March 23, 1937. A. SARGENT ET AL 2,074,622

VENTILATING AND AIR TREATING PROVISION

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Fig. 1.

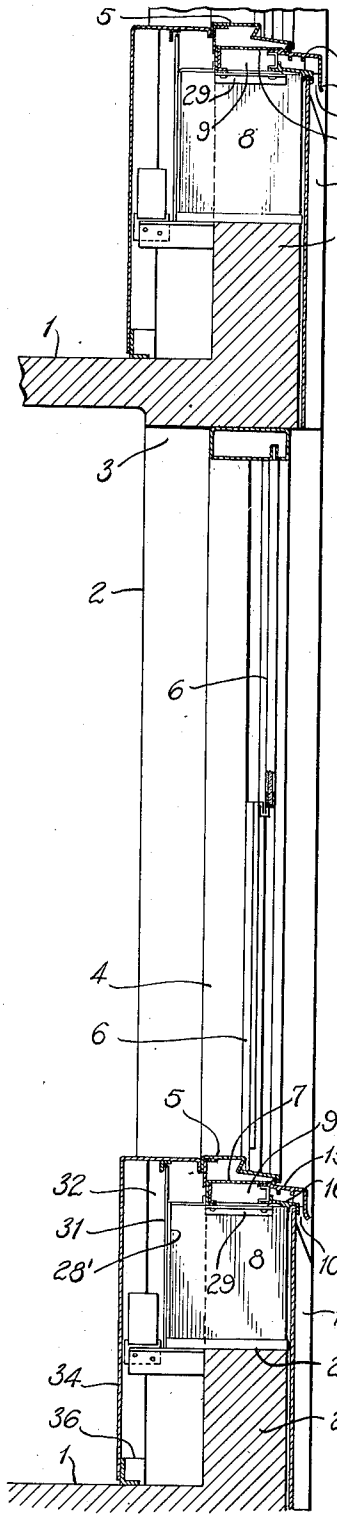
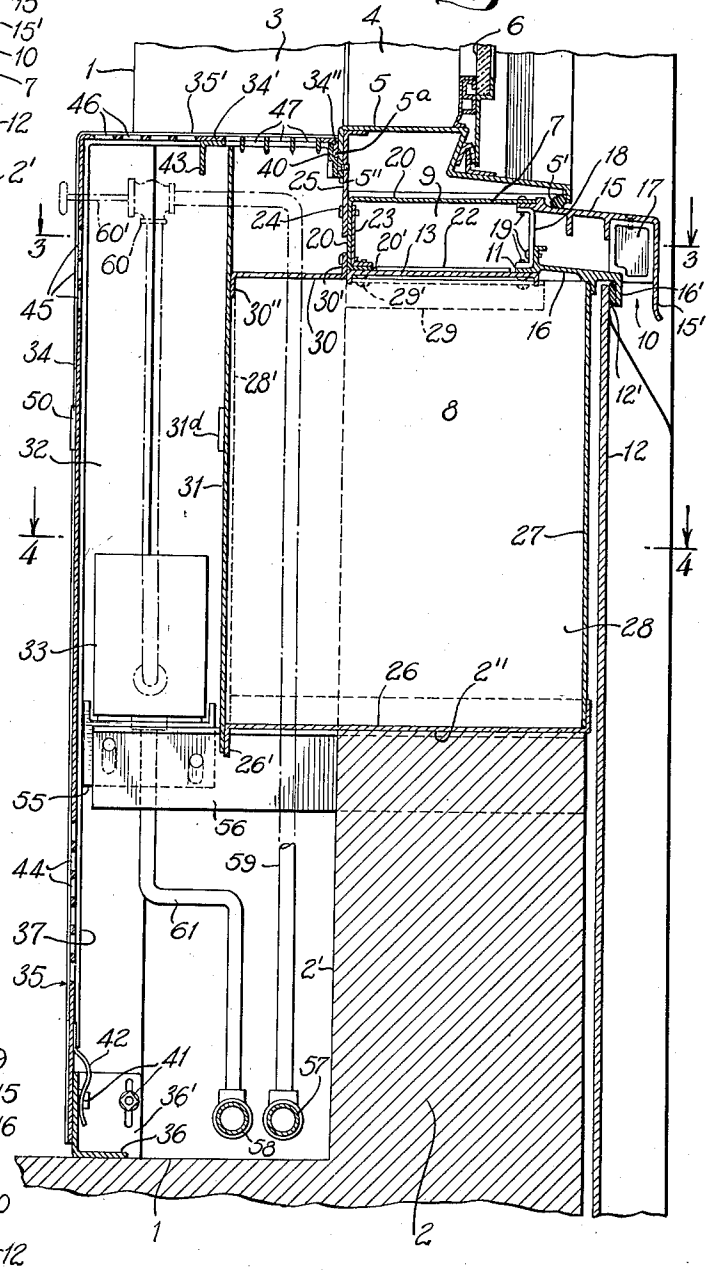


Fig. 2.



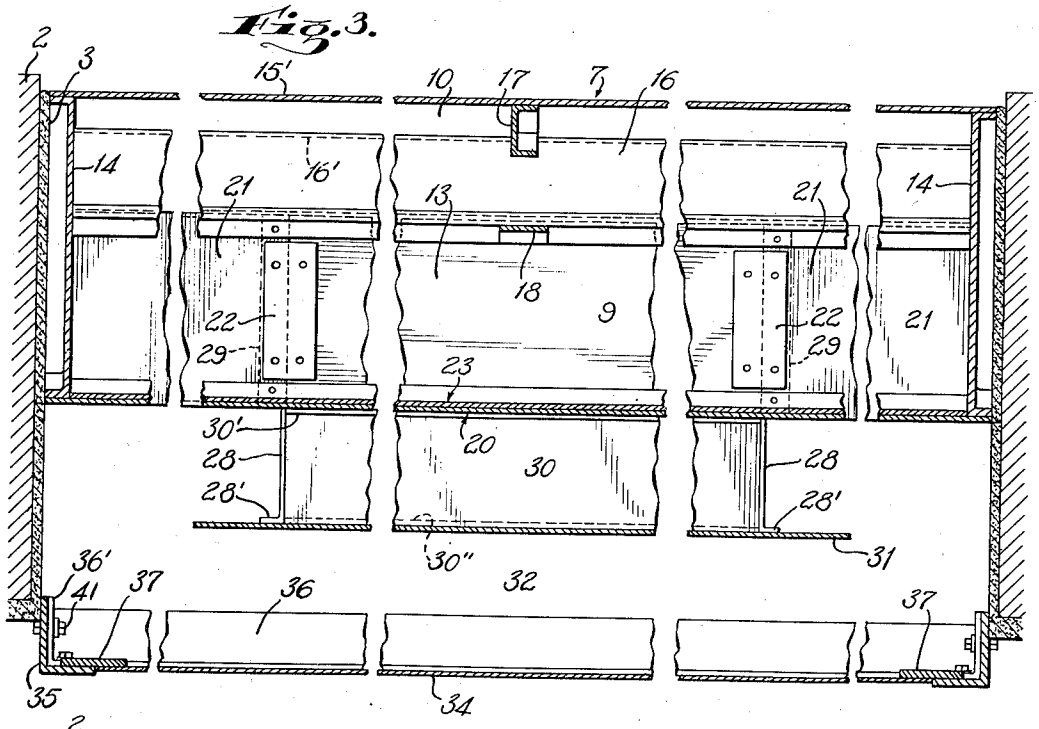
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March 23, 1937. A. SARGENT ET AL 2,074,622

VENTILATING AND AIR TREATING PROVISION

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Fig. 3.



