No. 613,746. Patented Nov. 8, 1898.

E. D. WESTON.

FLUE SCRAPER.

(Application filed May 9, 1898.)

(No Model.)

Fig. 1.

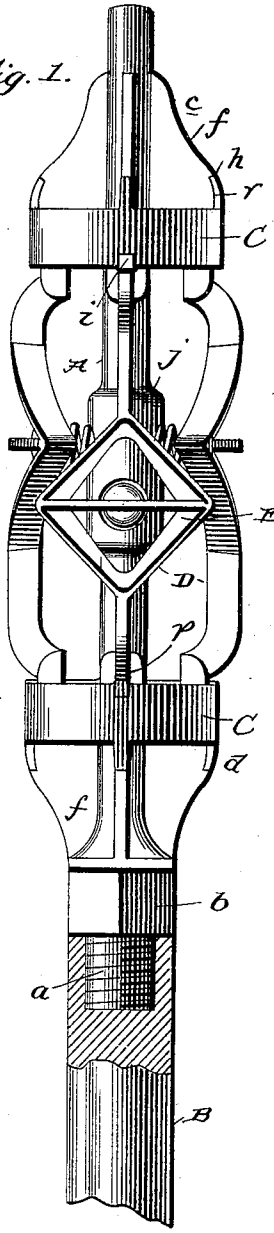


Fig. 2.

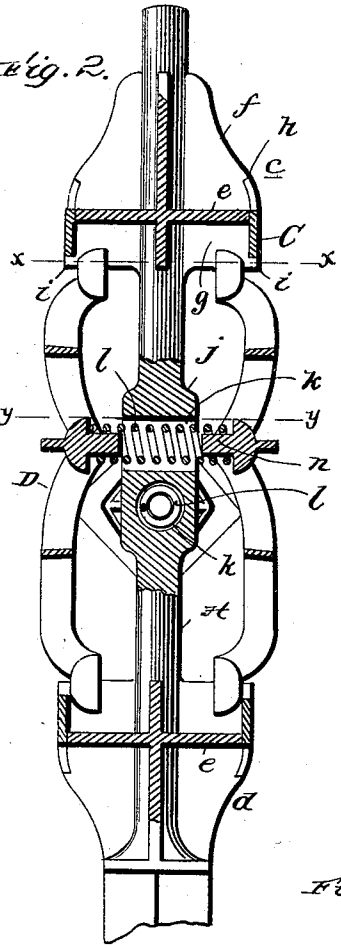


Fig. 3.

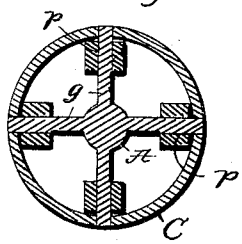


Fig. 4.

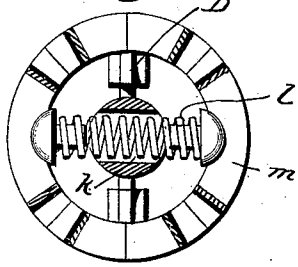


Fig. 5.

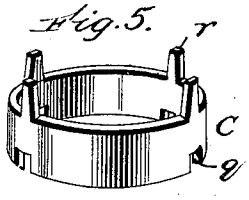


Fig. 6.

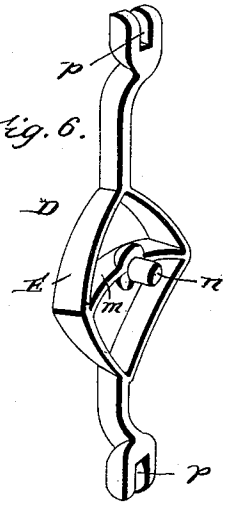
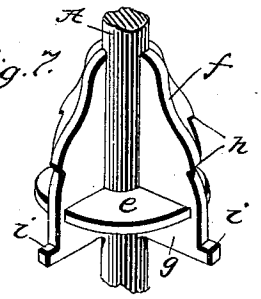


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD D. WESTON, OF JACKSON, MICHIGAN, ASSIGNOR OF ONE-HALF TO B. D. LEGG, OF SAME PLACE.

FLUE-SCRAPER.

SPECIFICATION forming part of Letters Patent No. 613,746, dated November 8, 1898.

Application filed May 9, 1898. Serial No. 680,181. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. WESTON, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented new and useful Improvements in Flue-Scrapers, of which the following is a specification.

This invention relates to improvements in that class of flue scrapers and cleaners in which the scraping-blades are backed by springs and are limited in their outward movements by heads or rings at the ends of the blades, and the novelty and many advantages will appear from the following description and claims, when taken in conjunction with the accompanying drawings, in which—

Figure 1 is a side view of my improved device with a part of the attaching rod or handle broken and in section. Fig. 2 is a longitudinal sectional view of the same, with parts in elevation. Fig. 3 is a cross-sectional view taken at the point indicated by the dotted line *x x* on Fig. 2. Fig. 4 is a similar view taken at the point indicated by the dotted line *y y* on Fig. 2. Fig. 5 is a perspective view of one of the bands or rings removed. Fig. 6 is a similar view of one of the scrapers, and Fig. 7 is a broken perspective view of one end of the stock.

