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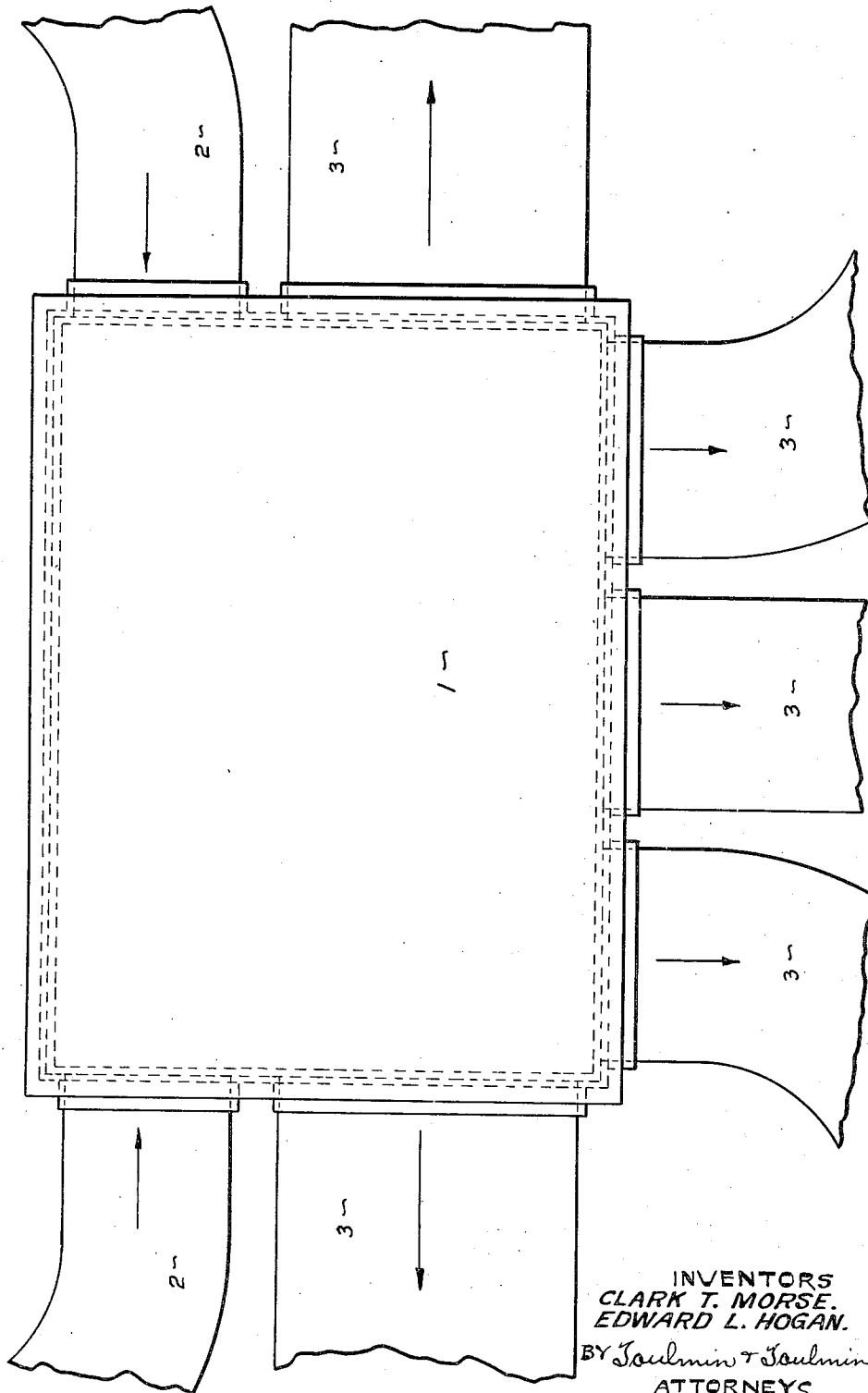
C. T. MORSE ET AL
AIR CONDITIONING APPARATUS

