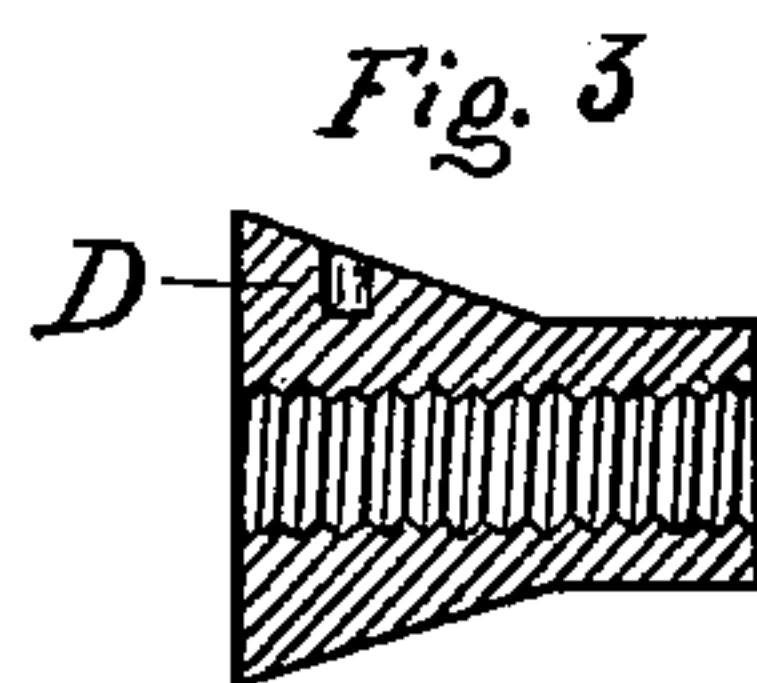
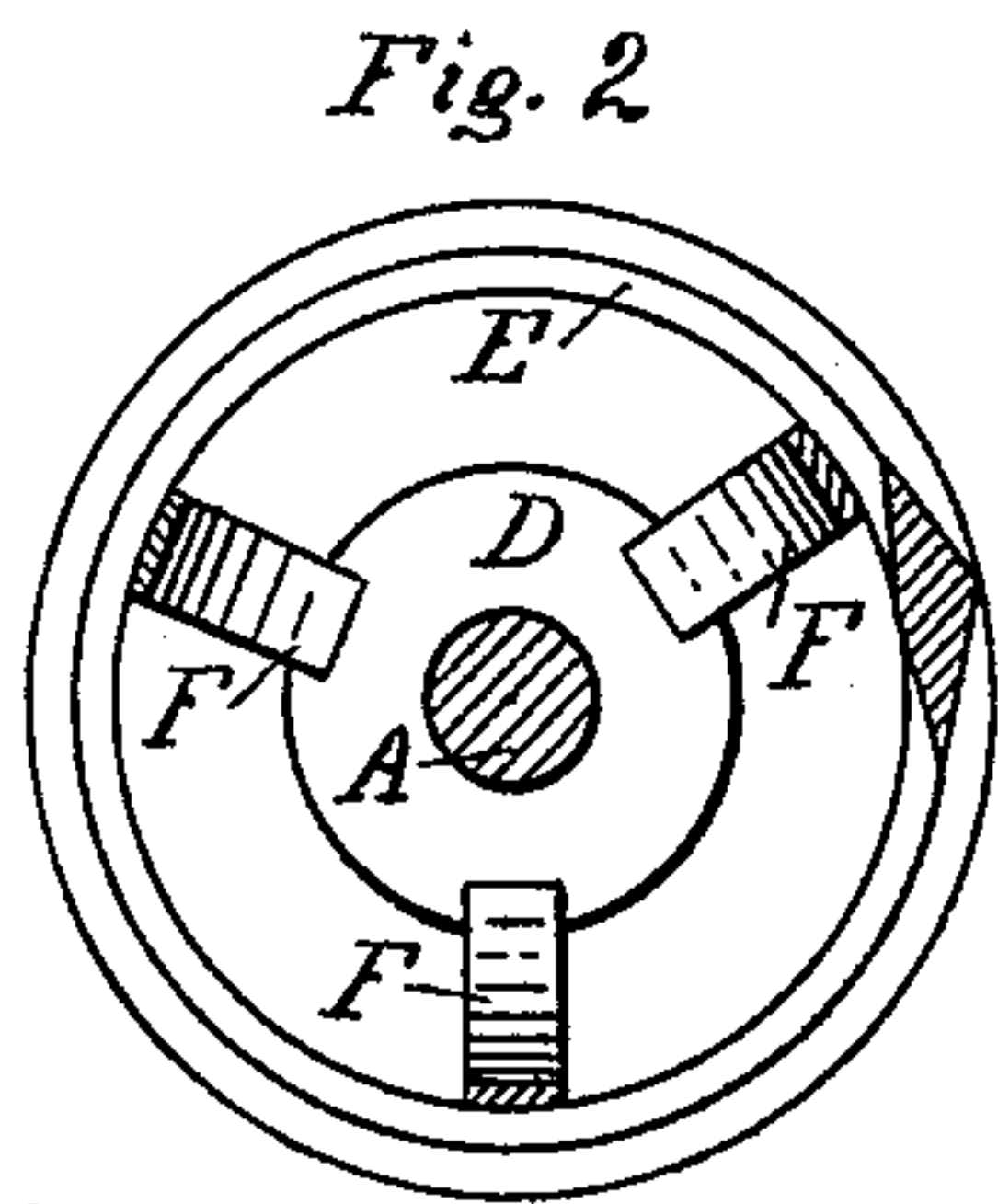
