(No Model.)

V. RADSPINNER.

FLUE SCRAPER.

No. 415,282. Patented Nov. 19, 1889.

Fig. 1.

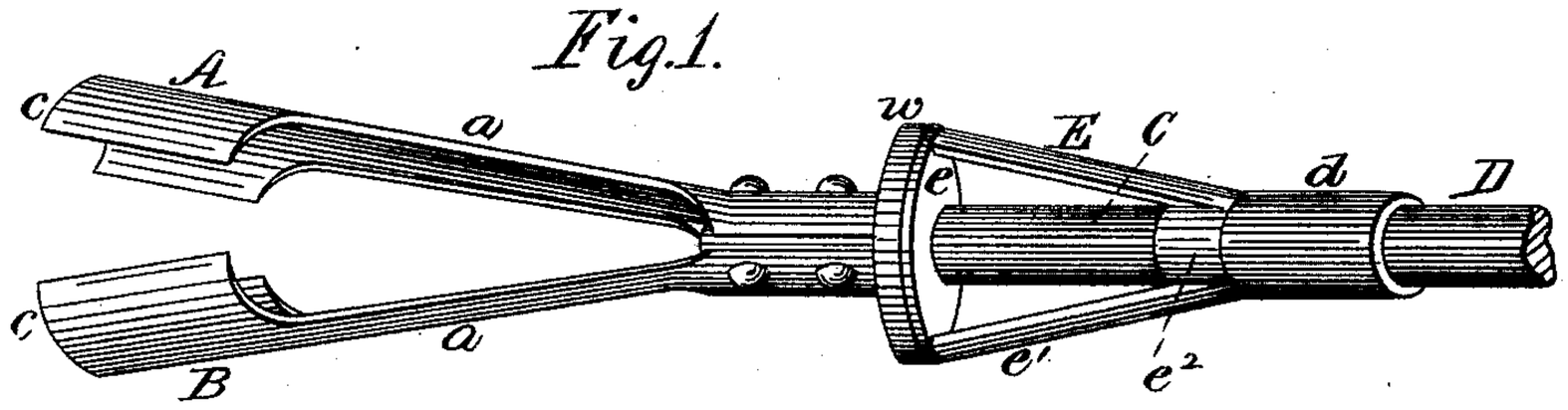


Fig. 2.

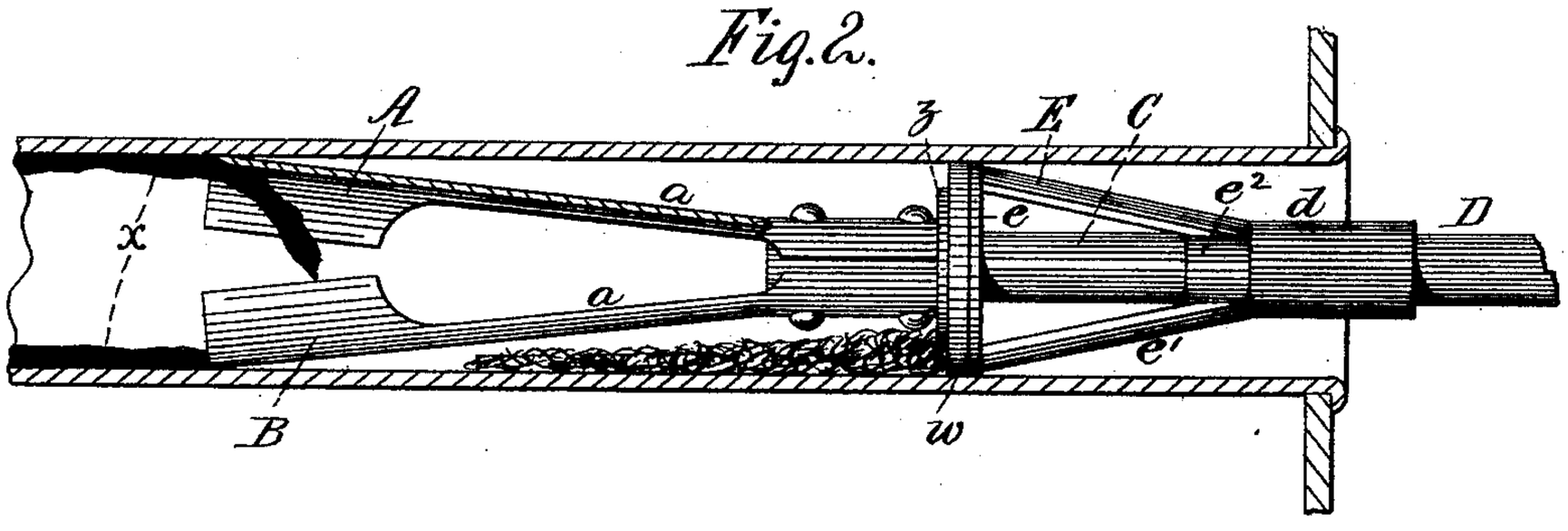


Fig. 3.

