

No. 702,581.

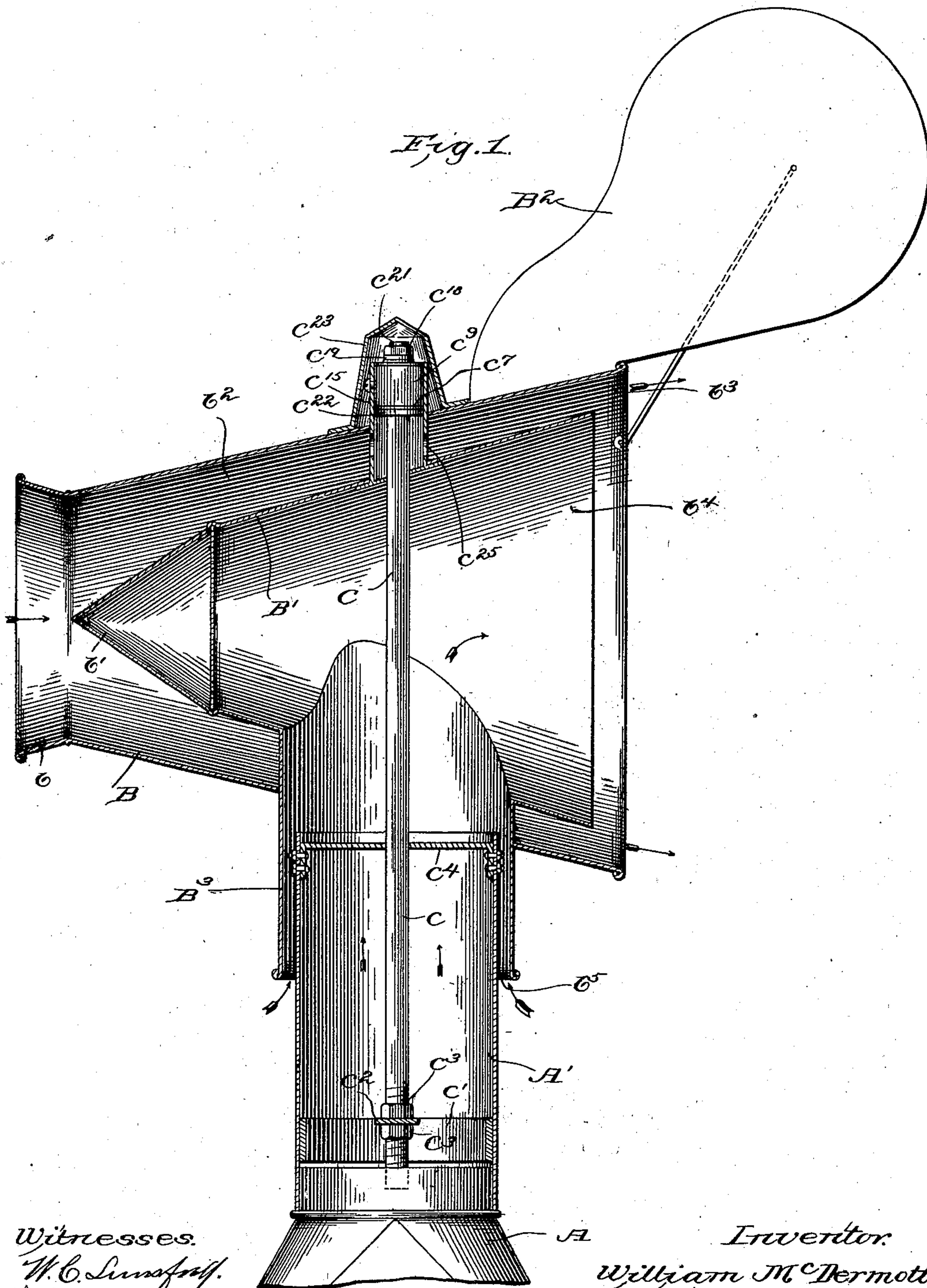
Patented June 17, 1902.

W. McDERMOTT.
VENTILATOR.

(Application filed Jan. 28, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.