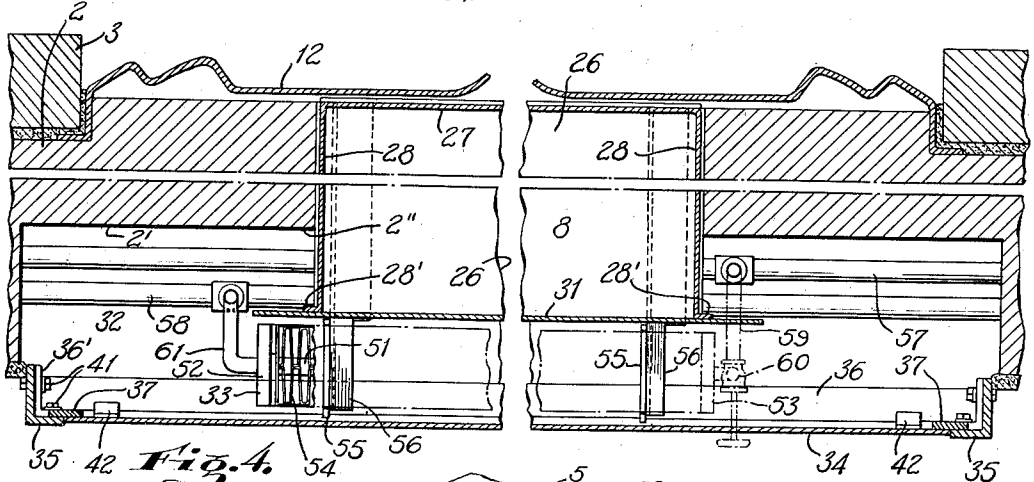


Fig. 4.

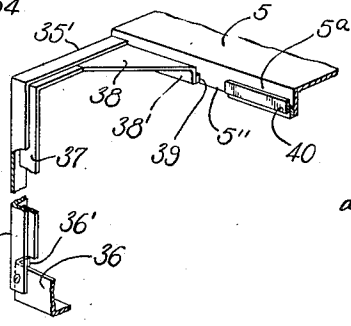


Fig. 5.

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VENTILATING AND AIR TREATING PROVISION

Filed June 3, 1933 5 Sheets-Sheet 3

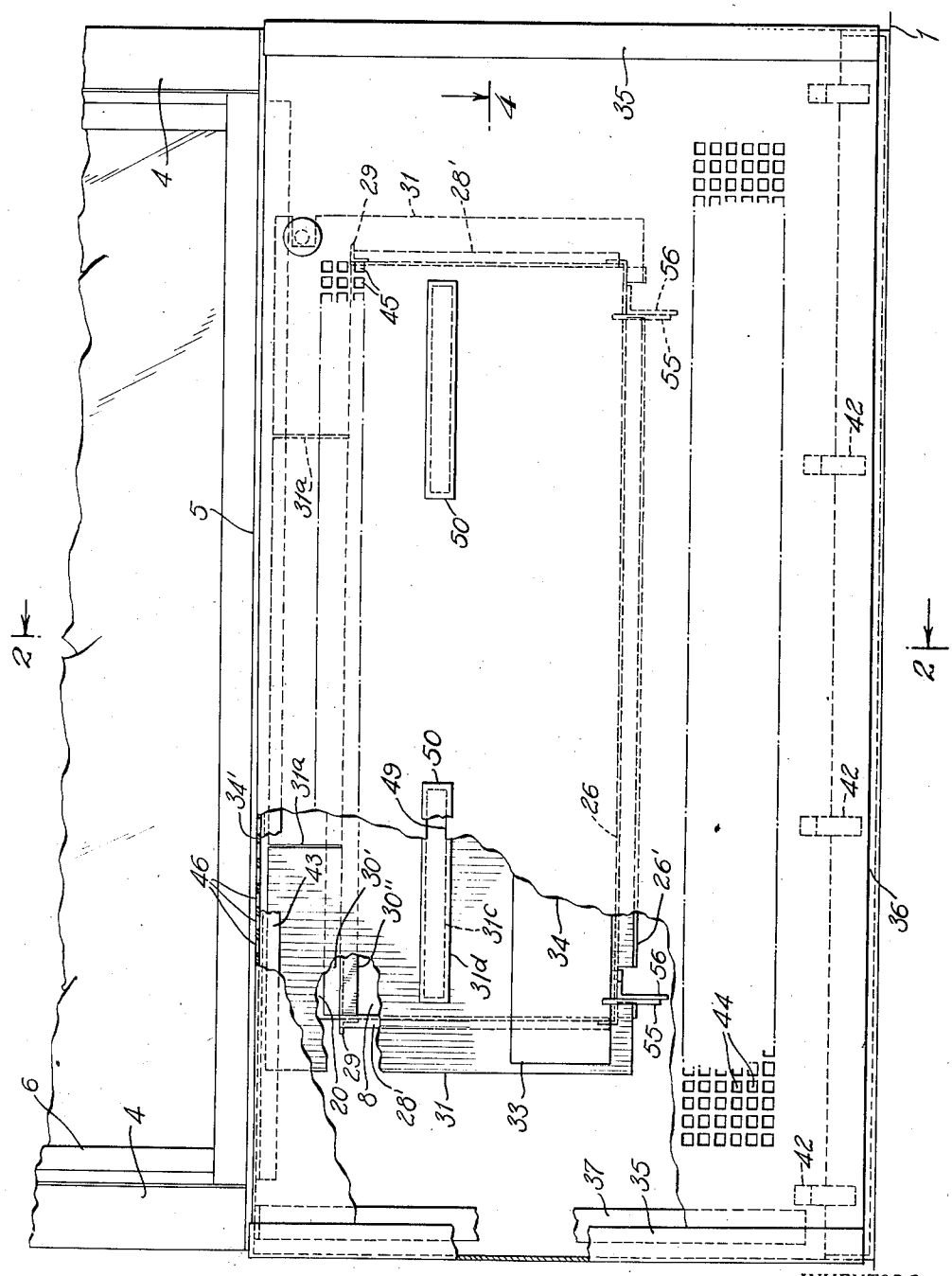


Fig. 6.

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VENTILATING AND AIR TREATING PROVISION

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Fig. 7.

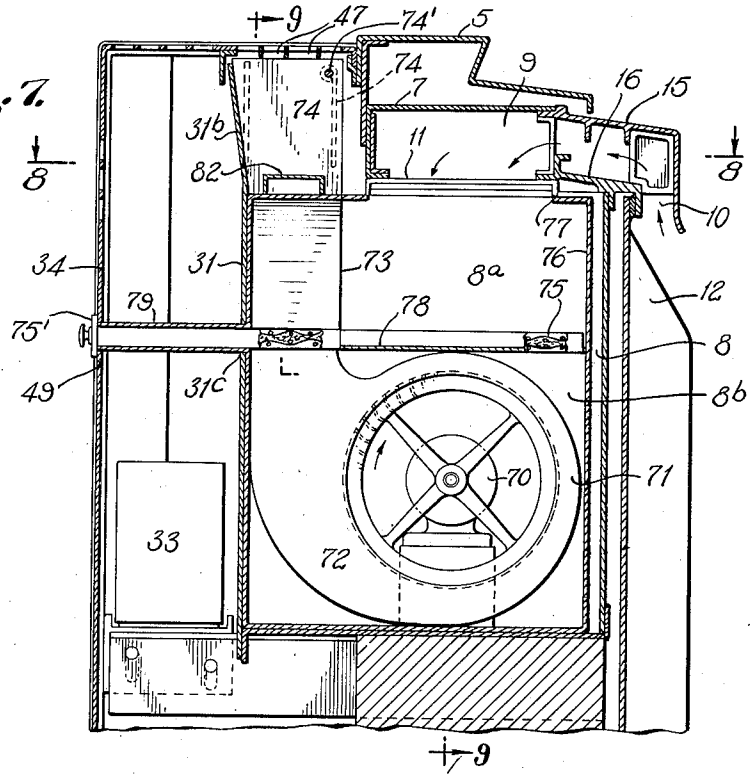
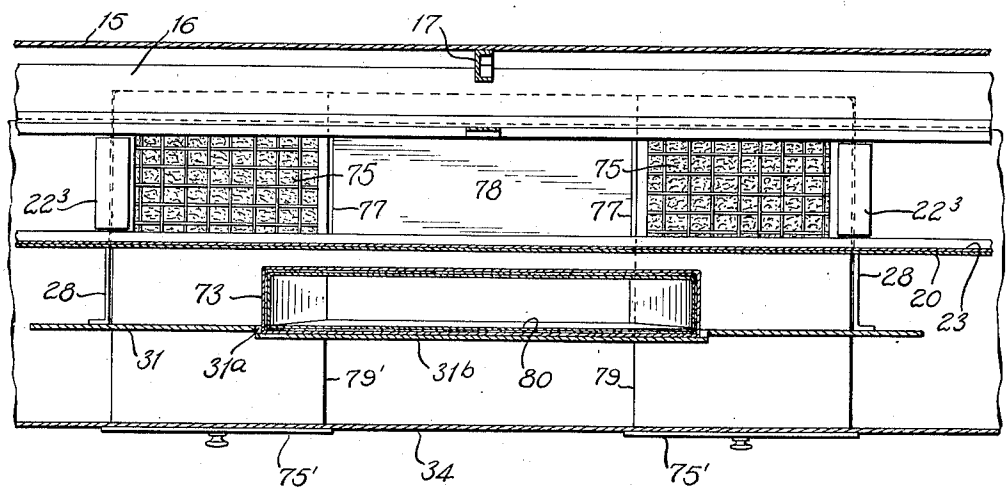


Fig. 8.



