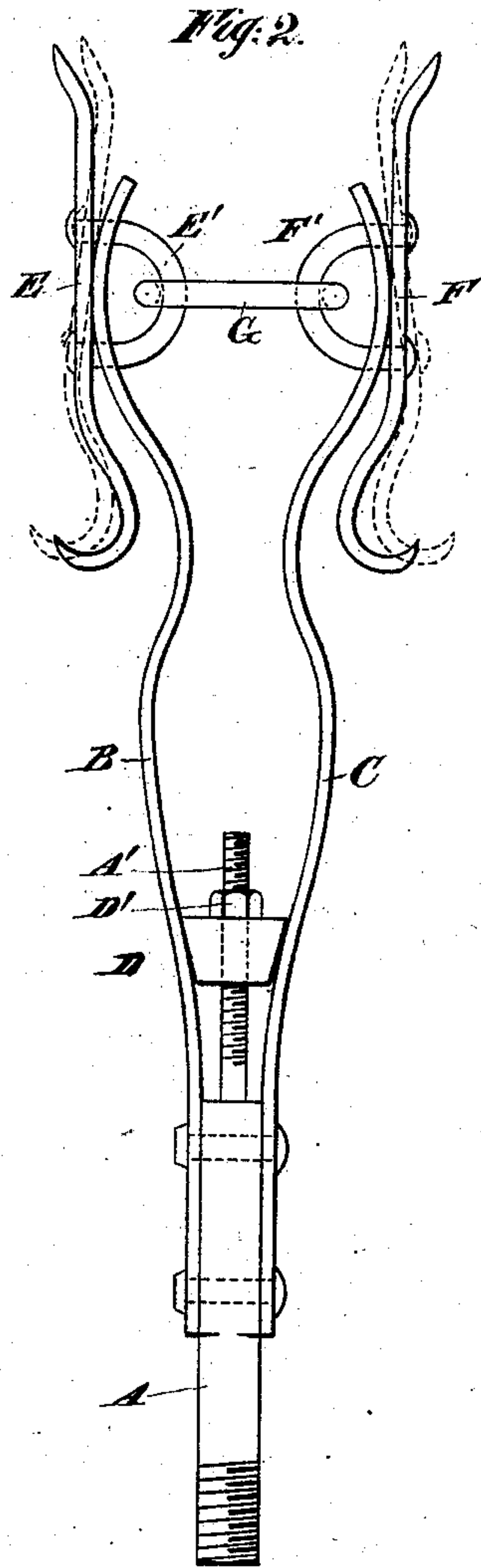
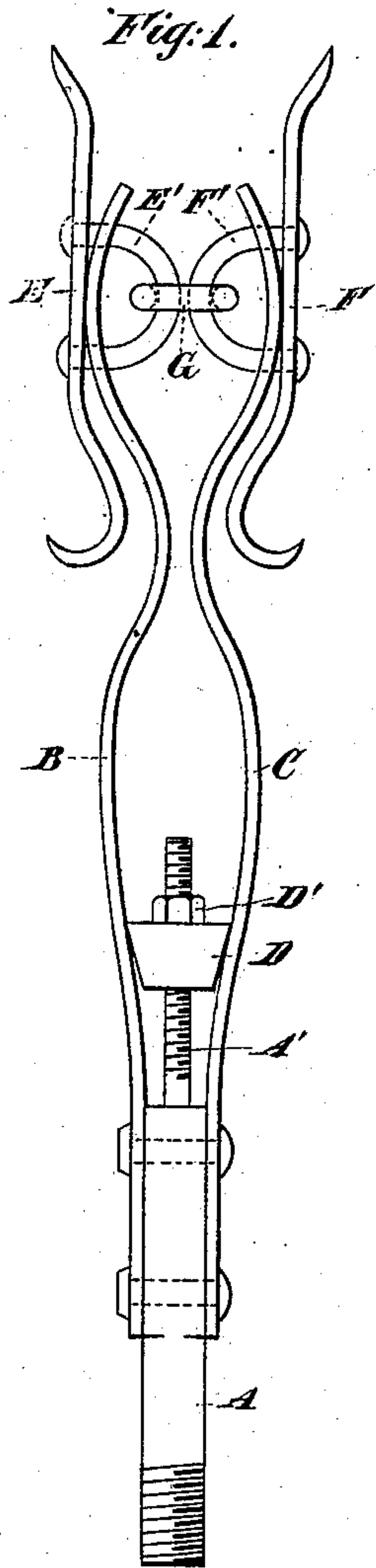


(No Model.)

C. P. HIGGINS.
TUBE SCRAPER.

No. 272,437.

Patented Feb. 20, 1883.



WITNESSES—

H. T. Brewster
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CAMPBELL P. HIGGINS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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TUBE-SCRAPER.

SPECIFICATION forming part of Letters Patent No. 272,437, dated February 20, 1883.

Application filed July 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, CAMPBELL P. HIGGINS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements relating to Tube-Scrapers, of which the following is a specification.

My device is adapted to be mounted on the end of a rod or tube, and to be reciprocated back and forward and turned in various directions, scraping and cleaning, so as to remove the soot, ashes, and accumulations generally from the interior of the tube. I provide two scrapers, each scraping at two points in the tube, and pressed apart by an elastic force, with provisions to adjust such force within considerable limits. I provide, furthermore, a simple device for holding the scrapers forcibly together, so as to be out of contact with the tube until the device is entered in the tube, and it may then be easily released, and the elastic force brought to bear to urge the scrapers against the interior of the tube.

