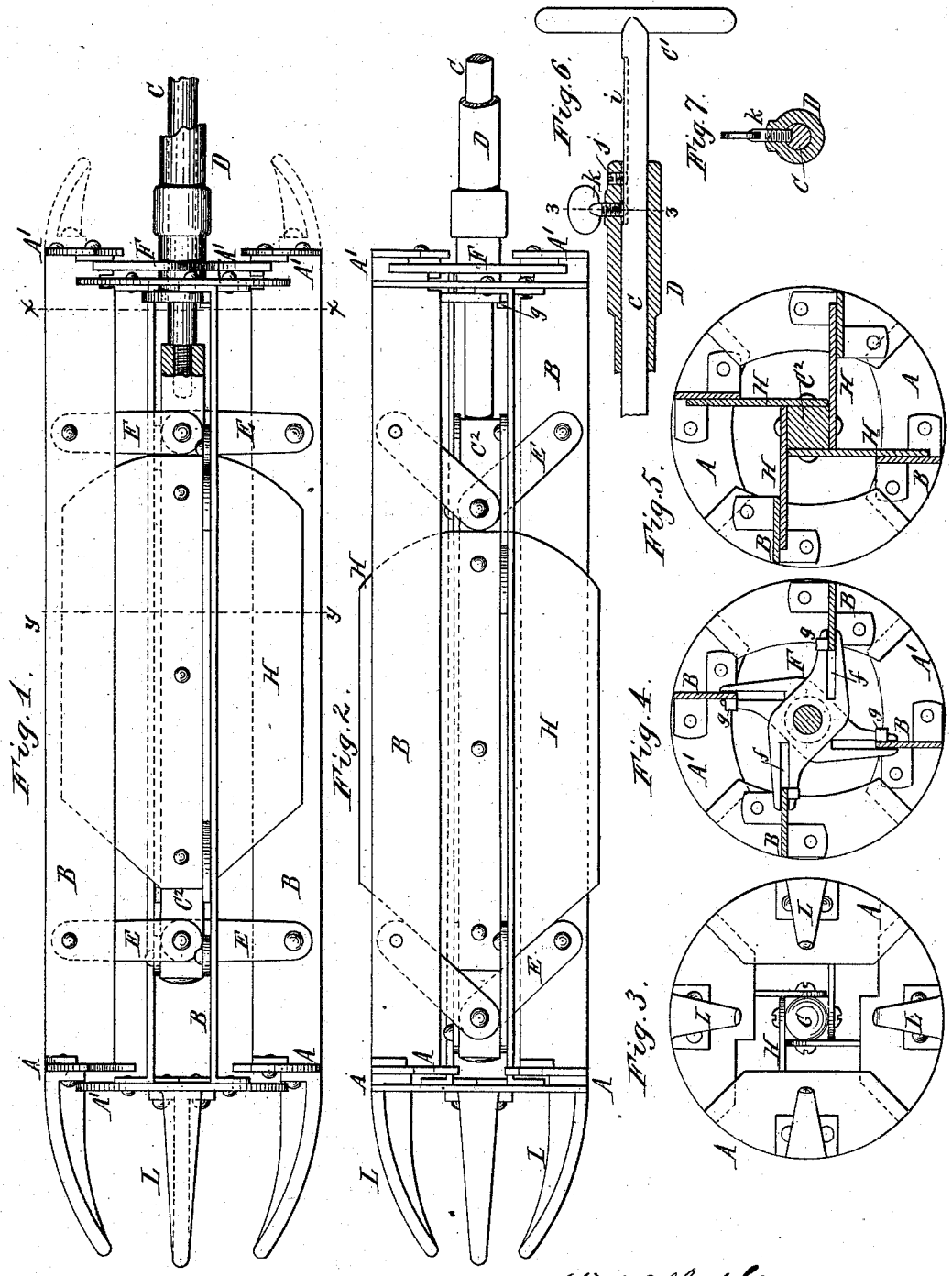
(No Model.) 2 Sheets—Sheet 1.

W. A. GAY.

BOILER FLUE SCRAPER.

No. 274,756. Patented Mar. 27, 1883.



Witnesses.
Edw. J. Brady.
Theo. L. Popp.

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Fig. 8.