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VENTILATING AND AIR TREATING PROVISION

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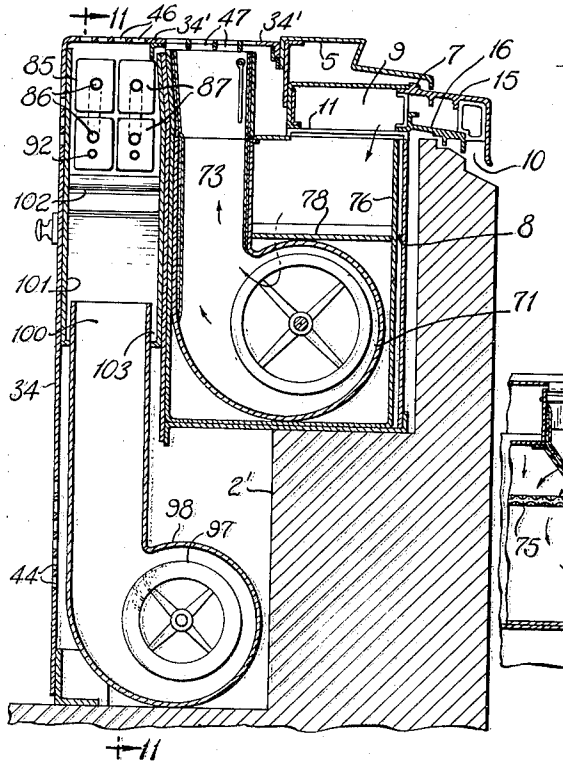


Fig. 10.

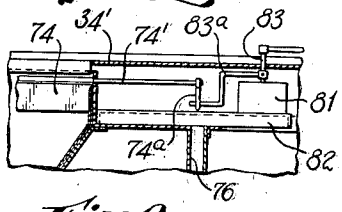


Fig. 9a.

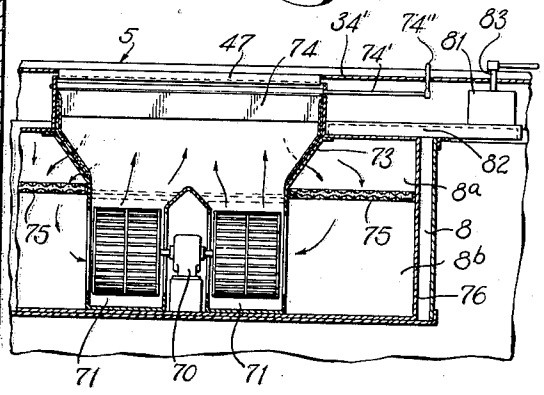


Fig. 9.

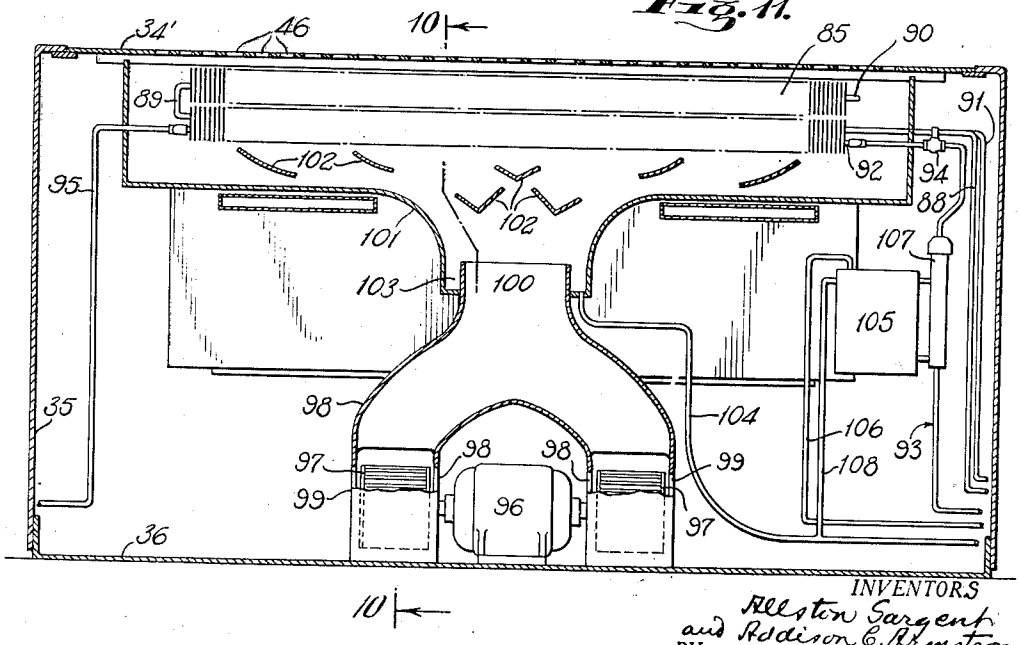


Fig. 11.

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Patented Mar. 23, 1937 2,074,622

UNITED STATES PATENT OFFICE

2,074,622

VENTILATING AND AIR TREATING PROVISION

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Application June 3, 1933, Serial No. 674,188

23 Claims. (Cl. 257—137)

Our present invention comprises novel ventilating and air treating provisions primarily devised for use in room ventilation and air treatment, and by the term air treating, as used herein, we mean to generically include one or more of a variety of actions or effects such as circulating, heating, cooling and humidifying air, for the general purpose of maintaining desirable atmospheric conditions in dwelling, office and other rooms which contribute to the health or comfort of the occupants of such rooms.

The present invention includes building wall construction and arrangement features devised to provide a suitable and suitably located space to receive ventilating and air treating provisions, and construction and arrangement features of housing parts associated with the wall structure to provide a suitable enclosure for said space.

The present invention also comprises improvements in ventilating and air treating provisions proper, which contribute to their structural and operative desirability, and some of which are of especial utility because of their adaptability for use in a receiving space of restricted dimensions.

The present invention in respect to its building wall features is characterized by the formation of a recess space beneath a window opening in the outer wall of a building, such as an office building or apartment house, in which the normal wall thickness is substantial, so that by the provision of a recess space in front beneath a window opening, sufficient space to accommodate suitably compact ventilating and air treating provisions may be provided within an enclosure the room side of which projects inwardly but little, if any, from the inner face of the body portion of said outer wall.

The invention in its preferred form is also characterized by special means employed in conjunction with the said outer wall to provide an enclosure for the recess space which normally is anchored or secured rigidly in place, and externally is attractive in form and of convenient shape, and which may be opened up readily when conditions require to permit access to the ventilating and air treating provisions therein.

Certain features of the invention are of especial utility in connection with a building wall including metallic windows, and the present invention consists, in part, in a ventilating and air treating space enclosing partition means characterized by their relation and connection to the lower portion of a metallic window.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific objects obtained with it, reference should be had to the accompanying drawings and descriptive matter in which we have illustrated and described preferred embodiments of the invention.

Of the drawings:

Fig. 1 is a vertical section on the plane of the line 2—2 of Fig. 6;

Fig. 2 is a section taken similarly to Fig. 1, but on a larger scale and showing a portion only of the structure shown in Fig. 1;

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

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a perspective view illustrating a detail of construction of the structure shown in Figs. 1–4;

Fig. 6 is a front or room side elevation of the structure shown in Fig. 2, with parts broken away and in section;

Fig. 7 is a view taken similarly to Fig. 2 illustrating the use of air moving and noise eliminating apparatus incorporated in a recess space shown as empty in Fig. 2;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a section on the line 9—9 of Fig. 7;

Fig. 9a is a section taken similarly to, and illustrating a modification of control means shown in Fig. 9;

Fig. 10 is a section on the line 10—10 of Fig. 11 illustrating the use of a modified form of ventilating and air treating means; and

Fig. 11 is a section on the line 11—11 of Fig. 10.

