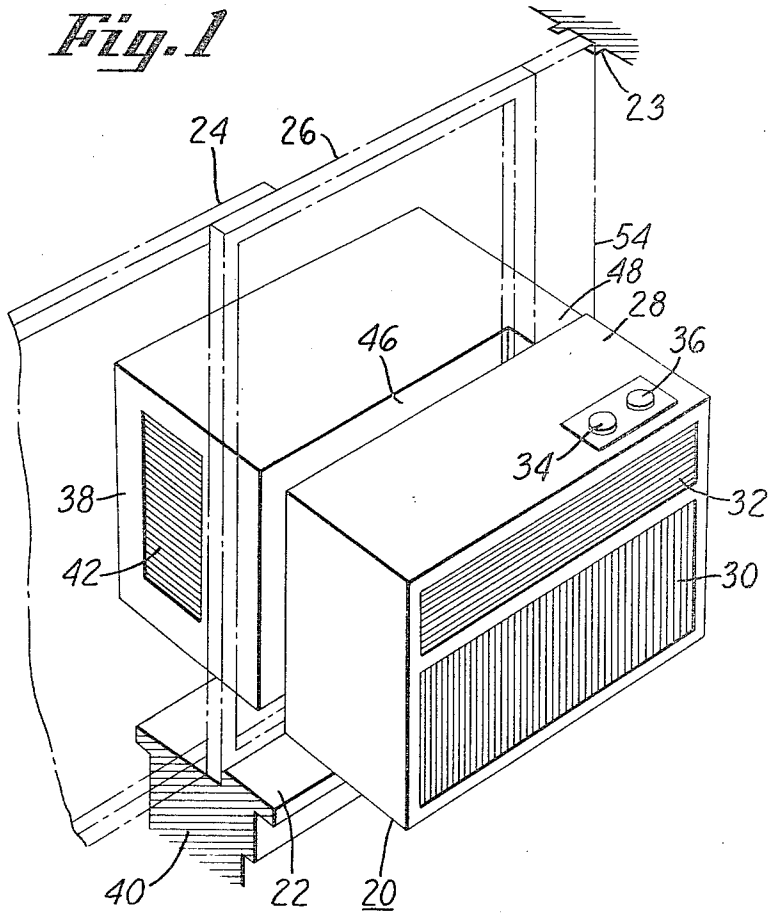
March 21, 1967 C. A. COPP, JR 3,309,889

AIR CONDITIONER FOR SLIDING WINDOWS

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Fig. 1



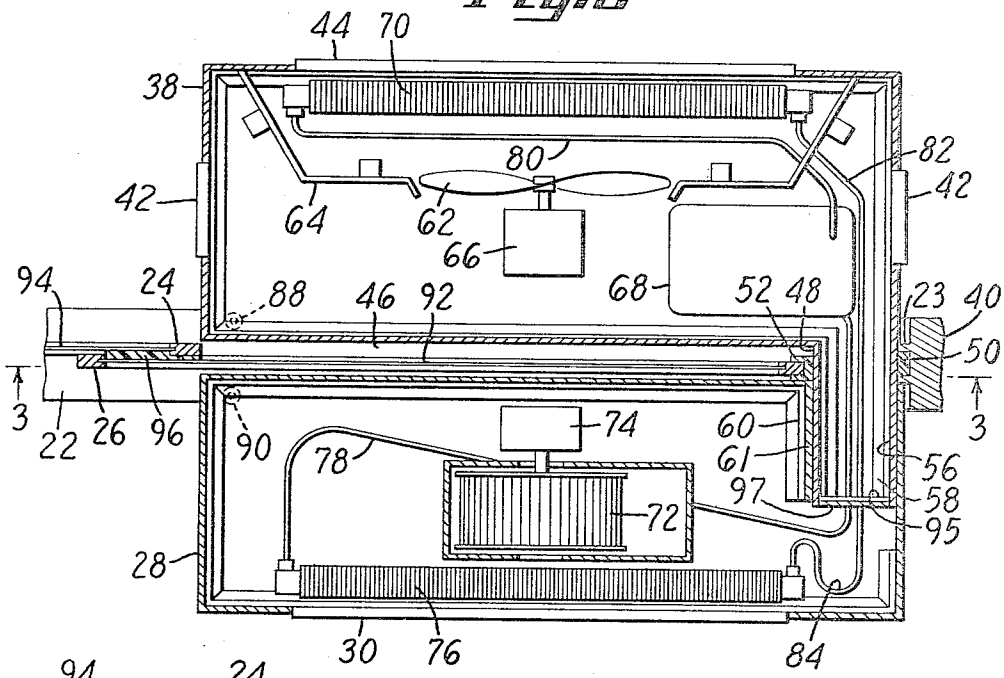
INVENTOR.
CARL A. COPP JR.
BY
Carl A. Sticket
ATTORNEY

