

W. S. POPE.

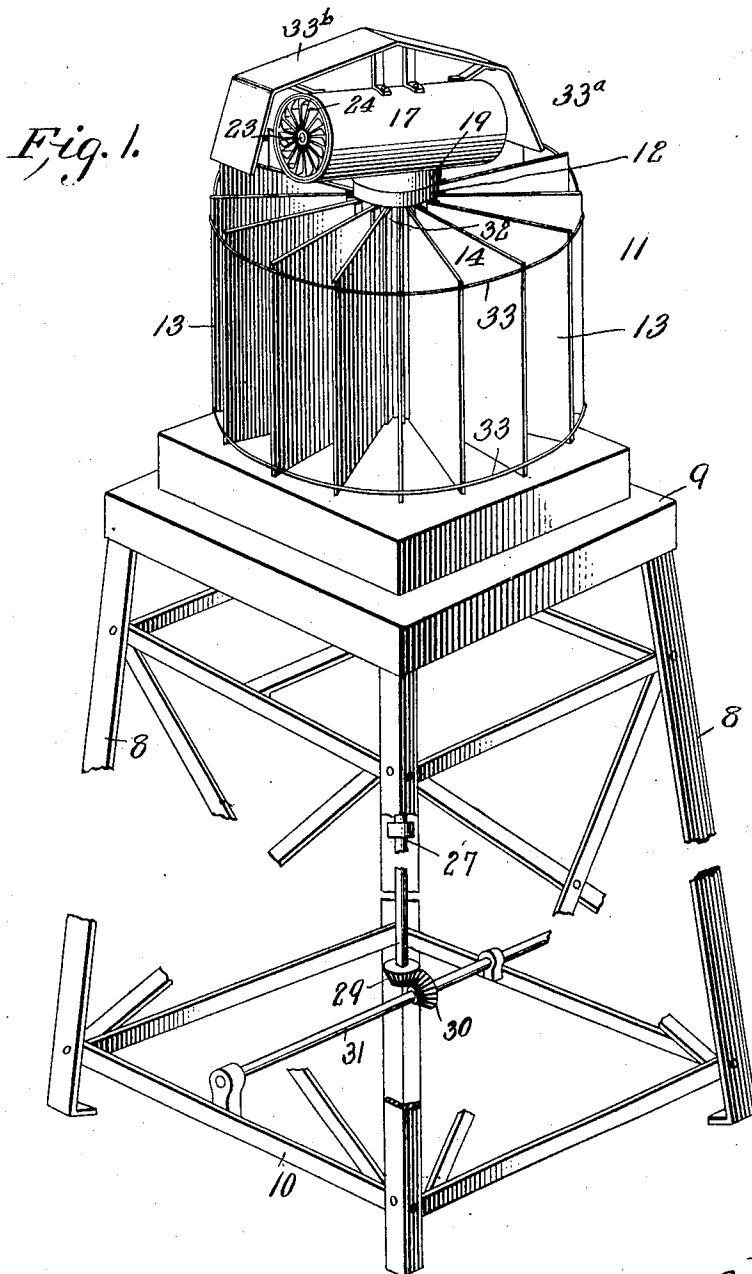
WINDMILL.

APPLICATION FILED DEC. 31, 1907.

918,364.

Patented Apr. 13, 1909.

3 SHEETS—SHEET 1.



Witnesses.
Jos F Collins
R. C. Braddock.

Inventor:
William S. Pope
By William D. Deane
his Attorney.

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3 SHEETS—SHEET 2.

