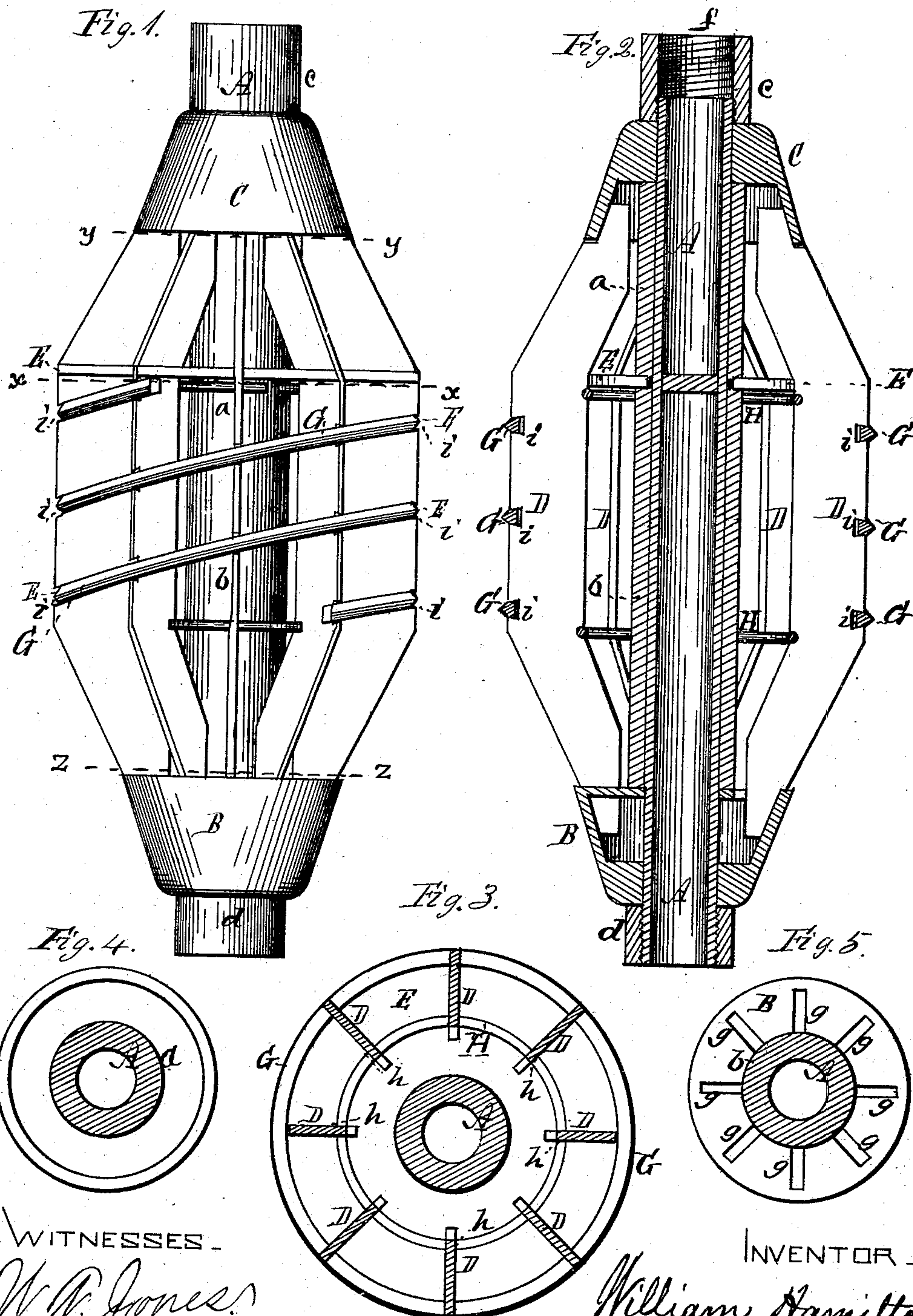


(No Model.)

W. HAMILTON.  
FLUE CLEANER.

No. 263,173.

Patented Aug. 22, 1882.



WITNESSES.  
W. R. Jones.  
J. S. Brown.

INVENTOR.  
William Hamilton,  
By his Attorney,  
J. B. Lawver.



# UNITED STATES PATENT OFFICE.

WILLIAM HAMILTON, OF ERIE, PENNSYLVANIA.

## FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 263,173, dated August 22, 1882.

Application filed June 9, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HAMILTON, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Flue-Cleaners; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification—

Figure 1 being a side view of my improved flue-cleaner; Fig. 2, a central longitudinal section of the same; Figs. 3, 4, and 5, cross-sections thereof, respectively, in planes indicated by the lines *xx*, *yy*, and *zz*, Fig. 1.

