Nov. 4, 1924. 1,514,028

C. ANSCHÜTZ

DEVICE FOR AUTOMATICALLY REGULATING THE DRAFT IN CHIMNEYS, SMOKE-FLUES, OR OTHER SIMILAR APPLIANCES

Filed Jan. 22 1921 3 Sheets-Sheet 1

Fig. 1

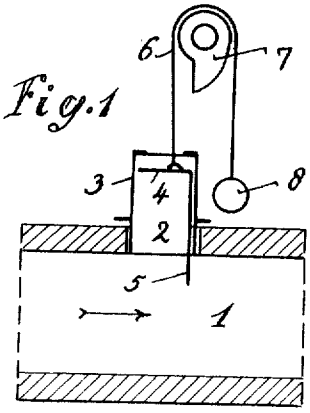


Fig. 2.

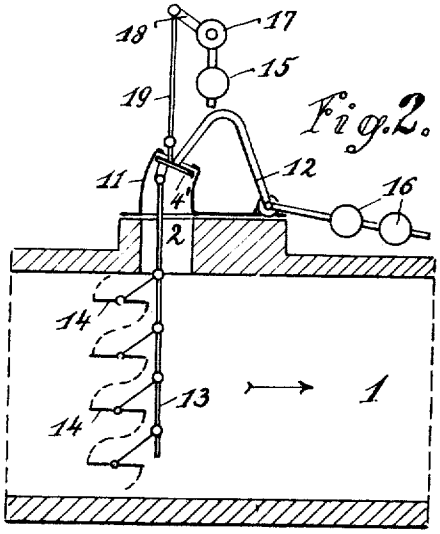


Fig. 3.

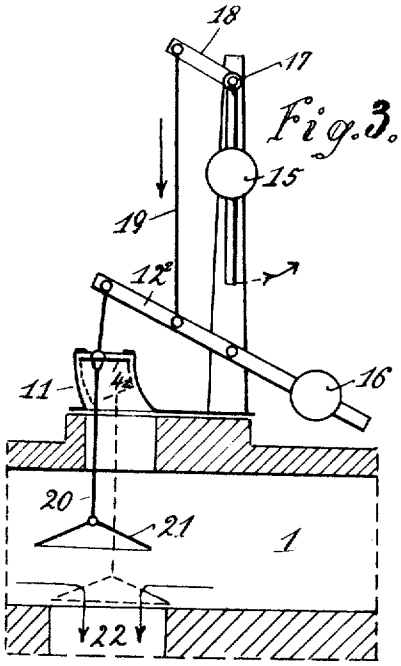
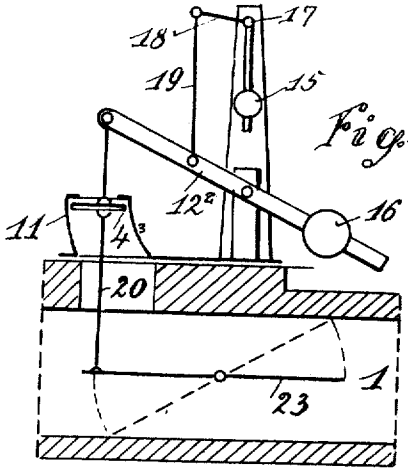


Fig. 4.



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Fig. 5.