1,950,807

Filed Aug. 7, 1931

4 Sheets-Sheet 1

FIG. 1



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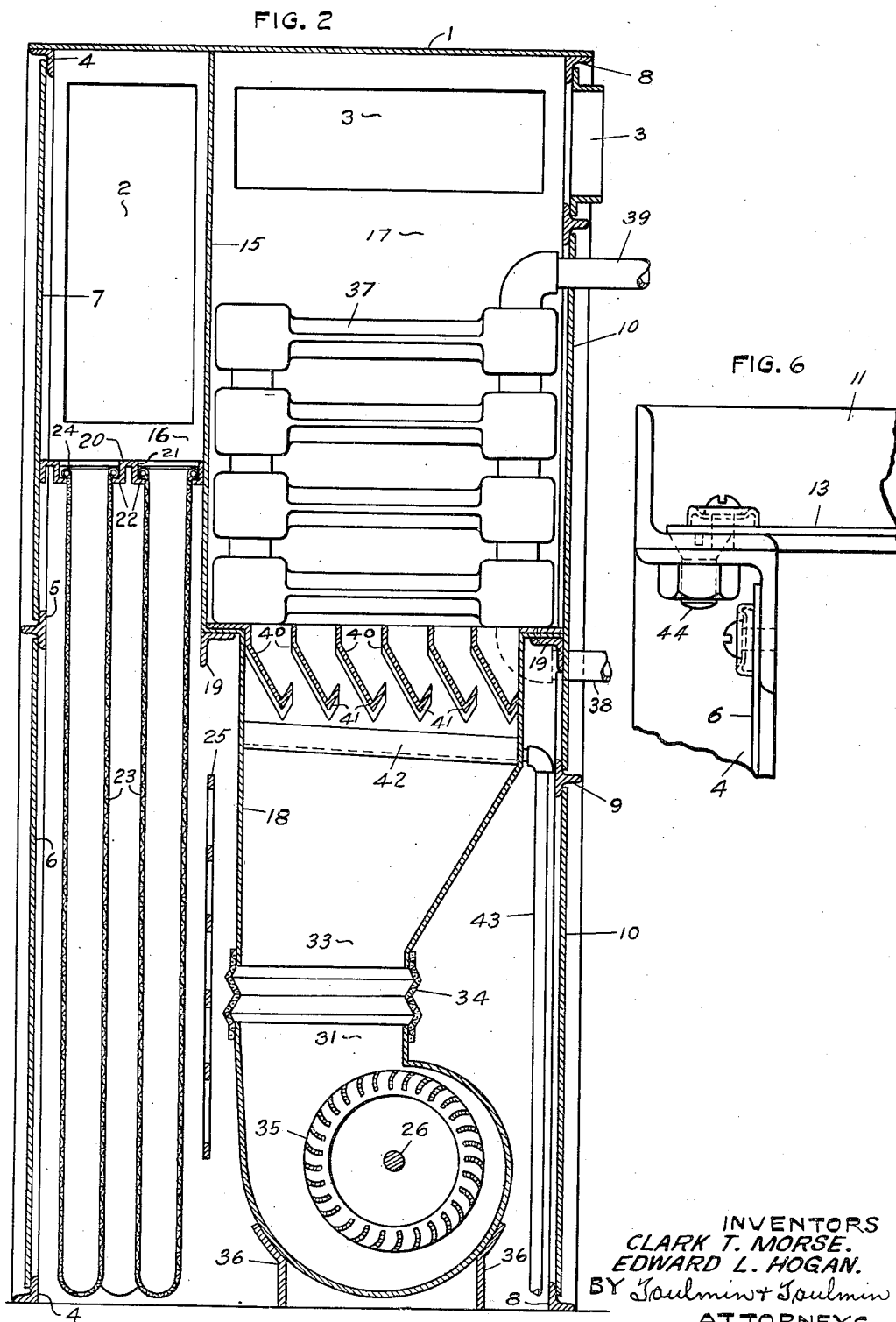
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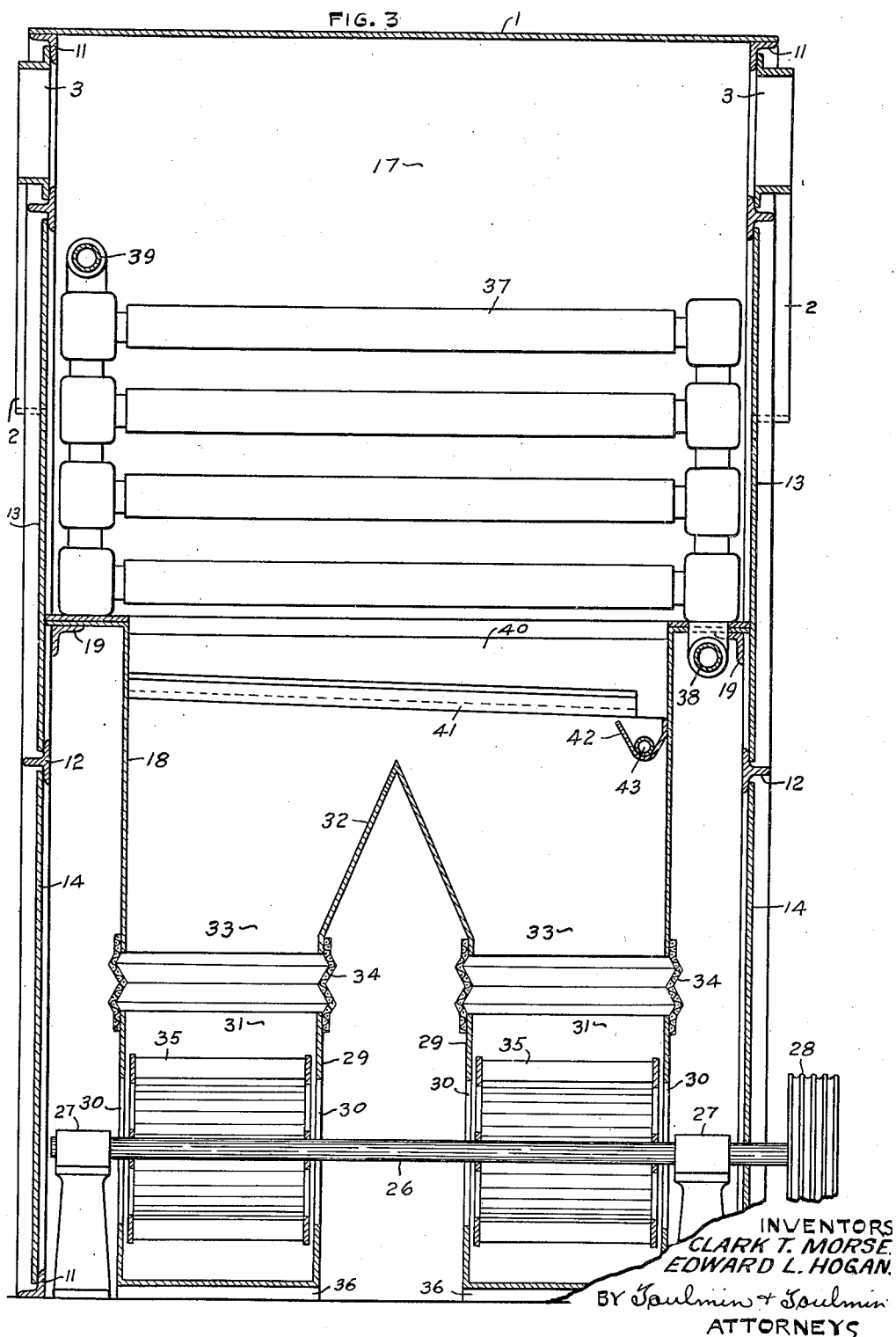
