

May 9, 1933.

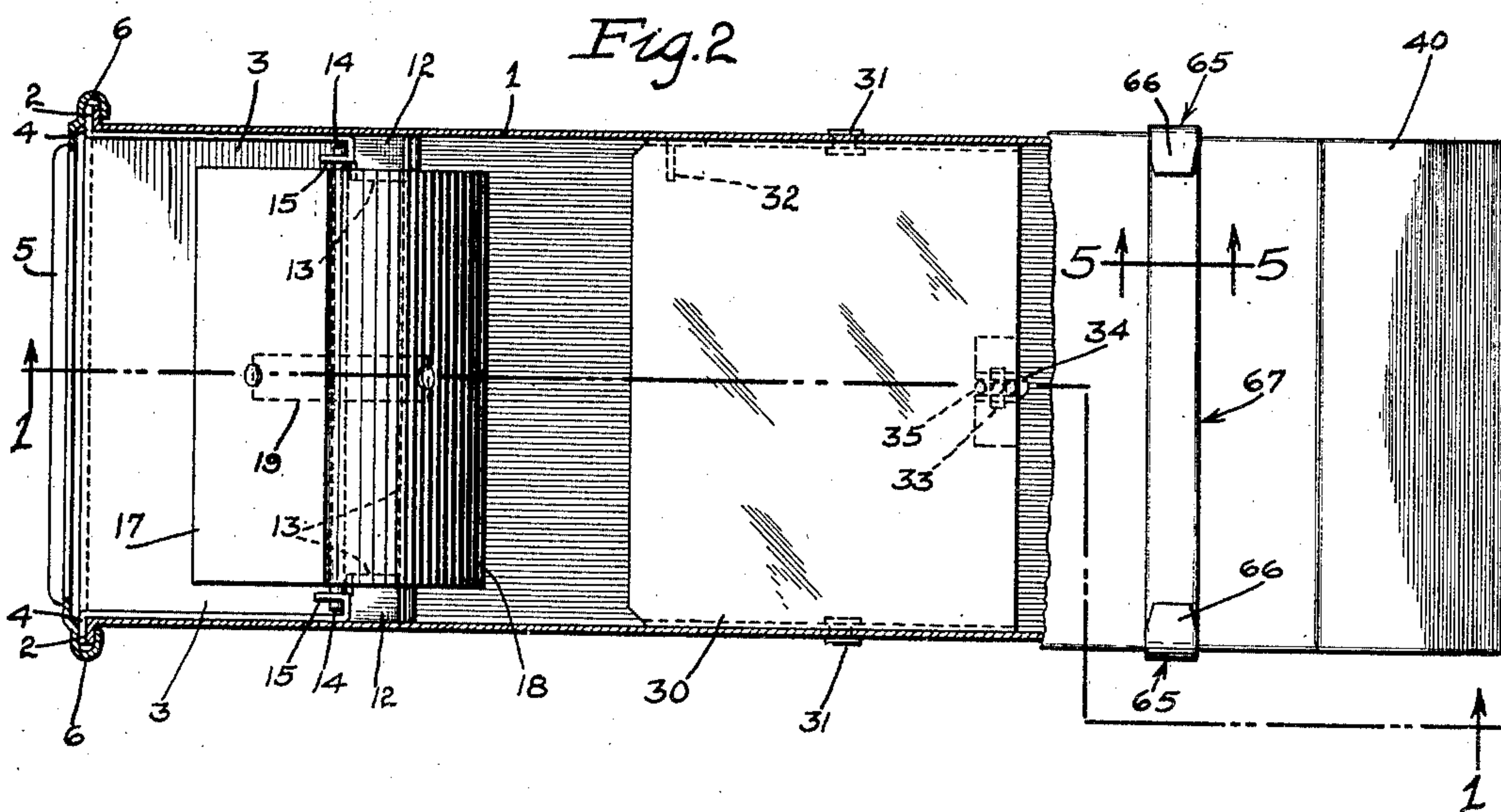