In the drawings, and referring first to the arrangement shown in Figs. 1–6, 1 represents the floor of a room having a window opening 3 in the outer wall 2 of the room. Mounted in the window opening 3 is a window casing comprising side members 4, a window sill member 5 and sash members 6 of a known type of metallic window frame construction. In respect to its general construction and the upper portions of its window opening 3, the wall 2, shown in Figs. 1–6, may be, and is, shown as of a type commonly employed heretofore, particularly in tall office buildings and apartment houses having relatively thick outer walls. The wall 2 differs, however, from what has heretofore been customary in the manner in which the wall is recessed below its window openings, and in which parts are associated with the wall proper to provide an en-

closed space beneath the window opening for the reception of ventilating and air treating provisions.

As shown, the wall 2 comprises a masonry portion 2' beneath the window opening and adjacent the outer side of the wall which is of less horizontal thickness than the main portion of the wall 2. The inner or room side face of this thin masonry wall portion 2' thus forms the outer wall of a recess space which, as is shown in Fig. 4, is of the full width of the window opening, and which extends downward to the floor level. A space 2'' is also provided between the top of the wall portion 2' and the metallic window casing parts. The space 2'' in the particular construction illustrated in Figs. 2–6 does not extend the full width of the window opening, but is in the form of a rectangular recess or notch in the upper edge of the wall portion 2', with each end wall of the notch spaced away from the corresponding side of the window opening. The said recess space in front of the wall 2' and the notch space 2'' collectively form a recess which is partly beneath and partly in front of the window, and all or a portion only of which, depending on conditions of use, may be utilized for ventilation and air treatment purposes, as hereinafter described.

For the purposes of the present invention a chambered metallic subsill 7 is mounted in the wall 2 immediately beneath the window sill 5, and extends between the latter and the upper edge portions of the thin masonry wall 2' at the ends of the recess 2'' over which the central portion of the sub-sill extends. Mounted in the notch or recess 2'' is the outer portion of a metallic box or casing structure enclosing a chamber 8 of rectangular form which is adapted to receive ventilating and air treating provisions. No such provisions in the chamber 8 are shown in Figs. 1–6 which represents a building constructed with the chamber 8 therein to receive ventilating and air treating provisions, but adapted to initial use without such provisions. In the hereinafter described Figs. 7–11, however, arrangements including the use of such provisions in the chamber 8 are illustrated.

The subsill 7, while not used for the purpose in the arrangement shown in Figs. 1–6, was devised and is adapted for use as an air intake member. To this end the subsill is formed with air chamber 9, having an inlet 10 opening externally of the building and an outlet 11 which when open discharges into the chamber 8. As shown the subsill extends outwardly beyond a so-called spandrel or plate-like body 12 of aluminum, or other suitable metal, which, in the arrangement shown in Figs. 1–6, forms the outer facing of the portion of the wall 2 extending between each subsill 7 and the top of the immediately subjacent window opening (see Fig. 1). In the condition of the apparatus shown in Figs. 1–6, the outlet 11 is closed by a plate 13 detachably secured in place, and removable through the chamber 8.

In the preferred construction illustrated, the subsill 7 comprises end castings 14, members 15 and 16, forming the top and bottom walls of the projecting outer portion of the subsill, and spaced apart by the end castings intermediate brace or strut members comprising a casting 17 and a plate member 18, and certain metal plates, all suitably connected as by bolt or screw connectors 19. The parts 15 and 16 might be castings, but advantageously are sections of extruded metal. The part 15 has a downturned portion 15' at its outer edge which forms the outer wall of the elongated inlet 10 and extends downward below the upper edge of the corresponding spandrel 12 and serves to prevent rain or snow from driving into the inlet 10. The part 16 has a downturned flange 16' at its outer edge which forms the inner wall of the inlet 10 and overlaps the upper edge of the spandrel 12, and preferably is spaced away from the latter to provide a space receiving calking material 12'.

As shown, the portion of the subsill top wall at the inner side of the part 15, is formed by a metal plate 20 which also includes a downturned vertical portion forming the front or room facing wall of the chamber 9 and terminating at its lower edge in an outwardly extending flange 20'. The previously mentioned plate 13 employed as a temporary closure for the subsill outlet 11 has its inner edge extending under and secured against the flange 20'. The outer edge of the plate 13 extends under and is connected to the front or inner edge of the part 16. At the ends of the plate 13, the subsill 7 is provided with short bottom wall plates 21 carrying batten members 22 which overlap the ends of the plate 13. A stiffening angle plate 23 is shown as having a horizontal flange engaging the upper side of the flange 20', and a vertical flange extending alongside and reenforcing the vertical portion of the plate 20, being secured to the latter by bolt or screw connectors 24. The upper connectors 24 serve not only to connect the parts 20 and 23, but also connect the latter to a vertical plate 25 which is connected to and forms a downward extension of the inner vertical wall of the metallic window sill 5. To insure against air leakage through the joints of the subsill structure the joints are advantageously sealed by a suitable joint material such as mastick. Calking material 5' is employed to close the joint between the outer edge of the window sill 5 and the subsill member 15.

In the construction illustrated the casing structure enclosing the chamber 8 comprises a bottom plate member 26 and vertical outer and end wall plate members 27 and 28, respectively, welded or otherwise suitably secured to the member 26. Angle members 29 secured to the external sides of the end plate members 28 at the upper edges of the latter are provided to facilitate the attachment of the casing structure to the hollow sill as by suitable bolt or screw connectors 29'. The major portion of the top wall of the chamber 8 is formed by the subsill 7, but a portion of the chamber 8 projects inwardly or to the front of the subsill. This projecting front portion of the chamber 8 is closed at its top in the condition of the apparatus shown in Figs. 1–6 by a removable cover plate 30. The latter has an upwardly extending flange 30' at its outer edge which abuts against and is secured against the vertical portion of the subsill plate member 20, and downturned flange 30'' at its opposite edge which is in register with outturned flanges 28' of the side wall plates 28 and the downturned front edge flange 26' of the bottom plate 26. The front wall of the chamber 8 is formed in the arrangement shown in Figs. 1–6 by a removable plate member 31 bolt or screw connected to the flanges 30'', 28' and 26'.

In the arrangement shown in Figs. 1–6, the space provided for the reception of ventilating

and air treating means includes not only the chamber **8**, but a chamber or space **32** in front of the chamber **8**. The space **32** extends for the full width of the window opening from the floor level approximately to the level of the upper side of the window sill **5**. In the arrangement shown in Figs. 1–6, the air treating apparatus in the chamber **32** is a steam heating radiator **33**, but in some cases other apparatus may advantageously be installed in the space **32**, one such use of other apparatus being illustrated in Figs. 9, 10 and 11.

The front or room side, and the top wall portions of the housing or enclosure for the space **32** comprises a front and top cover plate member **34**, corner post members **35** to which the ends of the plate **34** are detachably secured and a floor member **36** engaged by the lower edge of the plate **34**. The latter comprises a main vertical portion forming the front wall of the chamber **32** and an outwardly inclined horizontal flanged portion **34'** at a level which, as shown, is slightly below the upper side of the window sill member **5**. The horizontal portion **34'** of the plate **34** terminates in a downturned flange which abuts against and is detachably secured, as hereinafter described, to the vertical front portion of the sill **5**.

The corner post members **35**, advantageously, are permanently secured in place in the building wall structure prior to the application of the plaster wall finish, and may be regarded as forming fixed parts of the wall **2**. Each corner post member **35** comprises a vertical portion of the angle bar cross-section and with one flange parallel and the other transverse to the general direction of the wall. Each part **35** may project into the room beyond the inner face of the body portion of the wall **2**, as shown, for a distance nearly equal to the width of the corner post flange which is transverse to the face of the wall **2**. The vertical flange of each corner post which is parallel to the wall **2** extends towards the opposite corner post and abuts against the adjacent edge of the plate **34**. The outer side of the latter bears against batten members **37** secured to the corresponding flanges of the corner post members at the sides of the latter facing the space **32**. Each corner post **35** has its upper end connected by a horizontal member **35'** to the corresponding end of the window sill **5**. As shown each member **35'** is an integral extension of that flange of the corresponding corner post which abuts against the adjacent end of the cover plate **34**, the corresponding portion of the other flange of the corner post being cut away.