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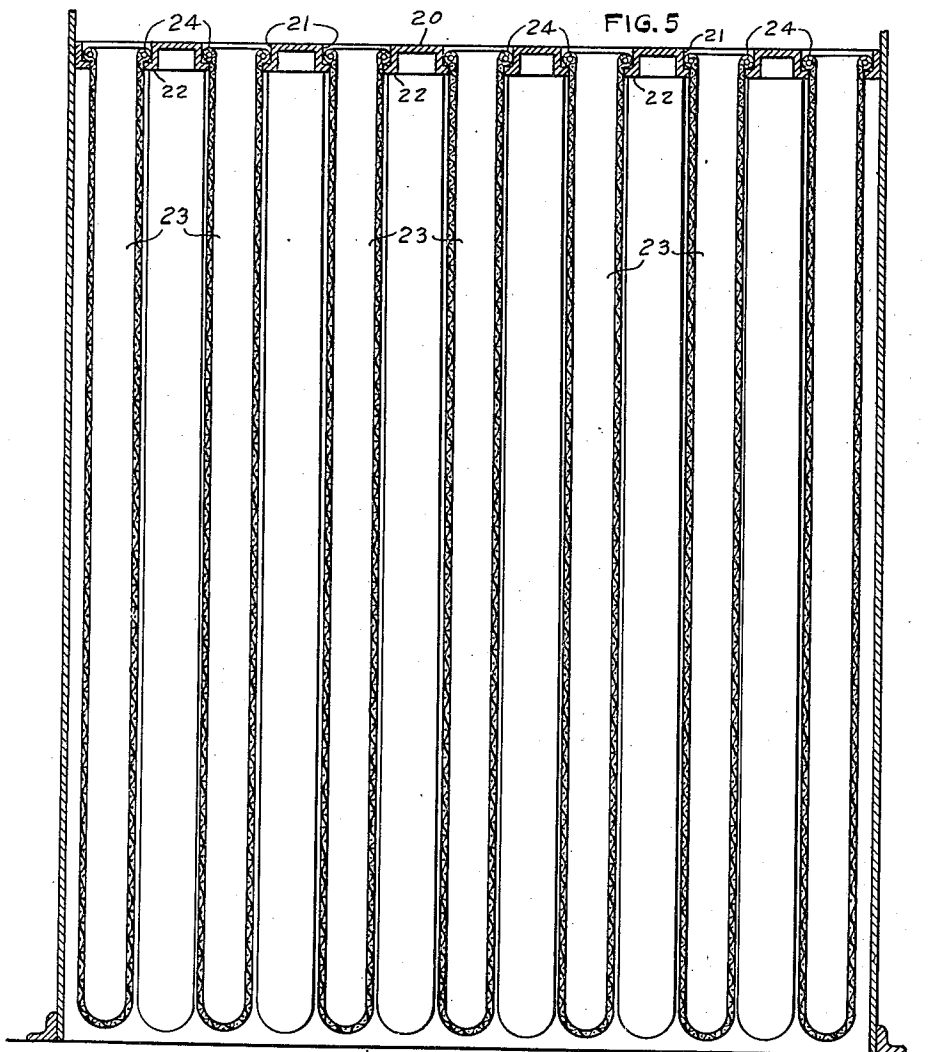
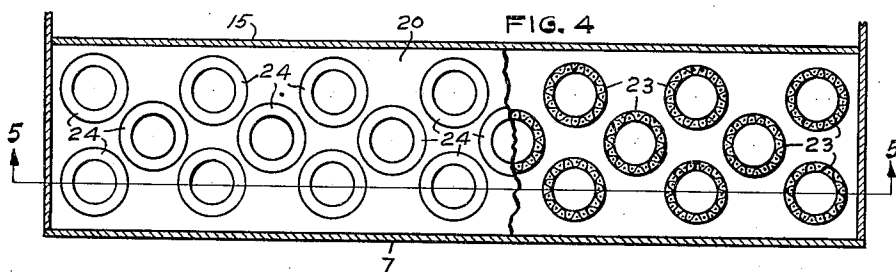
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1,950,807

