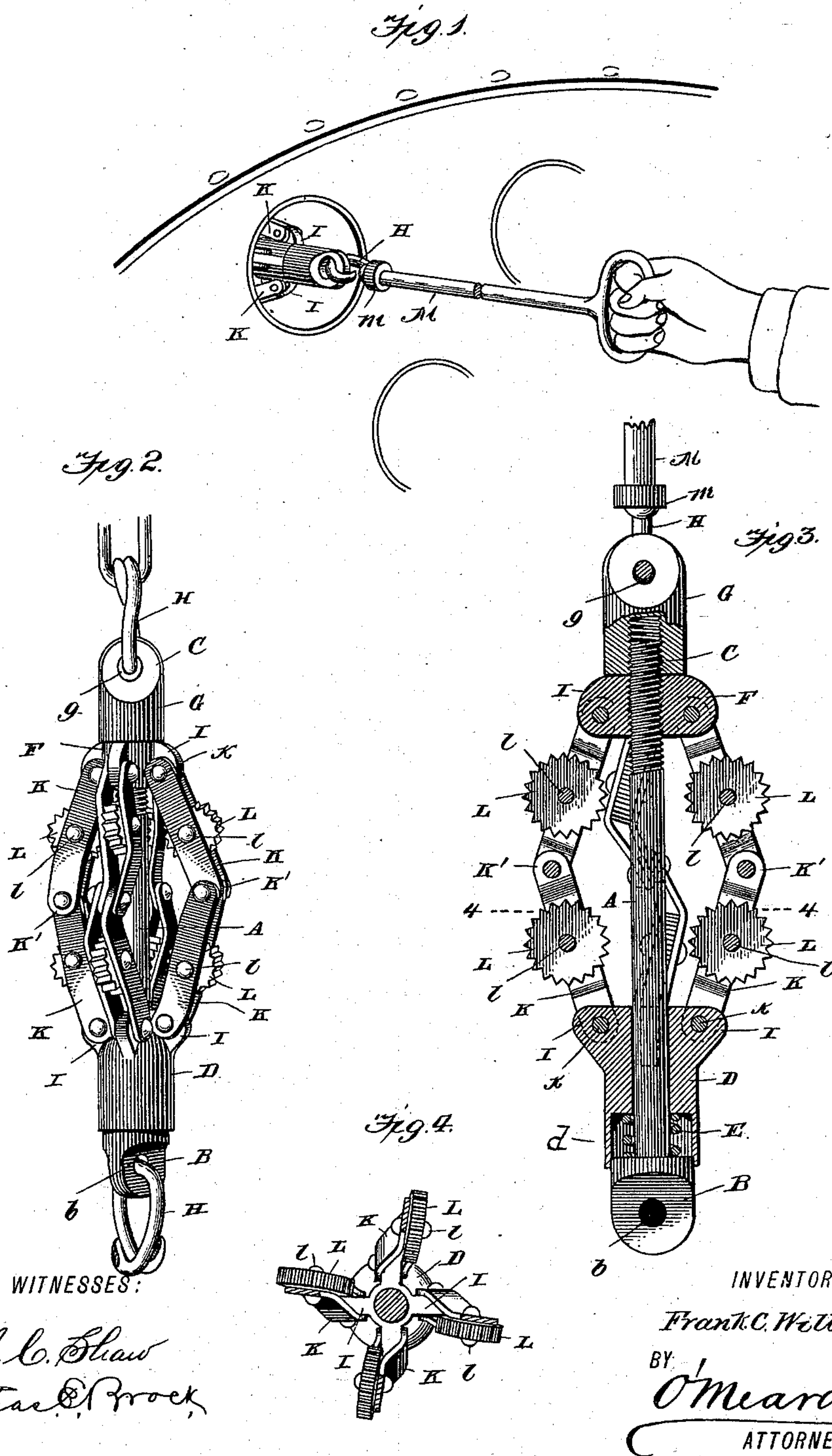


(No Model.)

F. C. WILLIAMS.
FLUE CLEANER.

No. 573,946.

Patented Dec. 29, 1896.



UNITED STATES PATENT OFFICE.

FRANK C. WILLIAMS, OF BELLEFONTE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JAMES D. SEIBERT, OF SAME PLACE.

FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 573,946, dated December 29, 1896.

Application filed April 1, 1896. Serial No. 585,783. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. WILLIAMS, residing at Bellefonte, in the county of Centre and State of Pennsylvania, have invented a new and Improved Flue-Cleaner, of which the following is a specification.

This invention relates generally to flue or pipe cleaners, and more particularly to an internal cleaner for cutting away the scales or incrustations which form upon the interior of the boiler flues or pipes.

The object of the invention is to provide a cheap and simple form of flue-cleaner which can be used upon either straight or curved flue boilers, and one which can be operated by either a rod or chain, as circumstances may require.

Another object is to provide an improved flue-cleaner which will rotate in its passage through the flue, thereby effectively removing all of the scales from the interior of the flue or pipe.

Another object is to provide a flue-cleaner which is adjustable, or expansible and contractible, so that the cleaner can be used in connection with pipes of different sizes.

Another object is to provide a flue-cleaner which shall be pivotally connected with the operating rod or chain, so that said cleaner can revolve within the tube or flue while the rod or chain is held within the hand.