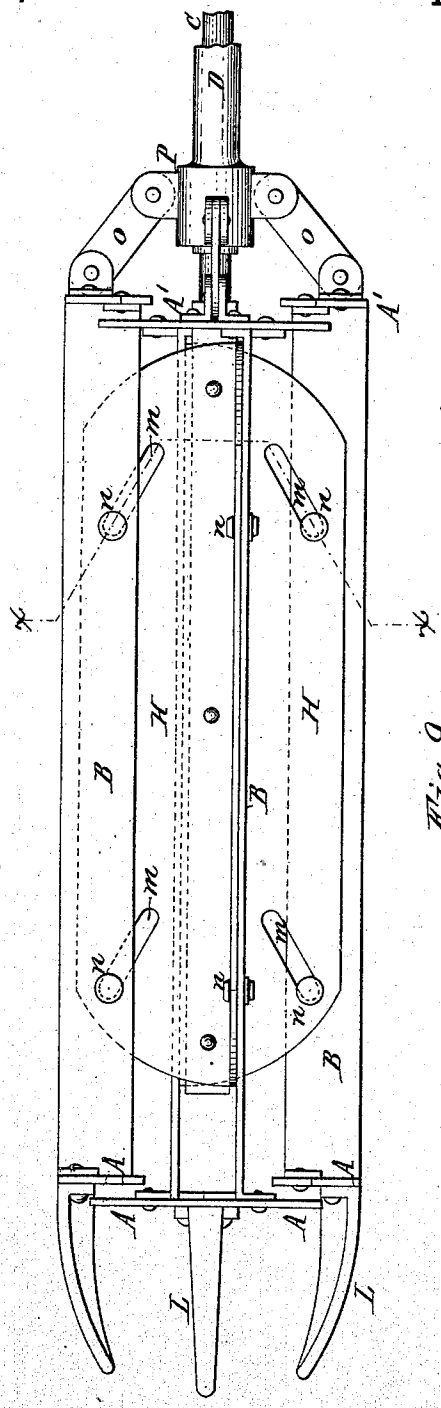
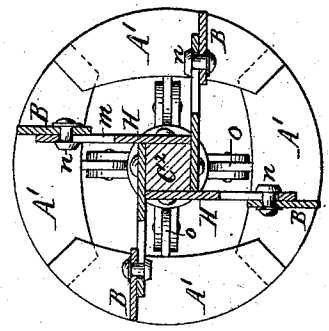


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM ALFRED GAY, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO JOHN OTTO, OF SAME PLACE.

BOILER-FLUE SCRAPER.

SPECIFICATION forming part of Letters Patent No. 274,756, dated March 27, 1883.

Application filed January 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, WM. ALFRED GAY, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Boiler-Flue Scrapers, of which the following is a specification.

This invention relates to an improvement in that class of boiler-flue scrapers which are provided with a number of scraping-blades having the form of circular segments which are adjustable toward and from the axis of the scraper, so that the device can be contracted before introducing it into the flue and be expanded in the flue until the scraping-blades bear against the inner walls of the flue.

The object of my invention is to construct the scraper in such manner that the blades can be readily adjusted and secured in any desired position, and also to increase the contact-surface of the blades with the flue and improve the construction and operation of the device in other particulars, as will be hereinafter fully described.

My invention consists of the particular improvements which will be pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal elevation of my improved boiler-flue scraper with the scraper-blades in an expanded position as they are adjusted when in the flue. Fig. 2 is a similar elevation with the scraper-blades contracted. Fig. 3 is a front elevation of the device. Figs. 4 and 5 are cross-sections in lines *x x* and *y y*, Fig. 1, respectively. Fig. 6 is a sectional elevation of the handle of the scraper. Fig. 7 is a cross-section in line *z z*, Fig. 6. Fig. 8 is an elevation showing a modified construction of my improved boiler-flue scraper. Fig. 9 is a cross-section in line *x x*, Fig. 8.

Like letters of reference refer to like parts in the several figures.

A represents a series of segmental scraping-blades arranged at the front end of the scraper. A′ represents a series of similar scraping-blades arranged at the rear end of the scraper; and B represents longitudinal scraping-blades which connect the front blades, A, with the rear blades, A′, in such manner that each longitudinal blade B is connected at its front end with one of the blades A and its rear end with one of the blades A′. The blades A A′ stand at right angles to the blades B.

C represents a rod whereby the scraping-blades are adjusted toward or from the axis of the device, the rod C being arranged in the axial line of the device.

D represents a tube which incloses the rod C, except that portion of the rod which extends forwardly beyond the rear blades, A′, and except the opposite extremity of the rod C, to which the handle C, is attached.

E E represent inclined links or rods which connect the longitudinal blades B with the adjusting rod C. The links E are pivoted at their inner ends to the rod C and at their outer ends to the longitudinal blades B in such manner that the links will stand in an inclined position when the blades are contracted, or nearest the axis of the device, so that upon taking hold of the tube D and pulling the rod C backwardly the links E will tend to approach a position at right angles to the axis of the device, and thereby move the longitudinal blades B and the segmental blades A A′, attached thereto, outwardly or away from the axis of the device.

That portion of the rod C to which the links E are attached is preferably made square in cross-section, as represented at C^2 in the drawings, to facilitate the attachment of the links and other parts thereto.

The two segmental blades which are located on diametrically opposite sides of the axis of the device in each of the two series of segmental blades A A′ are arranged in the same plane, and the two pairs of blades in each series arranged in different planes, one slightly behind the other, so that the blades can move past each other as they are adjusted.