AIR CONDITIONING APPARATUS

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Application August 7, 1931, Serial No. 555,778

16 Claims. (Cl. 257-9)

This invention relates to air conditioning apparatus, and has for its object to provide means to receive air from a room, condition it and discharge it back into the same or similar rooms.

It is the object of this invention to provide means for taking air from a room by means of pipes located adjacent the floor, condition the air by removing therefrom dust, germs and other foreign matter, heating or cooling the air and discharging the air thus conditioned back into rooms by means of discharge pipes located beneath the floors of the rooms.

It is also an object of this invention to provide means for forcibly withdrawing air from a room, treating it for removing dust and other foreign matter therefrom, heating or cooling the air and conducting it back into a room. In case the air is cooled, means is provided for catching the accumulated moisture, due to sweating, and conveying the moisture collected away so that it is out of the path of the current of air being conditioned.

It is also an object of this invention to provide an air conditioning apparatus in which there is means for compelling or forcing a current of air. This means is located and supported independent of the air conditioning and air treating means so that no vibration of the motor is transmitted to any part of the conditioning means.

It is a further object of this invention to provide, in connection with air conditioning means, a plurality of long, fibrous stockings in which the air is drawn and through which it passes for removing therefrom dust and solid particles, and otherwise treating the air.

These and other advantages will appear from the following description taken in connection with the drawings, in which there is shown a preferred embodiment of the invention.

Referring to the drawings:

Figure 1 is a top plan view of the air conditioning casing, showing the inlet and outlet pipes connected therewith.

Figure 2 is a vertical, transverse section through the casing and the air conditioning means therein, but showing the heating means not in section.

Figure 3 is a vertical, transverse section through the casing but showing the heating means not in section.