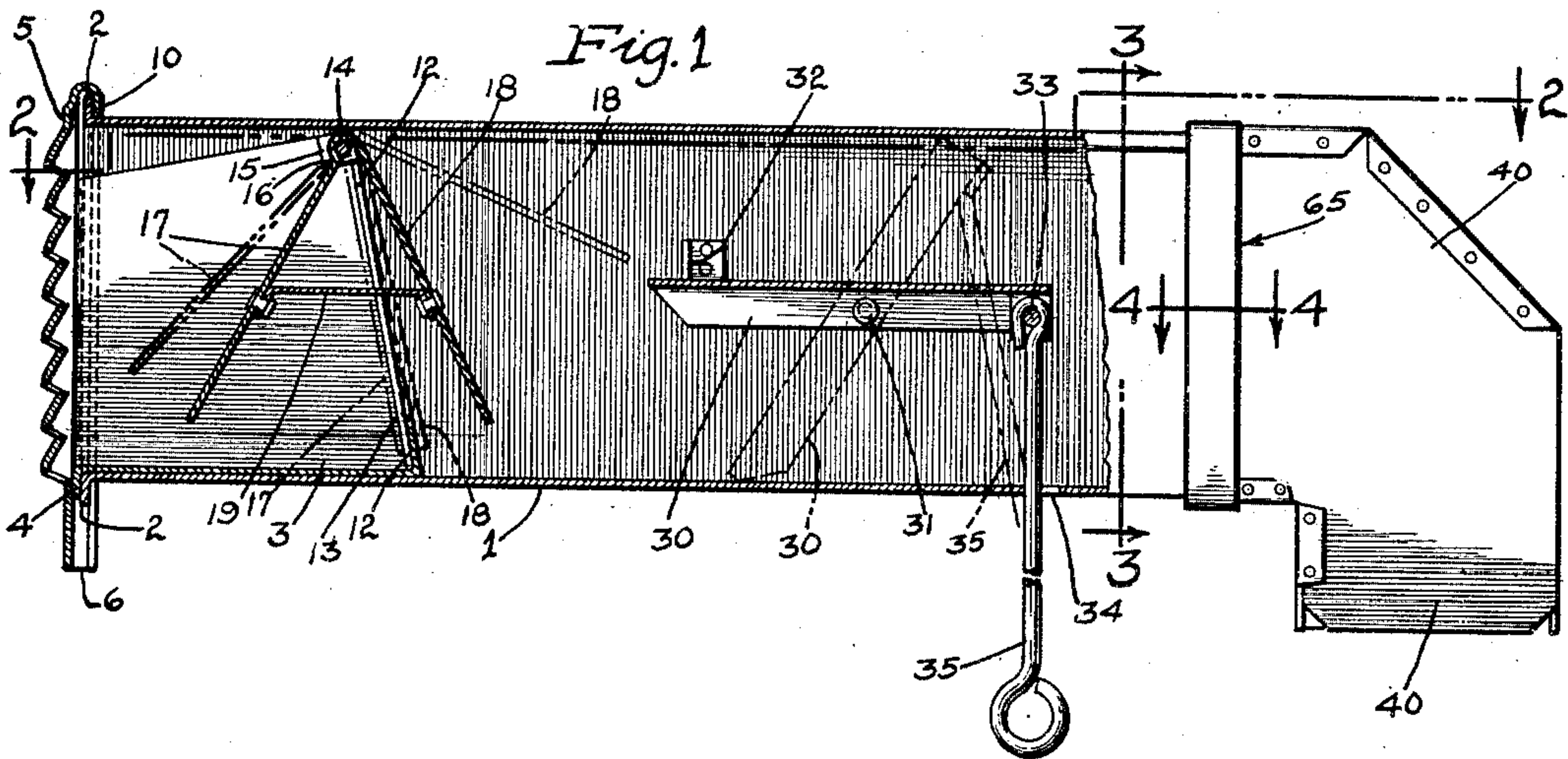
W. A. ZALOUDEK ET AL

