

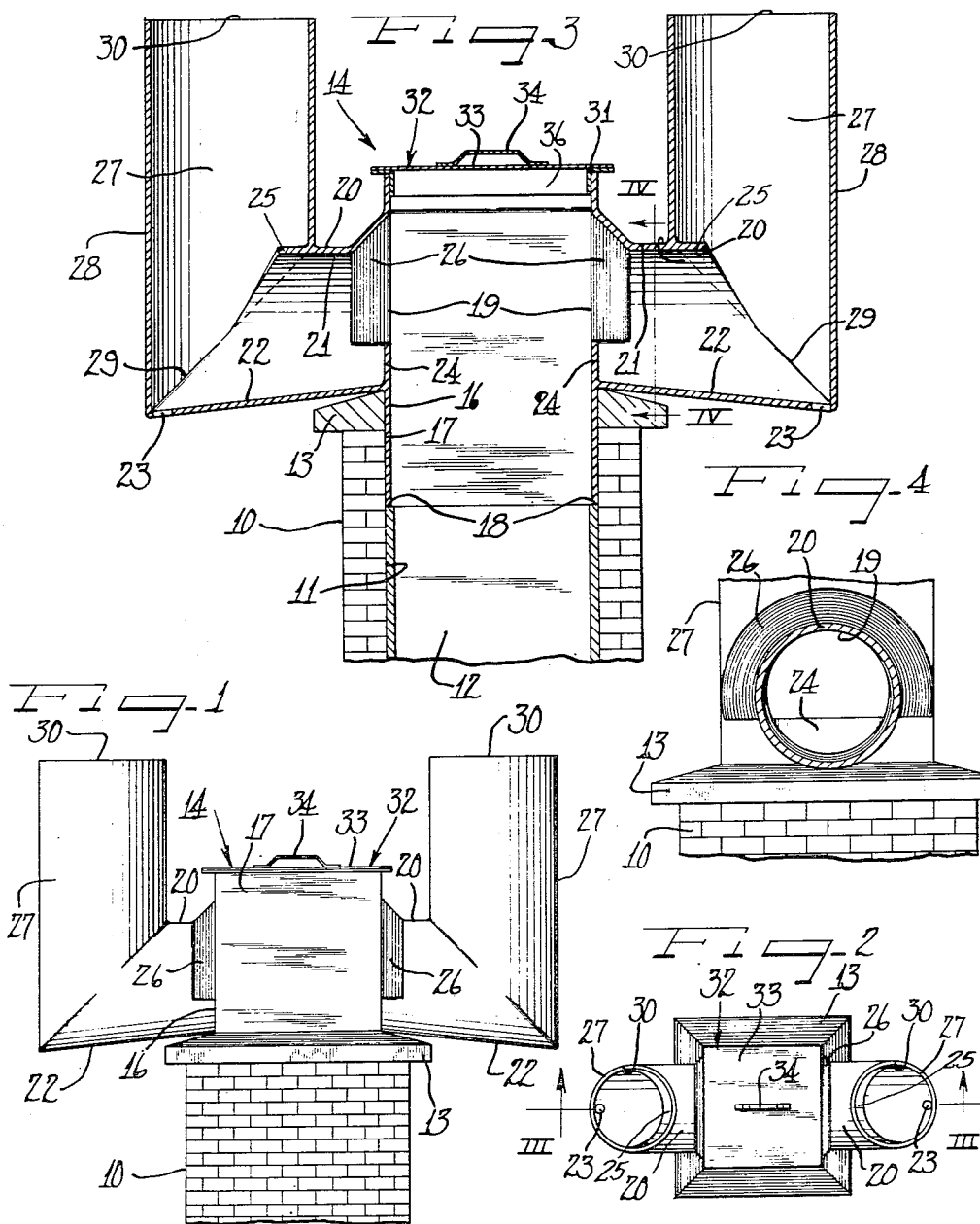
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RAIN COVER FOR CHIMNEYS

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RAIN COVER FOR CHIMNEYS

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This invention relates generally to chimney constructions and more particularly relates to an improved form of rain cover which maximizes protection of a chimney against damage by liquid fluids without interfering with the egress of gases of combustion discharging from the chimney.

