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C. M. JONES

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HIGH SPEED AIR CONDITIONER CIRCULATING CHAMBER

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2 Sheets-Sheet 1

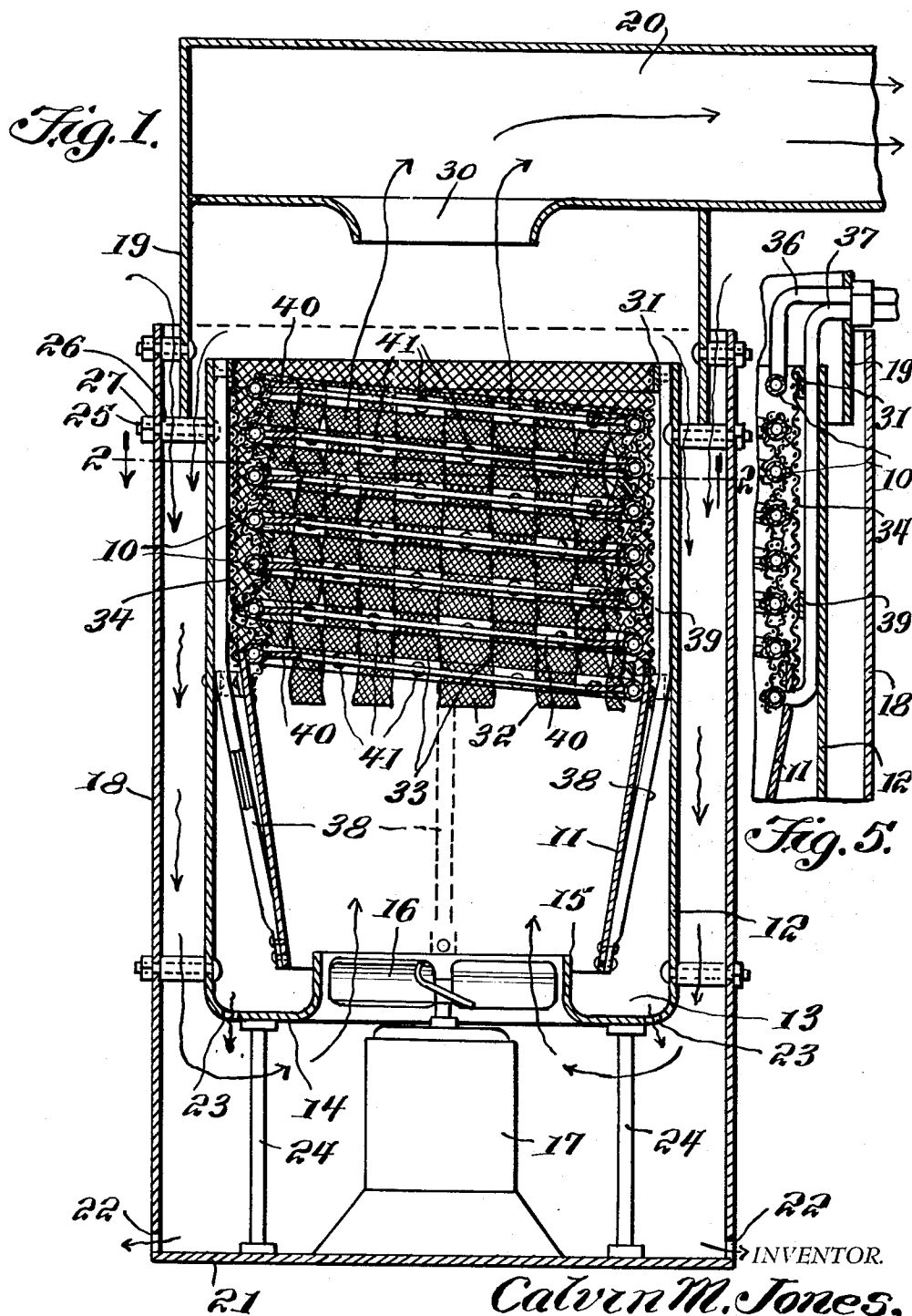


Fig. 5.