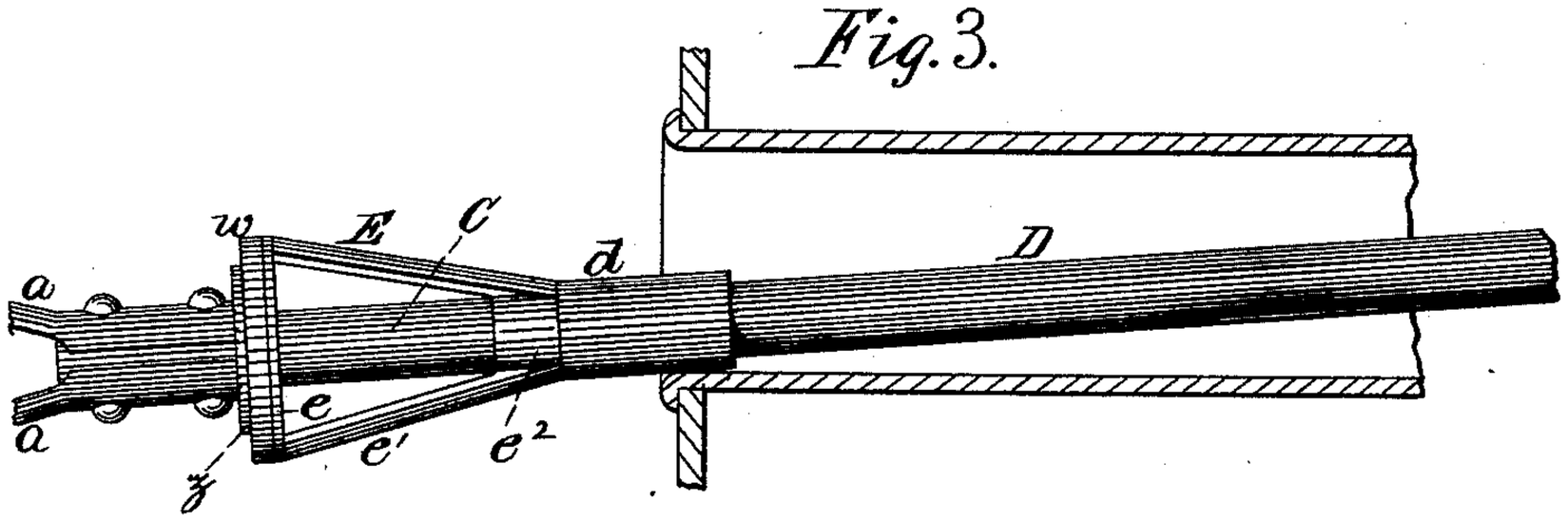
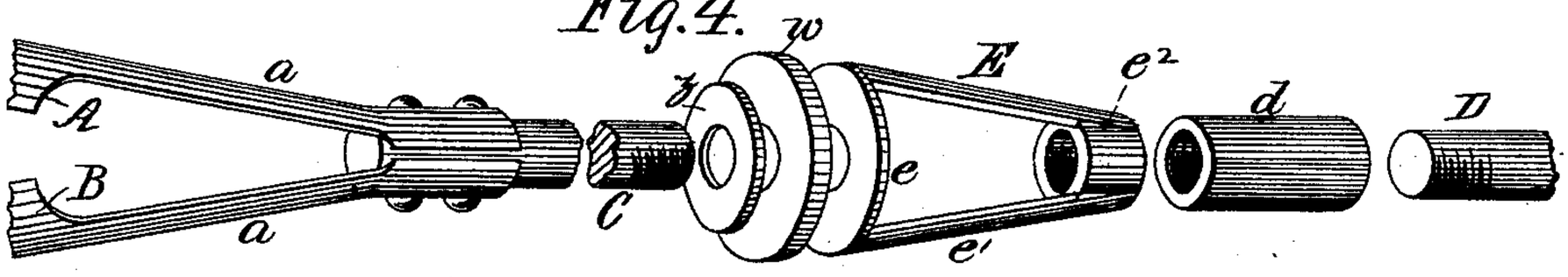


Fig. 4.



Witnesses:
W. C. Jirdinston.

L. E. Hosea.

Inventor:
Veitus Radspinner
by L. E. Hosea
Attorney.

UNITED STATES PATENT OFFICE.

VEITUS RADSPINNER, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO WILLARD W. BURT, OF PEORIA, ILLINOIS.

FLUE-SCRAPER.

SPECIFICATION forming part of Letters Patent No. 415,282, dated November 19, 1889.

Application filed December 17, 1888. Serial No. 293,830. (No model.)

To all whom it may concern:

Be it known that I, VEITUS RADSPINNER, a citizen of the United States, residing at Cincinnati, Ohio, have invented new and useful Improvements in Flue-Scrapers, of which the following is a specification.