According to the general principles of the present invention, a rain cover is provided which includes a generally vertical duct having a cover at the top thereof which may be selectively removed to facilitate access to the interior of the chimney without removing the rain cover. The vertical duct has at least one side opening to which is connected a generally horizontal duct. A baffle is formed in the side opening and extends across the lower portion of the horizontal duct to prevent liquid from flowing into the vertical duct from the horizontal duct. Means forming a second vertical duct are connected to the end of the horizontal duct laterally outwardly of the first vertical duct, thereby to provide an outlet for the rain cover. The horizontal duct is particularly characterized by the provision of bottom wall portions angularly inclined downwardly and outwardly from the baffle. One or more drain openings may be formed at the outer end of the bottom wall portions so that liquid may be released from the horizontal duct. The walls of the horizontal duct may also be enlarged in the vicinity of the baffle, thereby increasing the open cross-sectional area of the horizontal duct in compensation for the area closed by the baffle.

A top portion of the horizontal duct also extends into the vertical duct, thereby further assisting in blocking the passage of rain from the outlet to the first vertical duct.

It is an object of the present invention, therefore, to provide a rain cover for a chimney which will maximize protection against damage from liquids but which will not interfere with the flow of combustion gases ordinarily discharged from the chimney.

Another object of the present invention is to provide a chimney cover which affords easy access to the interior of the chimney without necessitating the removal of the rain cover.

Many other features, advantages and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows and the accompanying sheet of drawings in which a preferred structural embodiment of a rain cover incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

Figure 1 is an elevational view of a rain cover for a chimney incorporating the principles of the present invention;

Figure 2 is a reduced top plan view of the rain cover shown in Figure 1;

Figure 3 is a cross-sectional view taken substantially on line III—III of Figure 2; and

Figure 4 is a fragmentary cross-sectional view taken substantially on line IV—IV of Figure 3.

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As shown on the drawings:

A chimney is indicated generally at 10 and comprises a plurality of bricks laid to form a generally vertically extending chimney duct 11 which may, for purposes of illustration, have a flue liner indicated at 12. The flue liner 12 terminates below the level of the top of the chimney 10 as is indicated in Figure 3. A chimney cap 13 is provided to circumscribe the top opening of the chimney 10.

In accordance with the principles of the present invention, a rain cover indicated generally at 14 is provided for the chimney and may be constructed out of any suitable material, for example, a ceramic tile, a suitable molding clay or, if desired, the rain cover 14 may be constructed of sheet metal.

In any event, the rain cover 14 is particularly characterized by the provision of means forming a first duct 16 disposed on a vertical axis and having side walls which are shaped to conform to the flue or duct of the chimney 10. In this particular embodiment, the invention is illustrated in connection with a chimney 10 having a rectangular flue and, accordingly the rain cover 14 has a first duct 16 characterized by the provision of four rectangular walls 17.

The lower portion of the rectangular walls 17 is inserted into the top opening of the chimney 10 and the bottom edge indicated at 18 is shown abutting against the flue liner 12. It will be understood that a layer of mortar can be used between the bottom portion of the walls 17 and the chimney 10 so that the rain cover 14 will be securely cemented in place and will therefore be placed in firm assembly with the chimney 10.

The vertical duct 16 of the rain cover 14 not only provides the support means through which the rain cover 14 is carried by the chimney 10 but also provides a bottom inlet for the rain cover 14 through which the gases of combustion discharged by the chimney 10 may flow.

At least one of the side walls 17 and, in the embodiment illustrated in the drawings, two of the opposite disposed walls 17 are provided with lateral or side openings 19.

Each opening 19 has in register therewith a means providing a second duct disposed on a generally horizontal axis and indicated generally by the reference numeral 20. Each duct 20 is provided with side walls 21 integrated with the corresponding side walls 17 of the first duct 16.

The horizontally disposed ducts 20, 20 are particularly characterized by the provision of bottom wall portions 22 which are angularly inclined and which taper downwardly and outwardly away from the side walls 17 of the first duct 16. The bottom wall portions 22 are further characterized by the formation in the lowermost outer extremities thereof of a drain opening 23. Thus, any liquid fluids within the horizontal duct or ducts will drain downwardly and outwardly away from the first duct 16 and will be gravitationally released through the drain holes 23, 23.