Figure 4 is a top plan view of the stocking support with a part of the support broken away to show the stocking structure.

Figure 5 is a vertical section on the line 5-5 of Figure 4.

Figure 6 is a detail view showing the manner in which the corners of the casing are formed.

In Figure 1 there is shown a top plan view of casing 1, which has connected to one side a pair of inlets 2. It also has connected to the other side a plurality of outlets 3. This casing, and the inlet and outlet pipes, as shown in Figure 1, are located beneath the floor of a room or building in which the air is treated, and all inlets and outlets are connected to the top of the casing. The casing is composed of sheet metal and has the usual top, as shown in Figure 1. To this top are attached sides and a front and a back.

For supporting the back there is provided around the back part of the casing back angle irons 4. These angle irons extend across the top, down the sides and across the bottom. Extending transversely and vertically between the back angle irons are T-irons 5. These T-irons and back angle irons form the back of the casing into panel structures in which there are back panels 6 and back panel doors 7. The doors are used for the purpose of inspection and reaching into the casing for any purpose, such as removing from and placing in the casing stockings or other parts of the apparatus.

In the front there are angle irons 8, similar to the back angle irons 4. There are also provided in the front T-irons 9. These T-irons divide the front into panels 10. The sides of the casing also have side angle irons 11 and T-irons 12. The sides are divided by the angle irons and the T-irons into panels 13 and side panel doors 14. The casing is substantially rectangular in shape and is mounted upon the concrete floor of a basement or some other suitable supporting means.

Extending transversely from side to side and nearer the back than the front is a partition 15. This partition extends downwardly from the top of the casing substantially half-way to the bottom of the casing. The partition 15 divides the casing into an inlet chamber and an outlet chamber. One chamber 16 is the air inlet chamber; the other chamber 17 is the air outlet or the heating chamber. It is in this chamber that the heating apparatus is located and from which the outlets extend. The partition 15 passes into and forms a substantially rectangular air duct 18. The form of this air duct is shown in Figure 2, as far as its front and rear shapes are concerned.

The lower end of the partition 15, where it passes into the air duct 18, is provided with angle irons 19 for supporting the partition at this point and the air duct. The air duct is supported be-

neath the angle irons 19. There are two of these angle irons, one in front and the other directly beneath the partition 15. The inlet chamber is provided with a floor 20, which has a plurality of holes 21 therein. Around the edge of each hole there is formed a ledge or seat 22. Into each hole there is fitted a filter stocking 23, which has on its upper end a bead 24 for resting upon the ledge. This bead is formed in the upper end of the stocking by means of a wire or a coil spring around which the open end of each stocking is coiled.

These stockings are relatively long and extend all the way from the floor of the inlet chamber to the bottom of the casing. These stockings are made of some suitable fabric, and are adapted to catch and retain dust and other foreign matter that may be in the air coming through the air inlet chamber. The fabric of these stockings may also be treated so that disease germs and other similar deleterious organisms may be removed or destroyed. The air passes through the walls of the stocking by means of suction created by a fan located beneath the heating chamber, and in order to cause the free distribution of the air to the fan there is provided a baffle plate 25. This baffle plate may be made in any suitable form or size, and has holes therein through which the air may pass.

By means of long stockings the stockings may be used for a considerable length of time before removing and cleaning. Dirt, etc. that accumulates in the stocking will drop to the bottom, and since the stockings are long, each stocking may be used for a long time before cleaning is necessary. When it is desired to clean the stockings they may be removed through the back panel door 7 and the same stocking may be replaced or another one put in its place.

Located below the heating chamber and adjacent the floor supporting the casing is a fan shaft 26 supported on supports or pillars 27. On the end of the shaft outside of the casing 29 there is a pulley 28 for rotating the shaft and fan. The casing is provided with inlets 30 for taking in the air after it has passed through the filter stockings.

The casing is also provided with outlets 31. There are two of these casings, as clearly indicated by Figure 3. The lower end of the air duct is divided into two parts by an A-shaped partition 32. This partition, with the walls of the air duct, provide two air inlets 33 into which the air duct 18 opens. These inlets are located immediately above the outlets 31 and each inlet is connected to an outlet by means of a pliable connection 34 formed of some suitable fabric, rubber or any suitable pliable material.

