

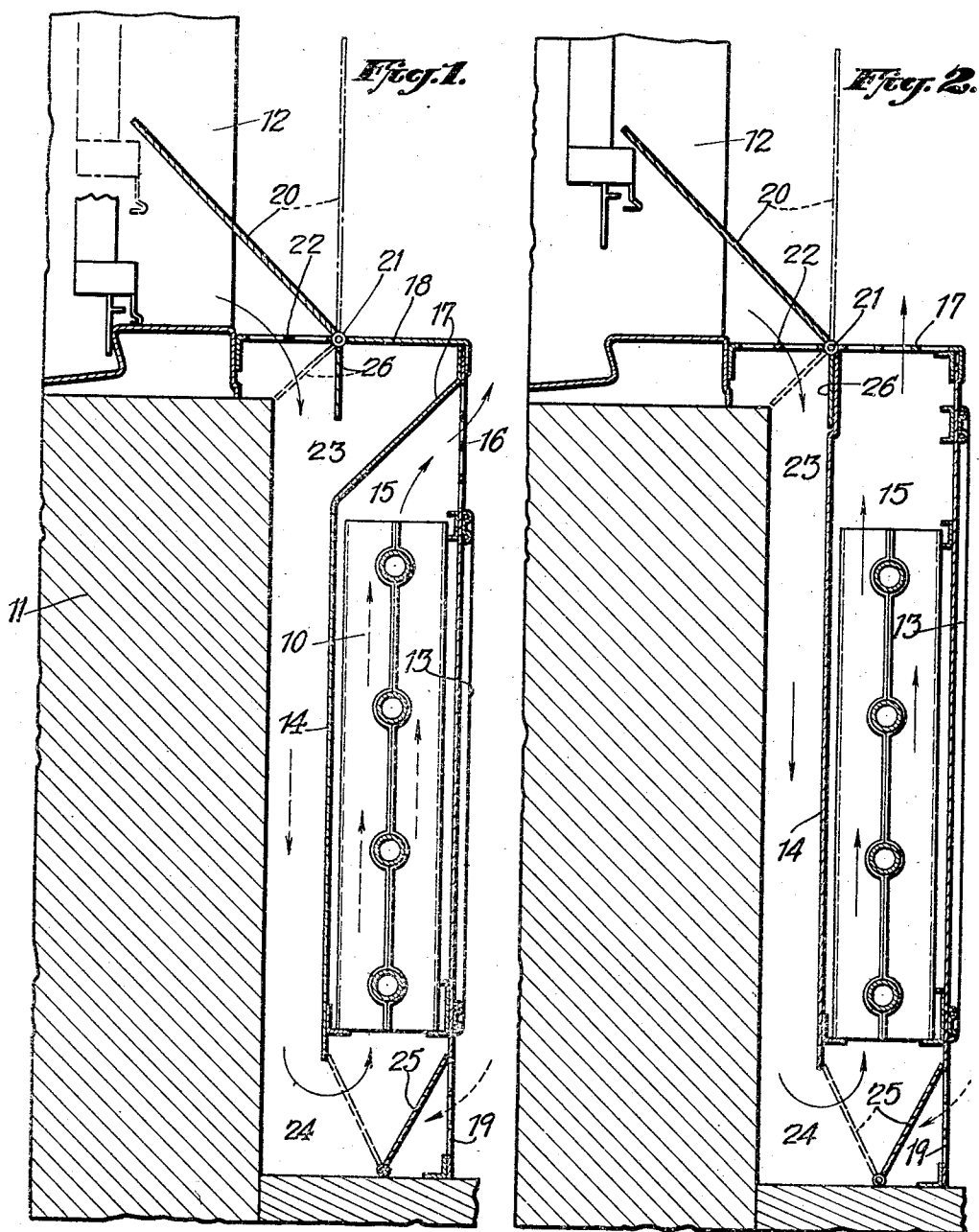
July 4, 1933.