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Fig. 2



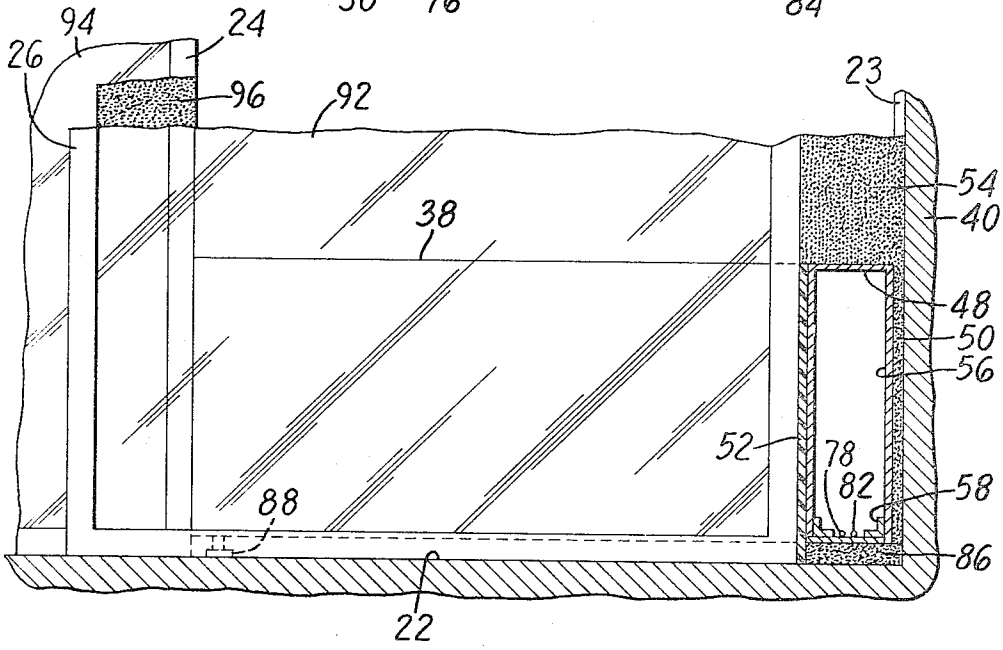


Fig. 3

INVENTOR.
CARL A. COPP JR.

BY

ATTORNEY

March 21, 1967 C. A. COPP, JR 3,309,889

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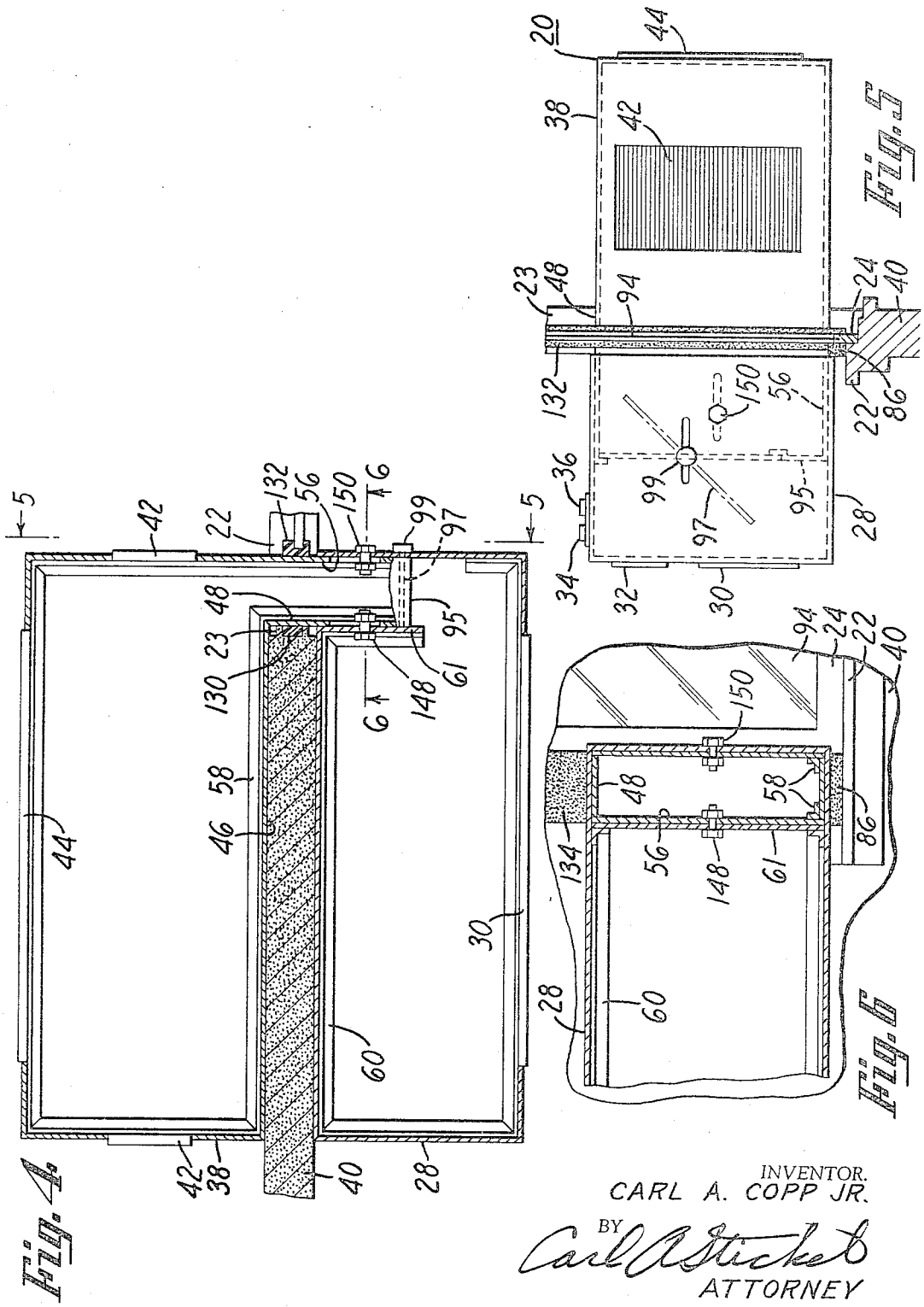