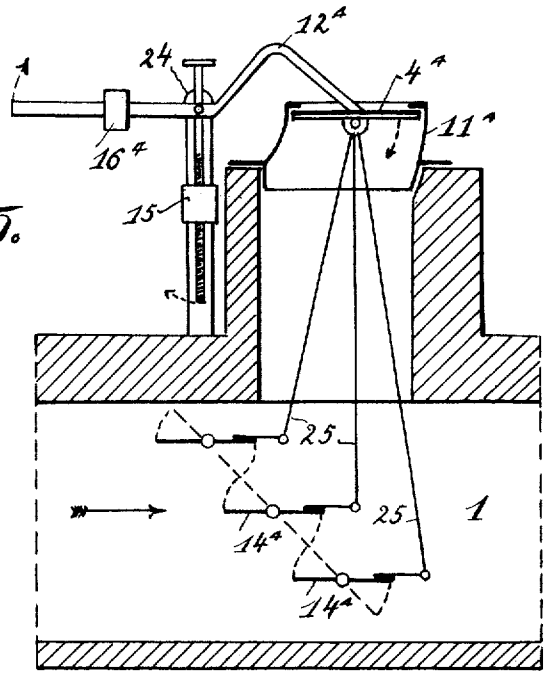
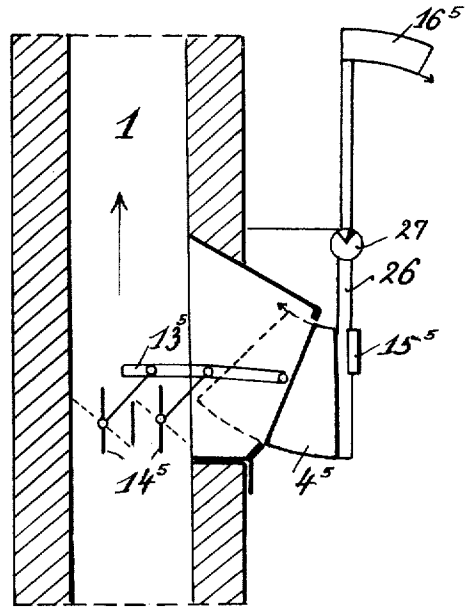


Fig. 6.



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Fig. 7.

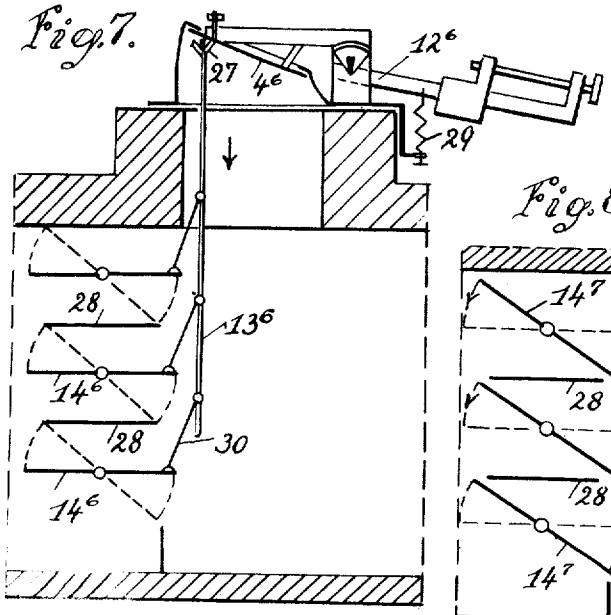


Fig. 8

Fig. 9.

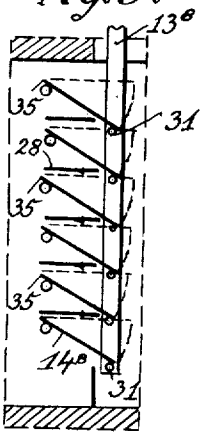


Fig. 10.