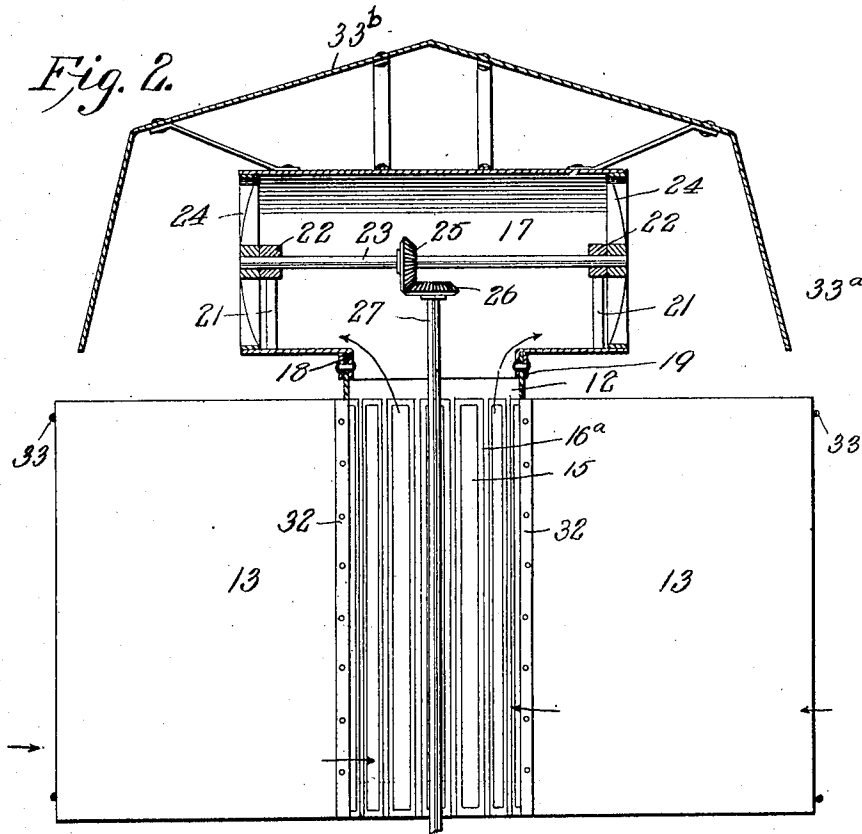
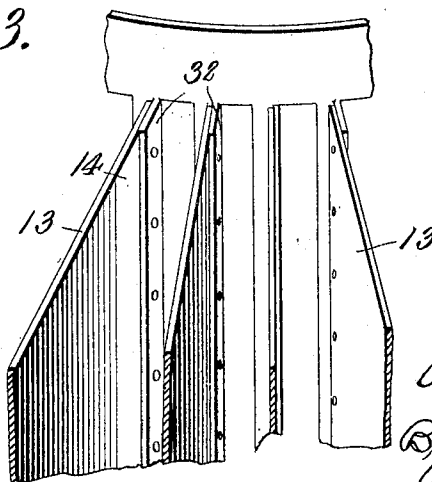


Fig. 3.



Witnesses.

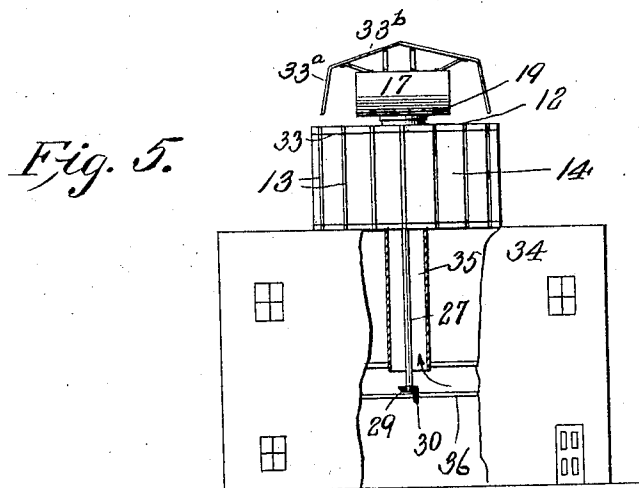
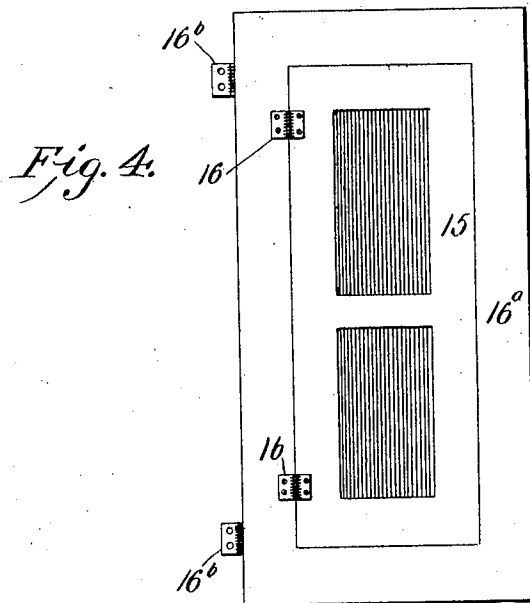
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R. C. Braddock

Inventor.