Projecting upwardly into each opening 19 is a baffle 24. Each baffle 24 is positioned uprightly and extends across the lowermost portion of a corresponding cylindrical duct 20 adjacent the bottom wall portions 22. Accordingly, the baffles 24, 24 form an obstruction between the duct passages provided by the cylindrical ducts 20, 20 and the rain cover inlet provided by the vertical duct 16.

Although it is desirable to provide the baffles 24, 24 in order to preclude the leakage of liquid fluid into the vertical duct 16 from the horizontal duct 20, it will be appreciated that the baffle 24 tends to cut down the available open area of the duct 20. Accordingly, to compensate therefor, the side walls of the cylindrical duct 20 are angularly offset as at 26 and diverge outwardly from a medial portion of the duct 20 towards the area of inte-

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gration with the side walls 17 of the vertical duct 16. There is thus provided an increased cross-sectional area in the duct 20 in the vicinity of the baffle 24 so that in all points of the ducts 20, 20, the total cross-sectional area of the ducts 20, 20 will be in excess of the total cross-sectional area of the vertical duct 16.

The offset wall portions further serve to rigidify the structure, thereby contributing to the strength of the rain cover structure.

Each of the horizontal ducts 20 terminates at its outer end in a means providing a third duct 27 disposed on a vertical axis substantially laterally displaced from the vertical axis of the vertical duct 16. Each vertical duct 27 has side walls 23 which are integrated as at 29 with the corresponding adjacent side walls 21 of the horizontal ducts 20.

Each of the vertical ducts 27 has a top opening 30 forming an outlet for the rain cover. It will be understood that the available cross-sectional area of the vertical ducts 27 will also be in excess of the cross-sectional area of the vertical duct 16, thereby to insure the uninhibited flow of flue gases from the chimney 10.

In many instances, it is desirable to gain access to the interior of a chimney even though a rain cover is installed. For example, in contemporary times, may heating plants are being converted from coal operation to gas operation. When such a conversion takes place, it may be desirable to line the interior surface of the chimney 10, an operation which would require ready access to the interior of the chimney 10.

In accordance with the principles of the present invention, the vertical duct 16 is provided with an auxiliary top opening 31 which is in register with the vertical flow duct or flue 11 of the chimney 10. The auxiliary opening 31 is above the level of the side openings 19 formed in the side wall 17 of the vertical duct 16 and is normally closed by a cover 32 consisting of a lid 33 having a handle 34 affixed thereto and including a support flange 36 which overlies the edges of the auxiliary opening 31, thereby facilitating assembly of the cover 32 in the auxiliary opening 31.

It will be understood that the cover 32 may be conveniently removed whenever access to the interior of the chimney 10 is desired.

In operation, flue gases from the chimney 10 will flow upwardly through the vertical duct 16 and outwardly through the side openings 19 through the horizontal ducts 20, 20 and through the vertical ducts 27, 27, whereupon the flue gases will be discharged from the rain cover at the top outlets 30, 30.

If inclement weather occurs, any precipitation gaining access to the interior of the rain cover 14 through the top outlets 30 will be precluded from entering the vertical duct 16 by virtue of the baffles 24 as well as the lateral outward spacing of the vertical ducts 27 with respect to the vertical axis of the duct 16. Moreover, any precipitation of liquid fluid finding its way into the horizontal ducts 20, 20 will be deposited upon the inclined bottom walls 22 whereupon the liquid fluid will be drained downwardly and outwardly for release through the drain openings 23. The drain openings 23 are spaced considerably outwardly of the chimney 10, thereby insuring maximum protection of the chimney 10 against any liquid fluid leakage.

It should be particularly noted that the protection against liquid fluid leakage is accomplished in accordance with the principles of the present invention without sacrificing the advantages of an adequate flow passage for flue gases. This is particularly true because of the enlarged diverging wall portions provided in the vicinity of the lateral side openings 19 and the proportions which are maintained with respect to the available open cross-sectional area in the branch ducts 20 and 27 relative to the available open cross-sectional area of the vertical duct 16 inserted into the chimney 10.

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The horizontal ducts 20, 20 are further characterized by projecting top portions forming baffles 25, 25 which extend horizontally into the corresponding vertical ducts 27, 27. The baffles 25, 25 together with the baffles 24, 24 are so arranged and are so aligned with respect to the top outlets 30, 30 as to preclude the entrance of rain into the chimney from any angle, even if driven by wind. In other words the flow path between the inlet and the outlets is tortuous and any straight line therebetween is intersected by a baffle 24 or 25.