Each batten **37** as shown in Fig. 5, includes an upper horizontal portion underlying the horizontal corner post portion **35'** and abutting at its outer end against the adjacent portion of a gusset plate or reenforcing member **38** which terminates at its outer edge in a downturned flange **38'** bearing against a spacer or filler strip **39** interposed between the flange and the front vertical wall of the sill member **5** to which said flange is secured. Each corner post **35** may be connected to the corresponding batten member **37** and gusset plate **38** in any suitable manner as by spot welding. The previously mentioned downturned flange **34''** at the upper corner of the cover plate member may advantageously be received, as shown, in a groove or channel **5a**. The outer wall of the latter is formed by the vertical portion **5''** of sill member **5**. At the ends of the pocket **5a**, the front and bottom walls thereof are formed by the gusset plate vertical flanges **38'** and filler strips **39**. The front and bottom walls of the intermediate portion or portions of the pocket **5a** are formed by offset parts of a bar **40** secured to the vertical portion **5''** of the sill **5** and extending continuously or in spaced apart sections between the end portions of the pocket.

The previously mentioned floor member **36** is of angle bar cross-section having one flange resting on the floor **1** and extending into the space **32** and having its other flange vertical and in register with the vertical portions of the batten member **37** and overlapping the parallel flanges of the corner post members. Inturned end extensions **36'** of the last mentioned flange of the floor member **36** abut against the corresponding flanges of the corner posts **35** which are connected to the parts **36'** by bolt or screw connectors **41**. The level of the upper ends of the corner posts is in definite relation to the window sill member **5** and the member **36** is formed with vertically elongated slots which receive the connectors **41**, and thereby provide for such vertical adjustment of the floor member relative to the corner post as may be necessary to accommodate variations in the vertical distance between floor and window sill level which may be expected in ordinary building construction.

The lower edge of the cover plate member **34** overlaps the vertical flange of the floor member **36** and is held in snug contact therewith by spring fingers **42** secured to the member **34** and overlapping the vertical flange of the floor member. This arrangement permits of such vertical adjustment of the member **34** relative to the floor member **36** as may be necessary to accommodate variations in the distance between the window sill and floor. The described connection between the plate **34** and the floor member also permits the removal of the member **34** by a simple vertical movement whenever it becomes necessary or desirable to obtain access to the space **32**. The vertical movement of the member **34** which separates the latter from the floor plate also moves its flange **34''** out of the pocket **5a**.

The horizontal portion **34'** of the cover plate **34** forms a stool or window seat-like extension of the window sill, and is advantageously stiffened as by means of an angle bar **43** spot welded or otherwise secured to the under side of the portion **34'** intermediate the inner and outer edges of the latter. The cover plate member **34** is formed with openings as required or made desirable by the character and disposition of the apparatus within the enclosure of which the member **34** forms a principal element. In the arrangement shown in Figs. 1–6, the openings through the member **34** include a set of lower air inlet openings **44** through which room air may enter the space **32** beneath the radiator **33**, a set of outlet openings **45** in the vertical portion of the member **34** adjacent the upper end of the latter, and a set of ports **46** in the horizontal portion **34'** above the radiator **33**, the air heated by the radiator normally escaping in part through the ports **45** and partly through the ports **46**. The portion **34'** is also formed with a series of outlet ports **47** above the inner partition of the chamber **8**. The last mentioned ports are practically functionless in the use of the apparatus illustrated in Figs. 1–6, but serve as outlet ports for air passing into the room from the chamber **8** when the latter is used as an air treating chamber. The ports **47** are confined to the portion of the cover

plate directly above the outer portion of the chamber 8, but the ports 44, 45 and 46 are arranged in rows which extend nearly the full width of the member 34. In addition to the ports 44, 45, 46 and 47, the member 34 may be formed with openings for the stem of a radiator valve and any other control part desirably extending through the member 34. As shown also, openings 49 in the vertical portion of the member 34, which in the use of the apparatus illustrated in Figs. 1–6 are closed by removable cover plates 50, are provided for the use of air filters which may be employed in some cases as hereinafter described.

The steam radiator 33 employed in the arrangement shown in Figs. 1–6 is advantageously of a type having a relatively high heating capacity. One commercial form of radiator well adapted for such use is the so-called Murray radiator which is manufactured by the American Radiator Company and which comprises horizontal copper tubes 51 extending between chambered end members 52 and 53 and traversing thin metal fin plates. The latter are spaced along the tubes and welded thereto and are shaped and connected to provide a multiplicity of vertical flues 54 or air passages offering little resistance to the flow of air therethrough. The radiator 33 is mounted on radiator supports 55 adjustably secured to bracket members 56. The latter are in the form of angle bars having upper horizontal flanges abutting against and secured as by spot welding to the bottom wall plate 26 of the chamber 8. The radiator supporting portions of the bracket 56 project in front of the chamber 8 through notches formed in the flange 26′ and the lower edge of the plate 31. The radiator steam supply and return pipes 57 and 58, respectively, pass horizontally through the lower portion of the recess space in front of the masonry wall portion 2′. The radiator 33 receives steam from the pipe 57 through a branch supply pipe 59 advantageously in the form of a gooseneck and including a control valve 60 having its horizontal stem 60′ projecting through the vertical portion of the member 34 near the top of the latter. A branch return pipe 61 leads from the radiator outlet to the return main 58.

When the radiator 33 is supplied with steam the flues 54 exert a stack action creating an upflow through them of air drawn into the enclosure about the radiator through the lower ports 44 in the cover member 34. The air thus heated is returned to the room through the ports 45 and 46 in the upper portion of the member 34. The air moving stack action of the flues 54 is augmented by the stack action of the space between the plate 31 and the vertical portion of the cover plate 34. Advantageously, the radiator 33 is of a width but little less than the distance between the plates 31 and 34 so that all of the air entering the space between those plates passes in close proximity to the heating surface of the radiator. This in conjunction with the desirably high heat dissipating capacity of the radiator insures an air temperature above the radiator which is substantially in excess of the room temperature and results in a correspondingly vigorous convection current circulation upward from the inlet ports 44 to the outlet ports 45 and 46.

What may be referred to as the observable portion of the enclosure for the ventilating and air treating space of Figs. 1–6 is formed almost wholly by the bent cover plate member 34 and the corner posts 35. The vertical portion of this observable portion of the enclosure projects into the room but a slight distance, and both from the standpoint of appearance and of available room space, differs little from the smooth extension of the inner face of the outer wall 2 which would exist if the latter were not recessed below the window in accordance with the present invention. The top portion of the enclosure formed by the portion 34 of the member 34 and the corresponding portions of the corner post members is similar in appearance to and is adapted to serve the usual purposes of a window stool or seat. The described arrangement augments the circulation effect long recognized as obtainable with a steam heating radiator located beneath and directly in front of a window. The metal parts of the enclosure are relatively simple in construction and are relatively inexpensive to construct with suitable strength and rigidity, and the removal of the readily removable cover plate member 34 provides full access to the apparatus within the enclosure. The construction shown in Figs. 1–6 is thus a desirable one even though no use is made of the chamber 8. The existence and effective capacity of that space and the effective use which may be made of it adds materially to the merit of the construction shown in Figs. 1–6.

The chamber 8 was primarily devised for the purpose of, and may be used with especial advantage as a space in which to incorporate apparatus for moving external air into the room, for filtering such air and for preventing the transmission of external noises into the room through the passages traversed by such air. One arrangement for thus supplying and filtering air and avoiding noise is illustrated in Figs. 7, 8 and 9.

The ventilating and air treating provisions incorporated in the chamber 8, as shown in Figs. 7, 8 and 9, include a motor 70 driving two fans or blowers 71 which are associated with a fan casing 72 having an upwardly directed discharge conduit 73 passing upward out of the chamber 8 in front of the subsill 7 to the under side of the enclosure outlets 47, a damper 74 in the outlet 73, and air filtering means 75 interposed in the path of the air passing from the subsill outlet 11 to the inlets of the fans 71. In the preferred construction illustrated all of the parts just mentioned form parts of a mechanical unit including a box-like casing or housing 76 which is bodily insertable in the chamber 8, after the removal of the plates 13, 30 and 31. The top wall of the casing 76 is formed with an inlet opening 77 which is adapted to register with the subsill outlet 11. The top wall of the casing 76 is also cut away for the passage of the fan outlet conduit 73. The casing 76 includes or has associated with it suitable provisions for making an air-tight joint between its top wall and the subsill at the margins of the registering openings 11 and 77. Those provisions and provisions desirably employed for anchoring the casing 76 in place in the chamber 8 need not be illustrated or described in detail as various forms of provisions suitable for the purpose may be provided without invention by a mechanic putting the casing 76 in place.

