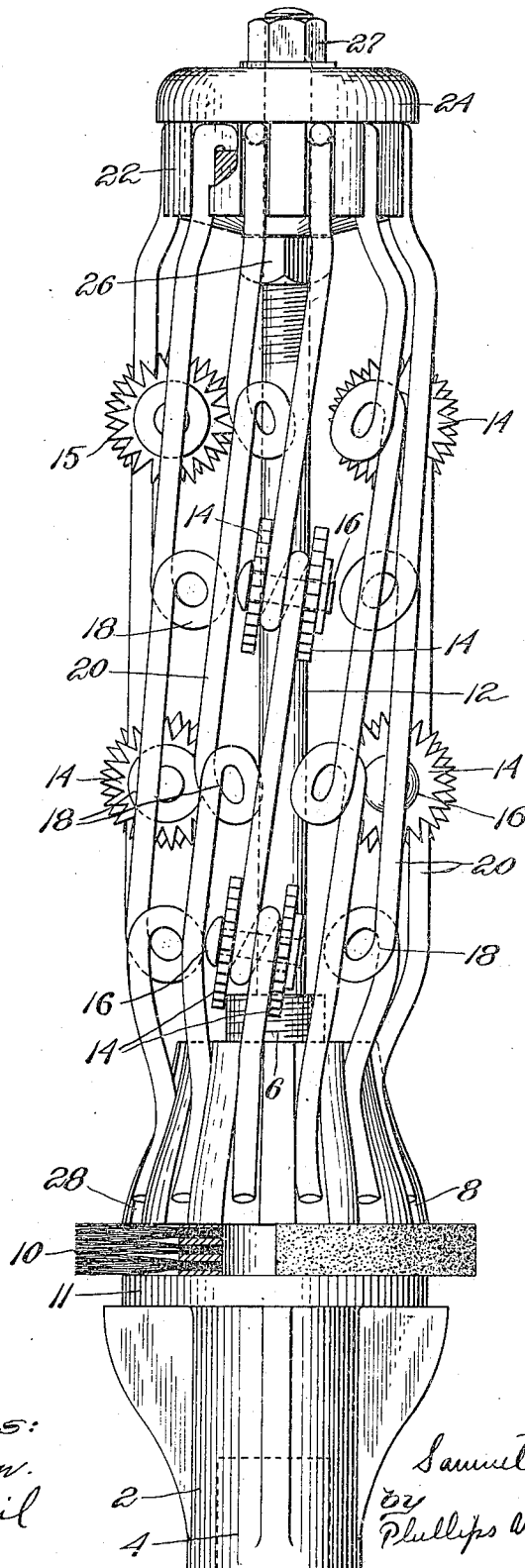


S. S. POOLE.
FLUE CLEANER.

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Witnesses:
W. L. Gilman.
H. D. McPhail

Inventor
Samuel S. Poole
By
Phillips Van Emmon & Fish
Attys.

UNITED STATES PATENT OFFICE.

SAMUEL S. POOLE, OF ALBANY, NEW YORK.

FLUE-CLEANER.

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To all whom it may concern:

Be it known that I, SAMUEL S. POOLE, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Flue-Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to flue cleaners, and more particularly to cleaners adapted for use in removing scale or other incrustations from boiler flues.

The primary object of the invention is to provide a flue cleaner which is adapted to be reciprocated within the flue and which has its scale cutting disks or rowels so located that they will be rotated by contact with the interior of the flue and produce a uniform cutting, chipping or loosening action upon the scale throughout substantially the length and circumference of the cleaner, thus rapidly removing the scale as well as evenly distributing the wear upon the cutters. To this end the cutters are mounted at such an angle to the longitudinal axis of the flue cleaner that they will be caused to rotate in a plane inclined to their line of movement through the flue by contact with its interior when the cleaner is reciprocated therein, said cutters being mounted upon supports which are inclined to the axis of the cleaner sufficiently to maintain the cutters out of longitudinal alinement to prevent the formation of tracks through the scale, thus insuring an efficient breaking up and loosening of the scale throughout the entire interior of the flue.

A further object is to provide a flue cleaner in which the cutting disks or rowels are rotatably mounted upon yielding supports to enable them to more readily pass by obstructions or uneven sections within the flue, said supports being also adjustable radially of the cleaner in order to adapt it for cleaning flues of various diameters. To this end the rowels are journaled upon shafts which are mounted upon resilient supporting members circumferentially distributed about the cleaner, said supporting

members being adjustable radially of the cleaner to vary the diameter of the cleaner in accordance with the size of the flue to be cleaned.

Other features of the invention will be referred to in connection with the specific description of the illustrated embodiment of the invention.

The several features of the invention will be clearly understood from an inspection of the accompanying drawing and the following detailed description of the construction shown therein.

In the drawing is shown an elevation with parts in section of a flue cleaner embodying the invention.

As shown in the drawings, the cleaner comprises a block or head 2 provided with a socket 4 whereby it may be mounted upon a rod. Projecting from the upper surface of the head 2 is a screw threaded cylindrical stem 6 upon which is mounted a conical fluted nut 8 which clamps a brush 10 against a disk 11 formed on the head 2, and a central rod or standard 12 extends upwardly from said stem.