I. T. BENNETT
WINDOW VENTILATOR

1,916,355

Filed May 4, 1929

3 Sheets-Sheet 1



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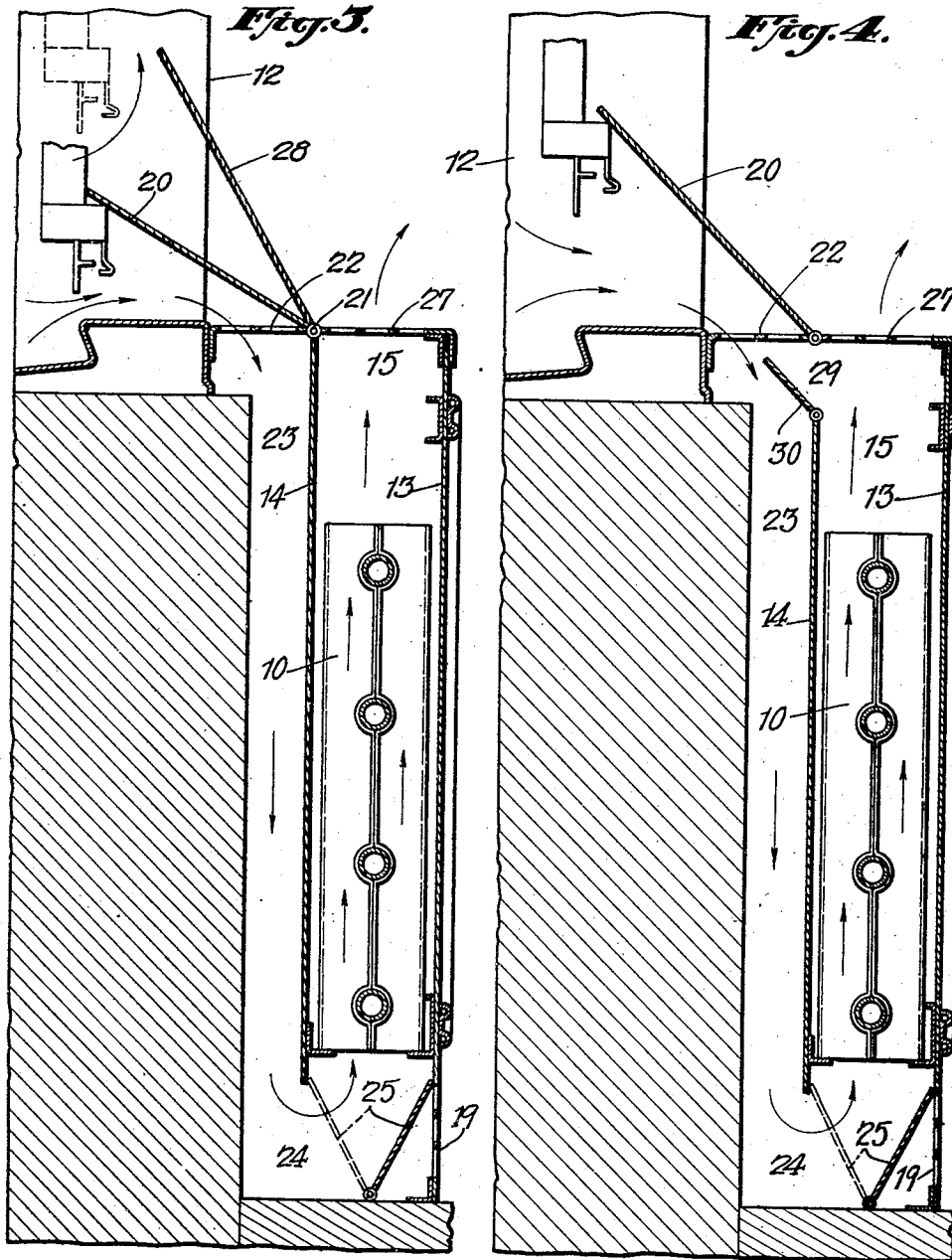