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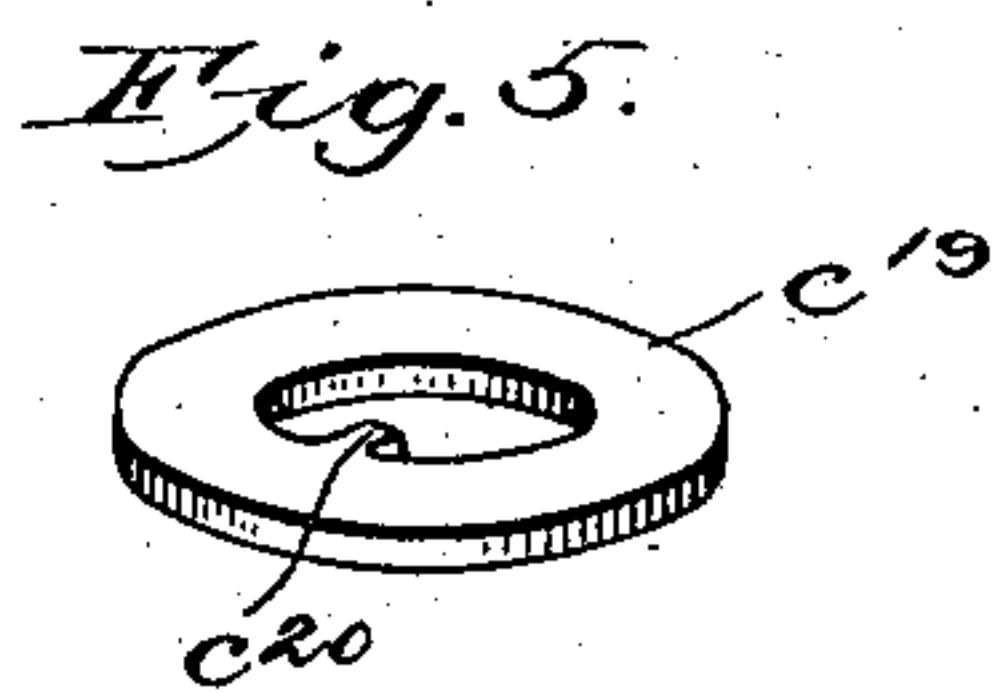
