

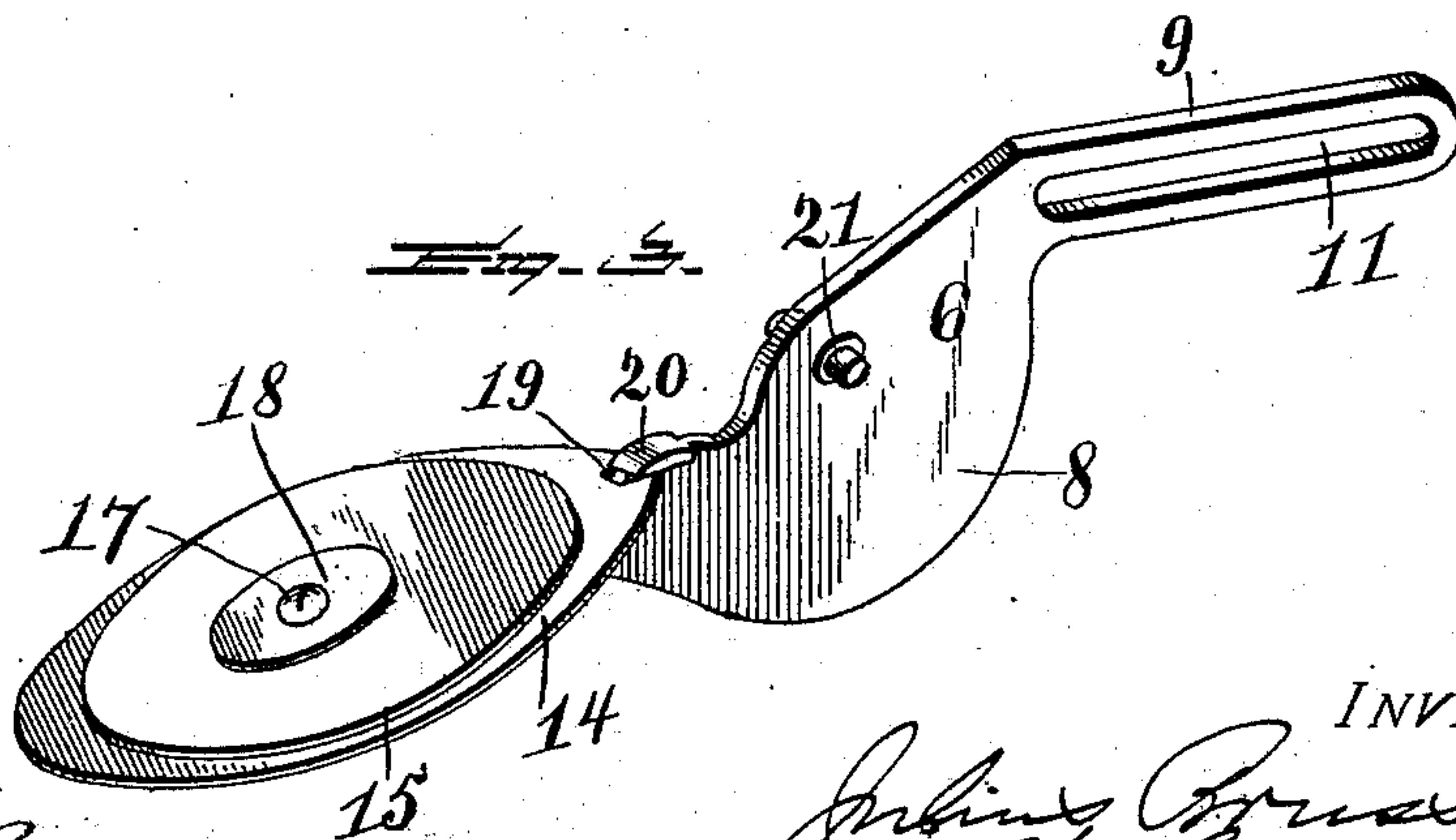
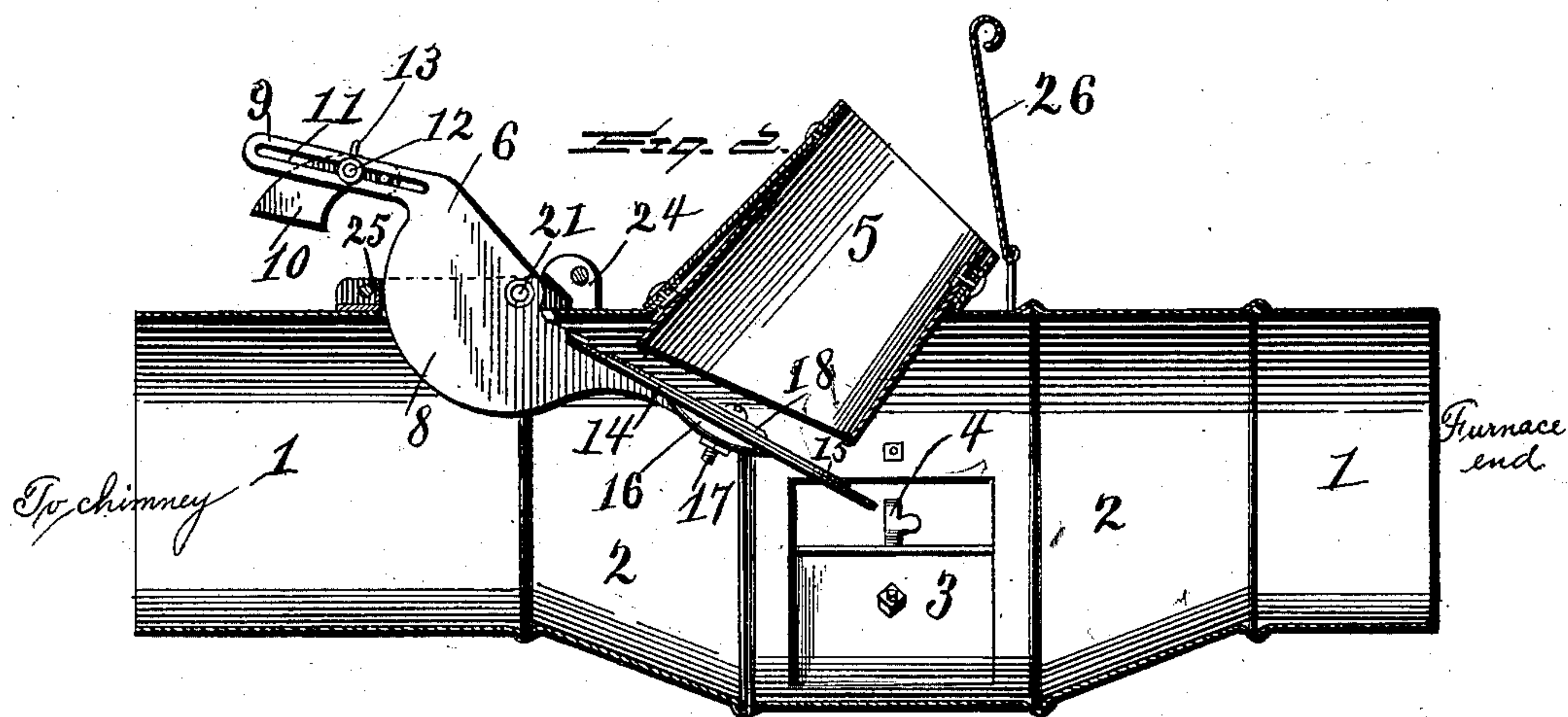