In each section of the fan casing there is a fan 35, rotated by the shaft 26. By means of these fans the air is drawn in through the inlets, down through the stockings, in through the inlets 30, through the outlets 31, through the inlets 33, and into the heating chamber where the air is either heated or cooled, owing to the condition of the radiators 37. The fan casing is volute in shape, with its inlets at the sides and its outlets at the top. Each fan casing is supported by means of legs 36 directly upon the floor of the basement or room in which the conditioning apparatus is located.

From an examination of Figures 2 and 3 it will appear that the fan and fan casing are supported independently of any other parts of the conditioning structure. There is absolutely no connection

whatever between the fan and the fan shaft and any other structure. There is no connection between the fan casing and any other structure except by means of the pliable connections 34, and these connections are for the purpose of preventing vibration being transmitted from the fan casing to the air duct or any other part of the conditioning apparatus.

The air tempering, heating or cooling means are the radiators 37, suitably located upon and supported by the angle irons 19 at the upper end of the air duct 18. To the radiators there is an inlet 38 and an outlet 39. For the purpose of heating the radiators steam or hot water may be used. For the purpose of cooling the radiators cold water or any other suitable liquid or gas may be used. The point at which the heating or cooling element enters the radiators is the point where there is a maximum difference between the temperature of the air and the temperature of the conditioning elements. In other words, the air to be heated comes in contact with the hottest part of the radiators. The air to be cooled comes in contact first with the coldest part of the radiators.

In order that the air passing from the fan up through the air duct 18 may be equally distributed to all parts of the radiators, distributor plates 40 are provided. These plates extend lengthwise across the casing from side to side, and each has at its lower edge a triangular trough 41. These distributor plates first extend vertically downwardly, then are bent, in the present instance, toward the front of the casing so that no air can pass through the distributor plates in a straight line, and also so that no drippings from the radiators can pass by the distributor plates without being caught in the troughs 41.

When the air is being heated these plates serve to distribute the air alone. When the air is being cooled and more or less warm air is passing over the cooling radiators, condensate is formed on the radiators so that drippage will take place, and it is the purpose of these troughs to keep any drippings that may fall from the radiators and prevent the drippings from getting into the fans or other parts of the apparatus. These troughs incline from one side to the other of the casing and conduct the condensate therefrom to a trough 42 which extends from the rear of the air duct 18 to the front, and discharges the condensate caught therein into a drain pipe 43. This drain pipe conducts the water condensed to any suitable point.

In Figure 6 there is shown a plan or scheme by which the various angle irons can be attached to each other at the corners, and also the manner in which the parts 13 and 6 are attached to the angle irons is shown. The angle irons 4 and 11 are attached to each other by means of a bolt 44. To the angle irons 4 and 11 the panels 6 and 13 are attached. This figure illustrates the manner in which the angle irons are attached to each other at each corner of the casing, and also illustrates the manner in which the panels are attached to the angle irons.

We desire to comprehend within our invention such modifications as may be embraced within our claims and the scope of our invention.

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

1. In an air conditioning apparatus, a casing having an inlet chamber and an outlet chamber, said inlet chamber having a floor with air holes

therein, filter means in said holes, and means in the casing supported independent of the casing to cause a current of air from the inlet chamber through the filter means to the outlet chamber.

2. In an air conditioning apparatus, a filter therefor consisting of a plate member having a plurality of holes therein, the plate member around each hole being formed into a bench-like seat, and a long fibrous stocking-like filter member in each hole, each stocking having a bead formed around its open end and adapted to rest in the seat.

3. In an air conditioning apparatus, a casing having an inlet chamber with a floor having holes therein, a long stocking-like filter member in each hole extending substantially to the bottom of the casing, suction means located to one side of the filter members, and means between the suction means and the filter members to distribute the air to the suction means.

4. In an air conditioning apparatus, a casing having an inlet chamber with a floor having holes therein, a long stocking-like filter member in each hole extending substantially to the bottom of the casing, suction means located to one side of the filter members, and means between the suction means and the filter members to distribute the air to the suction means, said last-named means consisting of a baffle plate having a plurality of holes therein.

5. In an air conditioning apparatus, a casing having an air inlet and an air outlet at the top thereof, a fan casing having an inlet and an outlet supported in the bottom of the casing independent of the casing, an air duct in the casing adapted to direct the air to the casing outlet, and a yielding connection between the fan casing and the air duct.