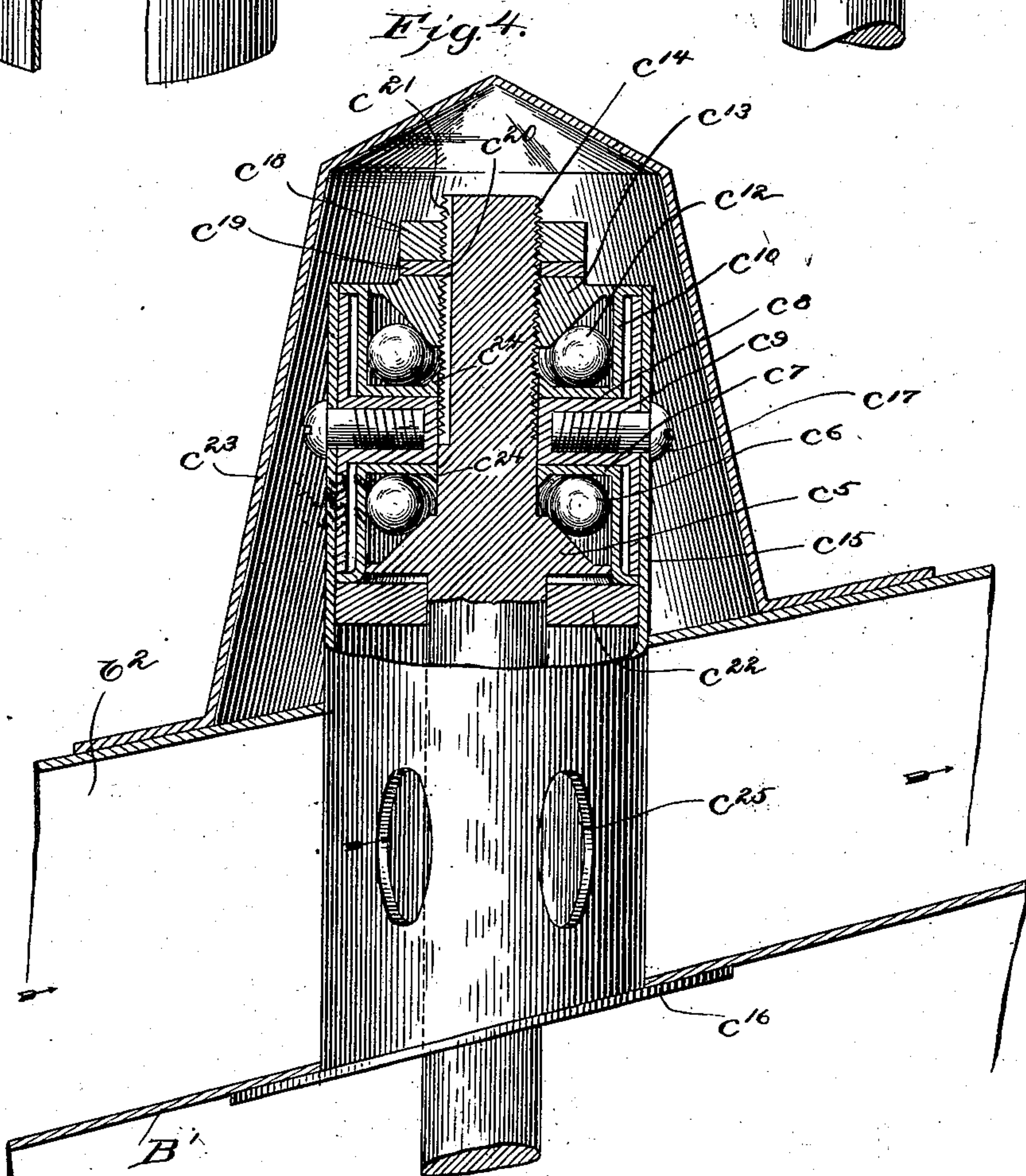
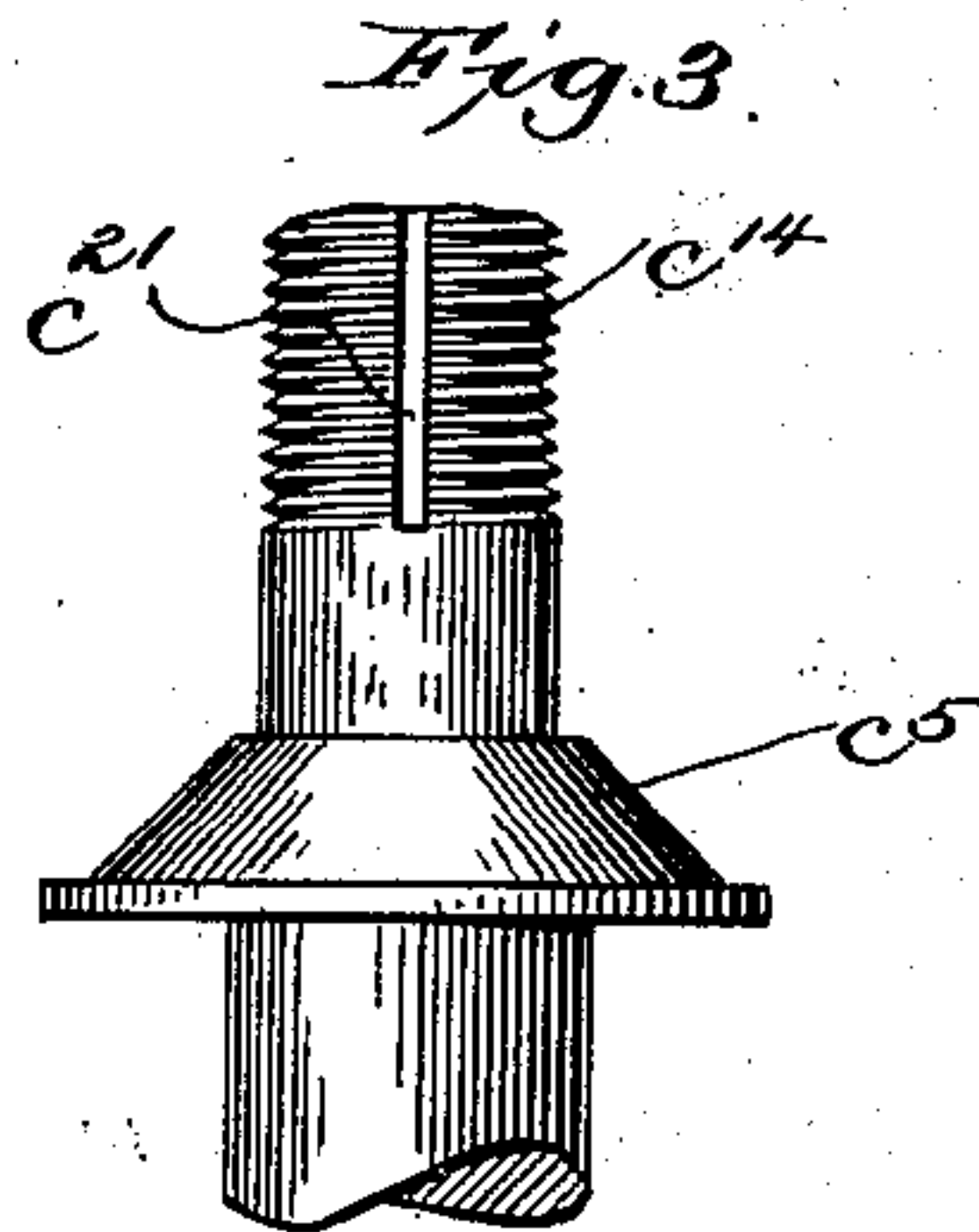