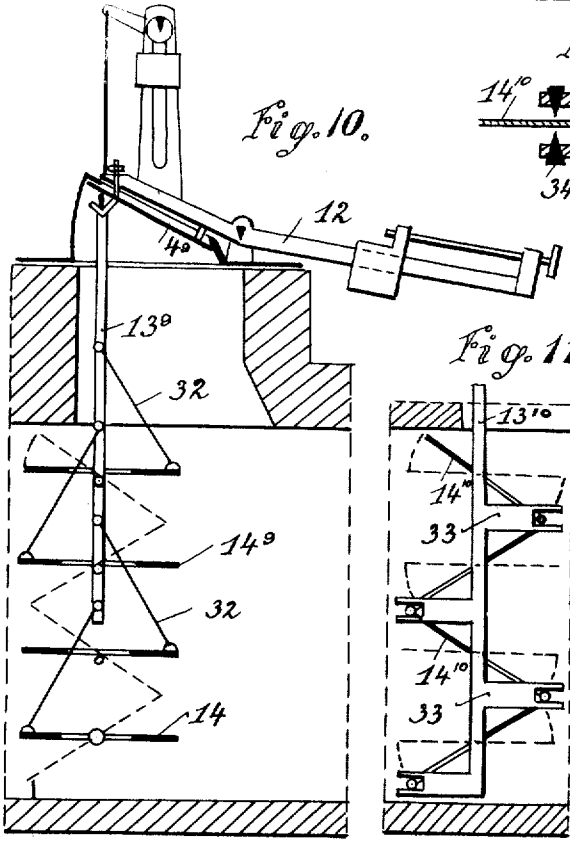


Fig. 12.

Fig. 13.

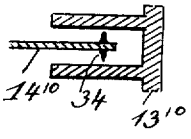


Fig. 11.

Fig. 14.

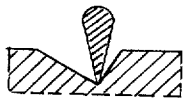
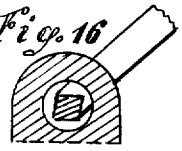


Fig. 15.



Fig. 16



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Patented Nov. 4, 1924.

1,514,028

UNITED STATES PATENT OFFICE.

CARL ANSCHÜTZ, OF CASSEL, GERMANY, ASSIGNOR TO GUSTAV KORNGBEL, OF CASSEL, GERMANY.

DEVICE FOR AUTOMATICALLY REGULATING THE DRAFT IN CHIMNEYS, SMOKE FLUES, OR OTHER SIMILAR APPLIANCES.

Application filed January 22, 1921. Serial No. 439,267.

To all whom it may concern:

Be it known that I, CARL ANSCHÜTZ, a subject of the German State, and resident of Cassel, Germany, have invented certain new and useful Improvements in a Device for Automatically Regulating the Draft in Chimneys, Smoke Flues, or Other Similar Appliances; and I do hereby 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 letters or figures of reference marked thereon, which form a part of this specification.

The invention has for its objects a device for automatically regulating the draft in chimneys, smoke pipes, smoke-flues or the like for furnace-installations.

The device which is built in closest possible proximity to the chimneys, i. e. in the smoke flue or at another suitable place between the furnace and chimney is constituted by a plate or a flap acted upon by the chimney-draft and built in an accessory opening of the smoke pipe or flue; such plate or flap is attached to a balance-beam with equalizing weight for the plate. In addition the plate is equipped with a draft regulating device having an adjusting effect on the plate, while it goes down. The plate or the flap can also be suspended from a rope or the like, passed over a lifting cam, carrying a counterweight. On the side turned towards the smoke-flue, the plate or the flap is in connection with a throttling device, such as for instance, cut-off registers, dampers, Venetian registers or other similar appliances, provided in the smoke-flue, which are displaced when the plate is lowered. When the normal draft in the chimney is exceeded, the plate shuts down and is drawn toward the smoke pipe with the effect that the throttling device dampers, and so on, connected to the plate and arranged in the smoke-flue shut off the passage in the smoke pipe or flue more or less.

Such arrangement prevents materials volumes of the air from entering the smoke-flue. When the draft in the chimney is restored to its normal amount, the shutting-off plate returns to its initial position, and the cut off registers or Venetian dampers in the smoke-flue are opened again. As will be readily understood this device can be shaped and carried out in manifold forms.

Figure 1 is a cross-section showing a simple form of my invention using a counterweight suspended over a cam.

Fig. 2 is a like view showing a weighted lever operating a plurality of damper elements.

Fig. 3 is a like view showing a weighted lever operating a vertically movable damper.