INVENTOR.
Calvin M. Jones,
BY *Victor J. Evans & Co.*

ATTORNEYS

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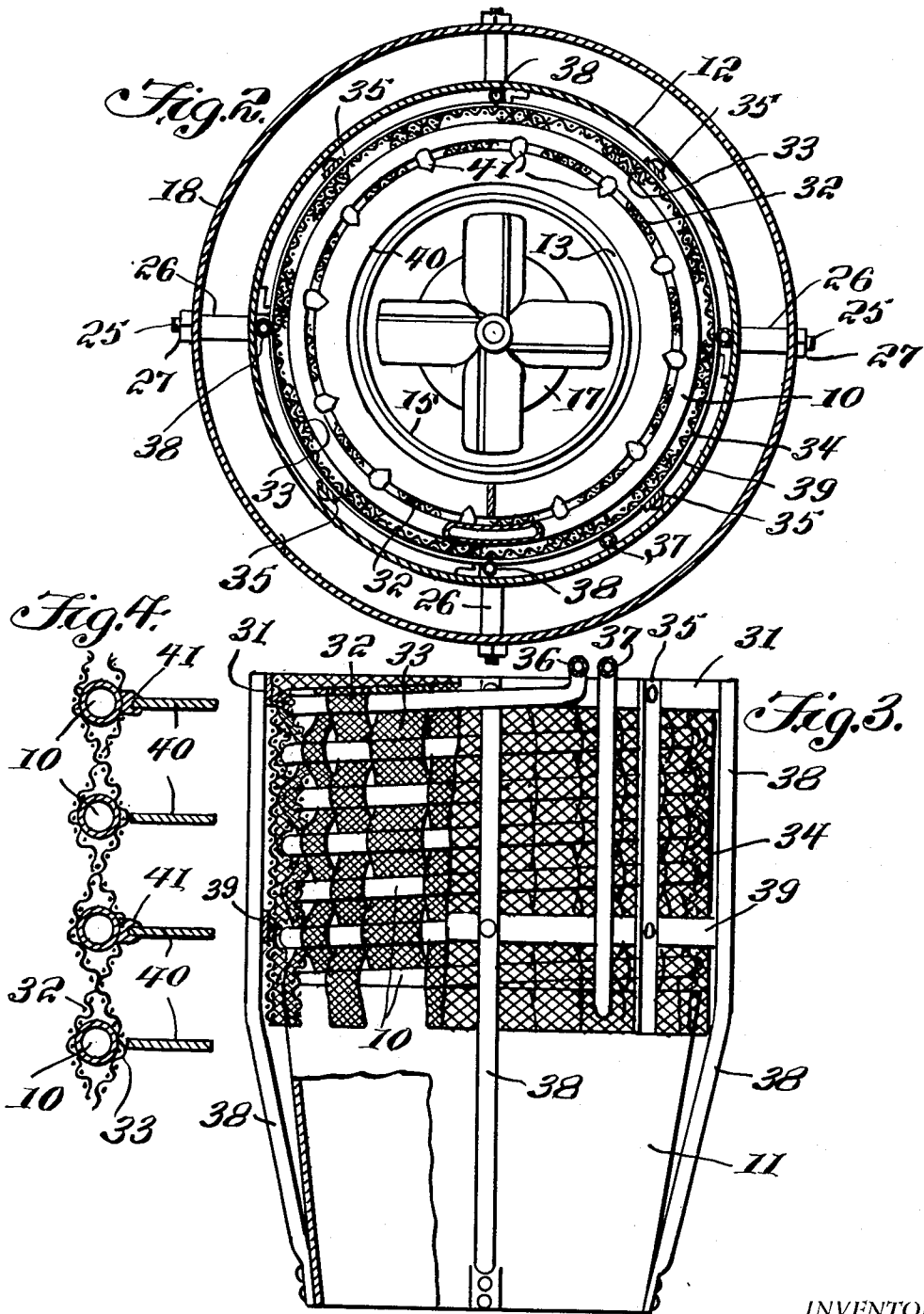
C. M. JONES

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INVENTOR.
Calvin M. Jones,
BY *Vieta J. Evans & Co.*

ATTORNEYS

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HIGH SPEED AIR CONDITIONER CIRCULATING CHAMBER

Calvin M. Jones, Miami, Fla.

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5 Claims. (Cl. 62—140)

This invention relates to air conditioning and circulating or distribution units wherein moisture is removed from air and the air is cooled or heated and supplied to distributing ducts of a building or the like, and in particular a unit in which air circulated by a fan through a cylindrical shaped section providing a vortex is circulated over a cylindrical coil with vertically disposed wire mesh strips woven through the coil and with air circulated from the periphery of the coil discharged into incoming air and recirculated with said incoming air.