The devices for cutting and loosening the scale consist of toothed cutter disks or rowels 14 preferably provided with chisel edge cutting teeth 15 and mounted to turn freely upon journals 16 extending at an angle to the axis of the cleaner. The journals are formed of rivets having a head at one end and a washer at the other and supported in retainers composed of loops 18 formed in resilient rods or wires 20. Two cutters are journaled upon each rivet and are loosely mounted to allow their peripheries to have considerable lateral motion so that they may adapt themselves more readily to the interior of the flue and more effectively chip and loosen the scale by bringing the corners of the chisel shaped teeth in contact therewith.

The journal supporting members 20 are each formed with a plurality of journal retaining loops, and are supported at their upper ends in a fluted head 22 which is capped by a disk 24 and held upon the standard 12 by nuts 26 and 27. Said supporting members are formed of wires extending at an angle to the axis of the cleaner,

and their lower ends are received in the channels or flutes 28 formed on the nut 8. The main portions of said members are substantially straight and form a generally cylindrical body portion for the cleaner, their upper ends being offset to produce the desired degree of angularity of the main portions with respect to the axis of the cleaner.

By the arrangement of the supporting members at an inclination to the axis of the cleaners, the cutters on the respective members are out of alinement longitudinally of the cleaner. Thus when the cleaner is reciprocated within a flue, the cutters are caused to rotate by engagement with its interior in planes inclined to the axis of the cleaner, and since one set of cutters does not follow directly in the path of a preceding set, an effective cutting, chipping and loosening of the scale or other incrustation over the entire interior surface of the flue is secured. The mounting of the cutters in staggered relation circumferentially of the cleaner allows the supporting members to be mounted comparatively near together, thus enabling the cleaner to contain a larger number of them than would be the case if the cutters on adjacent supporting members were located opposite one another.

By lowering the nuts 26 and 27, the lower ends of the supporting members 20 will be forced downwardly along the conical nut 8, thereby spreading them radially and adapting the cleaner to a flue of larger diameter. It will be noted that by thus adjusting the cleaner, the cutters will be moved outwardly by increasing ratios from the top toward the bottom of the cleaner, thereby producing in effect a slightly conical cleaner. Thus the work done by the cutters will be evenly distributed, since the upper ones may remove a portion of the scale, and each succeeding set also remove a portion, thereby rendering the result more satisfactory and lengthening the life of the cutters. The supporting members being made of resilient rods or wires, readily adapt themselves to any inequalities or obstructions in the flue, yet always maintain the cutters in contact with the surface to be cleaned. By raising or lowering the nuts 26 and 27, and thereby adjusting the position of the head 22, the cleaner will be adapted for cleaning flues of various diameters.

Having explained the nature and object of the invention, and specifically described one form of device in which it may be embodied, what I claim is:—

1. A flue cleaner comprising a series of resilient journal supporting members arranged at an angle to the axis of the cleaner and having loops formed intermediate their length, journals mounted in said loops, cut-

ter disks rotatably mounted on said journals, and means for adjusting said members radially, substantially as described. 65

2. A flue cleaner comprising a standard, a pair of heads mounted on the standard, a series of resilient supporting members extending between the heads and having loops formed intermediate their length, journals retained in said loops, and cutters mounted on the journals to rotate at an angle to the axis of the cleaner, substantially as described. 70 75

3. A flue cleaner comprising a standard, a pair of heads mounted on the standard, a series of substantially parallel resilient supporting members connecting the heads arranged at an angle to the axis of the cleaner and having journal retaining loops formed therein, journals mounted in the loops, and cutters mounted on the journals, substantially as described. 80 85

4. A flue cleaner comprising a standard, a pair of heads mounted on the standard, a series of resilient diagonally arranged supporting members extending between the heads and having loops formed intermediate their length, journals mounted in the loops, and cutters mounted on the journals, substantially as described. 90 95

5. A flue cleaner comprising a series of resilient journal-supporting members arranged at an angle to the axis of the cleaner, a plurality of journals mounted in each of said members, and cutter disks rotatably mounted on said journals, said cutter disks being out of alinement longitudinally and mounted in staggered relation circumferentially of the cleaner, thus producing a generally cylindrical cutting surface, substantially as described. 100 105

6. A flue cleaner comprising a standard, an exteriorly fluted conical member, a movable head on the standard, a series of diagonally arranged supporting members attached to the movable head at one end and having their free ends received in the flutes on the conical member, and cutters rotatably mounted on said members, said cutters being out of alinement longitudinally and mounted in staggered relation circumferentially, thus producing a generally cylindrical cutting surface, substantially as described. 110 115

7. A flue cleaner comprising a series of resilient journal-supporting members arranged at an angle to the axis of the cleaner, a plurality of journals mounted in each of said members, cutter disks rotatably mounted on said journals, said cutter disks being out of alinement longitudinally and mounted in staggered relation circumferentially of the cleaner thus producing a generally cylindrical cutting surface, and means for adjusting one end of the members radially to 120 125

vary the diameter of the cleaner, substantially as described.

5 8. A flue cleaner comprising a standard, a stationary head having a fluted conical member, a movable head on the standard, a series of rods secured at one end to the movable head and having their free ends in contact with the fluted member, cutters rotatably mounted on said rods, and means for ad-

justing the movable head to vary the radial position of the free ends of said rods, substantially as described.

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

SAMUEL S. POOLE.

Witnesses:

RICHARD E. ELLIS,
ERNEST W. RIECK.