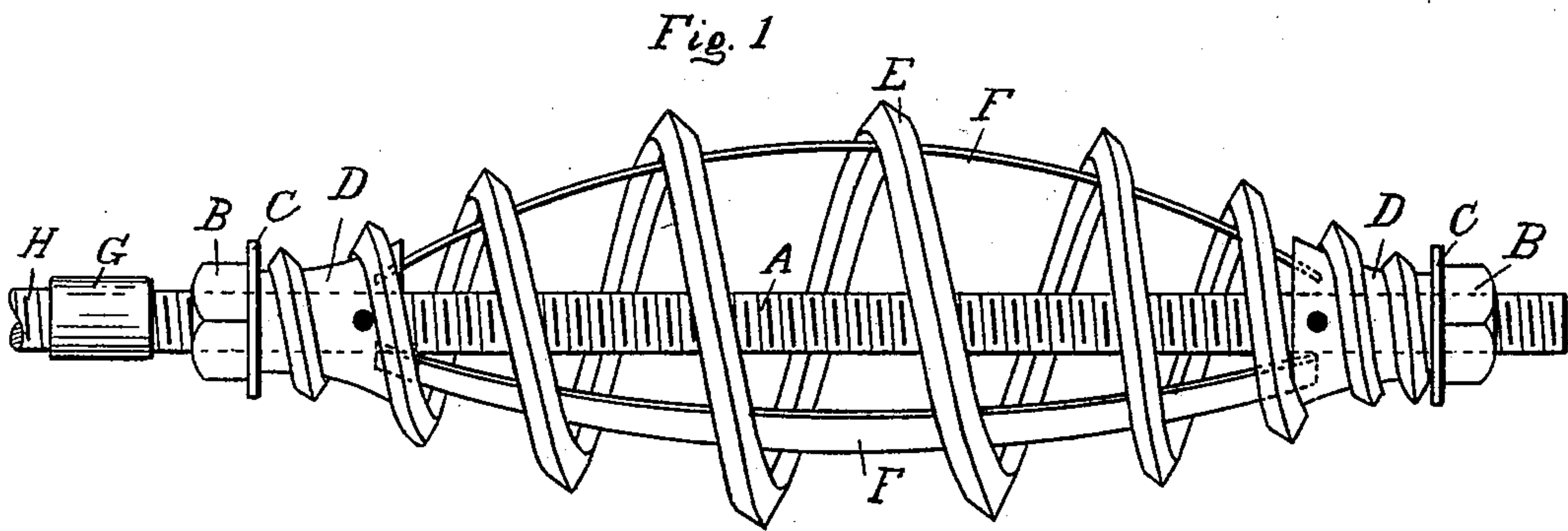