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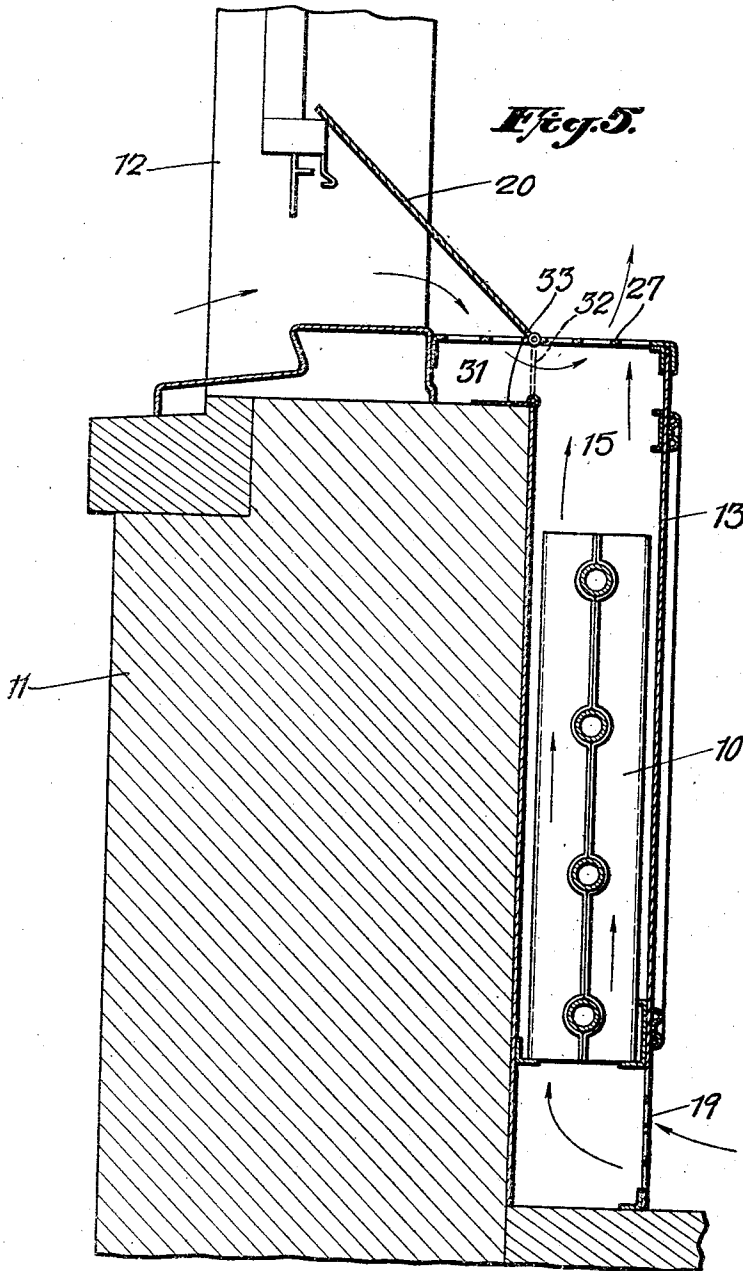
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UNITED STATES PATENT OFFICE