The purpose of this invention is to provide an air conditioner that handles a comparatively large volume of air whereby fresh air only is circulated through the device and the necessity for recirculating air of a room or other enclosure is eliminated.

With the conventional type of air conditioning system air of a room or other enclosure is drawn into an air conditioning unit and discharged into the room or enclosure from which it is drawn. By this means the same air is reused or recirculated and the use of fresh air, continuously, in air conditioning units has not been considered practical because it is impossible, with conventional units to circulate a sufficient quantity of air. With this thought in mind this invention contemplates an improved air conditioning unit through which a comparatively large quantity of air is circulated and which is so constructed that the air contacts both inner and outer surfaces of a coil, with the air being retained in suspension on both sides of the coil with wire mesh.

The object of this invention is, therefore, to provide means for constructing an air conditioning unit whereby a sufficient quantity of air is circulated and treated to make it possible to use only fresh air, thereby eliminating the necessity of recirculating foul air.

Another object of the invention is to provide a high speed air conditioning unit that is also adapted to be used as a cooling device particularly for cooling fluid of compressors, engines, and other power devices.

A further object of the invention is to provide an air conditioning, circulating and distribution unit that is adapted to circulate comparatively large quantities of air and that is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies a cylindrical outer housing having an open upper end, an inner casing concentric with and spaced from the outer casing and supported with the lower end in spaced relation to the lower end of the outer casing, a substantially cylindrical coil concentric with and spaced inwardly from the inner casing and having a frusto-conical shaped shell extended downwardly from the lower end thereof, vertically disposed wire mesh screens interwoven with the coil, a cylindrical screen around the coil, a circulating fan positioned in an opening in the lower end of the inner casing, a cylindrical skirt extended downwardly into the upper end of the outer housing and positioned between the inner casing and outer housing and a circulating duct extended from said skirt.

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Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a vertical section through the improved air conditioning and circulating unit taken substantially on the center of the coil and housing.

Figure 2 is a sectional plan through the unit taken on line 2—2 of Fig. 1.

Figure 3 is a side elevational view illustrating the coil and screen combination, with parts on one side broken away and shown in section.

Figure 4 is a detail showing the wire mesh sections woven through one side of the coil.

Figure 5 is a detail illustrating the connections to the coil.

Referring now to the drawings wherein like reference characters denote corresponding parts the improved air conditioning and circulating device of this invention includes a coil 10, preferably formed of copper tubing, a frusto-conical shaped shell 11 depending from the lower end of the coil, an inner cylindrical casing 12 having a trough 13 in the lower end formed with an inwardly extended horizontally disposed flange 14 and an upwardly extended sleeve 15, a fan 16 positioned in the sleeve 15 and operated by a motor 17, an outer housing 18, a skirt 19 and a circulating duct 20.

The outer housing 18 is provided with a base 21 which provides a closure for the lower end and, as shown in Fig. 1 the upper end of the outer housing is open. The lower edge of the wall of the housing 18 is provided with drain openings 22 and similar drain openings, as indicated by the numeral 23, are provided in the flange 14 of the inner casing 12.

The inner casing 12 is supported by spaced posts 24 or other suitable means and the shell 11 is supported from the inner casing 12 with radially disposed bolts 25 having spacing sleeves 26 and nuts 27 thereon.

The upper end of the inner casing 12 is spaced below the upper end of the outer housing 18 and the skirt 19 extends downwardly into the area between the inner casing and outer housing with the lower end of the skirt spaced below the upper end of the inner casing 12.

The duct 20, which may be of any suitable shape in cross section is provided with an inlet opening 30.

The inner and outer surfaces of the coil 10 are covered with vertically disposed wire mesh screens 32 and 33 and an additional screen, as indicated by the numeral 34 is provided on the outside. The vertically disposed screen sections 32 and 33 are woven through the coil, as illustrated in Figure 4, and the upper ends are secured to a band 31 by rivets or the like.

The coil is also provided with vertically disposed strips 35 and the ends of the coil extend through the inner casing, skirt, and outer housing providing connections 36 and 37 by which the coil may be connected to a compressor or the like. It will be understood, however, that the connections from the coil may extend through the parts of the unit at a different point or at different points and also that the coil may be covered with other suitable screening or filtering elements.