Like letters designate corresponding parts in all of the figures.

This instrument is made to draw or push endwise through the tube or boiler-flue to be cleaned; and the main feature of the invention is a spiral cutter arranged in a holder which will allow the said cutter to spring in or out to adapt itself closely to the inner surface of the flue or tube, the ends of the cutter being free, so as not to interfere with its movements in thus adapting itself to the said inner surface of the same. In order to give the cutter this capability, it is mounted in a peculiarly-constructed holder, substantially as follows, referring to the accompanying drawings.

A central rod or shaft, *A*, which may be tubular, as shown, has secured thereon, at a proper distance apart, two heads, *B C*, which form the terminal parts of the cutter-holder. These heads are conveniently held in place on the shaft by means of sleeves *a b c d*, as shown in Fig. 2, two of them, *a b*, being on the shaft between the heads to keep the heads firmly spaced apart, and the other two, *c d*, being screwed upon the ends of the shaft to hold the heads thereon. Any equivalent and suitable means, however, may be employed for this purpose. A handle may be attached to the instrument by being screwed into a sleeve at one end of the shaft *A*, as at *f*, Fig. 2. One of the heads, *B*, has radial slots *g g* in its inner end, as shown, to receive one end each of a set of wings, *D D*, which extend from head to

head parallel with the shaft, being preferably of thin plates situated in radial planes, as represented. The other head, *C*, preferably has simply a hollow or cup form at its inner end, so as merely to receive the other end of the respective wings under the edge thereof, as clearly indicated. This allows, without binding, any slight lateral play of the wings *D D*, which may be caused by the use of a guide disk or plate, *E*, that is also secured on the shaft *A* between the two heads, and nearer the head *C* than the other, as shown. This guide-disk is or may be secured in position by being clamped between the two sleeves *a b*, the outer sleeves, *c d*, also holding the disk firmly between the adjacent sleeves. There are radial slots *h h* in this guide-disk to receive the respective wings *D D* and allow a free outward and inward play thereof, while they hold them from lateral deviation. The heads *B C* are of comparatively small diameter, as indicated, while the guide-disk *E* is nearly as great in diameter as the interior of the tubes or flues to be cleaned by the instrument. The outer edges of the wings *D D* correspond in shape to the requirements of these holding parts—that is, they slope outward from the ends until they reach the outward limit, and the middle part of each is straight or extends at equidistance from the center of the shaft along its edge. The inner edges of the wings may be about parallel with the outer edges, as shown. The guide-disk *E* is located at about the point where the middle edge of the several wings joins one of the inclined ends thereof.

In the outer edges of the wings *D D* is cut a series of notches *i i*, in which the cutter *G* is located, the said cutter surrounding the holder in the form of an open coil, as shown, and making several turns around it—say three or more. These notched wings compose the only holder of the cutter, which plays loosely in the notches *i i* thereof, and is thus perfectly free to adapt itself to the inner surface of the flue or tube, contracting or expanding in size, as required, and passing over lap-welded joints thereof, while cleaning completely the whole interior surface. The best form for this cutter I find to be nearly triangular in cross-section, as represented, one angle being outward and forming the scraping-edge thereof. The notches *i i* in the wings *D D* may have a similar un-



dercut form to help retain the cutter in place, though they should be large enough to allow the cutter to play freely therein. This allows more or less play outward and inward to the cutter; and to allow still more play, if necessary, I provide interior springs, H H, pressing outward against the inner edges of the wings D D to keep them in their outermost position, but to allow them to yield inward when necessary. The cutter G should be of spring hardened steel. The wings D D preferably should be of sheet-steel. The guide-disk E may be of iron, bushed at the guide-slots, and the heads B C may be of cast-iron.

I am aware that flue-cleaners have been made with spirally-arranged scraping-projections on separate sections, one end of each spiral projection being free to adapt itself to the interior surface of the flue. Such a construction I disclaim.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a flue-cleaner, a spring coil-cutter, G, in combination with a grooved holder, the spring-coil being arranged to play freely in the grooves of said holder, substantially as described.

2. The cutter-holder composed of the heads B C, wings D D, and guide-disk E, substantially as and for the purpose herein specified.

3. The combination of the notched wings D D and coiled cutter G, substantially as and for the purpose herein specified.

4. The combination of the springs H H with the wings D D, substantially as and for the purpose herein specified.

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

WILLIAM HAMILTON.

Witnesses:

JOHN JAMES TURNER,  
HENRY LAMB.