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WINDOW VENTILATOR

Application filed May 4, 1929. Serial No. 360,331.

This invention relates to apparatus for heating and ventilating buildings and more particularly to a window ventilator for deflecting and controlling a current of air admitted through an open or partly opened window to a heating radiator.

Among the objects of the invention are to provide a heating and ventilating apparatus whereby a uniform distribution of heat and air throughout a building may be obtained; to enable any desired heating and ventilating effect to be obtained by suitable control of the circulation of air and of an apportionment of the air to different parts of the ventilating and heating apparatus; to provide an apparatus whereby the heating capacity of radiators may be increased; and to provide a simple apparatus that may be easily installed in existing radiators to control the heating and distribution of air that may be admitted through an open or partly opened window.

A further object of the invention is to provide a method and apparatus of so directly ventilating currents in connection with a radiator as to intercept the transmission or escape of heat from the radiator to the adjacent wall of the building and thus avoid the overheating of the latter.

With these and other objects in view which will more fully appear from the following description, the invention comprises the apparatus described in the following specification and claims.

The various features of the invention are illustrated in the accompanying drawings, in which—

Fig. 1 is a vertical sectional view through a portion of a wall and window of a building, and a heating and ventilating apparatus embodying a preferred form of the invention.

Figs. 2, 3, 4 and 5 are similar vertical cross sections of modified forms of embodiments of the invention.

Referring more particularly to Fig. 1, the invention is shown as applied to a radiator 10 spaced a short distance from the inner surface of the wall 11 of a building and beneath a window 12. The radiator 10 may be of any suitable or standard type as, for example, the radiator shown in Murray Pat-

ent #1,705,491. The radiator 10 is enclosed in a case of metal or other suitable material having a front wall 13 and wall 14 which, with suitable side walls of any desired construction, form a chamber 15. The front wall 13 is extended for some distance above the upper end of the radiator 10 and is provided at its upper end with a grille or outlet opening 16. The wall 14 is inclined forwardly at 17 above the upper end of the radiator 10 to meet the wall 13 above the opening 16, thus deflecting heated air passing upwardly through the chamber 15 to the outlet opening 16. The upper end of the radiator is covered by a top plate or cover 18.

The wall 13 is also provided with an inlet opening 19 below the lower end of the radiator 10 for the admission of air to the chamber 15 from the room to be heated. In addition to the air admitted through the lower inlet opening 19, a current of air may be supplied through the lower portion of the window 12 whenever the window sash is raised to the position indicated in dotted lines. The cold air admitted through the window 12 is deflected by means of a deflector plate 20 hinged at 21 on the top 18 to an inlet grille or opening 22 in the rear part of the top 18 and at approximately the level of the sill of the window 12. The draft of cold air deflected through the inlet 22 is received in a rear down-draft chamber 23 formed between the inner surface of the wall 11 and the wall 14 and side walls of the casing. The draft of cold air passes downwardly through the down-draft chamber 23 to an opening 24 in the wall 14 and thus enters the lower part of the radiator chamber 15 and, passing upwardly therethrough, is heated by the radiator and delivered through the outlet 16. The cold air thus delivered through the opening 24 and the air from the room or interior of the building entering through the inlet 19 may be proportioned by means of a hinged damper 25 in the lower part of the chamber 15 in such a manner as to apportion the drafts of air to attain any desired ventilating effect. Thus, by swinging the damper 25 forwardly the air admitted through the inlet 19 may be diminished or entirely shut off while by

swinging the damper to the rear the admission of air through the inlet 19 may be increased and the admission of air through the chamber 23 and opening 24 will be proportionately diminished.

Inasmuch as the downward passage of air through the chamber 23 is between the radiator and the wall of the building, the downwardly passing cold air tends to intercept heat transmitted from the radiator 10 to the wall 11 and to chill the wall 11 and thus prevent its overheating by the radiator. The heat thus intercepted serves to preheat the incoming cold air and is immediately returned to the interior of the building.

When it is not desired to direct the air from the window 12 to the radiator 10 but to pass it directly into the room, the deflector plate 20 is tilted forwardly to the position shown in dotted lines. To prevent any air from passing into the chamber 23 when the deflecting plate 20 is in its forward position, a damper 26 is rigidly fastened to the lower or pivoted part of the plate 20 in such a manner as to occupy the unobstructed position shown in full lines when the plate 20 is tilted rearwardly towards the window, and to be tilted to the position shown in dotted lines and thus close the passage 23 to the inlet of air when the deflecting plate 20 is moved to its forward position. In the latter position the current of air entering through the lower part of the window 12 is deflected upwardly away from the radiator.