The following is what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is an elevation of the device in its contracted condition, ready to be passed any distance through a smoke-box or other chamber to the mouth of a tube, and to be entered into such tube without resistance, by reason of the two scrapers being held forcibly together. Fig. 2 is a corresponding view of the device after the scrapers have been liberated. Fig. 3 represents a portion detached.

Similar letters of reference indicate corresponding parts in all the figures.

A is the stock, and A' a smaller screw-threaded extension thereof. The stock may be a bar of what was originally square iron reduced to a cylindrical form for about half its length and screw-threaded. In the end which remains square are two holes, through which are passed long rivets, which secure two extended springs, B C, curved as represented. For cleaning tubes six inches in diameter the stock A may be two inches square and the springs B and C two inches wide and a quarter of an inch thick. On the screw-

threaded portion A' of the stock is adjusted a piece, D, which, according as it is shifted in one direction or the other, relaxes the springs B C and allows them to be drawn together for scraping a small tube, or urges them apart and adapts them to act with sufficient force against the interior of a large tube.

D' is a nut by means of which the block D can be set in any required position.

Near the ends of the springs B C are holes, in which are loosely mounted the curved strips E' F', which are welded, riveted, or otherwise firmly fixed on the scrapers E F. These scrapers are curved, as shown, and sharpened chiselwise, so as to act efficiently within the tube on the outgoing motion of the scraper at each reciprocation and detach the soot or other lightly adhering matter which should be removed.

G is an oblong link engaging the straps E' F' together. When the scrapers E F are urged together by the hands or by any suitable apparatus against the elastic force of the springs B C, the oblong link G may be turned into the position shown in Fig. 1. Then, while the link is thus held, the springs B C, and consequently the scrapers E F, are allowed to move apart to the small extent allowed by the link. Their tension will hold the link in place, and the device will be in condition to be introduced into a tube, and by reason of the fact that the scrapers are held close together by the turned position of the link G the scrapers will be easily entered into the tube. This condition of the apparatus is shown in Fig. 1. So soon as the scraper is fully and completely entered into the tube, a violent twisting motion or jarring motion of the device being communicated through the stock A, which, it will be understood, is manipulated by means of a tube (not shown) screwed upon the threaded end, the oblong link G becomes loosened, and in obedience to the considerable force of the springs B C the scrapers E F move apart until they strike forcibly against the interior of the tube. (Not represented.) In this condition the machine is ready to be used, being thrust forward and drawn backward and turned partially around until all the dirt is detached, either falling out of the tube by gravity or ly-

ing in a loose condition, so that it is easily removed by a blast of steam or by the natural draft of the flue so soon as it is allowed to act upon it. This condition of the apparatus is shown in Fig. 2. It will be observed that in Fig. 2 the link is shown in the position to give the greatest freedom to the scrapers, and consequently to allow them to assume their most expanded condition, while in Fig. 1 it is represented in the most contracted condition. The construction allows the scrapers to rock all that is required to adjust themselves to irregularities in the surfaces. Fig. 2 shows in dotted lines a rocked position of both scrapers.

Modifications may be made. The springs B C may be welded to the stock. The adjustable piece D may be in various forms. A nearly round form may serve well. The springs B C and the scrapers E F may be varied in length, width, and curvature indefinitely. It is possible to employ four scrapers instead of two, in which case the additional springs are mounted in a manner corresponding to the two which are shown, but quartering thereto, and the springs are made a little longer or a little shorter than those here shown, so that a separate and independent link corresponding to G may connect those springs and scrapers and hold them temporarily together when the device is introduced in the tube in the same manner as the link G holds the two which are shown. Parts of the invention may be used without the whole. I can operate with some success with scrapers which scrape each at one point instead of two. In such case the scrapers may be attached directly to the ends of the springs corresponding to B and C. Double-ended scrapers may be used having the edges presented in opposite directions, so as to, by a reciprocating motion of the device, scrape the tube in both directions. It will be understood

that the liberation of the scraper by the loosening of the link G may be effected by other means than a shaking of the whole device. Any means may be employed which will agitate or disturb the link so that it will no longer hold the springs together, as shown in Fig. 1, but will be turned promptly, on being disturbed, into the position shown in Fig. 2, by the force of the springs. I can, for example, reach into the tube and hit the link G with a tool. (Not shown.) I propose in some cases to properly attach a rod by the movement of which to effect such disengagement; but I do not consider such generally necessary.

I claim as my invention—

1. In a tube-scraper, the springs B C, exerting a force tending to urge the scrapers into contact with the interior of the tube, in combination with the oblong link G, adapted in one position to hold the scrapers inward to allow the device to be inserted in the tube, and in another position to allow the springs to move apart and cause the scrapers to act efficiently, all substantially as and for the purposes herein specified.

2. The double-ended rocking scrapers E F and connected straps E' F', loosely mounted in the springs B C, adjusted by the block D and controlling-nut D', combined and arranged relatively to each other and to the stock A and oblong link G, substantially as and for the purposes herein set forth.

In testimony whereof I have hereunto set my hand, at Philadelphia, this 19th day of July, 1882, in the presence of two subscribing witnesses.

CAMPBELL P. HIGGINS.

Witnesses:

H. T. BREWSTER,
RICUARD J. LENNON.