Fig. 4.

Fig. 5

Fig. 6

INVENTOR.
CARL A. COPP JR.
BY
Carl A. Sticket
ATTORNEY

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AIR CONDITIONER FOR SLIDING WINDOWS

Carl A. Copp, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Mar. 11, 1966, Ser. No. 533,471
9 Claims. (Cl. 62—262)

This invention pertains to window air conditioners for horizontal, sliding windows.

Window air conditioners were first applied to conventional vertical sliding double hung windows. Many have been sold for such installation. The application of window air conditioners to other types of windows has been more difficult. Heretofore, no fully satisfactory arrangements have been proposed for installing window air conditioners in horizontal sliding windows even though such windows have been popular in home construction for many years.

It is an object of this invention to provide a window air conditioner for horizontal sliding windows having a minimum of interference with the normal use and the transmission of light by the window.

It is another object of this invention to provide a window air conditioner for horizontal sliding windows which will reduce to a minimum the area of glass which is covered or obstructed by the air conditioner.

These and other objects are attained by constructing the air conditioning casing as illustrated in the drawings with a deep notch extending inwardly from one side sufficiently wide to receive both sliding windows or the wall at the side of the window. The narrow but high neck portion of the cabinet at the inner end of the notch may be fixed or adjustable to vary the width of the notch to accommodate varying thicknesses of the walls or windows.

The refrigerant conduits and electric conductors extend through the neck portion connecting the condenser, compressor and fan in the outside part of the casing with the evaporator, fan and controls in the inside portion of the casing.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the present invention are clearly shown.

In the drawings:

FIGURE 1 is a perspective view of a window air conditioner for horizontal sliding windows embodying one form of my invention;

FIGURE 2 is a horizontal sectional view through the air conditioner shown in FIGURE 1 including adjacent portions of the window and wall;

FIGURE 3 is a vertical sectional view taken along the lines 3—3 of FIGURE 2;

FIGURE 4 is a horizontal sectional view similar to FIGURE 2 with the parts of the refrigerating system omitted showing the application of the air conditioner to the wall at the side of the sliding window;

FIGURE 5 is a side view partly in section taken along the line 5—5 of FIGURE 4; and,

FIGURE 6 is a fragmentary vertical section taken along the lines 6—6 of FIGURE 4.