1,907,928

VENTILATING UNIT

Filed June 7, 1930

2 Sheets-Sheet 1



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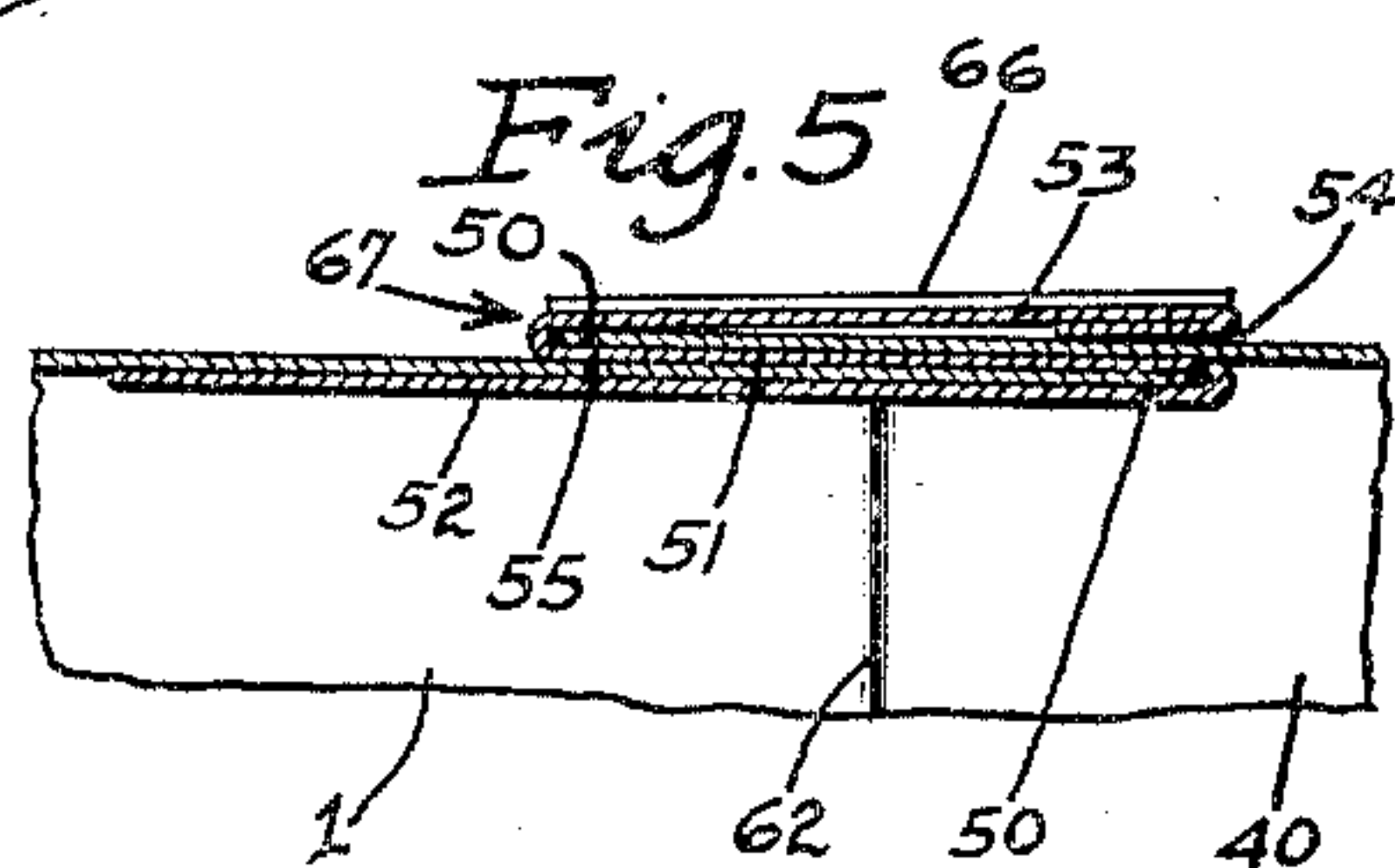