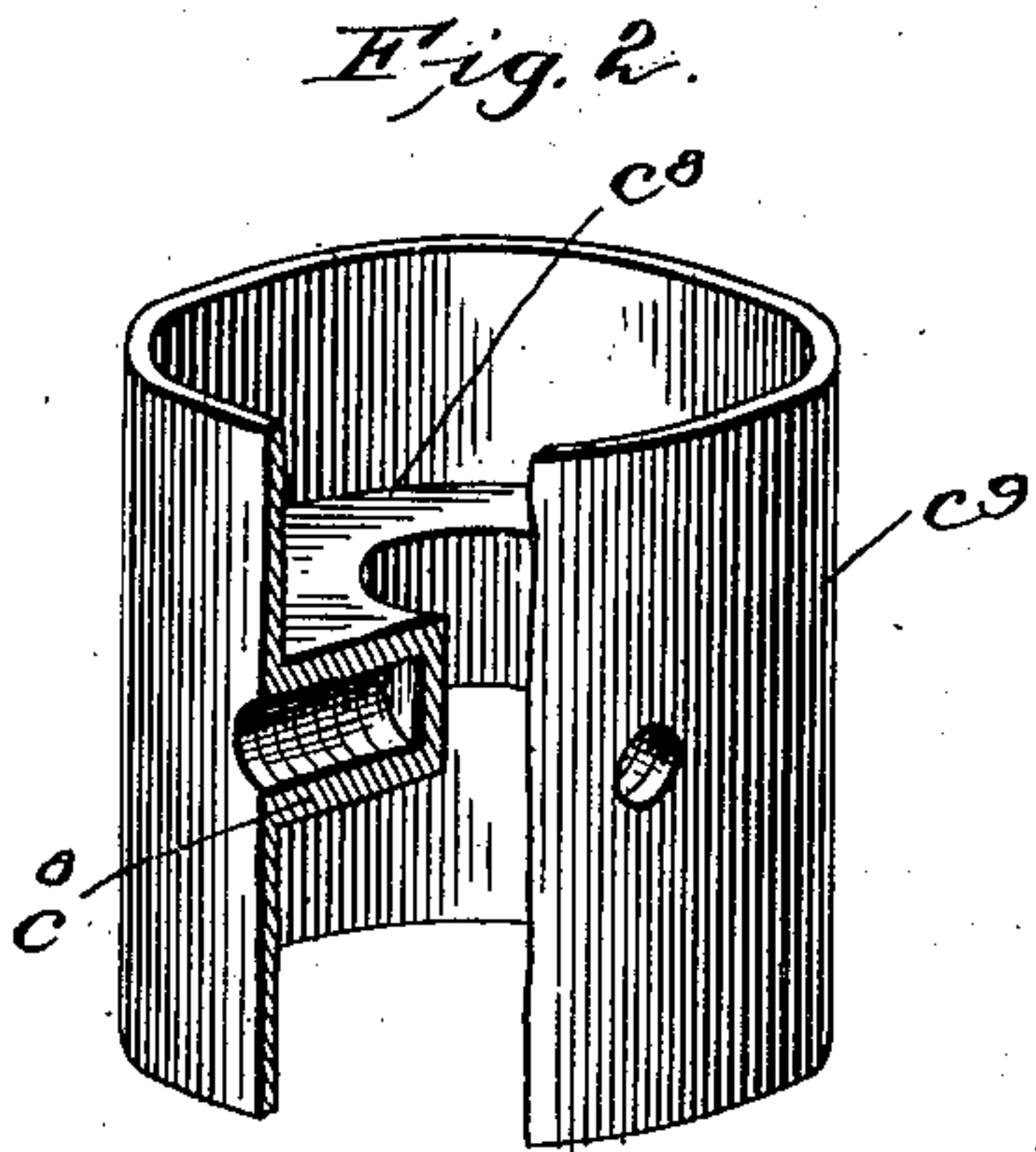
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(No Model.)