In the embodiment shown in Fig. 2 the wall 14 is continued vertically to the top of the chamber 15 and an outlet opening or grille 27 is provided in the top of the heating chamber 15 rather than in the side wall as in the form shown in Fig. 1. In the embodiment shown in Fig. 2 the upper damper 26 in its open position lies against and is supported by the partition or wall 14 which is preferably offset at its upper end to receive the damper.

In the form of the embodiment shown in Fig. 3 the arrangement of the radiator casing and of the down-draft and up-draft chambers is similar to that of Fig. 2 but, in addition to the deflector 20, a second deflector 28 is added whereby by raising the window 20 above the upper edge of the deflector 20, a portion of the incoming air may be deflected downwardly to the chamber 23, and a portion deflected upwardly away from the radiator.

In the form of embodiment shown in Fig. 4 the arrangement of the casing walls and chambers and of the deflector 20 is similar to that of Fig. 2 but, instead of having the damper 26 rigidly secured to and movable with the deflecting plate 20, an opening 29 is provided in the upper end of the wall 14 between the passages 15 and 23 and a damper 30 is mounted at the lower edge of this open-

ing so that it may be swung to any desired position in the path of the air passing downwardly through the chamber 23, and may thus deflect a greater or less proportion of this air into the upper part of the chamber 15 so that it will pass through the outlet 27 without coming into contact with, or into heat receiving relation to, the radiator 10. Thus by swinging the damper 30 the temperature of the air leaving the outlet may be modified or controlled.

In the form of the invention shown in Fig. 5 the inner wall or partition is omitted and only the heating chamber 15 is formed about the radiator 10. Accordingly the damper 25 is omitted and all of the air that passes through the chamber 15 about the radiator 10 enters through the lower inlet 19. The air entering the window 12 and being deflected downwardly, passes through a narrow chamber or passage 31 and thence through an opening 32 into the upper part of the chamber 15 without contacting with, or receiving heat from, the radiator 10 and, mixing with the heated air passes outwardly through the outlet 27. The quantity of air admitted through the opening 32 may be controlled by a damper 33 operating similarly to the damper 30 of the form of embodiment shown in Fig. 4.

Through the above invention an apparatus of simple construction is provided whereby with the ordinary radiator a circulation of air is obtained and whereby a controlled amount of fresh air may be heated to a greater or less extent and added to the circulating air. In cases in which wind is apt to carry the heat from one side of a building to the other thus causing an unequal heating, the above invention enables this defect to be counteracted by carrying the incoming draft of air directly to the radiators, thus heating the air and, at the same time, causing a more rapid heat transfer from the radiators to the air and thus increasing the capacity of the radiators to obtain the desired heating effect.

As changes of construction could be made within the scope of my invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. In combination with a radiator and a window of a casing for said radiator having a downward passage back of said radiator and a passage to said radiator from the lower part of said passage, a deflecting damper at the upper end of said downward passage tiltable to deflect air from said window into said passage or to close said passage and direct said air in an upward direction.

2. A radiator casing having an up-draft chamber for the radiator, said chamber having an opening in the lower part of its rear

wall, and a deflector hinged to the upper part of the rear wall of said chamber and tiltable to deflect air downwardly towards said opening.

5 3. A radiator casing having an up-draft chamber for the radiator, said chamber having an opening in the lower part of its rear wall and an opening in said wall above said radiator, a deflector hinged to the upper part
10 of the rear wall of said chamber tiltable to deflect air downwardly towards said opening, and dampers in said openings.

4. A radiator casing having an up-draft chamber for the radiator, said chamber having an opening in the lower part of its rear wall, a deflector hinged at the rear of said chamber tiltable to deflect air downwardly towards said opening, a damper in said opening, the rear wall of said chamber also having
20 an opening in its upper end, and a damper for said upper opening.

5. Apparatus of the type described having an enclosing casing for a radiator, said casing having an inlet opening in the lower part of
25 one wall, an outlet opening in its upper end and an upper inlet, and a deflector tiltable to a position to deflect a draft of air into said upper inlet.

