

March 31, 1925.

1,531,831

H. A. BARTHOLDI

CHIMNEY TOP.

Filed May 24, 1922

Fig. 1.

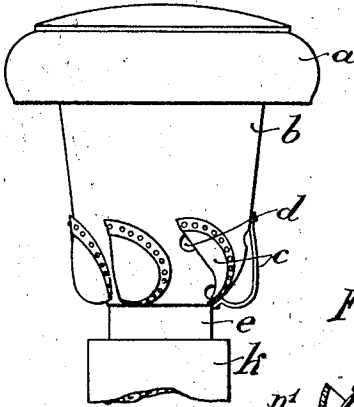


Fig. 2.

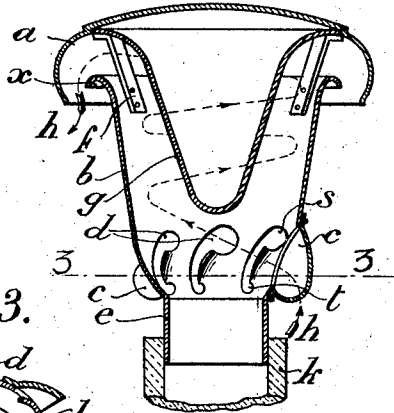


Fig. 3.

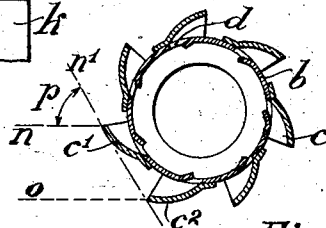


Fig. 4.

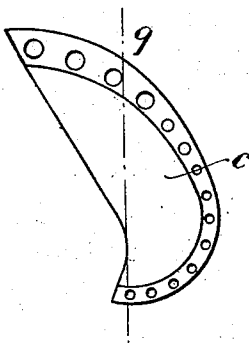


Fig. 5.

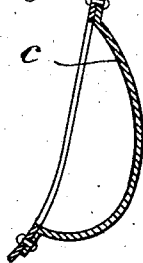


Fig. 6.

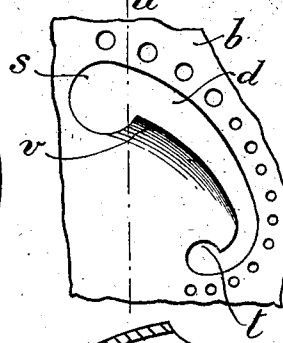
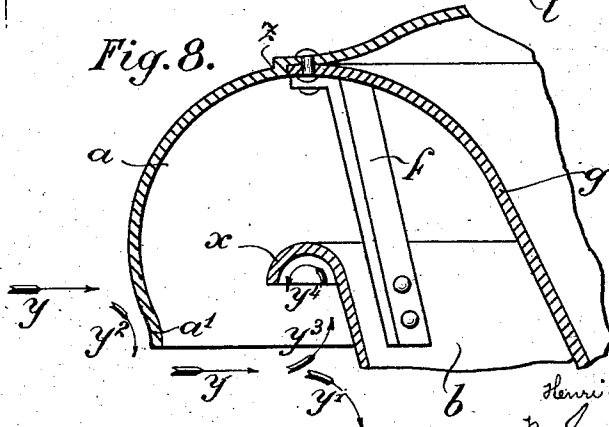


Fig. 7.



Fig. 8.



Inventor

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By *James H. [Signature]*
his Attorneys.

Patented Mar. 31, 1925.

1,531,831

UNITED STATES PATENT OFFICE.

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CHIMNEY TOP.

Application filed May 24, 1922. Serial No. 563,302.

To all whom it may concern:

Be it known that I, HENRI ANTOINE BARTHOLDI, a citizen of Switzerland, residing at Geneva, Canton of Geneva, in the Confederation of Switzerland, have invented certain new and useful Improvements in Chimney Tops, of which the following is a specification.

The object of this invention is the provision of a device for producing under the influence of the wind, a draught in a flue for the passage of gases, vapours, smokes and so on, as for instance in a chimney, in a drain for bad air, or in an escape for deleterious gases or vapours.

For producing such a draught, it has been customary up to now to either provide a chimney top without any movable portion but with large or numerous openings in which the wind is ingulfed and thereby causes a draught, or to provide chimney tops having a rotary head turned by the wind so that when the wind strikes upon it, the exit of the gases from the chimney is accelerated and thereby the desired draught is realized.

Practice has proved that the usual chimney tops without any rotary member are unsatisfactory. In order to obtain a good draught a certain minimum velocity of the wind is indispensable. It then enters not only in the opening or openings corresponding to the direction the wind blows from but also into other large and numerous apertures, with the result that several currents are created in the chimney top which counteract one another.