Another object is to provide a flue-cleaner carrying a series of independently-rotating cutter-wheels adapted to cut or break up the scales upon the interior of the tube or flue; and another object is to arrange said cutter-wheels in spiral, zigzag, or staggered order, in order to cause a rotation of the cleaner as it is drawn back and forth through the tube or flue.

With these various objects in view my invention consists in the peculiar construction of the various parts and in their novel combination or arrangement, all of which are shown in the drawings, fully set forth in the description, and pointed out in the appended claims.

In the drawings forming a part of this specification, Figure 1 is a view showing the invention in use. Fig. 2 is a perspective view of the invention, showing the same attached

to a chain and adapted for cleaning a curved flue. Fig. 3 is a sectional view of such cleaner attached to a rod and adapted for cleaning a straight flue. Fig. 4 is a transverse section on the line 4 4 of Fig. 1.

In constructing a flue-cleaner in accordance with my invention I employ a bolt or rod A, having a shouldered head B at one end, the opposite end being threaded, as shown at C. A collar D is arranged upon the bolt or rod A adjacent to the head B, a coil-spring E being arranged between the end of said collar and the said head and surrounding the rod or bolt at that point, said collar having a depending flange *d*, which fits over the head B.

A collar F is screwed upon the threaded end of the bolt or rod A, and upon the extreme end of said bolt or rod is screwed the lock nut or cap G. The head B and the cap G are each provided with apertures *b* and *g*, respectively, whereby a link H may be attached, and to which link a chain or rod can be connected, as hereinafter explained.

The collars D and F are each provided with perforated ears or lugs I, to which are pivotally attached the parallel toggle-arms K by means of bolts or rivets *k*, there being four pairs of ears and four pairs of parallel toggle-arms, the said toggle-arms having a knuckle or joint K' about midway their length.

As before stated, the toggle arms or levers are arranged in parallel pairs, and between the said parallel members are pivotally mounted the rotary cutters L, said cutters being mounted upon a bolt or spindle *l*, the periphery of said cutter being transversely serrated, as most clearly shown, in order to cut or break the scale or incrustation upon the interior of the flue or tube.

In practice I prefer to make the edges of the rotary cutter very sharp, somewhat in the shape of an ax-bit.

The members of the toggle arms or levers, although arranged parallel, are also bent in a zigzag or staggered form, as clearly shown in Figs. 2 and 3, and by means of this arrangement the cutters are held at an angle oblique to the line of draft, and, furthermore, lie in different but parallel oblique planes, as most clearly shown in Fig. 3.

By the above-described arrangement of the

cutters the cleaner will be caused to rotate as it is drawn through the flue, causing each cutter to describe a spiral path, and as said flues are arranged close together and in parallel order it is clear that the interior of the flue or tube will be completely acted upon.

The nut or cap G prevents the collar F from moving outward, and the normal tendency of the spring E is to throw the collar D inward, thereby spreading the toggle arms or levers and forcing the rotary cutters into contact with the interior of the flue or tube, and as said cleaner is drawn back and forth through the tube it is clear that the rotary cutters will always be held in contact with the interior face, as before described.

The operating-handle M is connected to the link H by means of a swivel *m*, so that as said rod is moved back and forth to force the cleaner through the tube said rod can be held firmly in the hand while the cleaner rotates within the tube, as before mentioned.

In operation the cleaner is forced back and forth through the tube several times, thereby cutting away the scale or incrustation, which can be easily removed by a brush or by forcing water through the flue or tube.

By attaching a chain to the cleaner it is clear that a curved flue or tube can be cleaned as readily as a straight one with the handle or rod attached thereto.

It will thus be seen that I provide an exceedingly simple and efficient construction of flue-cleaner, one which will cut away or remove all of the incrustation or scale upon the interior of a flue, and one which can be readily adjusted to suit flues or tubes of different sizes. It will also be noted that the toggle-arms carrying the rotary cutters are normally expanded by spring-pressure, thereby insuring a positive contact or cutting action be-

tween the said cutters and the interior of the flue or tube. It will also be noted that parallel zigzag or staggered arrangement of the rotary cutters insures a rapid rotation of the cleaner during its passage through the tube or flue.

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

1. An improved cleaner comprising a central bolt or rod, the zigzag toggle-arms the collars to which said arms are connected, and the rotating cutters carried by said arms, substantially as shown and described.

2. In a flue-cleaner the combination with the central rod or bolt having the head at one end and threaded at the opposite end, the collars arranged upon said bolt, the parallel zigzag toggle arms or levers, the rotary cutters pivoted in said arms or levers, the coil-spring and the screw-cap all arranged substantially as shown and described.

3. In a flue-cleaner, the combination with the central rod or bolt having a head at one end and threaded at the other end, the collars arranged upon said bolt, the coil-spring arranged between one of the said collars and the head of bolt, the screw cap or nut arranged upon the opposite end of bolt, swivel connection attached to said cap or nut, the toggle arms or levers composed of parallel zigzag members pivotally connected to the said collars and having a knuckle or joint and the serrated rotary cutters pivotally mounted between the members upon both sides of the knuckle or joint substantially as shown and described.

FRANK C. WILLIAMS.

Witnesses:

W. A. GOODWIN,
THOMAS FAXON.