2 Sheets—Sheet 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM McDERMOTT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
AMOS L. WOOD, OF BOSTON, MASSACHUSETTS.

VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 702,581, dated June 17, 1902.

Application filed January 28, 1901. Serial No. 45,001. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM McDERMOTT, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Ventilators, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention is an improvement in that class of ventilators illustrated in United States Patent No. 634,215, granted October 3, 1899, to C. F. Nickerson, and has for its principal object the provision of means permitting the
15 noiseless and ready turning of the ventilator for maintaining itself in accurate operative position. These ventilators depend for their operation upon the draft produced therein by the wind blowing through them somewhat
20 on the injector principle, and it therefore becomes essential that they should maintain an accurate position in exact alinement with the direction of the wind. Also as the wind is continually shifting, and hence the ventilators are correspondingly turning, and as any
25 noise would prohibit the use of the ventilators on account of the disturbance to the rooms below, it is a serious problem to provide a construction in connection with the
30 ventilator which will insure proper balance and noiselessness combined.

My improved ventilator is also specially constructed for maintaining itself in operative condition at all times by preventing the
35 accumulation of foreign matter, such as dirt, cobwebs, &c.

The constructional details and further features of advantage of my invention will be pointed out in the course of the following description, reference being had to the accompanying drawings, illustrative of a preferred
40 embodiment of my invention.

Figure 1 is a central vertical sectional view of the ventilator. Fig. 2 is a broken perspective of one part of the bearing. Fig. 3
45 is a detail, in side elevation, of a portion of the bearing. Fig. 4 is a central vertical section of the bearing and adjacent parts, a portion of the sleeve or shell being shown in side
50 elevation. Fig. 5 is a perspective view of the upper washer.

The general construction of the ventilator, including the base A, main pipe or flue A', conical funnel B, inner deflector B', and vane B², may be of the general shape and construction shown in the before-mentioned patent or
55 any other preferred form.

These ventilators, it will be understood, are intended to take the place of such devices as blowers and exhaust-fans, &c., which are operated by power and commonly provided for
60 ventilating large buildings, halls, theaters, &c., and this ventilator instead of being operated by a dynamo-engine or other usual power is entirely automatic and because of
65 the injector principle operates with extreme efficiency and certainty, continuing in operation, moreover, unremittingly, and therefore being preferable to the other kinds of ventilators mentioned, which are usually stopped
70 when the building is closed or not in use. It is essential, however, for the present kind of ventilator that it shall maintain its direction accurately with the wind, as upon the latter depends the proper working of the exhaust
75 feature or injector principle of the ventilator, and in this connection it may be well to state briefly that the wind upon entering the flaring mouth *b* of the ventilator which faces the wind is deflected by the apex *b'* and passes
80 in a spread-out form through the conical passage *b²* and out at the enlarged mouth *b³* of the funnel in an attenuated condition, thereby producing a powerful suction or tendency to a vacuum within the inside funnel B' at
85 *b⁴*, which in turn operates to cause a constant and powerful upward draft in the pipe A', provided the damper is open, which is usually provided in the flue leading from the room being ventilated to the ventilator.
90

The vane B² has been heretofore depended upon for maintaining the ventilator in operative position; but in practice it has been found that it is not capable of doing so at all times, and also I have found it extremely difficult and, indeed, to be a very serious problem to provide a bearing and cooperating construction capable of accomplishing my object under all conditions. The present construction, however, has been found in practice to
100 solve the problem, providing, as it does, a main bearing for supporting the ventilator

which is above the smoke and gases which pass through the ventilator and is so constructed and arranged that it cannot possibly become clogged, requires no lubricant, is not
 5 in a position to be affected by the weather, and maintains the ventilator in proper balance.

