to correspond to the size of the tubes or flues to be cleaned, and they are adjusted inward and outward by means of an annular series of toggle-arms
80 13, which have their outer ends pivotally connected with the blades and their inner ends similarly secured to a sliding sleeve 14. The
85 arms 13 are slightly curved to offset their outer ends laterally from the points of attachment of their inner ends, owing to the lateral curve of the blades, and the latter are provided at their inner faces with plates 15, having perforated ears and preferably constructed of brass or similar metal. The sliding
90 sleeve is provided with a series of radial slots 16, in which the inner ends of the arms 13 are arranged, and the said inner ends of the arms are perforated and are secured to the sliding sleeve by means of a wire 17, arranged in an annular groove 18, which intersects the slots; but any other form of pivotal connection may be employed, if desired. The sliding sleeve is provided at its inner end
95 with an annular groove 19, which is engaged by arms 20 of an adjusting-nut 21, and the latter, which is arranged on the inner threaded

portion 2 of the central shaft, is adapted to be rotated to slide the sleeve inward and outward. The inner threaded portion of the shaft also receives a bell 21', having a threaded opening and presenting an inner concave face and an outer or rear convex face to center the device and guide it into a tube or flue after it has been pushed entirely through the same, thereby preventing any liability of the inner ends of the blades striking a wall or sheet of a boiler.

The flue-cleaner, which is designed to be operated by hand or steam, is adapted to clean either water-tubes or smoke-flues, and in cleaning the latter it is only necessary to move the cleaner backward and forward through the flues without rotating it, as it will touch the flues at all points. In removing the crust or scale from water-tubes it is rotated, and it will thoroughly cut the same from the tubes, leaving their inner faces perfectly clean. The shaft may be connected with a rigid shaft or rod; but when it is desired to clean curved tubes and flues a cable may be attached to the device.

The invention has the following advantages: The flue-cleaner, which is simple and comparatively inexpensive in construction, is adapted to be operated either by hand or steam and may be employed for cleaning either water-tube boilers or smoke-flue boilers. The knives or blades, while being rigidly supported, have sufficient flexibility to enable them to conform to the configuration of a tube or flue and shave the scale or crust completely off the same. By constructing and supporting the blades in this manner the device is also adapted to operate on boilers having welded flues. The bell, which is adapted to push the accumulation ahead of it, insures the safety of the cleaner in drawing the same backward into a tube or flue. By constructing the cleaner of both brass and steel, as described, two steel parts do not come in contact with each other and the liability to rust is reduced to a minimum.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. A device of the class described comprising a shaft having an inner threaded portion, a head arranged at the outer portion of the shaft, longitudinal blades connected at their outer ends with the head, a sliding sleeve mounted on the rear portion of the shaft and provided with an annular groove, the toggle-arms pivotally connected with the blades and with the sleeve, and a nut engaging the threaded portion of the shaft and provided with arms interlocked with said groove and adapted to move the sleeve inward and outward whereby the blades are expanded and contracted, substantially as described.

2. A device of the class described comprising a central shaft, a head arranged at the outer end of the shaft and provided with an annular series of flat peripheral faces converging toward the outer end of the shaft, said faces being formed by recessing the head and providing the tapering intervening portions 10 having shoulders 11, blades rigidly secured to the faces of the head and supported by the shoulders 11, a sleeve sliding on the inner portion of the shaft, toggle-arms connecting the blades with the sliding sleeve, and means for adjusting the sleeve, substantially as described.

3. A device of the class described comprising a shaft provided with inner and outer threaded portions, a threaded head arranged on the outer threaded portion of the shaft, a tapering cap-nut mounted on the shaft and engaging the head, longitudinal blades rigidly secured at their front ends to the head, a sliding sleeve mounted on the rear portion of the shaft and provided with an annular groove, a nut engaging the rear threaded portion of the shaft and provided with arms interlocked with the said groove, and the toggle-arms pivotally connected with the blades and similarly secured to the sleeve, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HARRY A. RUGGLES.

Witnesses:

CONSTANT M. RUGGLES,
FRANKLIN A. BECHER.