Fig. 4 is a like view showing a weighted lever operating a butterfly valve.

Figs. 5, 6 and 7 are like views showing different constructions of weighting means.

Figs. 8 and 9 show different constructions for operating plural dampers.

Figs. 10 and 11 show elevations of modified constructions of plural dampers.

Figs. 12 and 13 are enlarged cross-sectional detail views of Fig. 11.

Figs. 14, 15 and 16 show enlarged detail views of knife-edge supports.

Fig. 1 illustrates a length of the smoke-flue in longitudinal section with an opening 2 and casing 3 above it, in which the shutting down plate 4 has its movement. This has attached thereto the transverse register, or damper 5 throttling the channel 1. The plate 4 is suspended from a rope 6 carrying a counterweight 8 and passing over an eccentrically arranged roller or a lifting cam 7. While normal draft is prevailing in the channel 1, the plate 4 and the damper 5 are in their highest position. Upon any excess above the normal draft in the channel 1, the plate 4 is moved downwards. At each lowering of the plate 4 the cross section of the channel 1 is simultaneously reduced by the damper 5 or enlarged again when it rises, with consequent regulation of the draft. By means of the lifting cam 7 the counterweight is gradually farther distanced from the shaft, thus causing the counter-load of the plate 4 to be gradually increased during its sinking, ensuring in this way a lowering of the plate commensurate with the increased draft.

The form of embodiment as per Figure 2 shows at the opening 2 of the smoke-flue 1 a curved flanged casing 11, wherein the plate 4', attached to a swinging lever 12 with counterweights 16 has its movement. From the plate 4' an operating rod 13 is suspend-

ed, which during the going down of the plate 4′ acts on the Venetian dampers 14 and closes the same, whereby the channel is more or less shut off. The counterweights 16 hold the plate 4′ in position in case of normal draft. In addition to the equalizing weights for the plate at normal draft, attached to the lever 12, the plate is also affected by the regulating device 15, 17, 18 and 19. This device includes a regulating weight 15 adjustable on the lever 18, swinging round the pivot 17. The connection with the plate is established through lever 18 and link 19. As soon as the plate 4′ begins to sink, the weight 15 rises, causing a gradual lowering of the plate 4′ in proportion to the draft.

The form, illustrated in Figure 3 is distinguished from the preceding one only by the fact that from the plate 4^2 there is suspended on a rod 20 a covering plate 21, covering the opening 22 of the smoke flue while the plate 4^2 is moving down. The regulating device 15, 17, 18 and 19 is identical with that shown in the preceding embodiment with the sole difference that the connecting rod 19 is attached at its lower end to a lever 12^2.

The device shown in Figure 4 is similar to that represented in Figure 3, the distinguishing feature being that while the plate 4^3 is lowering, a swinging plate 23 or butterfly valve is made to turn in the smoke flue.

In the form as per Figure 5 the plate 4^4, acted upon by the draft, is moved again in a curved flanged casing 11^4. It is fitted on the swinging lever 12^4, arranged on the shaft 24. At normal intensity of draft, the weight 16^4 holds the plate 4^4 in position. The regulating weight 15^4, suspended from the shaft 24 and adjustable, is used as a counter-weight during the sinking of the plate 4^4. In the channel 1 three Venetian dampers 14^4 are fitted which are displaced by aid of the rod-system 25. Each rod 25 is pivotally connected at one end to the plate 4^4 and each damper has a short arm extending therefrom which is pivotally connected to lower end of one of the rods.

Figure 6 shows a form of embodiment in which the draft-regulator is mounted on a chimney 1. In this example the operating plate 4^5 has the form of a box and it is fastened to a rod 25, mounted to swing in the bearing 27. The rod 26 carries a counterweight 16^5 and a movable regulating weight 15^5. The dampers 14^5, provided in the chimney 1, are turned by a rod-system 13^5 connected to the plate 4^5.