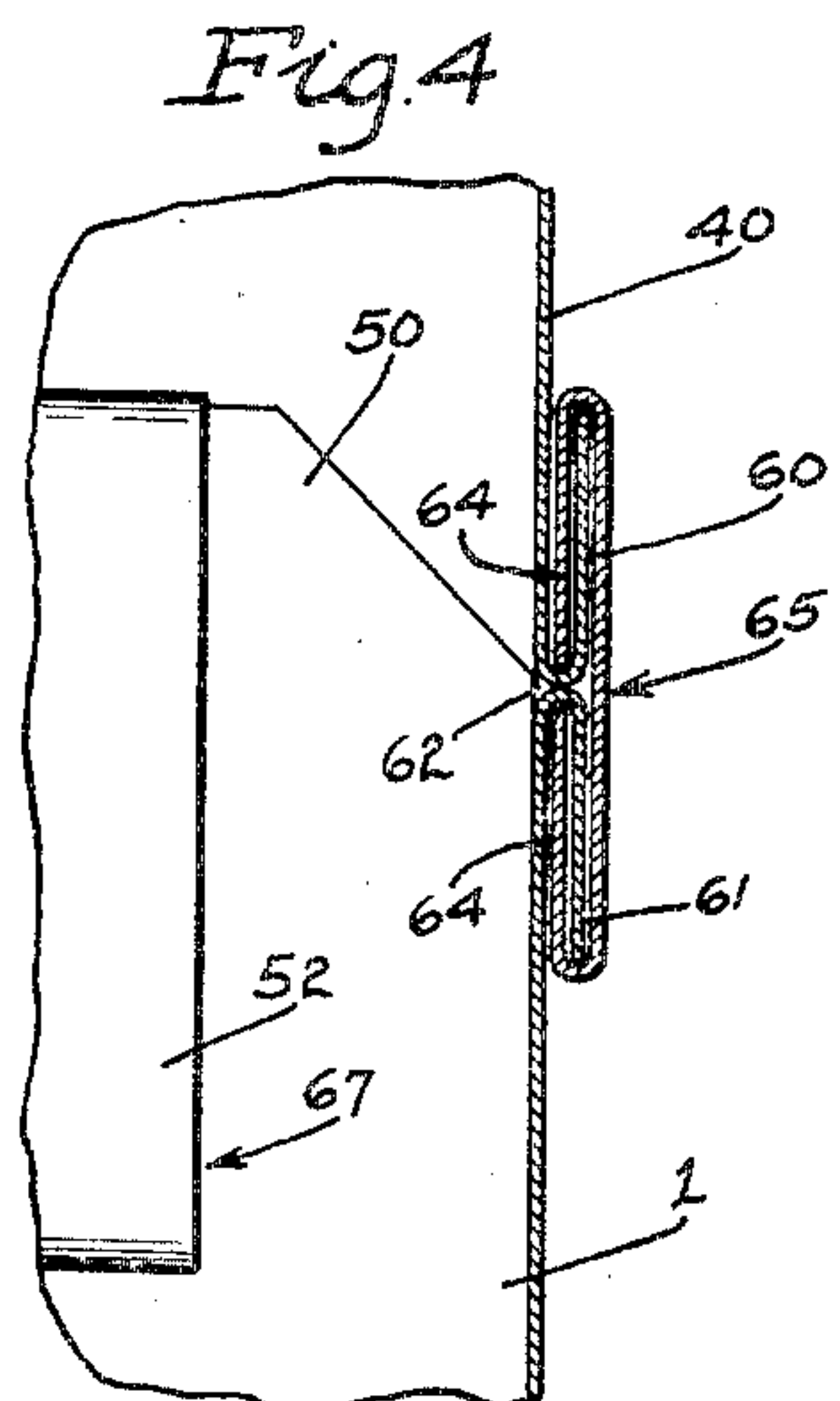
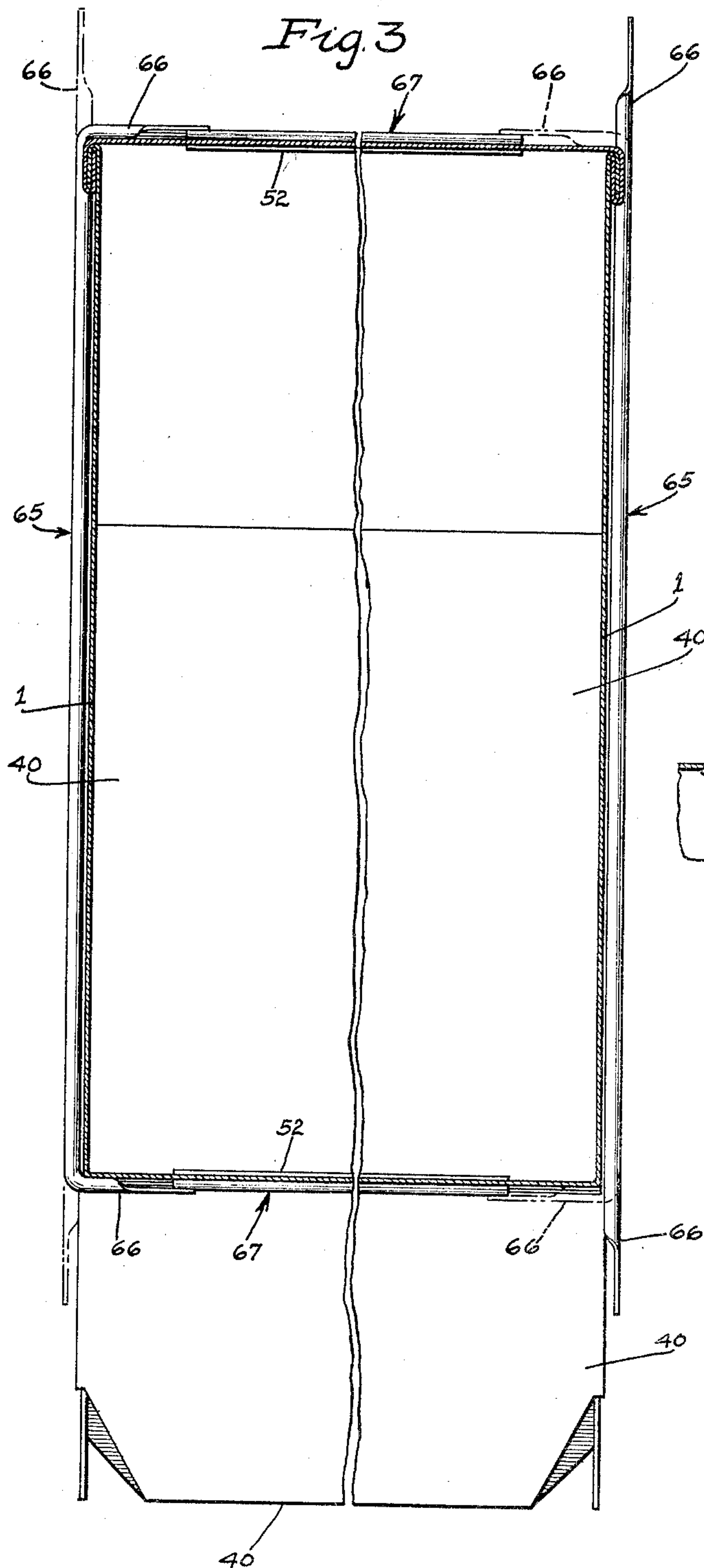
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UNITED STATES PATENT OFFICE

