

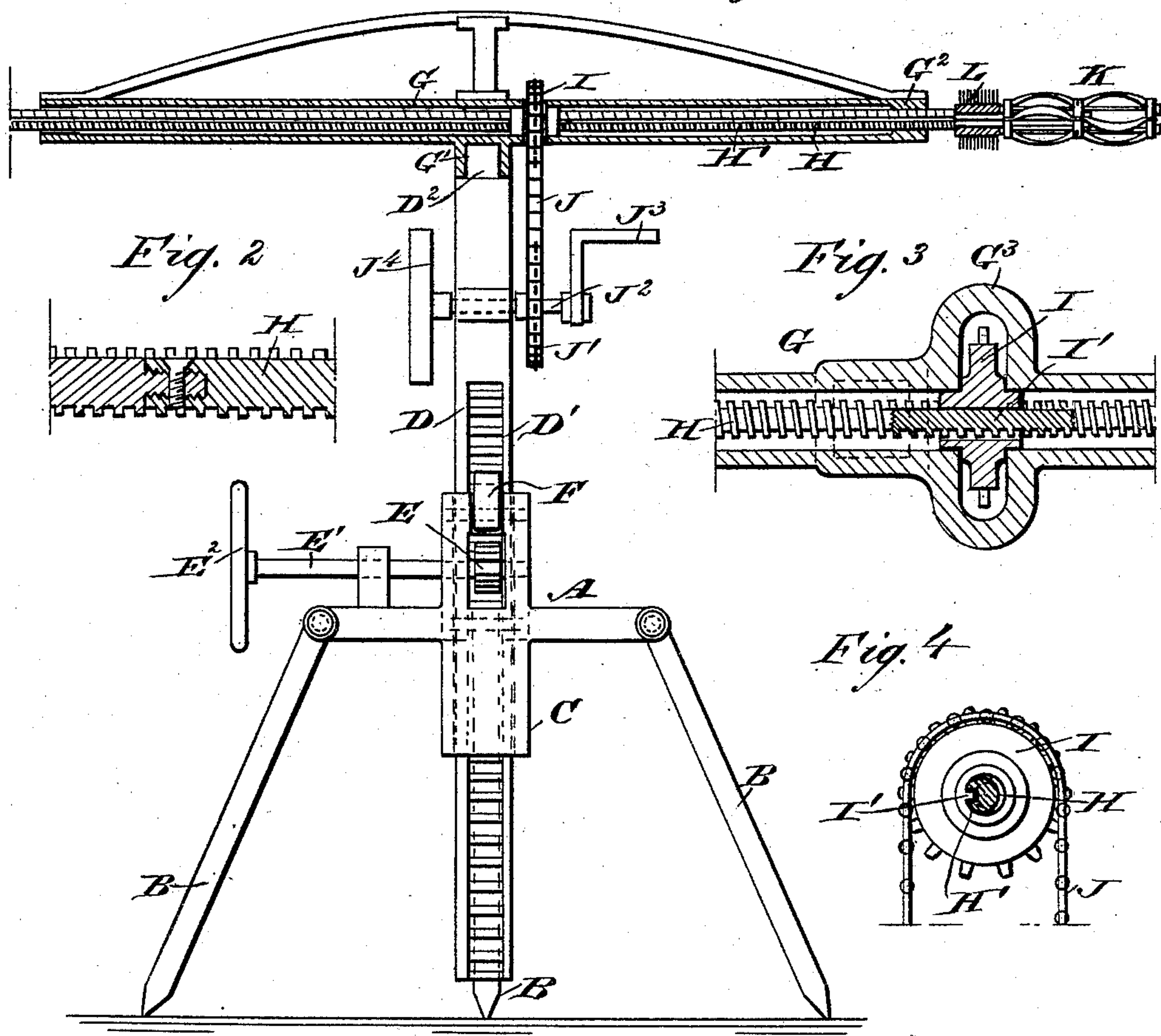
(No Model.)

