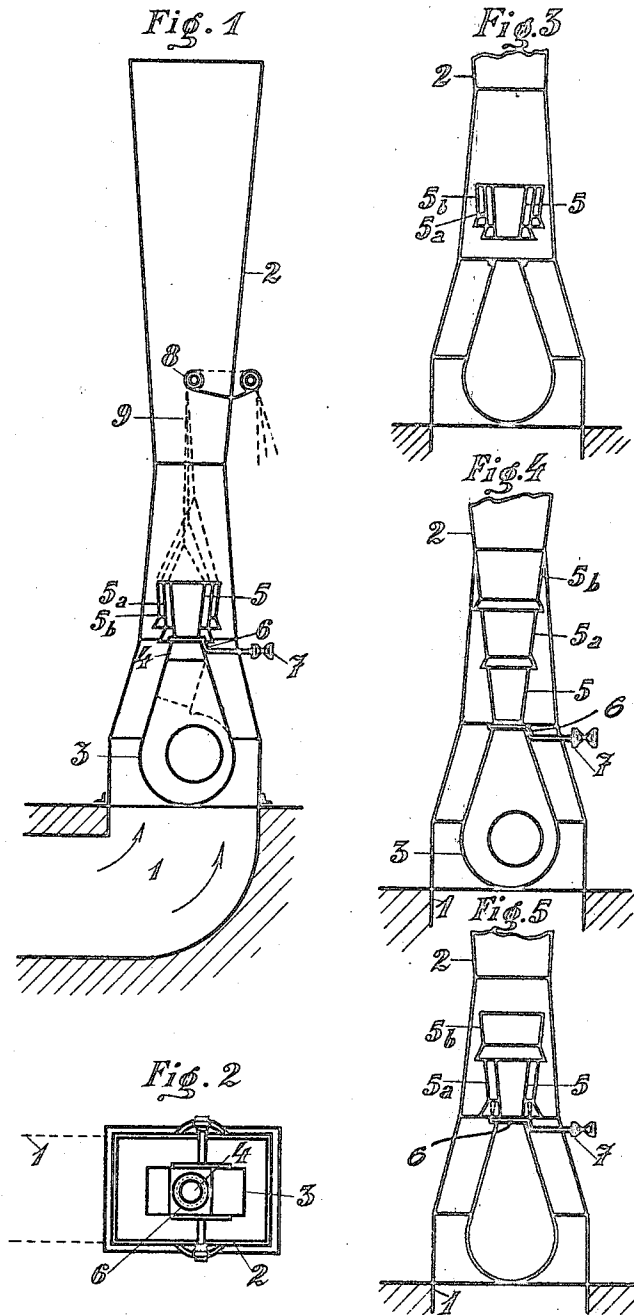


E. PRAT.
INDUCED DRAFT DEVICE.
APPLICATION FILED APR. 2, 1920.

1,434,313.

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INDUCED-DRAFT DEVICE.

Application filed April 2, 1920. Serial No. 370,860.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, EMILE PRAT, citizen of the French Republic, residing at Paris, France, 64 Rue de Miromesnil, have invented certain new and useful Improvements in Induced-Draft Devices (for which I have filed application in France, January 10, 1918), of which the following is a specification.

10 Induced-draft for furnaces, produced by an ejector such as generally employed, consists more particularly in the combination of an externally arranged fan and an ejector chimney, the two apparatus cooperating
15 for the discharge of the smoke, gas, vapours and the like.

This system of draft, which has lately been extensively employed, compares favorably, as a rule, with the induced-draft system consisting of an ordinary chimney, and of a fan through which all the gases to be discharged are passed.

20 These two systems have the defect of low efficiency because the gases have to take a sinuous course, and because said gases cannot be so regulated as to economize in fuel consumption owing to the fact that the speed of the fan cannot usually be modified.

The object of the present invention is to 30 lessen these drawbacks, and the invention is characterized by the fact that the fan is situated inside the chimney and has the external form of a solid offering the least practicable resistance to the flow of the gases; that is to say, the body of the fan is rounded at its lower sides while its delivery passage is upwardly tapered. In one form of the invention, the delivery nozzle of the fan is surrounded by one or more so-called expansion-rings which are movable axially so as to vary the sectional area of the nozzle of the fan. The device may be completed by an auxiliary steam jet, in the shape of a ring, in combination with staged expansion.

45 The invention is described hereinafter with reference to the accompanying drawing, which illustrates, diagrammatically and by way of example, one method of carrying out the invention.

50 Figure 1 is a vertical diagrammatic section of the induced draft chimney showing all the rings in the lowermost position and in nesting relation.

Fig. 2 is a plan view of the same.