6. Apparatus of the type described having
30 an enclosing casing for a radiator, said casing having an inlet opening in the lower part of one wall, an outlet opening in its upper end and an upper inlet, a deflector tiltable to a position to deflect a draft of air into said
35 upper inlet, and a damper to control the admission of deflected air through said upper inlet.

7. Apparatus of the type described having a casing to surround a radiator, said casing
40 having an outlet and an upper and a lower inlet, means for deflecting a draft of air into said inlets, and means for proportioning the deflected air between said inlets.

8. Apparatus of the type described which
45 comprises a casing, means for deflecting a current of air into said casing, said chamber having inlet openings to receive said air from said deflected currents and inlet openings to receive air by thermal displacement, and
50 means for proportioning the air admitted from said separate sources.

9. Apparatus of the type described which comprises a chamber to enclose a radiator, a deflecting plate tiltable on the upper rear
55 edge of said chamber to a position to deflect a draft of air downwardly at the rear of said chamber, said chamber having an opening in the lower rear wall of said chamber to admit said deflected current of air, and an in-
60 let opening in the lower part of the front wall of said casing, and a damper to apportion the admission of air through said openings.

10. Apparatus of the type described which comprises a chamber to enclose a radiator, a
65 deflecting plate tiltable to a position to de-

flect a draft of air downwardly at the rear of said chamber, said chamber having an opening in the lower rear wall of said chamber to admit said deflected current of air, and an inlet opening in the lower part of the front wall of said casing, a damper to apportion the admission of air through said openings, said deflector having a damper movable with the movement of said deflector to stop the downward passage of air at the rear of said chamber when said deflector is tilted forwardly.

11. Apparatus of the type described which comprises a radiator casing, a deflector plate at the rear of said casing to direct air from
80 an outside source downwardly into said casing, and a second deflector to direct air upwardly away from said casing.

12. In combination with a radiator and a window, a casing for said radiator said casing being adapted to form an air heating chamber about said radiator, air inlet and air outlet openings in said chamber, a second air inlet disposed in said casing adjacent the window and communicating interiorly with
90 said chamber, means to deflect at least a part of the fresh air entering through the window into said second air inlet and interiorly disposed damper means in said casing between said second air inlet and the said heating chamber.

13. In combination with a radiator and a window, a casing for said radiator said casing being adapted to form an air heating chamber about said radiator, air inlet and air outlet openings in said chamber, a second
100 air inlet disposed in the casing adjacent the window and communicating interiorly with the bottom of said heating chamber, means to deflect at least a part of the fresh air entering through the window into said second air inlet, and interiorly disposed damper means in said casing between the said heating chamber and the said second air inlet, said damper means also being disposed between the said heating chamber and the said first air inlet.

14. In combination with a radiator and a window, a casing for said radiator said casing being adapted to form an air heating chamber about said radiator, air inlet and air
115 outlet openings in said chamber, a second air inlet disposed in the casing adjacent the window and communicating interiorly with the top and bottom of said heating chamber, means to deflect at least a part of the fresh
120 air entering through the window into said second air inlet, and interiorly disposed damper means between the top of said heating chamber and the said second air inlet and interiorly disposed damper means between the bottom of said heating chamber and the second air inlet, said second damper means also being disposed between the said heating chamber and the said first air inlet.

15. Means for admitting fresh heated air 130

to a room comprising in combination with a window and a heat radiator located in proximity thereto; of a casing open at the top and enclosing said radiator and means co-
5 operating with the window when open for receiving the air admitted therethrough and for directing said air through the top of and into the casing for discharge adjacent the bottom of the casing and for subsequent dis-
10 charge from the casing at the top, said means comprising an air duct disposed within the casing, having an intake at the open top of the casing and an outlet adjacent the bottom of the casing and a cowl at the duct intake cooperating with the window frame and sash for directing the air into the intake, said cowl being mounted for optional movement to ad-
70 mit of the circulation of air from the room through the duct when the window sash is closed.

In witness whereof, I have hereunto signed
my name.

IRVING T. BENNETT.

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