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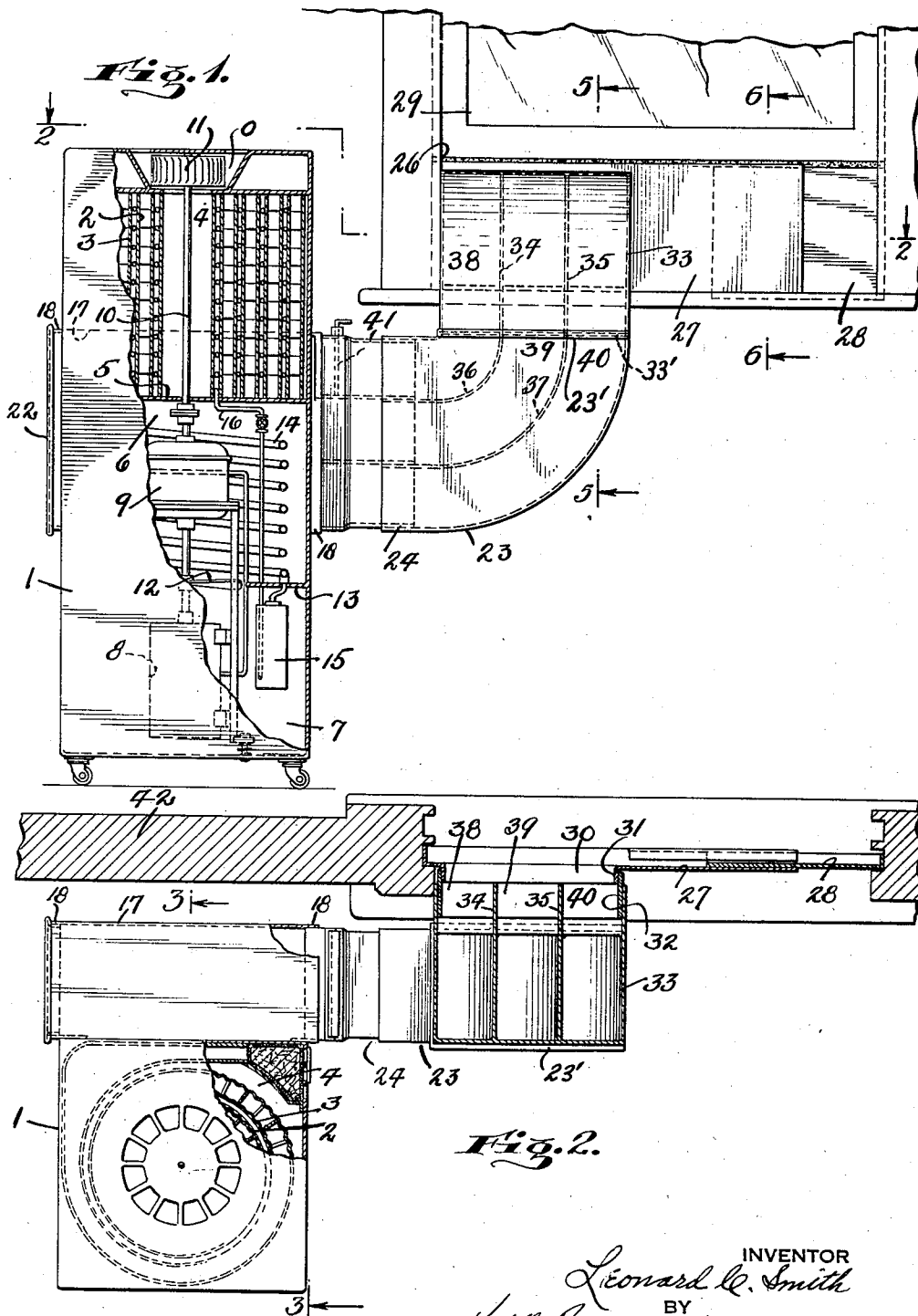
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2,091,019

AIR CONDITIONING APPARATUS

Filed Jan. 21, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

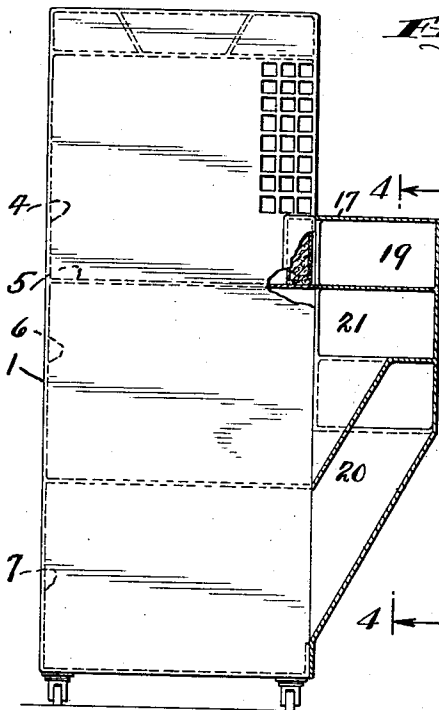


Fig. 3.