Since the plate 31 serves as a radiator baffle plate directing the air flow over the radiator 33, and in the particular construction illustrated in Figs. 1–9 extends horizontally at each side of the chamber 8 as does the radiator 33, the plate 31 is preferably put back in place, as shown in Figs. 7 and 8, after the insertion of the casing 76 in the chamber 8. As the discharge end of the fan discharge conduit 73 is preferably expanded,

as shown, so that its room side portion projects away from the sill 5 and subsill beyond the room side of the chamber 8, the plate 31 is advantageously formed with kerfs 31a of such depth and so spaced apart that a central upper tongue portion 31b of the plate 31 may be bent inwardly toward the room, as shown in Figs. 7 and 8, to accommodate the tapered inner side wall of the expanded end of the conduit 73.

In the preferred construction illustrated the air filter provisions include two spaced apart filters 75 of rectangular shape located on opposite sides of the conduit 73 and removable and replaceable through the previously mentioned openings 49 in the cover plate member 34. As shown each filter 75 is of the well known type comprising a frame including wired screen-like upper and lower supports with suitable filter cloth or fibrous filter material between the supports. Each filter frame is slidingly received in guideways 77 formed in a partition member 78 extending horizontally across the casing 76 above the top of the body portion of the fan casing 72 and dividing the interior of the casing 76 into an upper inlet chamber 8a and a lower fan chamber 8b. The air entering the chamber 8a through the subsill outlet port 11 and port 77 of the housing 76 can escape from the chamber 8a only through the two openings in the partition 78 across which the two filters 75 extend. The air thus entering the fan chamber 8b can leave the latter only through the fan casing which has an inlet opening coaxial with the fans 71 at each end of each fan.

To facilitate the removal and replacement of the casings and the avoidance of air leakage, tubular or open ended box-like parts 79 rectangular in transverse cross-section are secured to the inner or front wall of the casing 76 at the margin of openings in that wall through which the filters 75 are movable and in which operating extensions of the filter frames are normally disposed. Those extensions terminate at their outer ends in cover plate parts 75' replacing the previously mentioned cover plates 50 for the openings 49 in the front cover plate member 34. With the apparatus assembled as shown in Figs. 7, 8 and 9, the tubular parts 79 have their outer ends received in the openings 49 and extend through registering openings 31c in the plate 30, the last mentioned openings being closed by removable cover plates 31d in the condition of the apparatus illustrated in Figs. 1–7.

Preferably the discharge conduit 73 is provided with suitably disposed sound absorbing material 80 to prevent the transmission of external noise into the room through the air passages provided for the supply of external air to the room by the fans 71. The sound eliminating provisions need not be illustrated and described, however, as they may be of any suitable known form. The shaft 74' carrying the damper 74 is advantageously provided with operating means including an operating part 74'' projecting through the enclosure for the ventilating and air treating space. As shown the part 74'' projects through the portion 34' of the cover plate member 34 at one end of the outlet openings 47. A controller 81 for the fan motor 70 may be mounted in any convenient location, but preferably is carried on a bracket 82 secured to the upper front portion of the top wall of the casing 76 which, in effect, replaces the removable plate 30 used in the arrangement shown in Figs. 1–6. When so located the operating shaft 83 of the controller 81 is preferably extended upward through the horizontal portion 34' of the front cover plate.

Advantageously in some cases the controls for different mechanisms located in the casing or housing 76 include interconnecting means which may be located in the portion of the enclosed space external to said casing so that a single operating element projecting through the cover plate 34 may serve to adjust said controlling mechanisms. Fig. 9a shows one such arrangement differing from that shown in Fig. 9 in that in Fig. 9a, the operating shaft 83 of the controller 81 carries an arm 83a cooperating with an arm 74a secured to the damper shaft 74' which may replace the operating part 74'' of Fig. 9. With the particular arrangement shown in Fig. 9a the controller arm 83a engages the damper shaft arm 74a and turns the damper 74 into its closed position when the controller shaft 83 is adjusted into the position in which it opens circuits the fan motor 70. When the shaft 83 is adjusted to put the motor 70 into operation the arm 83a is moved to a position in which it permits the damper 74 to open by gravity.

As previously pointed out, the space within the main enclosure including the recess wall space may receive ventilating and air treating provisions of different forms and serving different purposes, and in Figs. 10 and 11, I have illustrated an arrangement in which the provisions within the chamber 8 may be and are shown as of the character illustrated in Figs. 7, 8 and 9, but in which the provisions in the remainder of the enclosed space are quite different from those illustrated in Figs. 1–6. The apparatus shown in Figs. 10 and 11 include a heat exchanger 85 adapted for use as a steam heating radiator at times when the room air needs to be heated and as a refrigerating or air cooling element at times when a room cooling effect is desired. The heat exchanger element 85 in the preferred construction illustrated, comprises a tube 86 bent back and forth to provide a plurality of parallel sections each extending the full length of the element and each of which passes through a corresponding plurality of spaced metal fins or plates 87 which are welded to the corresponding tube section. As shown there are four parallel sections of the tube 86 and four sets of fin plates 87, though the number of sections and the corresponding number of sets of fin plates may obviously be varied in accordance with conditions. As shown, the fin plates are rectangular in outline and the four sets of fin plates are placed close together so that they collectively form a heat exchange element rectangular in outline as shown in Fig. 10. Each fin plate is preferably in the same plane with the corresponding fin plates on the other tube sections so that the fin plates collectively form a multiplicity of narrow side by side air passages extending through the heat exchange element from top to bottom. In the particular arrangement shown the pipe 86 is intended for air cooling purposes and receives a refrigerant fluid at the right hand end of the heat exchanger through a refrigerant supply pipe 88. The section of the pipe 86 to which the supply pipe 88 is shown as directly connected extends through one of the lower sets of fins 87 and is connected at the left hand end of the exchanger through a loop or return portion 89 to a pipe section directly above. The opposite end of the latter section is connected through a horizontal loop or return portion 90 to the second of the two upper sections of the pipe 86. Said second upper section is connected at the left hand

end of the heat exchanger to the fourth pipe section, which is one of the two lower pipe sections, by a vertical loop portion of the pipe 86 similar to, and back of the loop section 89. The said fourth section of the pipe is connected at the right hand end of the heat exchange element to the refrigerant return pipe 91. The refrigerant supply and return pipes 88 and 91 are connected to suitable refrigerant apparatus which in some cases may form part of a refrigerating system adapted to cool the air in an entire building, or in a number of rooms of one suite or section of the building, or the refrigerating apparatus shown in Figs. 10 and 11 may be a part of a refrigerating unit individual to the room. In such case the refrigerating compressor, condenser, etc., may be located in the space beneath a second window in the room shaped and enclosed as is the space in which the heat exchanger 85 is placed.

For room heating, some or all of the sets of fin plates 87 may be traversed by separate horizontal steam pipe sections 92. As shown each of the two lower sets of fin plates is traversed by a corresponding steam pipe 92 which is welded to the fin plates traversed by it, as is the corresponding section of the pipe 86. The two steam pipes 92 receive steam in parallel from a common steam supply pipe 93 which ordinarily includes a control valve 94 with which ordinary thermostatic control provisions (not shown) may be associated in the usual manner. At the opposite end of the heat exchanger the two pipes 92 are connected to a common heating system return pipe 95.

To increase the heat exchange capacity of the heat exchanger 85 so that a suitably large room heating effect and room cooling effect may be obtained with a heat exchanger 85 of suitably small size and compact arrangement, a circulating fan is preferably employed to move air through the air passages betwen the fin plates 87. The air moving means provided for this purpose in the arrangement shown in Figs. 10 and 11 comprises a fan motor 96 mounted on the room floor between the front cover plate 34 and the masonry wall portion 2' and a fan or blower 97 mounted on each end of the motor shaft. Associated with the fans 97 is a fan casing 98, the lower portion of which is bifurcated and straddles the motor 96 and is formed with an axial fan inlet 99 at each end of each fan. The undivided upper portion of the fan casing proper terminates in a central upwardly directed discharge throat 100 which opens centrally through the bottom wall of a supplement or extension casing 101 which surrounds the heat exchange element 85, and has its open upper end immediately beneath the outlet ports 46 in the horizontal cover portions 34'.