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VENTILATING UNIT

Application filed June 7, 1930. Serial No. 459,754.

This invention relates to improvements in ventilating apparatus and the invention finds valuable application in the construction of a ventilating unit, sold as an article of manufacture to be arranged in the wall of any building to perform its intended functions.

Objects of the invention are: to provide a ventilating apparatus which will prevent sudden drops of temperature within the building as the result of loss of heat by escape through the ventilator, and by the entrance of cold air through the ventilator flue, particularly under windy conditions; to provide means for checking back draft, that is for substantially allowing air to pass only one way, that is inwardly; to provide a ventilator which automatically closes in direct proportion to the strength of an incoming cold draft and which acts in a similar manner to lessen heat losses through the ventilator. Another object is to provide a valve structure which is removable, and to provide a louver capping the end of the ventilator tube and formed in a manner to lock or secure the valve mount and structure in operative position.

The device herein may be termed a gravity-balanced valve arranged in an air duct in a manner to be closed when the incoming draft reaches a certain velocity or volume, and in a manner to also close when the out-going draft reaches a certain velocity or volume. In one embodiment, a stronger incoming draft is necessary to interrupt circulation through the ventilator than an out-going draft. The construction includes a partition over which the valve is pivoted, the valve having two flaps or valve members one at each opposite side of the partition, one of which valve members closes an opening in the partition when the incoming draft is too great, and the other of which closes the same opening when the out-going draft is too great. The partition is, in certain instances, normally slanted so that the valve which controls the incoming draft must move through a greater distance than the corresponding valve at the opposite side of the partition, and this is a feature of the invention.

Features of the invention include all details of construction of the unit as shown, along

with the broader ideas of means, which are represented in this particular embodiment of the invention.

Features and advantages of the invention will appear in the description of the drawings forming a part of this application, and in said drawings:

Figure 1 is a vertical longitudinal section, partly in elevation, of one of the units, taken on line 1—1 of Figure 2;

Figure 2 is a plan section on line 2—2 of Figure 1;

Figure 3 is an enlarged vertical section taken on line 3—3 of Figure 1, and illustrating the manner of joining the elbow section to the straight section of the unit;

Figure 4 is a plan section on line 4—4 of Figure 1 further illustrating the means for detachably connecting the elbow and straight sections of the ventilator; and

Figure 5 is a vertical cross section on line 5—5 of Figure 2.