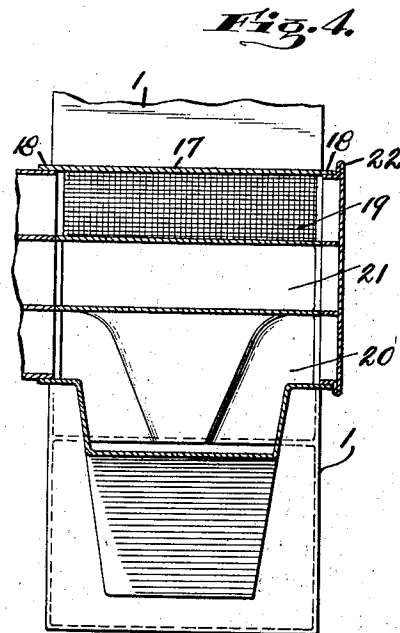


Fig. 4.

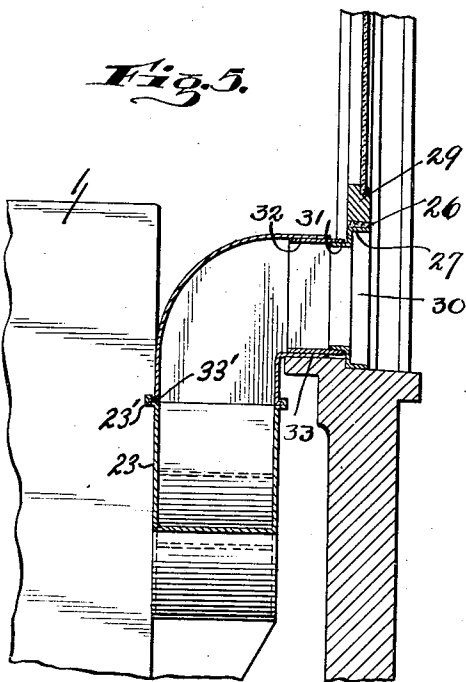


Fig. 5.

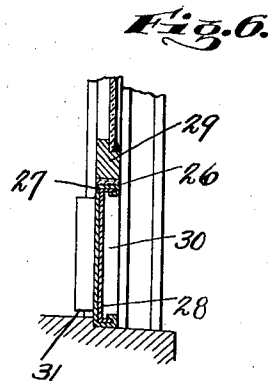


Fig. 6.

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AIR CONDITIONING APPARATUS

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Application January 21, 1936, Serial No. 60,053

3 Claims. (Cl. 98—94)

This invention relates to air conditioning apparatus and has for one of its objects the provision of an improved, simple and relatively inexpensive portable air conditioning apparatus which is particularly well adapted for conditioning the air of rooms in dwellings, for example, and where it may be desirable to shift the apparatus from one room to another where the windows may be of different widths and where conditions are such that it is desirable to be able to position the apparatus at either side of a window.

Primarily the apparatus of this invention provides an air conditioning cabinet containing means for drawing air into the cabinet, circulating the same for conditioning and for discharging the conditioned air into the room in which the apparatus is located. Air is drawn into the apparatus from the exterior of the room through a conduit detachably connected to the cabinet, the intake end of which is detachably connected to a device capable of being placed in an ordinary window opening simply by raising the window slightly, this device being adjustable to accommodate window openings of different widths.

In addition to all of the foregoing means are provided whereby the conduit can be attached to either side of the cabinet and whereby the intake end of the conduit can be placed at either side of the window opening, thereby enabling the cabinet to be placed at either side of the window.

The present invention also provides a construction in which the air conduit, above mentioned, is adjustable in the sense that the same may be lengthened or shortened permitting of varying the position of the conditioning cabinet which is mounted on rollers so that it may be readily moved along the floor.

In the accompanying drawings illustrating an embodiment of my invention:

Fig. 1 is a part sectional elevational view of my improved equipment showing the same in position ready for use;

Fig. 2 is a view taken on the line 2—2 of Fig. 1;

Fig. 3 is a view taken on the line 3—3 of Fig. 2;

Fig. 4 is a view on the line 4—4 of Fig. 3;

Fig. 5 is a sectional elevational view on the line 5—5 of Fig. 1; and

Fig. 6 is a section on the line 6—6 of Fig. 1.