Referring by letter to said drawings, A indicates the stock or stem. This stem may be threaded at one end, as shown at *a*, to receive the threaded end of a rod or handle B, and it may also be provided with an angular portion *b* to receive a wrench, whereby it may be turned into the handle. At or near each end of this stem I provide an integral head, the outer one being indicated by the letter *c* and the inner one by the letter *d*. Each head comprises an annular web *e*, with longitudinally-disposed flanges *f* on their outer sides and similarly-disposed flanges *g* on their inner sides. The flanges *c* taper on their edges from their inner to their outer ends, so as to facilitate the introduction of the scraper into a tube or flue, and they are notched or shouldered at *h* for a purpose which will presently appear. The flanges *g* are projected laterally at their inner ends to form stops or shoulders *i* for the bands or rings C, which are necessarily removable because of the heads *c d* being integral with the stem. It will thus be seen that I provide a shoulder on each longitudinal flange of the heads and at opposite sides of the webs *e*, so as to prevent the bands or rings from moving in either direction or turning on said heads when once placed in position over the ends of the scraping-blades. The outer flanges *c* will also serve in cutting or loosening scale and other foreign substances adhering to the interior surface of a tube or flue, and the webs, in addition to strengthening the flanges, will also serve as a means of carrying out any matter loosened up by the flanges and that may come in their paths from other cause.

The stem A is enlarged centrally, as shown at *j*, and this enlarged portion has two transverse holes *k*, one being disposed in a plane at right angles to the other, and each receives a spring *l*, which springs are here shown as of spiral form. These springs project at each end from the holes and furnish yielding supports for the scrapers.

D indicates the scraping-blades, there being usually but four employed and arranged opposite each other in pairs, so as to surround the stem A. These "scrapers" or "blades," as I have called them, are of a form and construction better shown in Fig. 6 of the drawings, and in order to withstand rough and heavy usage they may be made of cast-iron or other suitable material. Each blade is formed with an expanded portion E, so as to increase its rubbing-surface, and may comprise a substantially rectangular figure with a cross-bar *m* connecting two opposite corners. The outer sides of these cross-bars also form scraping edges, and on their inner sides they are provided with inwardly-directed studs *n* to receive the ends of the springs *l*.

The scrapers have a slight longitudinal curvature, and the cross-bars *m* are also slightly curved and extend into the plane of said longitudinal curvature, so that these cross-bars may also be effective in the scraping action of the device.

The expanded portions of the blades are not midway the length of the blades, but nearer one end than the other alternately, so that when the blades have been drawn in-

wardly to their greatest extent these enlarged or expanded portions will pass each other. Each blade has its ends slotted or forked, as shown at *p*, to straddle and receive the flanges *g* of the heads, which guide the blades in their movements.

The rings or bands C for holding the scrapers on the stem are made of wrought-iron or such material as will permit of slight bending. Each ring or band is provided on its inner edge with notches *q* to receive the projected ends or stops *i* of the flanges *g*, so as to prevent the rings from turning on the heads, and said rings are provided on their outer edges with short arms or branches *r*, which are adapted to be turned or bent down against the shoulders *h* when the rings have been properly seated on the heads and over the slotted or forked ends of the blades.

I have shown the rings as having a notch for each inner flange *g* and an arm for each outer flange *f*, and while such construction is preferable yet it is obvious that a single notch with a lug or stop will prevent the rings from turning on the heads, and the same is true of a single arm and shoulder on the opposite side of the web in preventing the rings from slipping or sliding off of the heads.

It will be observed that the scrapers E are fulcrumed near their centers on the springs *l*. By this means they can move bodily inwardly and outwardly, and they are also allowed a longitudinal tilting movement, so that while they will give at either end in entering or being withdrawn from a flue they will also present their entire outer surfaces to the interior of a flue or tube during operation.

By having the rings or bands removable it will be seen that the scrapers may be readily removed when desired, and should a spring become impaired or injured it may be quickly removed and replaced by another.

While I have shown spiral springs for supporting the scraping-blades and such springs are preferable, yet I do not wish to confine myself to the use of spiral springs, as in some cases flat springs might be employed and produce good results. In using flat springs I would provide the spring with a hole at a suitable point in its length to receive the studs *n* and bow or curve the spring longitudinally, so that its ends, which may be notched, can bear on the stem or stock and sustain the blades in a projected position.

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

1. In a flue-scraper, the combination of a stem having integral heads, at or near its opposite ends, provided on their inner sides with radially-disposed guides, scrapers interposed between the heads and engaging the guides thereof, springs arranged to press the blades outwardly from the stem, removable bands arranged on the heads and surrounding the guides so as to retain the blades thereon, and coacting devices on the bands and heads detachably securing the bands to the heads, substantially as specified.

2. The stem having the heads at or near its ends, and comprising the webs and outer flanges *f*, having notches, and inner flanges *g*, having shoulders; in combination with the bands having the notches on their inner edges and the arms on their outer edges, and scrapers having their ends slotted to receive the flanges *g*, substantially as specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD D. WESTON.

Witnesses:
CHAS. H. SMITH,
ALLIE B. CLAY.