William S. Pope

By William C. Seane
Attorney.

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his Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM S. POPE, OF SUFFOLK, VIRGINIA.

WINDMILL.

No. 918,384.

Specification of Letters Patent.

Patented April 13, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM S. POPE, a citizen of the United States, residing at Suffolk, in the county of Nansemond and State of Virginia, have invented certain new and useful Improvements in Windmills, of which the following is a specification.

The present invention consists of certain new and useful improvements in wind mills.

10 The principal object of the invention is to provide a wind mill in which the currents of air are first conveyed to a central chamber, and from said central chamber conveyed to an upper chamber, the exit ends of which
15 each have a wind wheel mounted therein on suitable shafting, the said wind wheels being so arranged whereby the rush of air currents from the upper chamber will cause them to revolve, and through the medium of their
20 shaft and a shaft extending through the central chamber, produce a power that may be used for various purposes.

Another object is to provide a housing divided into compartments having communication with a central air conveying chamber, the said central chamber being provided with means that will prevent the admission of air currents thereto from directions other than that in which the said air currents are
30 moving.

Another object is to provide a safety device for said central air conveying chamber which will prevent the air pressure within said chamber becoming too great.

35 Another object is to provide a central air chamber with a plurality of doors, the said doors being mounted at the end of each of the compartments in suitable outwardly swinging frames and being adapted to be
40 opened by the pressure of the air which has been conveyed to them through the said compartments.

Another object is to so arrange the housing whereby a stationary cylindrical structure is formed, the said structure comprising
45 a central air conveying chamber, a plurality of partition walls radiating therefrom, the said walls being spaced apart to provide a plurality of compartments, and doors mounted
50 in outwardly swinging spring hinged frames in said central chamber and located at the junction of the compartments and the said chamber.

Another object is to so arrange the radiating walls whereby there will be formed compartments pointing in all directions, so that

it will be possible to guide air currents to the central chamber no matter what direction the air currents may be moving.

With the above and other objects in view, 60 the invention comprises certain details of construction and combination of parts set forth in detail in the following description, pointed out in the claims and illustrated in the accompanying drawings. 65

In the accompanying drawings in which like characters of reference refer to corresponding parts, and in which I have illustrated a preferred embodiment of my invention—Figure 1 is a perspective view of the 70 windmill. Fig. 2 is a longitudinal section through the housing and upper chamber. Fig. 3 is a detail view of the central air conveying chamber, showing the preferred means for mounting the partition walls. 75 Fig. 4 is a detail view of one of the doors of the central air chamber, showing its mounting within the spring-hinged frame. Fig. 5 is a sectional view of a building showing the invention applied thereto to act as a ventilator as well as a power producing medium. 80

Referring to the drawings 8 designates a skeleton frame, which may be of the usual or any preferred type, provided with the upper platform 9 and base 10. Upon said upper 85 platform 9 a vertically arranged housing is rigidly secured, said housing being designated in its entirety by the numeral 11. Said housing 11 comprises a central, vertically arranged cylindrical air conveying chamber 12, 90 from which radiate a plurality of partition walls 13, said walls being spaced apart to form compartments 14. The said walls 13 may be of either wood or metal and are in the form of flat strips vertically arranged and are 95 so disposed relatively that the distance between their outer ends is greater than the distance between their inner ends where they are connected to the central air chamber 12. At the junction of each of the compartments 100 with the central air chamber 12, the said central air chamber is provided with an inwardly opening door 15, mounted on spring hinges 16, in a frame 16^a that is mounted on spring hinges 16^b arranged to open outwardly, or in 105 a direction opposite to the opening movement of the said doors.