The casing 101 is of sufficient vertical depth to provide an air distributing chamber or space extending beneath the heat exchanger for the full length of the latter. Suitably shaped and disposed baffle members 102 in the last mentioned space break up the vertical stream of air entering the casing 101 from the fan outlet 100 and distribute the air along the underside of the heat exchanger with suitable uniformity.

As those skilled in the art will understand, when a refrigerant fluid is passing through the pipe 86 of the heat exchanger, the air moving past the latter will be cooled normally to a temperature below the dew point of the room air, with the result that water will condense and drip from the heat exchanger. The lower portion of the casing 101 is shaped to collect the condensate formed and to pass it to a suitable drainage outlet. As shown the bottom wall of the casing 101 is shaped to pass all of the condensate to a central annular pocket or receiving space 103 surrounding the discharge end 100 of the fan casing which is extended upward into the casing 101 for this purpose. From the pocket 103 the condensate passes away through a suitable drain or waste pipe 104.

The fans 97 draw in room air through the lower inlet openings 44 in the front cover plate 34. The casing 101 may be ported or cut away to permit some of the air discharged by the fan to escape through the ports 45, but since, with the arrangement shown, it is desirable to locate the heat exchanger immediately beneath the top of the enclosure as shown in Figs. 10 and 11, and since a high velocity of air past the exchanger is desirable to increase the heat transfer rate of the latter, and is made possible by the use of the fans 97, the casing 101 may well be arranged to block the ports 45 so that all of the air passing through it escapes through the ports 46.

When the apparatus shown in Figs. 10 and 11 is employed for room heating the usual need for artificial humidification of the room atmosphere will be experienced, and humidifying apparatus is preferably located within the space provided for the ventilating and air treating apparatus. The humidifying apparatus shown in Fig. 11 comprises a water reservoir 105 receiving water as required through a water supply pipe 106 and supplying water to an evaporative element 107 which is heated by the steam passing to the heat exchange element through the steam supply pipe 93. An overflow pipe 108 running from the upper portion of the reservoir 105 to the waste pipe 104 limits the height of water level in the reservoir and eliminates risk of the latter overflowing. The reservoir 105 may contain a float operating a valve controlling the supply of water to the reservoir 105 through the pipe 106, and the evaporative element 107 may be of a character effective to vigorously boil the water received at its lower end from the reservoir at times when the rate of steam flow through the pipe 93 is relatively large, and to return to the upper portion of the reservoir 105 water moved through the water space of the evaporator by the boiling action therein. The above mentioned features of the humidifying apparatus shown need not be further illustrated or described herein, however, as the present invention is not concerned with the particular form of humidifying apparatus employed, and the special form of that apparatus illustrated, is disclosed and claimed in the copending application of Harry E. Campbell, Serial No. 674,797, filed June 8, 1933.

While in accordance with the provisions of the statutes, we have illustrated and described preferred embodiments of the present invention, those skilled in the art will understand that changes in the form of the apparatus disclosed herein may be made without departing from the spirit of the invention as set forth in the appended claims and that certain features of the invention may be used with advantage in certain cases without a corresponding use of other features. It is particularly to be noted that the form and extent of particular portions of the enclosed receiving space for ventilating and air treating provisions may vary in accordance with the conditions of use which may make it desirable to employ quite different provisions in dif-

ferent installations. It is to be noted also that while some features of the present invention are particularly useful in connection with window openings in relatively thick building walls, aside from the matter of wall thickness, the invention is independent of the character or type of wall construction. For example, the metal spandrel type of construction illustrated in Fig. 2 and other figures is in no wise essential to the present invention. On the contrary, the masonry wall portion 2' may extend to and form the outer face of the building wall as shown in Fig. 10.

Having now described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. The combination with the wall of a room having a window casing therein and a recess space beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including members in fixed and rigid relation with said wall and comprising vertical corner posts adjacent the room side ends of the end walls of said space extending upward from the floor level to the level of the lower portion of the window casing and horizontal parts extending from the upper ends of said corner posts to the corresponding ends of the lower portion of said window casing and connected to the latter, a vertical cover plate portion engaging and supported by said corner posts and a horizontal cover plate portion engaging and supported by said horizontal parts.

2. The combination with the wall of a room having a window casing therein and a recess space beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including members in fixed and rigid relation with said wall and comprising vertical corner posts adjacent the room side ends of the end walls of said space extending upward from the floor level to the level of the lower portion of the window casing and horizontal parts extending from the upper ends of said corner posts to the corresponding ends of the lower portion of said window casing and connected to the latter, vertical and horizontal batten parts secured to the rear and undersides of said corner posts and horizontal parts, respectively, a vertical cover plate portion engaging the front sides of the vertical batten parts and a horizontal cover plate portion engaging the top sides of the horizontal batten parts.

3. The combination with the wall of a room with a window casing therein and a recess space beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including members in fixed and rigid relation with said wall and comprising vertical corner posts adjacent the outer ends of the end walls of said space extending upward from the floor level to the level of the lower portion of the window casing and horizontal parts extending from the upper ends of said corner posts to the corresponding ends of the lower portion of said window casing and connected to the latter, a floor member extending between and secured to the lower ends of said corner posts, a vertical cover plate portion engaging and supported by said corner posts and engaging said floor member, and a horizontal cover plate portion engaging and supported by said horizontal parts.

4. The combination with the wall of a room with a window casing therein and with a recess space beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including members in fixed and rigid relation with said wall and comprising vertical corner posts adjacent the outer ends of the end walls of said space extending upward from the floor level to the level of the lower portion of the window casing and horizontal parts extending from the upper ends of said corner posts to the corresponding ends of the lower portion of said casing and connected to the latter, and a floor member extending between and in overlapping engagement with said corner posts, a vertical cover plate portion engaging and supported by said corner posts and in overlapping relation with said floor member and a horizontal cover plate portion engaging and supported by said horizontal parts, and connections between said corner posts and floor member adjustable to accommodate different elevations of the corner post parts above the floor level.

5. The combination with the wall of a room with a window casing therein and with a recess space beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including members in fixed and rigid relation with said wall and comprising vertical corner posts adjacent the outer ends of the end walls of said space extending upward from the floor level to the level of the lower portion of the window casing and horizontal parts extending from the upper ends of said corner posts to the corresponding ends of the lower portion of said casing and connected to the latter, a vertical cover plate portion engaging and supported by said corner posts and a horizontal cover plate portion engaging and supported by said horizontal parts, said horizontal portion having a downturned flange adjacent the lower portion of the window casing and the latter being formed with a pocket open at its top to receive said flange.

6. The combination with the wall of a room with a window casing therein and with a recess beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including metallic members in fixed and rigid relation with said wall and comprising vertical corner posts of angle bar cross-section each having a flange parallel to and adjacent the front portion of the corresponding end wall of said space extending upward from the floor level to the level of the lower portion of the window casing and having a second flange extending toward the other corner post part, the last mentioned flange of each corner post forming an integral horizontal projection extending from the upper end of the corner post to the adjacent end of the lower portion of the window casing and connected to the latter, a vertical cover plate portion engaging and supported by said corner post parts and a horizontal cover plate portion engaging and supported by said projections.

7. The combination with the wall of a room

with a window casing therein and with a recess space beneath and in front of said casing, of casing parts uniting with said wall to enclose a space including said recess and adapted to receive ventilating and air treating means, said casing parts including members in fixed relation with said wall and comprising vertical corner posts adjacent the outer ends of the end walls of said space and horizontal parts extending from the upper ends of said corner posts to the corresponding ends of the lower portion of said casing, and a floor member extending between and secured to said corner posts and comprising an upstanding plate like portion, a vertical cover plate portion engaging and supported by said corner posts and overlapping said upstanding portion of said floor member at one side and having resilient fingers engaging the other side of said portion, and a horizontal cover plate portion engaging and supported by said horizontal parts.

8. The combination with the wall of a room having a window with its sill therein and a recess beneath and in front of said sill, of casing means uniting with said wall to form an enclosed space including said recess, means within said casing dividing said space into two compartments one of which extends between the room side of said space and the other compartment and the latter of which extends under the window sill casing and has its walls formed mainly by parts permanently mounted in said wall but including a removable front wall member separating said compartments, said parts including a chambered subsill between the window sill and having an inlet for external air in its outer portion and having an outlet in the underside of the portion thereof directly above and opening into said other compartment.