(No Model.)

W. H. THOMAS.
FLUE CLEANER.

No. 390,822.

Patented Oct. 9, 1888.



Witnesses:
R. M. Hulbert.
N. J. Sprague.

Inventor:
William H. Thomas.
By Thos. S. Sprague & Co.
Att'ys.

UNITED STATES PATENT OFFICE.

WILLIAM H. THOMAS, OF DETROIT, MICHIGAN.

FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 390,822, dated October 9, 1888.

Application filed July 11, 1887. Serial No. 243,935. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. THOMAS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Flue-Cleaners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in flue-cleaners wherein mechanical means are employed for scraping off the soot and scale from the inside of boiler-flues; and the invention consists in the peculiar construction, arrangement, and combinations of the parts, all as more fully hereinafter described, and particularly set forth in the claims.

Figure 1 is an elevation of my improved cleaner. Fig. 2 is a cross-section thereof about midway between its ends. Fig. 3 is a section of a detail, identified by letter of reference.

In the accompanying drawings, which form a part of this specification, A is a screw-threaded stem, B is a nut, C is a washer, and D is another nut of conical shape. (Shown in Figs. 1 and 3.) One set of these devices is screwed upon one end of the stem and a like set upon the opposite end in the relative order shown.

E is a helical spring, with its largest diameter in the center and tapering from there toward the ends. This spring is made of spring-steel of angular cross-section, and with one of its sharp edges placed to form its outside edge adapted in the use of the device to form the scraping-edge of the spring. The outer and inner ends of the spring fit upon the conical nuts D, so as to hold the spring at both ends.

F are semi-elliptical springs stepped at one end into the inner face of one of the nuts D, and at the other end into the corresponding face of the other nut D, and these springs bear against the outer helical spring, E, about the middle of its length, but do not touch near the ends thereof.

In practice the scraper is attached, by means of a suitable coupling, G, or otherwise, to a handle, H, by means of which the device is inserted into the tubes and pushed backward and forward in the ordinary way of using scrapers of this character. Should it fit too

loosely into the flue, the spring E may be expanded by screwing up at either or both ends until the compression of the spring E resulting therefrom expands the diameter of the spring to a sufficient degree. The object of the inner spring, F, of which there are three or more, so as to brace the outer spring, is to laterally stay the spring in the center in a yielding manner, so that the scraping-edges of the spring are forced to do their work all around, and if the spring E is diametrically enlarged the inner springs are automatically adjusted at the same time.

The object of the conical nuts D is to strengthen or to stiffen the ends of the spring, so that it will not yield laterally, and at the same time to securely hold the scraping-spring at both ends, so that the movement in scraping cannot draw the spring from either end.

By my construction of securing and bracing the outer spring, E, I am enabled to produce a very effective scraper without making the device either bulky or heavy, so that it would be difficult to handle and require in practice the expenditure of much labor in operating it.

By connecting both springs to the nuts I simplify the device and provide for the uniform adjustment of the springs.

What I claim as my invention is—

1. The combination, with the stem and the adjusting-nuts, of the inner elliptical springs, and the outer helical spring bearing against the inner springs at or near the center of its length, and both of said springs secured to said nuts, substantially as described.

2. The combination of the outer spring, E, the inner elliptical springs, F, bracing said spring E at or near its longitudinal center, the conical nuts D, nuts B, and washers C, all constructed, arranged, and operating substantially in the manner and for the purposes described.

In testimony whereof I affix my signature, in presence of two witnesses, this 24th day of June, 1887.

WILLIAM H. THOMAS.

Witnesses:

H. S. SPRAGUE,

JAS. WHITEMORE.