Numerals 1 designates a casing forming the air flue. This flue casing is provided with a circumscribing terminal flange 2. A valve mount, as an open top casing generally indicated at 3, is telescopically engaged within the flue, and has flanges 4 one for each of those three sides which flatly engage the corresponding portions of flange 2 to limit inward motion of the mount. A louver 5, caps the end of the mount and flue, and has locking means indicated at 6, see Figure 2, in the form of opposed vertical grooves adapted to engage the flanges 2, 4, in the manner shown to prevent motion of the casing axially and therefore to secure the casing to the flue 1. This locking means is formed in a manner to slide upon the flanges during motion to the operative position. The mount, and the manner of connecting it to the flue by means of the louver, are all features of the invention. In order to provide a stop to limit downward motion of the louver at its operative position, the upper end is turned as at 10 to form a groove which engages over the flange 2, as best shown in Figure 1.

Another feature of the invention relates to a valve structure having a valve which is normally open but which is adapted to move

to check the draft, whatever the direction thereof, whenever it reaches a predetermined velocity or volume. The amount 3 (as a box-like casing open at the top) is provided with
 5 flanges 12, one bent upwardly from the bottom and one bent inwardly from each vertical side, which flanges cooperate to form transversely arranged plate-like partition means. These flanges define an opening 13,
 10 which is substantially the same area as that of the flue 1, and which forms a part of the ventilation passage. This element 12 acts as a valve seat, and a valve element is swingingly and pendently supported thereabove, in
 15 this instance by means of a transversely disposed rod 14 held in tab-like bearings 15 formed by bending the sides of the sheet metal mount, as best shown in Figure 2. The valve element is in the form of a plate which
 20 is bent as at 16 to form two angularly related portions respectively designated 17—18, which lie at opposite sides of the partition 12. Due to the design of the valve element, these portions are normally spaced from the
 25 partition 12, and are held in spaced relation by balanced action. A suitable brace 19 secures the portions 17—18 in properly spaced relation. This valve is of very simple construction, being simply a plate bent upon it-
 30 self to provide portions engageable with opposite sides of a common seat. The plate is dropped into position, and any substantial motion other than swinging motion, is prevented by engagement of the bent portion 16
 35 with the upper flue wall. The entire device, including the mount is formed of sheet metal. Because of the balanced condition of the valve, if the incoming draft becomes too great, it acts against the portion 17 and moves
 40 the valve in a counter-clockwise direction into engagement with the outer face of the seat to close the opening 13. On the other hand, too great an out-going draft acts against the element 18 to move it in clock-
 45 wise direction to engage the opposite side of the partition or seat and close opening 13.

A feature of the invention is the arrangement of the parts whereby less draft is required to move the valve to closed position
 50 when the draft is traveling in one direction, than when traveling in the other. This is accomplished by slanting the element 12 so that normally, when there is no draft, it lies nearer one of the valve elements 17—18 than
 55 the other, and therefore, less draft is required to cause it to close against the seat. Another feature is the arrangement whereby less out-draft is required to close the valve than in-draft. This is a valuable feature because it
 60 tends to conserve heat.

The flue is provided with a suitable damper 30 pivoted at 31 to the flue, and a stop 32 is provided which limits the valve in a horizontal and fully open position. A suitable
 65 operating handle 35 is pivoted as at 33 to the

valve and extends outwardly through an opening 34. The rod has a suitable operating handle.

Another feature of the invention relates to the means for substantially sealingly con-
 70 necting the flue 1, to an elbow element 40 which lies at the inner side of the building, and which may be connected to another flue casing. The device as shown is particularly
 75 well adapted for the connection of rectangularly configured sections. Referring to Figures 3, 4 and 5, and first to Figures 4 and 5: Each flue section has, on each of two opposite top and bottom sides, a terminally
 80 horizontally projecting portion 50 which overlaps with the corresponding projecting portion of the opposite flue section, as shown in Figures 4 and 5. Two S-shaped connectors 67 are provided, one for each side. Only
 85 one of these connectors is shown in Figure 5, but both are shown in edge view in Figure 3. This connector has an intermediate portion 51 which lies between the overlapping terminal portions 50 of the flue sections, and has
 90 outer or terminal bent portions respectively indicated at 52—53 opposed to and cooperative with the intermediate portion 51 to provide sockets respectively indicated at 54—55,
 95 facing in opposite directions, and which sealingly receive the terminal portions 50. The other two opposite sides of the rectangular elements 1 and 40, in this instance the vertical
 100 sides, have terminal portions which are bent backwardly respectively as shown at 60—61 to form vertical grooves, and the bent portions abut as at 62. The bent portions 61 form with the sides, sockets facing in opposite
 105 directions. A lock connector provided with terminal portions bent inwardly towards one another as at 64 provide means which are slidably received by aforementioned grooves, thereby substantially sealingly connecting the elements. The connectors generally indicated at 65, after being in-
 110 troduced to locking position by a sliding motion in a vertical direction, have terminal extensions 66 bent over and upon the S-shaped connectors 67. The left side of Figure 3 shows the terminals 66 after being bent over,
 115 and the right side of the figure shows these terminals positioned as before bending. All connectors are, therefore, formed and arranged to form a continuous circumscribing structure cooperating with the means carried
 120 by the sections to substantially sealingly connect the sections together.