Referring to the drawings in detail, 1 designates a casing or cabinet containing the air conditioning equipment. The specific equipment contained within this cabinet and shown in the drawings of the present application is the sub-

ject matter of my copending application Serial No. 39,400, filed September 6, 1935 now Pat. No. 2,050,470, patented Aug. 11, 1936. This equipment comprises plates 2 and 3 slightly spaced apart from each other and wound in a spiral, the assembly being mounted in a chamber 4 in the upper part of the cabinet.

Below the floor 5 of this chamber 4 is another chamber 6 out of communication with the chamber 4, and below the chamber 6 is still a third chamber 7. In this lower chamber 7 is a compressor 8 driven by an electric motor 9, mounted as described in my copending application above referred to, the armature shaft of this motor being coupled to a shaft 10 which extends upwardly through the floor 5 of the chamber 4 and carries at its upper end a fan 11 the function of which is to draw air into the chamber 4 for conditioning and to discharge the same into the room through openings O in the cabinet adjacent the fan. The motor circuit, as will be understood, is controlled thermostatically in the usual way from any convenient part of the room. The lower end of the armature shaft of the motor 9 may be coupled to the compressor 8 by the hub of a fan 12 which is located at an opening in the floor 13 of the chamber 6, the function of this fan being to draw air from the exterior of the casing into the chamber 7, the air passing over the compressor 8 to cool the same, the fan driving this air out of the casing to the atmosphere again.

14 designates the condenser coil for the conditioning equipment, this coil being mounted in the chamber 6.

It will be appreciated that this apparatus is charged initially with any suitable conditioning fluid, sulphur dioxide, for example, in the form of a gas under pressure and with the motor 9 in operation this gas will pass from the discharge side of the compressor through the condensing coils 14 where it will condense into a liquid, the liquid entering the tank 15 from whence it passes into a pipe 16 which is coiled in the spaces between the pipes 2 and 3 in the conditioning chamber 4, the liquid entering this pipe in the form of a vapor and circulating through the pipe and finally returning to the compressor 8 where it again passes through the same cycle.

As the conditioning fluid in the form of a vapor enters the pipe 16 its temperature drops, as will be understood, to effect a lowering of the temperature of the plates 2 and 3 and a consequent reduction in the temperature of the air sweeping along the outer surfaces of these plates by the action of the fan 11, so that cooled air

will be discharged into the atmosphere surrounding the casing 1.

The rear wall of the casing 1 is equipped with a housing 17 which projects slightly beyond each side thereof, as shown at 18. This housing is divided into three superimposed chambers, an upper chamber 19, lower chamber 20 and intermediate chamber 21, the chamber 19 communicating at all times with the upper chamber 4 in the casing 1, the chamber 20 communicating at all times with the lower chamber 7 in the casing 1, and the intermediate chamber 21 communicating at all times with the intermediate chamber 6 within the casing 1.

The projecting ends 18 of the housing 17 are open, one end of the housing being in use at a time, and a plug 22 is provided for closing the other end, this construction being provided, as will be brought out presently, for the purpose of adapting my apparatus for positioning at either side of a window.

23 designates a conduit either of flexible or rigid construction by which the cabinet 1 is connected to an outside source of air. The end of this conduit is telescoped by either end of the housing 17. For instance in Fig. 1 it is fitted into the right hand end of the housing, so that the cabinet may sit at one side of a window, and when the cabinet is to be shifted to the opposite side of the window then the conduit will be slipped into the opposite end of the housing. The conduit is adjustable as to length as shown at 24 to adapt the equipment to suit varying conditions.

26 designates a window opening through which air to be conditioned is to be drawn, and fitting into this window opening is a sectional collapsible and extensible member made up of plates 27 and 28 telescoping each other as shown in Fig. 6. This sectional member, as will be understood, is adapted to be placed in the window opening 26 and the window 29 closed down upon the top of the same to hold the member in place. The major part of the sectional member is preferably imperforate, but the left hand end, as viewed in Fig. 2, for instance the section 27, is provided with an opening 30, an outwardly extending flange 31 projecting outwardly from the face of this member or plate and surrounding the opening 30, this flange 31 receiving a collar 32 which in turn receives a conduit section 33. The conduit 23 at its outer end is formed into a channel 23' and receives a flange 33' of the conduit section 33 whereby the sections may be slid relative to each other to disconnect one from the other when it is desired to move the cabinet 1 from the left hand side of the window as illustrated in Fig. 1 to the right hand side as will be described presently. The conduit section 33 is provided internally with partitions 34 and 35 which are aligned with partitions 36 and 37, respectively, provided in that part of the conduit 23 which extends from the section 33 of the conduit to the cabinet 1. This provides three air channels, a channel 38 communicating with the channel 19 which in turn communicates with the upper chamber 4 of the cabinet 1, a channel 39 which communicates with the intermediate channel 21 in turn communicating with the intermediate chamber 6 in the cabinet 1 and a channel 40 communicating with the lower channel 20 in turn communicating with lower chamber 7 of the cabinet 1.