My invention relates to "flue-scrapers," or devices for removing the accumulations of sooty, carbonaceous, or scaly deposit from the flues or tubes of steam-boilers and water-heaters, and is designed to provide an economical and more efficient device for the purpose than those now in use. The devices commonly in use—such as brushes in various forms—act radially by surface abrasion upon the deposit. In many cases, however, the deposit is too hard and firmly attached to be thoroughly removed by this action, and much remains, causing a waste of fuel by imperfect conduction of heat, and sometimes a corrosion of the metal by the condensation of moisture and formation of corrosive acids at the cooled surface of the metal beneath the crusty deposit.

My improved device is designed to thoroughly remove all carbonaceous or scaly deposits; and to this end it consists of a scraper or series of curved scrapers mounted concentrically upon a rod or handle, with which they are connected by elastic shanks, and presenting cutting-edges formed approximately to the cylindrical interior contour of the tube and arranged to act in the longitudinal direction of the tube-surface somewhat as the bit of a plane acts upon the wood, and separate the scaly deposit by penetrating beneath and separating the same by a wedging or prying action.

A preferred form and construction of my invention is illustrated in the accompanying drawings, in which—

Figure 1 exhibits a perspective elevation of the device embodying two scraping-blades; Fig. 2, a side view of the same within a tube or flue in use, the tube and one scraper-blade being sectioned longitudinally to exhibit the separating action of the blades upon the scale and the position of the piston-washer in the tube; Fig. 3, a side view of the device projected through and beyond a tube, showing the action of the conical washer-frame in aiding the withdrawal of the device; and Fig. 4, a perspective view of the device with the parts slightly detached, showing the individual character of each part.

Referring now to the drawings, A B designate two scrapers, formed somewhat as curved shovel-blades, extended rearward into longitudinal shanks *a a*, by which they are attached to a suitable head C, which is practically an extended section of the handle D, or may be attached directly to the handle. The scrapers, with their immediate extensions, are preferably formed of steel with sharp cutting-edges *c* at the front. Where two blades are used, as is usually the case, they are attached to the head C at opposite sides, standing somewhat apart divergently as they project forward concentrically to a larger diameter than the flue, and are to be closed somewhat together against the yielding elasticity of their shank-extensions when inserted into the mouth of the flue. The outward "spring" of the shank-extensions *a b* causes the outer cutting-edges *c* to bear against the inner periphery of the flue F at a slight angle, but in the general longitudinal direction of the flue. The scraper being thus inserted and moved forward by the manipulating-handle, the cutting-edges *c* move forward as wedges between the accumulated crust or deposit *x* and the internal surface of the flue F, and being from time to time suitably rotated detach all such deposit cleanly and effectually therefrom without appreciable wear or abrasion of the flue-surface or any serious wear upon the implement.

It will be obvious that the principle of my invention may be effectuated in a degree with but one scraping-blade attached to the head C or manipulating-handle at such an angle as to obtain the desired resiliency of the spring-extension; also, that three or more scrapers may be arranged radially about the same containing-head.

I prefer for more effective use of the device to add additional features, as follows: Next behind the scrapers I place a washer *w*, preferably of yielding material—such as leather, rubber, asbestus, or other yielding material—to fit the flue somewhat closely, in the manner of a piston or plunger faced in front with an

ordinary metal washer *z* of smaller diameter. Behind this I place a backing-frame E, consisting of a washer-plate *e*, forming a loose fit in the tube, backed by ribs *e'*, connecting same with a collar e^2 slipping over the head C. A screw-cap *d* is then placed upon the rear threaded end of the head C as a follower, and serves as a socket for the attachment of the handle D. The function of the washer *w* is threefold: First, it serves as a sliding support for the device in the flue by which the scrapers are held in true concentric relation thereto; second, it serves to push forward the detached scale and carry the same through the flue as the device is shoved forward, and, third, it also serves as a temporary stopper within the flue to check the passage of flame and heated gases forward when the device is used with a furnace in operation, and thus prevent injury to the temper of the steel scrapers.

The function of the conical backing-frame is not only to strengthen and support the washer *w*, but also (as illustrated in Fig. 3) to aid the withdrawal of the scraper when it has been projected through and beyond a tube by presenting an inclined surface to guide the washer into its concentric position in the tube. These last-mentioned parts are all readily removable by taking off the screw-cap *d*, (which latter part may be a permanent socket-extension of the handle.) In many cases, especially in water-tube boilers, they may not be required, as the cleansing of the tubes after detaching the scale is preferably done by a hose and a forcible stream of water.

The operation of the device has already been sufficiently indicated in the foregoing description.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a flue-scraper, the combination of the curved blades A B, the resilient shanks *a b*, connecting said blades to the head C, leaving a comparatively open space between, the conical backing-frame E, screw-cap follower *d*, and handle D, substantially as set forth.

2. In a flue-scraper, the combination of the curved shovel-blades B, having resilient shanks and bolted or riveted to a handle-section C, the washer *w*, of resilient material, the backing-frame consisting of the annular disk *e*, hub e^2, and connecting-ribs *e'*, the screw-cap follower *d*, and handle D, substantially as set forth.

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

VEITUS RADSPINNER.

Witnesses:
L. M. HOSEA,
L. E. HOSEA.