9. The combination with the wall of a room having a window therein and having a box-like chamber beneath said window and having an inlet passage opening externally of said wall for supplying external air to said chamber, of a ventilating unit including a casing bodily insertable in said chamber with a portion thereof projecting toward the room from said chamber and supported by the portion of said wall forming the bottom of said chamber, means including a motor driven fan within said casing for drawing external air through said passage into said casing and discharging it into the room, controlling means for said motor mounted on a portion of said casing external to said chamber, casing means uniting with said wall to form an enclosed space into which the portion of said casing projecting from said chamber extends, and means within said space for the recirculation of room air therethrough and for subjecting the air so recirculated to a temperature modifying effect.

10. The combination with the wall of a room having a window therein and having a box-like chamber beneath said window and having an inlet passage opening externally of said wall for supplying external air to said chamber of a ventilating unit including a casing bodily insertable in said chamber with a portion thereof projecting toward the room from said chamber and supported by the portion of said wall forming the bottom of said chamber, casing means uniting with said wall to form an enclosed space into which the portion of said casing projects, means within said space for the recirculation of room air therethrough and for subjecting the air so recirculated to a temperature modifying effect, means including a motor driven fan and a damper within said casing for drawing external air at a regulated rate through said passage into said casing and discharging it into the room, controlling means for said motor in said space mounted on a portion of said casing external to said chamber, said damper having an adjusting part extending into said space from said casing.

11. The combination with the wall of a room having a window with its sill therein and having a box-like chamber beneath said sill and having an inlet passage opening externally of said wall for supplying external air to said chamber, of a ventilating and air treating unit including a casing bodily insertable in said chamber and formed with an air inlet adapted to communicate with and receive air from said passage and formed with an uprising air delivery conduit extending upwardly in front of said window sill to a level adjacent the top of said sill and air moving and treating means mounted in said casing.

12. The combination with the wall of a room having a window with its sill therein and having a box-like chamber beneath said sill, of a chambered air intake member secured to said sill and forming an upper portion of the wall of said chamber, and having an air passage opening externally of said wall, a ventilating and air treating unit including a casing bodily insertable in said chamber and formed with an air inlet adapted to receive air from said passage and formed with an uprising air delivery conduit extending upwardly in front of said window sill to a level adjacent the top of said sill and air moving means in said casing.

13. The combination with the wall of a room having a window therein and a box-like compartment extending beneath the window and having an inlet passage directly beneath the window for the passage of outside air into said compartment, of a ventilating and air treating unit comprising a casing bodily insertable in said compartment through the front side of the latter and having an inlet adapted to receive air from said passage and having an outlet for the discharge of air into the room, a fan in said casing for moving air from said inlet to said outlet and air filtering means in said casing between the inlet thereof and said fan.

14. The combination with the wall of a room having a window therein and a box-like compartment extending beneath the window and having an inlet passage directly beneath the window for the passage of outside air into said compartment, of a ventilating and air treating unit comprising a casing bodily insertable in said compartment through the front side of the latter and having an inlet adapted to receive air from said passage and having an outlet for the discharge of air into the room, and means in said casing for preventing the transmission of external noises into the room through said casing.

15. The combination with the wall of a room having a window therein and a box-like compartment extending beneath the window and having an inlet passage directly beneath the window for the passage of outside air into said compartment, of a ventilating and air treating unit comprising a casing bodily insertable in said compartment through the front side of the latter and having an inlet adapted to receive air from said passage and having an outlet for the discharge of air into the room, and ventilating and air

treating means mounted in said casing comprising a fan for drawing air from said passage and discharging it through said outlet and sound absorbing means for preventing the transmission of external noises into the room through said casing.

16. The combination with the wall of a room having a window with its sill therein and having a recess beneath and in front of said window, the recess space including a box-like chamber extending beneath said sill, and said wall having a passage with an inlet opening at the outer side of the wall and with an outlet opening into said chamber, of a casing bodily insertable in said chamber and formed with an inlet adapted to receive air from said outlet and formed with an uprising air outlet conduit extendng upward in front of the lower portion of the window sill, means within said casing for moving air from the inlet thereof through said outlet, casing means uniting with said wall to form an enclosed space and including a vertical portion in front of and spaced away from the front side of said unit casing and a top portion extending from the upper edge of said vertical portion to the window sill, said casing means being formed with an outlet above said delivery conduit and with another outlet in its upper portion and with a lower inlet, and means within said space and external to said casing for drawing room air in through said inlet and returning it to the room through said other outlet.

17. The combination with the wall of a room having a window with its sill therein and having a recess beneath and in front of said window, the recess space including a box-like chamber extending beneath said sill, and said wall having a passage with an inlet opening at the outer side of the wall and an outlet opening into said compartment, of a casing bodily insertable in said chamber and formed with an inlet adapted to receive air from said outlet and having an outlet in the front portion of its top wall, means within said casing for moving air from the inlet thereof through said outlet therefrom, casing means uniting with said wall to form an enclosed space and including a vertical portion in front of and spaced away from the front side of said casing and a top portion extending from the upper edge of said vertical portion to the window sill, said casing means being formed with an air outlet above said casing outlet and with another upper outlet and with a lower inlet, means within said space and external to said casing for drawing room air in through said inlet and returning it to the room through said other outlet and means within said space for segregating the air flows to the first mentioned outlet and said other outlet.

18. The combination with the wall of a room having a window therein and a recess beneath and in front of said window, of casing means uniting with said wall to form an enclosed space including said recess and means within said casing dividing said space into two compartments, one of which extends between the room side of said space and the other compartment and the latter extending under the window casing and having a portion of its wall formed by metallic members permanently mounted in said wall, brackets secured to said wall portion and extending into one compartment, and a heat exchanger in the last mentioned compartment supported by said brackets.

19. The combination with the wall of a room having a window therein and a recess beneath and in front of said window, of casing means uniting with said wall to form an enclosing space including said recess, means within said casing dividing said space into two compartments one of which is interposed between the room side of said space and the other compartment, means for recirculating room air through one compartment, means for introducing external air into said room through said other compartment, means for filtering said external air in its passage through said other compartment comprising a filter therein, and a hollow member extending across said one compartment through which said filter is insertable in and removable from said other compartment.

20. The combination with the wall of a room having a window therein and having a box-like chamber beneath said window and open at its front side and having an inlet passage opening externally of said wall for supplying external air to said chamber, of a ventilating unit including a casing bodily insertable in said chamber and formed with an air inlet adapted to communicate with and receive air from said passage and with an outlet for the discharge of air into the room, air filtering means in said casing, casing means uniting with said wall to form a ventilating and air treating compartment between the room and said chamber, and means for moving room air through and conditioning it in said compartment, said casing having a hollow extension from its front wall extending across said compartment and the front wall of said compartment having an opening in register with said extension, and said filtering means being insertable and removable through said opening and extension.

21. The combination with the wall of a room having a window therein and a recess beneath and in front of said opening, of casing means uniting with said wall to form an enclosed space including said recess, means within said casing dividing said space into two compartments, one of which is interposed between the room side of said space and the other compartment and supported by the portion of said wall forming the bottom of said recess, mechanism within said other compartment for moving external air into the latter and thence into the room and controlling means for said mechanism including a portion located in said one compartment and an operating portion extending out of the last mentioned compartment into the room.

22. The combination with the wall of a room having a window opening therein and a notch open at its top directly beneath the window opening, of a chambered metallic structure at the bottom of the window opening and extending across the top of said notch, said structure including a window sill portion, and a subjacent chamber space open at the outer side of the wall to receive external air, and a ventilating unit including a casing bodily insertable in and mainly supported by the wall of said notch and having an air inlet in its top wall receiving air from the space in said structure and having an air outlet opening to the room at the room side of said space, said unit including a ventilating fan mounted within said casing and revolving about an axis lying within said notch when said unit is inserted therein.

23. In apparatus of the character described, a wall for a room having a window opening therein located at a substantial distance above the room floor and having a notch-like recess therein directly beneath said window opening; a hollow

window sill defining the bottom of said window opening and the top of said recess, and providing an air passage extending therethrough including an inlet end communicating directly with the outside atmosphere and an outlet end communicating directly with the upper portion of said recess; and a ventilating unit arranged within the notch-like recess beneath said hollow window sill and including a casing structure bodily insertable in and removable from said recess and having an inlet opening communicating with the outlet end of the passage in said window sill and an outlet opening for the discharge of air into the room, and a motor-blower unit secured in said casing and forming a part of said ventilating unit and operable to draw air from the outside through said passage and said recess and discharge such air into said room.

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