The ventilator is carried by a shaft c , having two stationary bearings in the pipe or flue
 10 A' , the lower one consisting of a band c' and a cross-bar c^2 , on which the shaft is retained by nuts c^3 or other suitable means, and the upper bearing is shown as consisting of a cross-bar c^4 simply. At its upper end the
 15 shaft c' is provided with a fixed cone c^5 , shown as formed integrally with the shaft, on which travel a series of balls c^6 . These balls support the weight of the ventilator by bearing against a lower cup c^7 , which is held in place
 20 by an annular rib c^8 of a carrier c^9 . Above the rib c^8 is another cup c^{10} , which holds a second series of balls c^{12} , traveling against an adjustable cone c^{13} . The upper end of the shaft is provided with threads c^{14} and the upper cone
 25 c^{13} is threaded; but none of the other parts thus far mentioned are provided with threads, and I regard this feature of construction as of considerable value, because it enables me to put the parts quickly together and maintain them in accurate adjustment simply by
 30 turning up or down, as the case may be, the threaded cone c^{13} . All these parts are held in a sleeve or outside support c^{15} , which is provided at its lower end with a flange c^{16} , which
 35 may be secured against the inner surface of the deflector B' . The special carrier c^9 is provided with threaded sockets in which are mounted screws c^{17} , passing through the sleeve or shell c^{15} , as is clearly shown in Fig. 4, there-
 40 by retaining the shaft and bearing in its adjustment. When once adjusted, the parts are maintained by a nut c^{18} , which rests against a washer c^{19} , having a tongue c^{20} traveling in a longitudinal groove c^{21} for preventing rotation thereof relatively to the
 45 shaft, and beneath the bearing I drive in a false washer c^{22} to prevent the entrance of dust and keep the running parts perfectly clean. The whole bearing is inclosed in a
 50 water-tight cage or housing c^{23} . Each cup has a retaining-flange c^{24} , so that there is no possibility of the balls dropping out even though the parts may not yet be adjusted to working position.

55 It will be seen that the above construction is exceedingly simple and compact, and yet secures the objects intended in a very efficient manner. The upper balls provide steadiness, maintaining the ventilator against
 60 swaying movement, and the lower balls carry the weight of the ventilator noiselessly, being enabled to support the load (which at times of high wind is considerable) by reason of the heavy and strong form of carrier c^9 ,
 65 whose upright flanges or vertically-extending portion coöperate with the sleeve c^{15} in giving strength and rigidity of position, and the

heavy annular rib c^8 gives a wide and strong bearing-support for the ball-cups. The latter not being threaded tend to automatically
 70 adjust themselves and take up such wear as may occur. If any unevenness or wobbling occur, it may be instantly prevented simply by tightening the upper cone c^{13} .

Within the passage b^2 the sleeve or shell
 75 c^{15} is provided with a plurality of openings c^{25} , preferably opposite each other, for the purpose of keeping the parts cool by freely permitting the passage of the air as the wind
 80 blows through the way b^2 .

In assembling the parts of the bearing they are simply dropped into the sleeve from the top thereof one after the other in the order
 shown in Fig. 4 and then secured by the screws c^{17} and the nut c^{18} , and when in position
 85 the false washer or bottom c^{22} separates the bearing from the ventilator proper and prevents its becoming clogged by the action of smoke and gases or the accumulations of dirt.
 90

At the lower end of the ventilator I provide an annular opening b^5 between the flue
 A' and an outside flue B^3 , this passage b^5 being maintained in properly-centered position
 95 by the steadying-balls c^{12} , as before explained, and serving to maintain the ventilator in operative condition at all times irrespective of whether the flue A' is closed or open.

It will be understood that on occasion it
 100 will be preferred not to use the ventilator for ventilating the room below, and accordingly the flue A' will be closed, under which circumstances if the passage b^5 were not provided the rest of the ventilator might become
 105 clogged with leaves, cobwebs, or other debris, thereby rendering it inoperative when subsequently the damper controlling the flue A' might be opened, and because of the automatic character of this ventilator the users
 110 thereof below might not become aware of the fact that the ventilator was inoperative. For this reason it becomes especially important that the vacuum should remain in operation, and this is accomplished by the opening b^5 ,
 115 which permits the ventilator to keep in operation even though the flue A' be closed.