As regards the second type of known chimney tops with rotary members, it has been experienced that these do not turn in the wind as they should turn. Either the support of the rotary head is often rusty or oxidized or the wind is too light for overcoming the resistance opposed by the rotation of the head. It may also be that the chimneys on a roof with many corners suffer from the fact of counter-currents owing to said corners. In all these cases the wind instead of accelerating the exit of the gases from the chimney flue is ingulfed in such a way in the head, that it tends rather to force the gases down into the flue.

By the device according to this invention these drawbacks are avoided owing to the fact that it comprises a fixed hollow body

connected at its bottom part to the flue and is increasing in diameter from the bottom to the top and is provided in its lower portion with apertures arranged in such a manner that at least one of them provides an entrance for the wind no matter from which direction it comes, the whole device being designed in such a way that the wind circulates in the hollow body by describing consecutive spires the height of which above the apertures constantly increases simultaneously with their curve radii, thereby creating the desired draught in the flue to which said hollow body is connected.

The attached drawing illustrates by way of example a working form of the new device as applied to a chimney flue.

Fig. 1 is an elevation.

Fig. 2 is a vertical section through the axis.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

Figs. 4 to 7 show details on a larger scale.

Fig. 8 is a partial vertical section through the axis on a larger scale.

The hollow body *b* of this working form is made of metal, for instance of sheet iron, aluminium or brass and may be of any suitable shape for a rotary body having a vertical axis. The cylindrical bottom portion *c* serves as a collar which is tightly fitted into the top of the chimney flue. The middle portion of the hollow body has the general form of a truncated cone or of a flower-vase or urn whose smaller base is at the bottom and the larger base at the top. The top portion *x* of the hollow body has a semi-circular vertical cross section whose concavity is directed towards the base of the body. In the lower part of the middle portion of the body the wind collectors or shells *e* and apertures *d* are provided. These are spaced at equal distance from one another on the circumference of the body and are sufficient in number that the wind no matter from which direction it may come, always finds an entrance into one or more of them. These apertures have the general form of the letter **C** and comprise a lower circular portion *t* of relatively small diameter and a middle portion reaching upwards to a circular top portion *s* of relatively large diameter. The middle portion has a maximum width which is smaller than the diameter of the circular top and bot-

tom portions. It is incurved and inclined to the vertical, as indicated by line u in Fig. 6. The lip v of this middle portion is slightly bent round inwardly as shown in Figs. 6 and 7. Metallic shells c are riveted on the exterior of the body b to the right of the apertures d . They serve for guiding the wind towards said apertures d and are inclined to the vertical shown by the line 9 in Fig. 4.

A fixed guide g is placed inside of the body b . It is also made of metal as for instance of sheet iron, aluminium or brass and has the form of a cone whose rounded-off end reaches downwards into the hollow body b to about half the height of the latter. This guide g is fixed by means of metallic supports f fixed to the body b in such a manner that a circular annular space is left free between the body b and the guide g , whose median diameter increases from the bottom to the top but whose radial dimension decreases from the bottom to the top.

This guide g has a projecting circular cover a of a segment like vertical cross section whose concavity is turned downwards. The cover a constitutes together with the top portion x of the hollow body b a circular space communicating with the space below and on the other side opens downwards into the atmosphere. The border of the cover a reaches downwards below the plane of the portion x and is provided with an annular flute a' of nearly semi-circular cross-section and whose convexity is directed towards the axis of the device.

The guide g and the cover a are riveted to the supports f (Fig. 8) as indicated at z .

The described device works in practice as follows:

The wind strikes no matter from which ever direction it blows against one or more of the shells c into which it passes and by which it is directed towards the corresponding aperture d . The wind after entering through the same passes into the interior of the hollow body b in a direction which owing to the form of the shell c and the lip v is nearly tangential to the inner surface of the body. It therefore passes over this inner surface which enlarges from the bottom to the top and enters the annular space provided between b and g which is also of greater diameter towards the top. From this it results that within b eddies are created whose consecutive spires, as indicated by the broken line h in Fig. 2, are more and more elevated with regard to the apertures d and whose curve radii are continually increasing. These eddies which resemble somewhat the whirlwinds known in nature, cause a violent aspiration in the flue h in which consequently the products of combustion are submitted to a lively draught.

The wind and the products of combustion escape finally downwards through the annular space between the body b and the cover a and this generally on the side opposite to the one from which the wind entered into the body.

If the wind blows in the direction indicated by the dotted line n^1 in Fig. 3, it enters with its full force into the shell c^1 ; it cannot however, pass into the next shell c^2 . If the wind comes in the direction of the two parallel dotted lines n , o it can no longer enter into the shell c^1 at all, but may enter shell c^2 . The angle p which is constituted by the line n^1 and the lines n , o therefore determines the direction the wind must take to pass into two consecutive shells simultaneously. From Fig. 3 it becomes evident that at least one of the shells is exposed to the wind irrespective of the direction from which it blows.