The free end of the elbow 40 has projections which may be bent or overlapped and connected in the manner previously described, with similarly arranged extensions on another section.

We claim as our invention:

1. A ventilator structure including an air flue having a transversely arranged partition
 130 means therein providing a draft opening and

an element swingingly and pendently supported above the partition and having angularly related portions respectively lying at opposite sides of said partition means, and normally spaced therefrom, and held in spaced relation by the action of gravity, and adapted to alternately close the draft opening according as the incoming or outgoing draft reaches a certain velocity or volume, said partition means being slanted so as to be nearer one of the angularly related portions than the other, when the draft is not active.

2. A ventilator structure including an air flue having therein a transversely arranged plate having a draft opening, and a gravity-balanced valve having portions normally spaced from and respectively alternately engageable with opposite sides of said plate means in a manner to close the draft opening, when the air traveling through the flue and draft opening in a given direction reaches a predetermined velocity or volume.

3. A ventilator structure including an air flue having therein a transversely arranged partition means providing a draft opening and a gravity balanced valve having portions respectively alternately engageable with opposite sides of said partition means in a manner to close the draft opening, when the air traveling through the flue and draft opening in a given direction reaches a predetermined figure, the valve portions being so arranged with respect to the partition means, that less draft is required to move the valve to closed position when traveling in one direction than when traveling in another.

4. A ventilator structure including a flue casing having flanges, a valve mount telescopically engaging the casing, said mount having a valve adapted to control flow of air through the flue, said mount having a flange adapted to engage one of the flanges of the casing to limit inward motion of the mount, and a louver capping the end of said mount and casing and having locking means adapted to engage said flanges to secure the mount to the casing, said locking means being adapted to operatively engage said flanges in the manner of a slide during motion of said louver to operative position.

5. A ventilator structure including a flue, a valve mount telescopically engaging the flue, said mount having a valve adapted to control flow of air through the flue, and a louver capping the end of the flue and mount and securing the mount, and means detachably securing the louver to the flue.

6. A ventilator structure including a flue having a transversely arranged plate-like partitioning means providing a draft opening, an element swingingly and pendently supported over the partition means and having angularly related portions respectively lying at opposite sides thereof and normally spaced therefrom and held in spaced relation

by the action of gravity, and adapted to alternately engage the partitioning means to close the opening according as the incoming or outgoing draft reaches a certain velocity or volume, the partitioning means being slanted inwardly to lie nearer the inner portion of the pendently supported element than the outer portion thereof, so that a lesser velocity of outgoing draft will be required to close the valve than that of an incoming draft.

7. A ventilator structure including an air flue, a valve element swingingly pendently supported and gravity balanced within the flue to be moved by air flow and having downwardly divergent angularly related valving portions, valve seat means with which each portion alternately cooperates for reducing air flow through the flue, said seat means being arranged nearer to one of said valving portions than the other, so that that valving portion has a lesser distance to move to its valve-closed position than the other valving portion.

8. A ventilator structure including an air flue, a valve element swingingly pendently supported and gravity balanced within the flue to be moved by air flow and having downwardly divergent angularly related valving portions, valve seat means with which each portion alternately cooperates for reducing air flow through the flue, one of said valving portions being normally nearer said seat means than the other, so that valving action will occur more quickly when the draft is in one direction than when in the opposite direction.

In witness whereof, I have hereunto set my hand this 2nd day of June, 1930.

WILLIAM A. ZALOUDEK.

In witness whereof, we have hereunto set our hands this 3rd day of June, 1930.

ANNAR F. SYVERUD.
ROY L. SAYRE.