Although various minor structural modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such modifications as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A rain cover for a chimney comprising means providing a first duct disposed on a vertical axis and having side walls adapted to be inserted into a chimney opening, said side walls having a pair of oppositely disposed openings formed therein, each opening having in register therewith means providing a second duct disposed on a generally horizontal axis and having side walls integrated with said side walls of said first duct, the bottom portion of said side walls of each said second duct depending downwardly to prescribe an acute angle with the subjacent side walls of said first duct and forming an angularly inclined bottom drain directed outwardly away from said first duct, each said bottom portion having a drain aperture formed therein at the lowermost extremity thereof to gravitationally release all liquid fluids from said second duct, each said second duct terminating at its outer end in means providing a third duct disposed on a vertical axis substantially laterally displaced from said vertical axis of said first duct and having side walls integrated with said side walls of said second duct, each said third duct having a top opening forming an outlet for the chimney, means forming a baffle between said third duct and the upper portion of said second duct, an upright baffle adjacent said bottom portion of each said second duct between said first duct and said second duct and extending across the lowermost portion of said second duct to prevent liquid fluids from passing through said second duct into said first duct, said side walls of each said second duct being angularly offset to taper outwardly in diverging relation at the area of integration with said side walls of said first duct, thereby to increase the open cross-sectional area between said second ducts and said first duct in compensation for the cross-sectional area closed by each said baffle, the total cross-sectional area of both said second ducts and of both said third ducts being in excess of the open cross-sectional area of said first duct, said first duct having a top opening formed therein above the level of intersection of said second ducts with said first duct, and a removable cover seated in and closing said top opening, whereby flue gases from the chimney will pass through said first duct outwardly through said second ducts and said third ducts.

2. A rain cover for a chimney comprising means providing a generally horizontal duct having bottom walls inclined angularly and tapering downwardly and outwardly from the medial portions of said horizontal duct, said duct having drain openings formed in the lowermost outer extremities thereof and having outlet openings formed at the uppermost outer extremities thereof, and means including a bottom inlet opening for said horizontal duct formed medially thereof and adapted to connect said horizontal duct to a chimney, said horizontal duct having a pair of spaced apart upstanding baffles between said bottom walls and said inlet opening to check passage of liquid fluid from said outlet openings to said inlet opening, said last mentioned means including an auxiliary opening formed in a medial portion of said

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horizontal duct in register with said bottom inlet opening, and a removable cover seated in and closing said auxiliary opening to afford access through said bottom inlet opening without requiring removal or disassembly of the chimney rain cover.

3. A rain cover for a chimney comprising, duct means forming a rain cover inlet adapted to be connected in register with a chimney, oppositely extending generally horizontal passages formed by said duct means communicating with said inlet and including bottom walls tapered downwardly and outwardly from said inlet, said bottom walls having a drain outlet formed at the outer ends thereof, duct means having vertically upwardly directed outlets formed at the outer ends of said horizontal passages, and a baffle between said inlet and said bottom walls to prevent leakage of liquid fluid from said outlets into said rain cover inlet, said duct means having enlarged outwardly diverging wall portions adjacent said baffles to maximize the open area of said passages in the vicinity of said baffles.

4. A rain cover for a chimney comprising a vertically disposed rectangular tube having side walls adapted to be inserted into a chimney at the bottom end thereof and forming an auxiliary top opening at the top end thereof, a cover in said top opening, at least one of said side walls having a lateral opening formed therein, a

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first generally cylindrical tube in said opening disposed generally horizontally and having bottom wall portions tapered downwardly and outwardly from said one of said side walls, a baffle between said first and second tubes projecting uprightly into said opening adjacent said bottom wall portions to prevent liquids from flowing into said rectangular tube, and a second generally cylindrical tube connected to the outer end of said first cylindrical tube and disposed generally vertically, said second tube having a top outlet opening formed thereby, said bottom wall portions having a drain opening formed at the lowermost outermost portions thereof, said first tube having a projecting top portion forming a second baffle extending horizontally into said second tube inwardly of said top outlet opening.

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