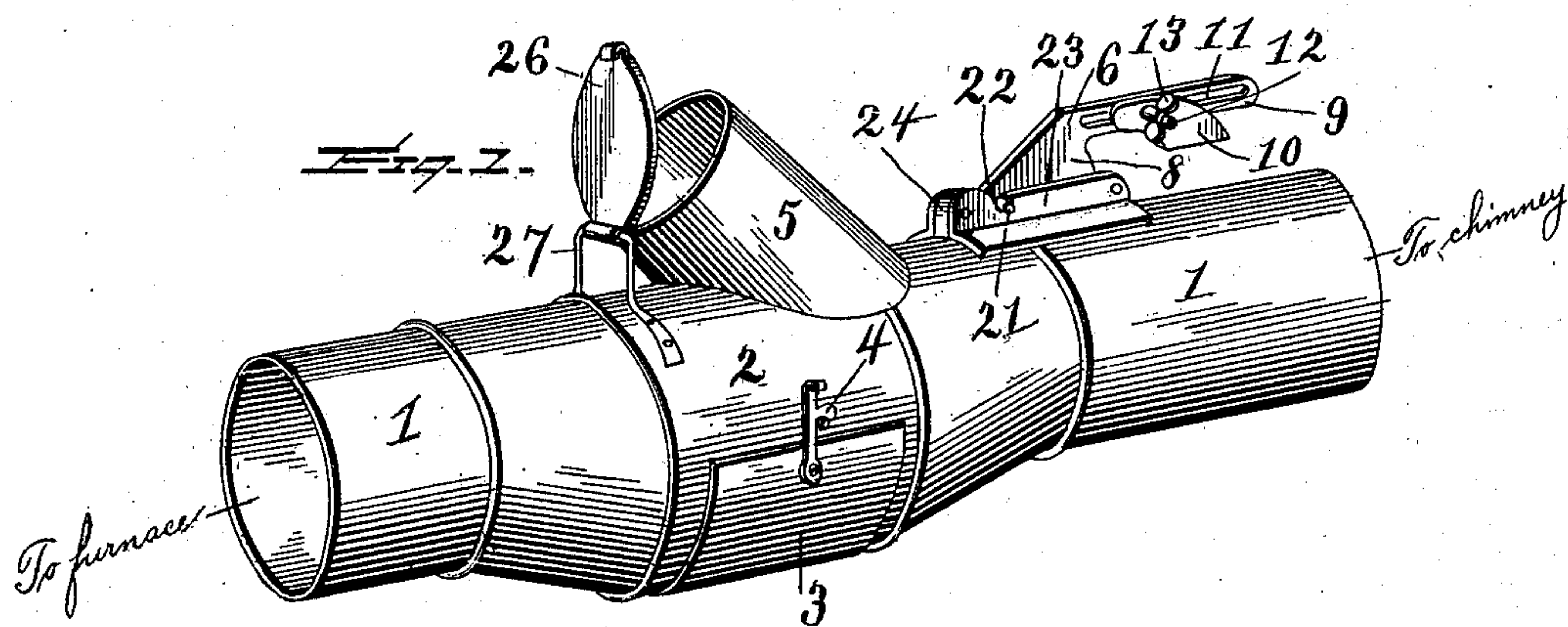
No. 676,120.