A horizontally disposed upper chamber 17 is provided with a central depending tube portion 18, which is of smaller diameter than 110 the upper end of the central air chamber 12, into which it is placed, and is held therein by

means of a ring or collar 19, carried by the upper end of the central cylinder 12.

Within the upper chamber 17, and adjacent to each end thereof, are arranged suitable rests 21, which support bearings 22 for a horizontal shaft 23. Said shaft is extended through its bearings 22 and upon each end thereof a windwheel 24 is mounted. The arrangement of said windwheels 24 relative to the ends of chamber 17 is such that said windwheels are just within the ends thereof and are of a size to permit of their free rotation therein. A beveled gear wheel 25 is mounted fast on said shaft 23, in a position directly over the vertical tube portion 18 of the chamber 17, and a complementary bevel gear 26 mounted on the upper end of a vertical shaft 27, is in a position to mesh with said bevel gear 17. The said vertical shaft 27 extends down through the tube portion 18, through the vertical central air chamber 12, to the base of the skeleton supporting frame 8, bearings being interposed at intervals in said skeleton frame for the purpose of reducing friction. The lower portion of said shaft 27 is provided with a gear wheel or the like, 29, which may engage with another gear wheel 30 carried by a shaft 31, to which power is to be applied.

A roof or covering 33^b is carried by the upper chamber 17, the ends thereof being projected beyond the said upper chamber and provided with depending end portions 33^a, which are disposed a slight distance ahead of the end openings of said chamber. The said end portions 33^a serve the important purpose of preventing exterior currents of air from operating against the windwheels 24 and interfering with the action on said windwheels of the blast of air which finds egress through the chamber 17. It will also be manifest that the roof or covering 33^b as a whole excludes rain from the working parts of the windmill and in that way prolongs the usefulness of said parts.

The operation of the windmill is as follows:—It is understood that the housing is held immovably on the platform 9, and that from the central vertically arranged air conveying chamber, compartments 14 radiate in all directions. It will therefore be seen that no matter what direction the air currents are moving, they will be caught by some of the said compartments and thereby guided to the doors at the ends thereof. Owing to the tapering formation of said compartments, it will be seen that the pressure of the air at the inner ends of the compartments will be considerably greater than at their outer ends, which pressure will be sufficient to cause the opening of the doors in the central air chamber, to admit the air into said chamber. As the amount of air in said central chamber increases, it will be forced upward and into the upper horizontal chamber

17 and out through the windwheels 24, the rush of said air through the said windwheels causing them to revolve, which rotary movement is communicated to the horizontal shaft 27, and, through the gear wheels 25 and 26, to the vertical shaft 27, and from said shaft 27, to the lower horizontal shaft 31, through the medium of the gears 29 and 30.

It will be understood that by means of the spring hinges of the doors, said doors will be normally retained in their closed position, only opening when the pressure of the air brought against them is sufficient to overcome the tension of the springs of the hinges. And it will be further understood that these doors 15 are arranged entirely around the central chamber 12, and that therefore no matter through which one of the doors the air is entering, there will be a corresponding door at the opposite side of the chamber that will be kept closed, through the medium of the spring hinges which will be assisted by the contact of the in-rushing air thereagainst.

By reference to Fig. 4 of the drawings, it will be seen that each of the doors 15 is mounted in a frame 16^a, which is hinged to the central chamber. Both said doors and frames are mounted upon springs hinges, arranged to permit of the doors and frames being swung in opposite directions. This form of mounting of the doors and frames constitutes the safety feature of the invention, the operation of which is as follows:—The hinges 16^b of the frame are arranged to have an opposite movement to that of the hinges of the doors, and said hinges 16^b are of sufficient strength to normally retain said frame in a position to receive the doors when they are in their closed position. But when the pressure of the air within the chamber is above the normal, such for instance as during heavy storms, the pressure exerted against said frames will be such as to cause them to swing outwardly, and permit the excess of air to escape.