The figures from 7 to 11 are illustrative of the regulating devices in connection with Venetian registers, i. e. more particularly varying forms of the connections of the operating rod for the Venetian registers, fitted in the smoke-flue.

In Figure 7 an operating rod 13^6 is suspended from a knife edge in the bearing 27 on the plate 4^6, connected to the weighted lever 12^6, and such rod is made to displace the movable dampers 14^6 by means of the intermediate links 30, until they bear against stationary traverse plates 28. In addition to the equalizing weight, the swinging lever 12^6 is connected to a spring 29, causing the plate 4^6 to go down uniformly as the draft increases.

In Figure 8, the operating rod 13^7 directly engages the movable flaps 14^7, arranged between stationary dampers 28.

The flaps 14^8 of Figure 9 are pivotally arranged at the one extremity 35 while the other free end rests on the traverse members 31 of the operating-rod 13^8.

In the forms shown in Figures 10 and 11, the stationary plates 28 are omitted. The operating rod 13^9 is made to traverse centrally the plates. The slotted plates 14^9, are suspended in superposition at a certain distance from one another on rod 13^9, in such a way that the one end of the plate 14^9 is assembled through a connection rod 32 with the operating rod 13^9 while the connecting rod of the subsequent plate forms the supporting point of the preceding damper. When the plate 4^9 is lowered, the longitudinal sides of the plates 14^9 approach each other, forming, when closed an acute angle, as indicated in dotted lines.

In Fig. 11 the plates 14^{10} are pivotally mounted in the flue on projections (not shown) formed on the ends of the plates and each plate has a transverse slot extending from its axis to near one edge of the plate. The operating rod 13^{10} has a plurality of laterally projecting arms 33 formed with forked ends which project through the slotted portions of the plates and engage the edges of the latter at the outer ends of the slots.

In order to mount the plates 14^{10} in the bifurcation of the arms 33, I proceed, with a view to reduce the friction to the possible minimum, in the manner shown on an enlarged scale in Figures 12 and 13, using sharp-pointed bolts 34 set, either in the bifurcation or in the plate.

To reduce the friction as far as possible, the points of support of the movable parts, such as operating rods, swinging levers and the like are carried out in form of sharp-pointed edges. The Figures 14, 15 and 16 illustrate this arrangement on a larger scale.

I claim—

1. The combination with a smoke flue, of a casing extending laterally of the flue and communicating at its inner end with the flue, said casing having end openings of substantially the same diameter as the casing, a plate normally closing the outer end of the casing, a counterbalanced lever support-

ing the plate free of the casing and adapted to permit the plate to bodily move piston-like lengthwise of the casing without affecting the flue, a damper operated by the movement of said plate and controlling the cross-sectional area of said flue without admitting additional air to the flue, and an auxiliary regulating means connected with the plate.

2. The combination with a smoke flue, of a casing extending laterally of the flue and communicating at its inner end with the flue, said casing having end openings of substantially the same diameter as the casing, a plate normally closing the outer end of the casing, a counterbalanced lever supporting the plate free of the casing and adapted to permit the plate to bodily move piston-like lengthwise of the casing without affecting the flue, a damper operated by the movement of said plate and controlling the cross-sectional area of said flue without admitting additional air to the flue, and means to gradually change the counter load on the plate commensurate with a change in the draft of the flue.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

CARL ANSCHÜTZ.

Witnesses:

HERMANN SPRINGER,

HEINRICH DVÖNNEN.

Certificate of Correction.

It is hereby certified that the name of the assignee in Letters Patent No. 1,514,028, granted November 4, 1924, upon the application of Carl Anschütz, of Cassel, Germany, for an improvement in "Devices for Automatically Regulating the Draft in Chimneys, Smoke Flues, or Other Similar Appliances," should have been written and printed as *Gustav Korngiebel* instead of "Gustav Korngbel," as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of January, A. D. 1925.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.