**M. J. CARBIS.**  
**FLUE CLEANER.**

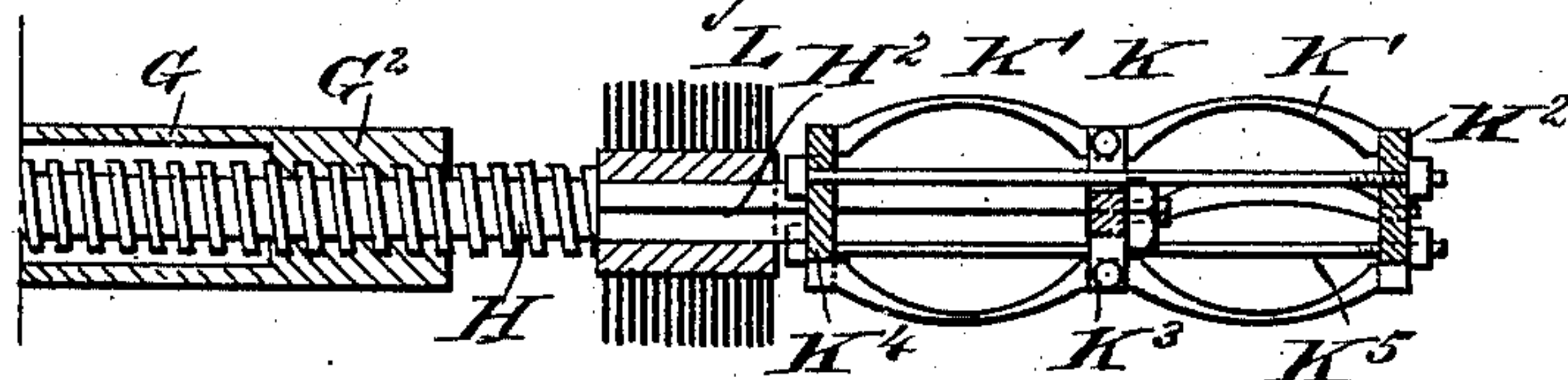
No. 473,821.

Patented Apr. 26, 1892.

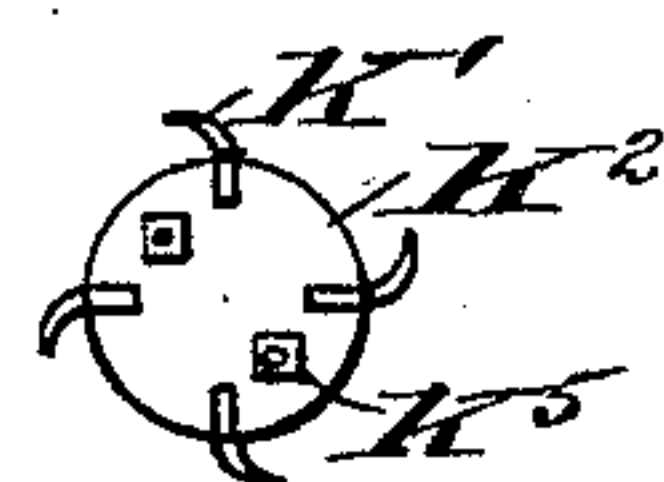
*Fig. 1.*



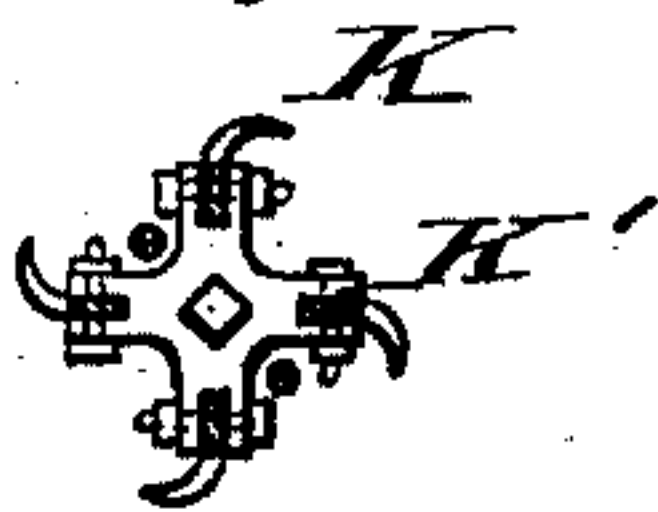
*Fig. 5*



*Fig. 6.*



*Fig. 7*



WITNESSES :

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# UNITED STATES PATENT OFFICE.