With the apparatus in operation as will now be understood and assuming that the equipment is set up as shown in Fig. 1, operation of the motor

9 will cause the fan 11 to draw air through the window and through the channels 38 and 19, from whence the air will pass into the chamber 4 there to be conditioned and discharged into the room. The amount of air taken in may be regulated by a damper 41. At the same time air will be drawn by the fan 12 through the window, channels 40 and 20 to the lower chamber 7 of the cabinet 1, the fan drawing this air across the compressor and into intermediate chamber 6 from whence it discharges it from the apparatus through the channel 39 and out of the window.

The adjustable connection of the upper part 33 of the conduit 23 to the plate 27 permits of adjustment of the intake end of the conduit inwardly and outwardly of the window, as will be appreciated, so that the cabinet 1 can be moved to different distances from the wall 42 of the room in which the equipment is located. Likewise the telescopic connection 24 provided in the conduit 23 permits of the cabinet 1 being placed at different distances from the window. Likewise it is evident that the sectional member by which the conduit is connected to a window opening accommodates the equipment for use with various size windows.

Should it be desired to operate the conditioning equipment from the right side of the window, instead of the left, as has been illustrated in the drawings, it is merely necessary for example to turn the sectional member comprising the plates 27 and 28 end-for-end in the window opening so as to bring the opening 30 at the right side of the window opening instead of at the left, the conduit 33 first having been disconnected from the plate 27 and the conduit 23 from the cabinet 1.

The conduits 23 and 33 may then be separated from each other by sliding the conduit 33 in the channel 23' and reassembled by turning the conduit 23 from the position shown in Fig. 1 around 180° and sliding the same into the other side of the conduit 33.

The cabinet 1 may then be rolled to the right hand side of the window, the right hand end of the housing 17 plugged with the plug 22 and the conduit 23 connected to the left hand end of the housing 17 with its intake end connected to the opening 30.

It is to be understood that various changes may be made in the details of construction which I have hereinabove described; that the conduit 23 may be of rigid construction or flexible as desired and that the three channels 38, 39 and 40 may take the form of three separate conduits instead of the self-contained unitary structure herein described. It is to be understood also that it is within the contemplation of the present invention to make the sectional member which is placed in the window opening in any number of sections which may be found expedient, the number of sections shown in the drawings being for purposes of illustration only.

From all of the foregoing it will be appreciated that I have provided an air conditioning equipment which is extremely simple in its construction and at the same time very flexible, in that the cabinet 1 is portable, can be positioned practically at any place desired with respect to the window through which fresh air is to be taken and may be readily moved from one room to another, all of which is of great convenience for conditioning the air of dwellings, for example.

What I claim is:—

1. Air conditioning equipment comprising in

combination a portable air conditioning cabinet, a housing at one wall of the cabinet for the passage of air into the cabinet, the ends of said housing being open, a removable closure mem-

5 ber for the housing ends, and an air conduit for the cabinet adapted to have one end attached to either end of said housing, with its other end in a window opening, to adapt the cabinet for operation at either side of the window opening.

10 2. Air conditioning equipment comprising in combination an air conditioning cabinet, divided into an upper chamber, a lower chamber and an intermediate chamber, a housing attached to one wall of said cabinet and provided with an
15 upper chamber, a lower chamber and an intermediate chamber communicating, respectively, with the cabinet chambers, an air conduit, the ends of said housing being constructed so as to permit of the attachment of the end of the air

conduit to either end of said housing to adapt the cabinet and conduit for operation at either side of an air opening.

3. Air conditioning equipment comprising in combination an air conditioning cabinet, divided 5 internally into a plurality of chambers, a housing attached to one side of said cabinet and provided with chambers communicating with the first mentioned chambers, an air conducting conduit, said housing being constructed for selective at- 10 tachment of the end of said conduit to either end thereof, said conduit being divided into a plurality of channels communicating with said housing chambers, and an adjustable member for mounting in a window opening, said member 15 being equipped with means for the detachable attachment of the outer end of the conduit thereto.

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