Patented June 11, 1901.

J. BRUSS.
FURNACE DAMPER REGULATOR.

(Application filed Oct. 11, 1900.)

(No Model.)



WITNESSES.

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FURNACE-DAMPER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 676,120, dated June 11, 1901.

Application filed October 11, 1900. Serial No. 32,744. (No model.)

To all whom it may concern:

Be it known that I, JULIUS BRUSS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Furnace-Damper Regulators; 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 figures of reference marked thereon, which form a part of this specification.

My invention relates to furnace-dampers, and has for its object to provide an automatically-operating damper which will be controlled in its operation by a difference in pressure on its two sides occasioned by the differences in temperature between the inside of the smoke-flue and the outside atmosphere and which will also be provided with means for adjustment by which the damper is rendered more or less sensitive in responding to outside atmospheric influences in operation. It has further to provide improved details in the construction of the damper with the view of increasing its efficiency and durability.

To the accomplishment of the foregoing and such other objects as may hereinafter appear the invention consists in the construction and in the combination of parts hereinafter particularly described and then sought to be specifically defined by the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a perspective of a section of a furnace smoke-flue having my invention applied thereto. Fig. 2 is a longitudinal vertical section of the same, and Fig. 3 is a perspective of the damper removed from the smoke-flue.

In the drawings the numeral 1 designates a section of the flue ordinarily leading from the furnace to the chimney, and it may be and preferably is formed with a swell or enlargement 2 at the point opposite where the damper is located, said enlargement or swell portion being provided with a clean-out door 3, which ordinarily will be kept closed by means

of a pivoted hook 4. In the top wall of the smoke-flue is located a branch pipe 5, set at an inclination, as shown, and preferably having its inner end beveled or formed on an incline, as illustrated, so as to enable the damper to fit snugly against the same to cut off communication between the inside of the smoke-flue and the outside atmosphere through the branch pipe 5 when necessary or desirable in the operation of the damper to control the draft.

The damper is designated by the numeral 6 and consists of the segmental central portion 8, from one end of which extends an arm 9 for supporting an adjustable weight 10, which may be supported thereon by having the arm formed with a slot 11, through which and the weight 10 will pass a bolt 12, provided with a thumb-nut 13, by which the weight may be held at any point of adjustment in the length of the arm. The end of the segment opposite to the arm 9 is provided with flap 14, which may have an inner facing 15 of asbestos or other material adapted to make close contact with the inner end of the branch pipe 5 when the damper is closed, said flap and facing being secured to the inner arm 16 of the segment 6 by means of the nutted bolt 17 and washer 18. The flap 14 is preferably made of elliptical form, as shown, and its inner end is formed with a notch 19 to receive a portion of the segment 6, which will prevent the flap from slipping sideways in the event that the nut of the bolt 17 should accidentally become loose, and at the notched end of the flap the segment 6 is formed with a lug 20, beneath which the notched end of the flap will lie when in position, said lug 20 being to prevent the flap from accidentally moving flatwise from the segment, these several details serving to more effectively secure the flap to the segment; but such details may be varied without departing from the essential features of my invention. The segmental portion 6 of the damper is provided with the fulcrum-pivot pintles 21, which will rest in notches 22, formed in the plates 23, which will be riveted to the smoke-flue and spaced apart by the spacing-blocks 24, and 25, the spacing-block 24 also serving to

limit the movement of the damper in one direction by the edge of the segment coming in contact with the block 24, which will prevent the possibility of the damper being moved so far in one direction under outside influences as to prevent it from automatically closing or receding after it has been moved a distance from the inner end of the branch pipe 5 in operation. The segmental form of the central portion 6 also serves in the movement of the damper to practically keep closed the opening in the pipe through which the segmental portion turns, and thus prevents, practically, impairment to the draft of the smoke-flue. A cap or cover 26 is also provided for closing the outer end of the branch pipe 5 under certain conditions, which cap or cover may be in any suitable manner hinged or supported in position, the drawings illustrating it as hinged by a bail 27 to the smoke-flue, although it may be hinged or supported in any other manner.