MICHAEL J. CARBIS, OF BINGHAM, UTAH TERRITORY.

## FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 473,821, dated April 26, 1892.

Application filed December 22, 1891. Serial No. 415,844. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL J. CARBIS, of Bingham, in the county of Salt Lake and Territory of Utah, have invented a new and Improved Flue-Cleaner, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved flue-cleaner, which is simple and durable in construction, very effective in operation, and arranged to quickly and conveniently clean boiler-tubes of every particle of soot without any injury to the tubes.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is an enlarged sectional side elevation of the feed-screw rod, showing the connection between two sections. Fig. 3 is an enlarged sectional side elevation of another part of the said feed-screw rod, showing means for rotating the same. Fig. 4 is a transverse section of the same, the casing being removed. Fig. 5 is an enlarged sectional side elevation of the scraper-brush and screw-rod. Fig. 6 is an end elevation of the scraper; and Fig. 7 is a transverse section of the same.

The improved flue-cleaner is mounted on a tripod provided with a head A, supported on legs B, pivotally connected with the said head. On the latter is secured the vertically-arranged sleeve C, in which is fitted to slide a post D, provided in one side with gear-teeth D', in mesh with a pinion E, secured on a shaft E', mounted to turn in suitable bearings on the said sleeve D, and also on a bearing attached to the head A.

On the outer end of the shaft E' is secured a hand-wheel E<sup>2</sup> for turning the said shaft to revolve the pinion E, thus raising and lowering the post D for the purpose hereinafter more fully described. On the upper end of the post D is formed a pivot D<sup>2</sup>, engaging a socket G', formed on the under side of a casing or tube G, extending horizontally and formed at one end with a nut G<sup>2</sup>, in which

screws the feed-screw rod H, passing through the said tube G.

On the outer end of the feed-screw rod H is secured a scraper K, in the rear of which is located a brush L. In the feed-screw H is formed a longitudinally-extending keyway H', engaged by a key I', formed or secured on a sprocket-wheel I, held loosely on the feed-screw H. The sprocket-wheel I is located in an offset G<sup>3</sup>, formed on the tube G so as to prevent longitudinal movement of the said sprocket-wheel, which when rotated rotates the said feed-screw rod and causes the same to screw in the nut G<sup>2</sup> and move inward or outward in the tube G, as desired, and for the purpose hereinafter more fully described.

Over the sprocket-wheel I passes a sprocket-chain J, also passing over a sprocket-wheel J', secured on a shaft J<sup>2</sup>, mounted to turn in suitable bearings in the post D, the said shaft being provided with a crank-arm J<sup>3</sup> for conveniently turning the said shaft J<sup>2</sup> to impart traveling motion to the chain J and rotary motion to the sprocket-wheel I to revolve the feed-screw rod, as above mentioned. On the shaft J<sup>2</sup> is also secured a small fly-wheel J<sup>4</sup>.

The scraper K is preferably of the construction illustrated in detail in Figs. 5, 6, and 7, the said scraper being provided with scraping-plates K', made of thin steel and curved spirally, as plainly shown in Fig. 1, the outer end of each plate K' being secured to a disk K<sup>2</sup>, the middle portion thereof being fastened to a disk K<sup>3</sup>, while the rear ends are attached to a similar disk K<sup>4</sup>, which latter, as well as the disk K<sup>3</sup>, is secured on the outer end of the reduced end H<sup>2</sup> of the screw-rod H. The three disks K<sup>2</sup>, K<sup>3</sup>, and K<sup>4</sup> are connected with each other by suitable longitudinally-extending rods K<sup>5</sup>, so as to hold the several parts together.

As will be seen by reference to Figs. 5, 6, and 7, each plate K' is curved between the disks K<sup>2</sup> K<sup>3</sup> and between the latter and the rear disk K<sup>4</sup>. At the same time each plate is spirally curved, as before described, and illustrated in Fig. 1. The spirally-curved part of each plate K' is so arranged that between the disk K<sup>2</sup> and the disk K<sup>3</sup> it is bent in one direction, as shown in Fig. 6, and between the



disks  $K^3$  and  $K^4$  it is bent in an opposite direction, as will be plainly understood by reference to Fig. 7.