F represents arms which are secured to the front end of the tube D, near the rear blades, A′, and which extend from the axis of the device outwardly.

f are slots formed in the arms F, parallel with the four sides of the rectangular portion C^2 of the rod C, and in line with the longitudinal scraping-blades B. The slots *f* divide

each arm into two jaws, which embrace the adjacent longitudinal blade B, and which guide the blade in its movement toward and from the axis of the device as the blades are adjusted.

g is a lug or projection formed on each of the blades B, so as to bear against the front side of the arm F, thereby preventing the blades B from following the backward movement of the central rod, C, when the latter is drawn backwardly for expanding the blades. The rear sides of the arms F bear against the front sides of the blades A′, and thereby prevent the blades from following the forward movement of the central rod, C, when the latter is pushed forwardly for drawing the blades together. By this means the blades are compelled to move outwardly or away from the axis of the device when the rod C is pulled back, and to move toward the axis of the device when the rod C is pushed forwardly.

H represents guide-plates which are secured to the rectangular portion C^2 of the rod C, between the scraping-blades A A′, parallel with the longitudinal blades B, and which project with their outer edges beyond the blades B and the segmental blades A A′, attached thereto, when the blades are drawn together, as represented in Fig. 2, so that upon introducing the device in this condition into a flue the scraper will rest upon the projecting edges of the plates H, which latter keep the scraping-blades away from the inner walls of the flue and prevent the blades from coming in contact with the material adhering to the inner wall of the flue and pushing the material farther into the flue.

i represents a longitudinal groove formed in the outer portion of the rod C, and *j* represents a key or projection secured in the bore of the tube D and projecting into the groove *i*, thereby preventing the rod C from turning in the tube, but permitting the rod to move longitudinally in the tube.

k represents a set-screw which works in a threaded opening in the tube D, and bears with its inner end against the rod C, so that upon tightening the screw *k* the rod C is secured in the tube and prevented from being displaced by the manipulation of the rod C in removing the material from the flue.

L represents curved arms secured to the front side of the scraping-blades A, and having their forward ends approaching the axis of the device, for the purpose of facilitating the introduction of the scraper into the flue and preventing the blades from being bent or otherwise injured by coming in contact with the ends of the flues. Similar curved arms may be secured to the rear sides of the blades A′, as indicated by dotted lines in Fig. 1.

Upon releasing the set-screw *k* and pushing the rod C forwardly, the scraping-blades are made to approach the axis of the device. The scraper is then introduced into the flue and the rod C pulled back until the scraping-blades come in contact with the walls of the flue, when the set-screw is tightened and the device is ready for operation. By moving the scraper back and forth through the flue the segmental blades A A′ detach therefrom the material adhering to the walls of the flue, and by turning the device in the flue the longitudinal blades B detach the material with which they come in contact, so that by a combined back-and-forth and rotary movement of the scraper in the flue all portions of the inner wall of the flue are reached and all material adhering to the same is completely detached therefrom.

If desired, the links E may be omitted, and the scraping-blades may be moved outwardly and inwardly by means of inclined slots *m*, formed in the guide-plates H, and pins or studs *n*, which are attached to the blades B, and which project into and move in the inclined slots *m*, as represented in Figs. 8 and 9; and the slotted arms F may also be omitted, and the blades may be connected to the tube D by means of links *o*, which are pivoted at their inner ends to a collar, P, secured to the tube D, while the outer ends of the links *o* are pivoted to the blades A′, as represented in Figs. 8 and 9.

The parts whereby the scraping-blades are adjusted are very simple in construction and not liable to become clogged by the material which the scraping-blades detach from the flues.

I claim as my invention—

1. In a flue-scraper, the combination, with a segmental scraping-blade, of a longitudinal scraping-blade, whereby the interior surface of the flue may be scraped in directions at right angles to each other, substantially as described.

2. The combination, with two series of segmental scraping-blades, A A′, and longitudinal connecting scraping-blades B, of mechanism whereby the blades are adjusted toward and from the axis of the device, substantially as set forth.

3. The combination, with two series of segmental scraping-blades, A A′, and longitudinal connecting scraping-blades B, of a central rod, C, a tube, D, inclosing the rod C, and mechanism whereby the blades are connected with the rod C and tube D, substantially as set forth.

4. The combination, with two series of segmental blades, A A′, and longitudinal connecting-blades B, of links E, connecting the blades with the rod C, and slotted arms F, connecting the blades with the tube D, substantially as set forth.

5. The combination, with the segmental scraping-blades A A′ and longitudinal-connecting blades B, of guides H projecting beyond the scraping-blades when the latter are contracted, substantially as set forth.

6. The combination, with the segmental scraping-blades A A′ and longitudinal connecting-blades B, of a rod, C, constructed with

a longitudinal groove, *i*, and a tube, D, inclosing the rod C, and constructed with a projection, *j*, secured in the tube D and projecting into the groove *i*, substantially as set forth.

7. The combination, with the segmental scraping-blades A A′ and longitudinal connecting-blades B, of the central rod, C, inclosing the tube D, mechanism whereby the blades are connected with the rod C and tube D, and the set-screw *k*, whereby the rod is secured in position after being adjusted, substantially as set forth.

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Witnesses:
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CHAS. F. GEYER.