In operation when the furnace-fire is to be started the outer end of the branch pipe 5 is closed by the cap or cover 26, so that the air outside of the pipe, which is colder, and consequently heavier, than the heated air passing through the smoke-flue, is cut off entirely from acting upon the face of the flap-valve which closes the inner end of the branch pipe 5, and this gives a direct and unopposed draft from the furnace to the chimney through the smoke-flue. After the fire has been well started the cover or cap 26 is thrown back, so that the cool air from the outside of the smoke-flue may have an opportunity to act or press upon the flap-valve 14, which pressure is rendered more or less effective by the varying pressure through the smoke-flue into the chimney, thus opening the damper, so as to break the draft through the smoke-flue and lower the draft through and from the furnace, and thus lower the temperature and reduce the consumption of fuel. By adjusting the weight 10 back and forth upon the arm 9 the leverage is changed and a stronger or milder suction or draft through the smoke-flue produced, depending upon the conditions of the weather as to heavy or light atmosphere and as to quiet or windy influences. By forming and applying the damper and providing it with the adjustable weight, as specified, the automatic action of the damper is rendered very sensitive. It will also be observed that there is a joint coöperation between the outside cap or cover to the branch pipe and the inside damper, because after the adjustment of the weight on the damper to the conditions of the outside weather and then closing the outside cap or cover the atmospheric conditions will have practically no effect upon the damper, for the reason that the heavier atmosphere outside of the smoke-flue is prevented from exerting the same amount of pressure upon the flap-valve of the damper, and thus a direct and unopposed draft is produced when starting up the fire in the furnace, and then by

throwing open the outside cap or cover to the branch pipe 5 rendering the damper very sensitive in its action, so that the temperature can be readily controlled by thus controlling the draft or suction in the smoke-flue. By the swell or enlargement of the smoke-flue at the point of location of the damper expansion or rarefaction of the air passing through the smoke-flue takes place at such point, and thus the sensitiveness and efficiency of the damper are increased.

I have illustrated and described with particularity what I consider to be the preferred details of construction of the several parts; but it is obvious that changes can be made in the details without departing from the essential features of other parts of my invention.

Having described my invention and set forth its merits, what I claim is—

1. In a furnace-damper regulator, the combination with the smoke-flue having an opening in the side thereof, of an automatically-operating damper to said opening located inside the smoke-flue, and a cap or cover located outside of the smoke-flue for controlling the pressure of the outside atmosphere, through said opening, upon the inside automatically-operating damper, substantially as described.

2. In a furnace-damper regulator, the combination with the smoke-flue, a branch pipe leading therefrom, and a cap or cover closing the outer end of the branch pipe, of the pivoted damper operating inside of the smoke-flue and located in relation to the inner end of the branch pipe to automatically open and close said pipe, substantially as described.

3. In a furnace-damper regulator, the combination with the smoke-flue and the branch pipe extending laterally therefrom, of the damper for automatically opening and closing the inner end of the branch pipe, said damper comprising the central segmental portion pivotally connected with the smoke-flue and having at one end an adjustable weight and at the opposite end the flap-valve adapted to bear against and close the inner end of the branch pipe, substantially as described.

4. In a furnace-damper regulator, the combination with the smoke-flue, of the regulating-damper comprising a segmental portion pivotally connected with the smoke-flue, and provided at one end with an adjustable weight and at the other end with an arm supporting a flap-valve, said flap-valve being formed with a notch to receive a part of the segmental portion, and the segmental portion being formed with a lug to lie above the face of the flap-valve, substantially as described.

5. In a furnace-damper regulator, the combination with the smoke-flue having an intermediate swell or enlarged portion, and branch pipe leading from the smoke-flue at such swelled portion, of a damper pivotally connected with the smoke-flue and having a flap-valve in proximity to the inner end of the branch pipe for automatically opening and

closing the branch pipe at its inner end, substantially as described.

6. In a furnace-damper regulator, the combination with the smoke-flue having a swell
5 or enlarged portion provided with a clean-out door, of a branch pipe leading from the smoke-flue at the swelled or enlarged portion, and a damper pivotally connected with the smoke-

flue adapted to automatically open and close the branch pipe, substantially as described. 10

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

JULIUS BRUSS.

Witnesses:

THEO. RICHTER,
HENRY SCHLOEGE.