Fig. 3 is a fragmentary elevation similar 55 to Figure 1 with the rings arranged in nesting relation but spaced above the fan casing.

Fig. 4 is a similar view showing the rings fully extended, and

Fig. 5 is a similar view showing the rings in another position.

1 is the flue through which the gases are discharged into the chimney; 2 is the sheet-iron chimney; 3 is the fan, which is arranged 65 entirely within the chimney, and is preferably provided with two intakes. Its external form is that of a solid body which offers the least practicable resistance to the passage of the gases, so that its presence in 70 the chimney does not cause any appreciable loss, either through contraction or expansion, as regards the gases circulating round it.

The fan delivers into a short nozzle 4, 75 about which are arranged one or more expansion-rings 5, 5^a and 5^b for varying the sectional area of the ejector nozzle. These rings are tapered outwardly and their lower ends preferably taper in the opposite direction 80 in order to facilitate the passage of the gases between them. Around the nozzle 4 is arranged an auxiliary steam device 6, in the shape of a ring having a circular series of steam outlet ports, the discharge of steam 85 from which may be manually controlled by means of the valve 7; the arrangement as a whole affording capability for effecting staged expansion of the steam.

The expansion rings 5, 5^a, 5^b, when dis- 90 placed vertically, as shown in Fig. 4, by means of chains 9 passing over pulleys 8, or by any other means, vary the sectional area of the ejector nozzle and consequently the ejecting action of the fan. Thus when, as in 95 Figure 3, all the rings are collapsed, the sectional area of the discharge orifice of the fan is reduced to a minimum, whereas when, as in Figure 4, they are drawn out like a telescope, they give a maximum sectional area 100 of blast.

It should be noted that the position of maximum sectional area of blast corresponds to minimum work of the ejector, nearly the whole of the gases passing through the fan. 105

Practical experience has shown that, for

a given consumption, steam delivered through a multiple jet arranged as a ring gives better results than delivery through a single aperture. The auxiliary steam device is therefore arranged in the form of a multiple-jet ring 6 surrounding the nozzle 4, but with this peculiarity, that the expansion of the steam can be staged by means of the rings 5, 5^a, 5^b so as to increase the efficiency of the device (Figure 5).

It will be understood that the same arrangement for regulating with rings may also be applied to the nozzles of fans mounted outside the chimney, as is the case with the majority of existing types.

In my co-pending application Serial No. 370,861, filed April 2, 1920, I have described a draft device in which the fan is always traversed, when working, by all of the gases and in which, when the fan is not working, the gases are carried along by the ejector action of a steam blast. In my co-pending application Serial No. 370,862, filed April 2, 1920, I have further described a draft device in which a fan divided into two parts simultaneously causes the draft of the combustion gases to the chimney in one part of the fan and blows atmospheric air to the furnace grate in the other part. But my present application does not relate to any device of the kind as it concerns a draft device in which a portion of the gases passes inside the fan and the remainder outside the fan, means being provided to control the ratio of the two portions.

What I claim is:

1. A chimney draft device comprising a chimney, a fan arranged to discharge into the chimney, and a plurality of rings arranged about the outlet of said fan for varying the area of said outlet, the uppermost ring being adapted to make close contact with the chimney.

2. A chimney draft device comprising a chimney, a fan arranged to discharge into

the chimney, a nozzle at the outlet of said fan, a plurality of rings arranged about the outlet nozzle of the fan, and means for raising and collapsing said rings telescopically and for applying the uppermost ring in close contact with the chimney.

3. A chimney draft device comprising a chimney having a convergent part and a divergent part, a fan arranged to blow only a portion of the smoke into the chimney, a plurality of divergent rings arranged about the outlet of the fan, and means for raising and collapsing said rings telescopically and for applying the uppermost ring in close contact with the chimney.

4. A chimney draft device comprising an ejector-shaped chimney, a fan arranged wholly inside the chimney, means for drawing only a portion of the smoke through the fan, the remaining portion of the smoke being drawn directly upwardly within the chimney, a plurality of rings arranged about the outlet of the fan, said rings having oppositely flaring upper and lower portions, and means for raising and collapsing said rings telescopically.

5. A chimney draft device comprising a chimney, a convergent part and a divergent part, a fan arranged wholly within said chimney, said fan having the shape of a solid to present minimum resistance to the flow of gases thereby, a plurality of divergent rings arranged about the outlet of the fan, and means for raising and collapsing said rings telescopically in variable relative position.

6. A chimney draft device comprising a chimney, a fan adapted to discharge into said chimney, a plurality of divergent rings spaced around the fan outlet, means for raising and collapsing said rings telescopically, and steam ejecting means adapted to eject steam into said rings.

In testimony whereof I affix my signature.
EMILE PRAT.