The brush L is fastened on the rear end of the reduced part  $H^2$  of the feed-screw rod H, the said brush being thus located directly in the rear of the scraper K, as shown. The brush is preferably circular in form and has a diameter somewhat in excess to the diameter of the scraper K, so that the brush removes all the particles of soot loosened by the scraper.

The operation is as follows: The tripod is set up in front of the boiler and the wheel E is turned, so as to raise the post D to the proper height to bring the scraper K, brush L, and feed-screw rod H in line with the tube to be cleaned. The post D is then held in an uppermost position by a pawl F, engaging the corresponding tooth of the teeth  $D'$ , the said pawl F being pivoted on the sleeve D. The scraper K is then at the entrance-opening of the tube to be cleaned, and when the operator now turns the shaft  $J^2$  by manipulating the crank-arm  $J^3$ , a rotary motion is given to the feed-screw rod H, so that the scraper K advances into the tube to be cleaned. By feeding the feed-screw rod H outward the plates  $K'$  of the scraper engage the inner wall of the tube to be cleaned, and by their sharp edges cut the soot from the inner surface of the tube on the simultaneous forward and revolving motion of the scraper. It is understood that the plates  $K'$  are sufficiently elastic to conform to the shape of the tube, the said plates in a normal position being somewhat in excess of the diameter of the tube. The brush revolving in the rear of the scraper K brushes off very completely the soot loosened by the scraper-plates  $K'$ , and at the same time carries the soot along, so as to discharge the same at the farther end of the tube. It will be seen that the feed-screw rod H has to be of considerable length, so as to pass the scraper K and brush L completely through the tube, the said feed-screw rod being for this purpose made in sections fastened together, as plainly shown in Fig. 2. When the tube has been cleaned and the screw-rod H returned by revolving the shaft  $J^2$  in an opposite direction, then the operator turns the shaft  $E'$  to raise the post D to bring the scraper and brush L to the next tube above, which latter is then cleaned in the manner above described. It is understood that the scraper K, as well as the brush L, similarly revolve and advance in the tube to be cleaned, the scraper serving to loosen the soot, the brush completely cleaning the tube and moving the soot forward. The tube G, through which passes the feed-screw rod H, is preferably braced, as illustrated in Fig. 1.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The scraper K, comprising a body portion and a series of blades  $K'$ , each secured at its ends and middle to the said body and bowed outwardly at both sides of its center, the longitudinal edges of the blades at one end of the scraper being curved laterally in an opposite direction to those at the opposite end, substantially as set forth.

2. The combination, with a tripod provided with a vertically-adjustable post having a transverse casing on its upper end provided with a nut, of a feed-screw passing through said nut and carrying a scraper at one end, and means for rotating the said screw, substantially as set forth.

3. In a flue-cleaner, the combination, with a tripod, of a post fitted to slide in the said tripod and provided with gear-teeth, a pinion in mesh with the said teeth, a shaft held to turn on the said tripod and carrying the said pinion, a casing arranged on the upper end of the said post, a feed-screw mounted to turn in the said casing and engaging a nut therein, and a scraper held on the outer end of the said feed-screw, substantially as shown and described.

4. In a flue-cleaner, the combination, with a tripod, of a post fitted to slide in the said tripod and provided with gear-teeth, a pinion in mesh with the said teeth, a shaft held to turn on the said tripod and carrying the said pinion, a casing arranged on the upper end of the said post, a feed-screw mounted to turn in the said casing and engaging a nut therein, a scraper held on the outer end of the said feed-screw, and a circular brush attached to the said feed-screw in the rear of the said scraper, substantially as shown and described.

5. In a flue-cleaner, the combination, with a tripod, of a post fitted to slide in the said tripod and provided with gear-teeth, a pinion in mesh with the said teeth, a shaft held to turn on the said tripod and carrying the said pinion, a casing arranged on the upper end of the said post, a feed-screw mounted to turn in the said casing and engaging a nut therein, a scraper held on the outer end of the said feed-screw, a circular brush attached to the said feed-screw in the rear of the said scraper, a sprocket-wheel held loosely on the said feed-screw rod and provided with a key engaging a keyway in the said screw-rod, and means for imparting a rotary motion to the said sprocket-wheel, substantially as shown and described.

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Witnesses:

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WILLIAM A. HICKS.