It will be understood that I do not limit myself to all the details of construction and arrangement set forth at length in the above description, inasmuch as many changes in form,
 120 construction, and combination of parts may be resorted to without departing from my invention, and accordingly I do not otherwise limit myself than as hereinafter expressed in
 125 the claims.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A ventilator having a horizontal passage
 130 for the wind, and a vertical passage for foul air, the wind in passing through said horizontal passage producing an exhaust effect for drawing the foul air out through the vertical

passage, alining mechanism for maintaining said ventilator in the direction of the wind, and means for permitting the free turning of the ventilator by said alining mechanism,

5 said means comprising a shaft provided with a plurality of stationary bearings at its lower end for giving lateral rigidity, and having a bearing at its upper end above the center of gravity of the ventilator, said bearing including a lower cone on the shaft and supporting the weight of all the apparatus, a lower cup adjacent said cone, balls between the two for receiving the weight of the ventilator, an upper cone and cup, and balls between them 10 for centering and balancing the ventilator, and a sleeve independent of the shaft and rigidly secured to the ventilator for transmitting the weight thereof to said lower cone and provided with means for retaining said movable bearing in place. 20

2. In a ventilator, a bearing for centering and supporting the ventilator and permitting it to turn freely in the direction of the wind, said bearing comprising a sleeve mounted in 25 the upper side of the ventilator, a carrier secured rigidly in said sleeve and provided with an annular rib, a shaft passing loosely centrally through said rib and provided with a lower cone, a cup resting against the under side of said rib, balls traveling between said cone and said cup, said cone supporting the weight of the ventilator, a second cup carried by said rib on the upper side thereof, balls therefor, and an upper cone, said lower 30 cone being integral with said shaft, and said upper cone being mounted adjustably on said shaft for cooperating with said upper cup and balls in centering and balancing the ventilator. 35

3. In a ventilator, a bearing for centering and supporting the ventilator and permitting it to turn freely in the direction of the wind, said bearing comprising a sleeve mounted in 40 the upper side of the ventilator, a carrier secured fixedly in said sleeve and provided with an annular rib, a shaft passing centrally through said rib and provided with a lower cone, said cone being integral with said shaft and said carrier being independent of said 45 shaft, a cup resting against the under side of said rib, balls traveling between said cone and said cup, the latter transmitting the weight of the ventilator from said rib to the lower cone to be borne by the latter, a second cup carried 50 by said rib on the upper side thereof, balls therefor, and an adjustable cone mounted on said shaft for cooperating with said upper cup and balls in centering and balancing the ven-

tilator, said shaft being threaded to receive said adjustable cone, and having a retaining nut and washer for maintaining the parts in adjustment. 60

4. In a ventilator, a bearing for centering and supporting the ventilator and permitting it to turn freely in the direction of the wind, 65 said bearing comprising a sleeve mounted in the upper side of the ventilator, a carrier secured to said sleeve and provided with an annular rib, a shaft passing centrally through and independent of said rib and provided 70 with an integral lower cone, a cup resting against the under side of said rib, balls traveling between said cone and said cup, said balls transmitting the weight of the ventilator from said rib to the lower cone, a second 75 cup carried by said rib on the upper side thereof, balls therefor, and an adjustable cone mounted on said shaft for cooperating with said upper cup and balls in centering and balancing the ventilator, said shaft being thread- 80 ed to receive said adjustable cone, and a false washer or bottom fitting tightly around said shaft within said sleeve below the bearing, said bearing being carried by said ventilator entirely above the air-passage thereof out of 85 line with the smoke and gas.

5. In a ventilator, a conical funnel, a second conical funnel within the same, providing a conical passage between the two for the passage of wind, and a stationary, vertical 90 shaft for supporting said ventilator and permitting the same to follow the direction of the wind, said shaft having a movable bearing at its upper end, comprising a tubular sleeve or shell provided with a flange at its lower end 95 secured to the inner side of the inner funnel about said shaft, a carrier mounted in the upper end of said sleeve and immovably secured thereto, said carrier having a heavy annular rib extending inwardly transversely of said 100 shaft, and a cone, cup and balls mounted on opposite sides of said rib about said shaft, for the rotation of the ventilator, the cups being rigid with the shaft, the lower cup bearing all the weight and downward thrusts, and 105 the upper cup receiving the sidewise thrusts and acting to center the ventilator and maintain it steady.

In testimony whereof I have signed my name to this specification in the presence of 110 two subscribing witnesses.

WILLIAM McDERMOTT.

Witnesses:

GEO. H. MAXWELL,
GEO. W. GREGORY.