The wind which arrives upon the device as shown by the arrows y of Fig. 8 strikes particularly the cover a near its lower rim which presents an annular flute which rejects the threads of the wind reaching the rim so that they take a direction according to the curved arrow y^2 and so prevents them from entering directly under the cover a where they might prove an obstacle to the exit of the air and products of combustion passing out of the chimney top.

As regards the threads of the wind which pass horizontally below the cover a they will strike against the middle portion of the hollow body b , a part of them will be directed downwards and another part upwards as shown by the curved arrows y^1 , y^3 . The former ones follow the wall of b and arriving at the top portion x , owing to its shape, will be directed downwards according to arrow y^4 so that on the side from which the wind blows they cannot obstruct the exit of the air and products of combustion from the chimney top.

The guide g may be made to enter more or less deeply into the body b than is shown in the drawing. It is also evident that the device may be adapted to other than chimney flues.

I claim as my invention:

1. A chimney top comprising a hollow body increasing in diameter from the bottom upwardly and adapted at its lower end to be connected to the upper end of a chimney, a plurality of spaced shells secured to the lower outer end of the said hollow body, there being a corresponding number of apertures in the body and the said shells being so spaced as to direct the wind into at least one of the same and the corresponding aperture irrespective of the direction in which the wind blows and each aperture being so formed that the wind in passing through the same enters the said body in a substan-

tially tangential direction, and a guide member fixed in the said body, the said guide member also increasing in diameter upwardly and providing between the same and the said hollow body an annular passage communicating with the atmosphere and through which the wind passes in spirally disposed currents increasing in diameter with the distance above the said shells, the lower end of the said guide member being slightly above the top of the said shells and the apertures in the said hollow body.

2. A chimney top comprising a hollow body increasing in diameter from the bottom upwardly and adapted at its lower end to be connected to the upper end of a chimney, a plurality of spaced shells secured to the lower outer end of the said hollow body, there being a corresponding number of apertures in the body and the said shells being so spaced as to direct the wind into at least one of the same and the corresponding aperture irrespective of the direction in which the wind blows and each aperture being so formed that the wind in passing through the same enters the said body in a substantially tangential direction, a guide member fixed in the said body, the said guide member also increasing in diameter upwardly and providing between the same and the said hollow body an annular passage through which the wind passes in spirally disposed currents increasing in diameter with the distance above the said shells, the lower end of the said guide member being slightly above the top of the said shells and the apertures in the said hollow body, brackets secured to the said hollow body at the upper end thereof and by which the said member is supported, and a cover secured to the said guide member and extending over the same to a position in which the periphery of the cover is below the upper end of the hollow body providing a discharge passage from the said annular passage to the atmosphere, the upper end of the hollow body being semi-circular in cross section with its concavity directed downwardly and the peripheral portion of the cover fluted and its edge turned outwardly to deflect downwardly and outwardly the air currents striking against these portions of the apparatus.

3. A chimney top comprising a hollow body increasing in diameter from the bottom upwardly and adapted at its lower end to be connected to the upper end of a chimney, a plurality of spaced shells secured to

the lower outer end of the said hollow body, there being a corresponding number of apertures in the body and the said shells being so spaced as to direct the wind into at least one of the same and the corresponding aperture irrespective of the direction in which the wind blows, each of the said apertures being correspondingly inclined with the upper end thereof larger than the lower end and that portion of the hollow body defining the lower edge of the aperture being inclined to direct the wind currents entering the hollow body in a substantially tangential direction, a guide member fixed in the said body, the said guide member also increasing in diameter upwardly and providing between the same and the said hollow body an annular passage communicating with the atmosphere and through which the wind passes in spirally disposed currents increasing in diameter with the distance above the said shells, the lower end of the said guide member being slightly above the top of the said shells and the apertures in the said hollow body, means for supporting the said guide, and a cover connected to the said guide.

4. A chimney top comprising a hollow body increasing in diameter from the bottom upwardly and adapted at its lower end to be connected to the upper end of a chimney, a plurality of spaced shells secured to the lower outer end of the said hollow body, there being a corresponding number of apertures in the body and the said shells being so spaced as to direct the wind into at least one of the same and the corresponding aperture irrespective of the direction in which the wind blows and each aperture being so formed that the wind in passing through the same enters the said body in a substantially tangential direction, and a guide member connected to the said body, the said guide member also increasing in diameter upwardly and providing between the same and the said body an annular passage communicating with the atmosphere and through which the wind passes in spirally disposed currents increasing in diameter with the distance above the said shells and apertures at which the wind is admitted.

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

HENRI ANTOINE BARTHOLDI.

Witnesses:

MAURICE FREY,
EDWARD EMMANUEL.