6. In an air conditioning apparatus, a casing having an air inlet and an air outlet at the top thereof, a fan casing having an inlet and an outlet supported in the bottom of the casing independent of the casing, an air duct in the casing adapted to direct the air to the casing outlet, and a yielding connection between the fan casing and the air duct, said yielding connection consisting of a fibrous tube.

7. In an air conditioning apparatus, a casing having an inlet opening and an outlet chamber, temperature regulating means in the outlet chamber, an air duct for directing air to the chamber, a fan having a casing with an inlet and an outlet supported independent of the first-named casing, and a yielding connection between the fan casing outlet and the air duct.

8. In an air conditioning apparatus, means to produce a current of air, means to remove from the current of air foreign matter, means to cool the air in the current, and means to distribute the air over the air cooling means and to catch any moisture precipitated by the cooling means.

9. In an air conditioning apparatus, means to produce a current of air, means to remove from the current of air foreign matter, means to cool the air in the current, and means to distribute the air over the air cooling means and to catch any moisture precipitated by the cooling means, said last-named means consisting of a plurality of downwardly inclined plates, each having a trough on its lower edge.

10. In an air conditioning apparatus, means to produce a current of air, means to remove from the current of air foreign matter, means to cool the air in the current, means to distribute the air over the air cooling means and to catch any

moisture precipitated by the cooling, said last-named means consisting of a plurality of downwardly inclined plates, each having an inclined trough on its lower edge, and means to receive the moisture from the troughs and conduct it away.

11. In an air conditioning apparatus, a casing having a partition forming the upper end of the casing into an inlet chamber and an outlet chamber, said partition having its lower end formed into an air duct, means to support the upper end of the air duct, temperature regulating means supported by said support means, filtering means supported below the inlet chamber, and means supported independent of the casing for drawing air into the inlet chamber and through the filtering means and forcing it up through the air duct and the temperature regulating means into the exit chamber.

12. In an air conditioning apparatus, a casing having a partition forming the upper end of the casing into an inlet chamber and an outlet chamber, said partition having its lower end formed into an air duct, means to support the upper end of the air duct, temperature regulating means supported by said support means, filtering means supported below the inlet chamber, means supported independent of the casing for drawing air into the inlet chamber and through the filtering means and forcing it up through the air duct and the temperature regulating means into the exit chamber, and means to catch moisture precipitated by the temperature regulating means and conduct it out of the casing.

13. In an air conditioning apparatus, a casing having a partition forming the upper end of the casing into an inlet chamber and an outlet chamber, said partition having its lower end formed into an air duct, means to support the upper end of the air duct, temperature regulating means supported by said support means, filtering means supported below the inlet chamber, means supported independent of the casing for drawing air into the inlet chamber and through the filtering means and forcing it up through the air duct and the temperature regulating means into the exit chamber, and means to catch moisture precipitated by the temperature regulating means and conduct it out of the casing, said means including a plurality of inclined plates, each having an inclined trough on its lower edge.

14. In combination, a relatively narrow vertically disposed casing having an open bottom with air inlet and exit at the top of the casing, a partition in said casing between said air inlet and air outlet openings at the top, a narrow filtering chamber to one side of said casing below the inlet extending to the bottom of the casing having a plurality of rows of depending textile stockings, a fan mounted on the floor at the bottom of the casing having a casing projecting upwardly towards the outlet joining the partition, a radiating unit between the fan and the outlet at the top of the casing, whereby the air is taken in at the top of the casing, drawn downwardly through the filter in the filtering chamber to the bottom of the casing, discharged upwardly over the radiating unit and out of the top of the casing, and a foraminous guard plate near the bottom of the casing between the filter and the fan.

15. In an air conditioning apparatus, a casing having an air inlet passageway and an air outlet passageway arranged in parallelism and communicating with one another at their bottoms through the casing, an air moving means below

said passageways interposed between them, an air cooling means in the outlet passageway above the air moving means, and a plurality of troughs between the air moving means and the air cooling means below the cooling means to collect the moisture precipitated by the air cooling means.	said passageways interposed between them, an air cooling means in the outlet passageway above the air moving means, and a plurality of troughs between the air moving means and the air cooling means below the cooling means to collect the moisture precipitated by the air cooling means, and means to receive the moisture from the troughs to conduct it away from the casing.
16. In an air conditioning apparatus, a casing having an air inlet passageway and an air outlet passageway arranged in parallelism and communicating with one another at their bottoms through the casing, an air moving means below	CLARK T. MORSE. EDWARD L. HOGAN.
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