In Fig. 3 of the accompanying drawings I have illustrated a preferred form of connection between the partition walls 13 and the central air chamber 12. By reference to said figure it will be seen that the spaces which form the doorways are provided by first slitting the metal and then bending outwardly each side of the slit to form flanges 32, to each of which one of said walls are riveted. The hinges of the door frames are attached to the inner part of the central chamber, and are so arranged that the door frames and doors will be in a position to completely close the openings formed by the removal of the slitted portions. By this form of connection, it will be seen that a strong and durable connection is made, and it will be further understood that the attaching flanges can be made in said chamber at the time the chamber is being manufactured.

While this form of connection is one that has been found to be practicable and serviceable, I do not wish to be limited thereto, as other, or preferred, attaching means may be used without departing from the spirit of my invention.

To provide for a reinforcement of the outer ends of the partitions, metal bands or hoops 33 are placed around said ends and secured to each end in any suitable or preferred manner.

In Fig. 5 of the drawings I have illustrated my invention as applied for ventilating purposes as well as for providing power. By reference to said figure it will be seen that the housing 11 is mounted on the top of a building 34 into which a pipe 35 carried by the lower portion of the central chamber 12 extends. The shaft 27 is extended down into said building and is connected with a power shaft 36, which may be employed for running light machinery of any description. In this form of the invention it will be seen that the rush of air through the central chamber and out through the windwheels at the ends of the upper horizontal chamber, in addition to causing the rotation of the windwheels and through its shaft and connecting shaftings, produce a power, will also cause a suction having an upward trend to be formed in the central chamber 12, the force of which is imparted within the pipe 35 and through said pipe 35 to the room, thereby drawing air from all parts of said room to said pipe and through it and the central air chamber and upper horizontal chamber, to the outside atmosphere.

I claim as my invention:—

1. A windmill having an air chamber provided with means for admitting air, means for conducting air from said chamber and terminating in a horizontally-disposed outlet for the air, power producing means mounted in said air-conducting means to be actuated by the passage of air through said outlet, and a covering arranged above the said outlet and having a depending portion located in front of and separated by an intervening space from the outlet.

2. A windmill comprising a stationary housing provided with an air chamber, means for conveying air to said chamber, a horizontally disposed chamber having open ends, positioned above the first named chamber and in communication therewith, power producing means arranged within the upper chamber, and a covering carried by the upper chamber extending across the open ends thereof.

3. A windmill comprising an air chamber having a horizontally-disposed inlet for air, a spring mounted frame at said inlet to swing outward, a spring mounted door in said frame

to swing inward, means for conducting air from said chamber, and power producing means mounted in said conducting means to be actuated by the passage of air from said chamber.

4. A windmill comprising an air chamber having a horizontally-disposed inlet for air, a spring mounted frame at said inlet to swing outward, a spring mounted door in said frame to swing inward, a chamber disposed above and communicating with the first named chamber and having a horizontally-disposed outlet for air, power producing means mounted in the second named chamber to be actuated by the passage of air through said outlet, and a covering arranged above the said outlet and having a depending portion located in front of and separated by an intervening space from the outlet.

5. A windmill comprising a stationary air chamber, compartments radiating therefrom, a spring mounted frame at the junction of each compartment to swing outward, a spring mounted door in the frame to swing inward, a chamber disposed above and communicating with the first-named chamber and having horizontally disposed outlets or open ends, power producing means arranged within the upper chamber, and a covering carried by the upper chamber and extending across the open ends thereof.

6. A windmill comprising a stationary air chamber, compartments radiating therefrom, a spring mounted frame at the junction of each compartment to swing outward, a spring mounted door in the frame to swing inward, a chamber disposed above and communicating with the first-named chamber and having horizontally disposed outlets or open ends, power producing means arranged within the upper chamber, a covering carried by the upper chamber and extending across the open ends thereof, a building supporting the stationary air chamber, a conduit for air between said air chamber and the interior of the building, and a driving connection extending through said conduit and between the power producing means and the interior of the building.

7. A windmill comprising a stationary air chamber, compartments radiating therefrom, a spring mounted frame at the junction of each compartment to swing outwardly, a spring mounted door in the frame to swing inwardly, and a power producing means carried by the chamber.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM S. POPE.

Witnesses:

E. W. JORDAN,
F. W. LLOYD.