Referring now more particularly to FIGURE 1, there is illustrated a window type air conditioner **20** resting upon

the window sill **22** of a horizontal sliding window having the sliding window sashes **24** and **26** (shown in dot-dash lines) which slide horizontally in suitable grooves upon the sill **22** forming a part of the window frame **23**. The air conditioner **20** includes a cabinet or casing having an inner portion **28** extending from the window into the room having an inlet air grille **30** and an outlet air grille **32** in the front of the cabinet. This inner portion **28** also has control knobs **34** and **36** for shutting the air conditioner off or turning it on and for controlling the fans and dampers. These controls may be similar to those illustrated in Patents Re. 22,303 issued Apr. 20, 1943, and 2,472,792 issued June 14, 1949. The air conditioning casing also includes an outer portion **38** extending outside the room or building wall **40** having side air inlets **42** and a rear outside air discharge grille or louvers **44**. The casing is provided with a deep notch **46** extending inwardly from the left side for receiving substantially all of the window sash **26** and whenever necessary, as much of the window sash **24** as desired. This permits the opening and closing of the window **24** or **26** whenever desired without any substantial interference from the window air conditioner since the window sash can freely move into and out of the deep notch **46**. The outer portion at the inner end of the deep notch **46** has a narrow neck portion **48** formed integral with it extending into the inner portion **28** as is illustrated in FIGURES 1 and 2. The side of the wall **40** may be provided with a gasket seal **50** between it and the adjacent side of the neck portion **48**. The edge of the window sash **26** may likewise be provided with a gasket seal **52** for making a seal with the inner face of the neck portion **48**. Above the neck portion **48** there is provided a filler panel **54** which is held between the adjacent edge of the wall **40** and the adjacent edge of the window sash **26** extending upwardly from the top of the neck portion **48** to the top of the window sash **26**. This provides an adequate seal to prevent air leakage through the window opening when it is provided with my air conditioner. The filler panel **54** may be transparent or translucent, if desired.

The narrow neck portion **48** is integral with the outside portion **38** of the casing and extends in the form of a rectangular sleeve **56** into the inner portion **28** which is located in the room to be cooled. The sleeve **56** and the casing **38** may be further strengthened wherever necessary by the use of the angle iron framework **58** which is provided along the top and bottom edges of the various walls. The inner portion **28** likewise is provided with a supporting angle iron framework **60** along the top and bottom edges of the walls forming a sleeve **61** which slidably receives the rectangular sleeve **56** as illustrated particularly in the FIGURE 2. The rectangular sleeve **56** can slide into the inner portion **28** various distances to vary the width of the deep notch **46**. The adjusted position of the rectangular sleeve **56** relative to the inner portion **28** may be held through the use of bolts extending through apertures and slots in the side walls as illustrated in FIGURES 4–6.

The outer portion **38** contains a propeller type fan **62** positioned within the shroud **64** driven by the fan motor **66** for drawing air in through the air inlets **42** in heat transfer relation with the sealed motor compressor unit **68** and discharging the air in heat transfer with the condenser **70** through the air outlet **44**. The

inner portion also includes a fan **72**, preferably of the centrifugal type, driven by an electric motor **74** for drawing air in through the air inlet **30** in heat transfer relation with the refrigerant evaporator **76** and discharging the air through the air outlet **32** into the room. The sealed motor compressor unit **68** withdraws evaporated refrigerant from the evaporator **76** through the flexible suction conduit **78** which extends through the neck portion **48** to the inlet of the sealed motor compressor unit **68**. This suction conduit **78** has a long lateral extending portion within the inner portion **28** which will allow the inner and outer portions **28** and **38** to be moved further apart to increase the width of the notch **46**. The refrigerant drawn through the suction conduit **78** is compressed in the sealed motor compressor unit **68** and forward through the supply conduit **80** to the inlet of the condenser **70**. The outlet of the condenser **70** is connected by a capillary restrictor supply conduit **82** to the inlet of the evaporator **76**. This capillary supply conduit **82** is flexible and has a serpentine loop portion **84** sufficiently long to flex and allow the outer portion **38** to be moved further away from the inner portion **28** to increase the width of the notch **46**. A transverse wall **95** is provided at the inner end of the rectangular sleeve **56** to separate the inner and outer portions **28** and **38**. For exhaust or ventilation it may be provided with a pivoted door **97** (FIGURE 5) which may be opened by a knob.

The neck portion **48** may be supported upon the bottom by a pad **86** resting upon the sill **22**. This pad may be made of any suitable resilient rubber-like material such as natural or synthetic rubber. The outer portion **38** may be provided with a threaded adjustable screw type support **88** located in the inner corner opposite the neck portion **48** extending down to and being supported by the sill **22**. The inner portion **28** may also be provided with a threaded adjustable screw type support **90** extending down to and being supported by the sill **22**. If desired, the space between the two window panes **92** and **94** in the sash **26** and **24** may be filled by a sponge rubber strip **96** to prevent leakage of air into and out of the room at this place. This however, will not interfere with the opening of the sash **24** and also will allow the movement of the sash **26** for cleaning and ventilation.