The outer surface of the coil is also provided with spaced vertically disposed stays 38 which extend from the band 31 to the lower end of the shell 11. A band 39 is also provided around the outer surface of the cylindrical screen 34 and this band is connected to the lower ends of the strips 35.

The coil is also provided with a spiral vane 40 which is supported from the inner surfaces of the coils with connectors 41, as shown in Figure 4.

With the parts arranged in this manner the fan or blower 16, which is provided with efficiently formed blades circulates the air at high speeds as indicated by

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the arrows with the air at the center of the vortex passing upwardly through the opening 30 into the duct and with the air passing around the shell and coil passing downwardly between the skirt and inner casing and mixing with incoming air entering the upper end of the outer housing also as indicated by the arrows.

The cooled air passes from the duct to points in a building or the like.

It will be understood that modifications, within the scope of the appended claims, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. An air conditioner comprising a coil, the axis of which is vertically disposed, an inverted frustro-conical shaped shell depending from the lower end of the coil, a blower mounted in the lower end of the frustro-conical shaped shell and positioned to blow upwardly through the coil, a wire mesh cylindrical element surrounding the coil, depending strips of wire mesh interlaced through the coil, a cylindrical inner casing positioned around the coil and spaced outwardly from the cylindrical wire mesh element, an outer housing positioned around the casing and spaced therefrom, a skirt extended downwardly from the upper end of the housing into the area between the casing and housing, a duct having an opening positioned to register with the upper end of the coil secured to the upper end of the skirt and adapted to extend from the device.

2. In an air conditioner, the combination which comprises a coil, the axis of which is vertically disposed, an inverted frustro-conical shaped shell depending from the lower end of the coil, a blower positioned in the lower end of the shell and adapted to discharge air upwardly through the shell and coil, a spiral vane suspended from the inner surface of the coil and adapted to circulate air around the inner surface of the coil providing a vortex, vertically disposed wire mesh strips interlaced through the coil, a cylindrical wire mesh screen extended around the coil, an inner casing positioned around the screen and spaced therefrom, an outer housing positioned around the casing and spaced therefrom, and a duct extended from the upper end of the housing.

3. An air conditioner comprising a coil, the axis of which is vertically disposed, a frustro-conical shaped shell extended from the lower end of the coil, vertically disposed screen sections woven through the coil, a casing having an annular trough in the lower end spaced from and positioned around said coil, a blower positioned on the axis of the coil and mounted in an area around which the trough of the inner casing extends, an outer housing

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spaced from and positioned around the inner casing, a skirt extended downwardly into the upper end of the housing and positioned between the housing and casing, and a duct having an opening therein extended from said skirt.

4. In a high speed air conditioning unit, the combination which comprises a vertically disposed refrigerant coil, screens covering inner and outer surfaces of said coil, a frustro-conical shaped shell depending from the coil, an inner casing positioned around and spaced from the coil and shell, said inner casing having a horizontally disposed inwardly extended annular flange with a vertically disposed upwardly extended sleeve on the inner edge at the lower end, a blower having blades positioned in said sleeve and adapted to circulate air through the shell and coil creating a vortex in the area within the shell and coil, an outer housing surrounding the inner casing and spaced therefrom, means supporting the inner casing with the blades of the blower positioned in said sleeve, and a skirt with an opening in the upper end positioned above the housing and extended downwardly into the area between the housing and inner casing.

5. In a high speed air conditioning unit, the combination which comprises a vertically disposed refrigerant coil, vertically disposed wire mesh sections woven through the coil, a cylindrical screen positioned around the outer surface of the coil, a frustro-conical shaped shell depending from the coil, an inner casing positioned around and spaced from the coil and shell, said inner casing having a horizontally disposed inwardly extended annular flange with a vertically disposed upwardly extended sleeve on the inner edge at the lower end, a blower having blades positioned in said sleeve and adapted to circulate air through the shell and coil creating a vortex in the area within the shell and coil, an outer housing surrounding the inner casing and spaced therefrom, means supporting the inner casing with the blades of the blower positioned in said sleeve, and a skirt with an opening in the upper end positioned above the housing and extended downwardly into the area between the housing and inner casing.

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