In the form shown in FIGURE 6, my air conditioner is applied to the sliding window in a different manner. Both of the window sashes and the window still are similar to the window sill **22** and the window sashes **24** and **26** shown in FIGURES 1–3. In this form the refrigerating system is omitted but preferably is similar to that illustrated in FIGURE 2. In this application, the casing or cabinet **20** has the adjustable neck portion **48** resting upon a resilient support pad **86** which in turn rests upon the window sill **22**. In this arrangement however, the neck portion **48** is lodged against the extreme left side of the window frame **23** and sealed by a gasket **130** on the left side of the window frame. The window sash **24** has a sealing gasket **132** providing a seal between the sash **24** and the side of the neck portion **48**. Above the neck portion extending to the top of the window frame **23** is a rectangular filler panel **134** which extends between the adjacent side of the window sash **24** and the adjacent side of the window frame **23**. This filler panel **134** may be transparent or translucent if desired. This completes the seal for preventing the flow of air from the outside into the room.

Integrally connected to the neck portion **48** is the larger outer portion **38**. This larger outer portion contains all of the portion of the refrigerating system contained in the outer portion of FIGURE 2 including the sealed motor compressor unit **68**, the condenser **70**, the fan **62**, the shroud **64** and the fan motor **66**. These are not shown to avoid unnecessary duplication. The two sleeve portions **56** and **61** are provided with suitable

slots and apertures for receiving the clamping bolts **148** and **150** which extend through the side walls. Similar clamping bolts are provided in a similar arrangement for the cabinet shown in FIGURES 1–3. The inner portion **28** includes an evaporator **76**, fan **72** and the fan motor **74** like those shown in FIGURE 2.

The deep notch **46** extending inwardly from the left side to the neck portion **48** receives the wall portion **40** extending into the notch **46** from the left side and extending to the left side of the window frame **23**. It will be seen that in this arrangement the air conditioning cabinet only obstructs the portion of window equal to the cross sectional area of the neck portion **48**. If desired, the filler portion **134** may be made of translucent or transparent material so that the light is substantially unobstructed by reason of installation of the air conditioner within the window frame **23**. By the provision of the deep notch **46** only the wall **40** is covered by the major portion of the air conditioner. This, therefore, provides an arrangement whereby the sliding window is substantially free for normal use since they may be moved horizontally for cleaning or ventilation with only the narrow neck portion **48** limiting the movement of the window sash **24** at the left edge of the window frame **23**. Since this amount is very small, the window remains available for substantially all normal use thereof.

While the embodiments of the present invention as herein disclosed, constitute preferred forms, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. A window air conditioner for laterally slidable windows including an enclosing casing having a deep notch extending inwardly from one side, said notch having a width sufficient to receive a substantial portion of a window, said casing having having a neck portion at the inner end of said deep notch connecting outer and inner larger portions, said outer and inner portions each having an air inlet and an air outlet and a refrigerating means in said casing comprising a compressor and condenser means in said outer portion and evaporating means in said inner portion and having operating connections extending through said neck portion connecting said compressor and condenser means and said evaporating means.

2. A window air conditioner as defined in claim **1** in which said neck portion has a slidable connection with one of the other portions of said casing to vary the width of said notch.

3. A window air conditioner as defined in claim **1** in which said neck portion has a height substantially equal to the height of one of the other portions of said casing.

4. A window air conditioner as defined in claim **1** in which said neck portion has a slidable connection with one of the other portions of said casing to vary the width of said notch and in which operating connections are flexible.

5. A window air conditioner as defined in claim **1** in which said neck portion has a slidable connection with one of the other portions of said casing to vary the width of said notch and in which said operating connections are flexible and have portions extending laterally from said neck to provide added length for flexing to accommodate any increased distance between the inner and outer portions of said casing.

6. A window air conditioner as defined in claim **1** in which said neck portion has a slidable connection with one of the other portions of said casing to vary the width of said notch, has an extension extending into one of the other portions of said casing, said one portion being provided with a slidable mounting for said extension.

7. A window air conditioner as defined in claim **1** in which said outer larger portion has fan means for circulating air from said air inlet to said air outlet in heat transfer with said condenser means and said inner larger

portion has fan means for circulating air from said air inlet to said air outlet in heat transfer with said evaporating means.

8. A window air conditioner as defined in claim 1 in which the neck portion is provided with a transverse partition wall.

9. A window air conditioner as defined in claim 1 in which the neck portion is provided with a transverse partition wall having therein a door and means for opening and closing the door.

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WILLIAM J. WYE, *Primary Examiner.*