

No. 679,108.

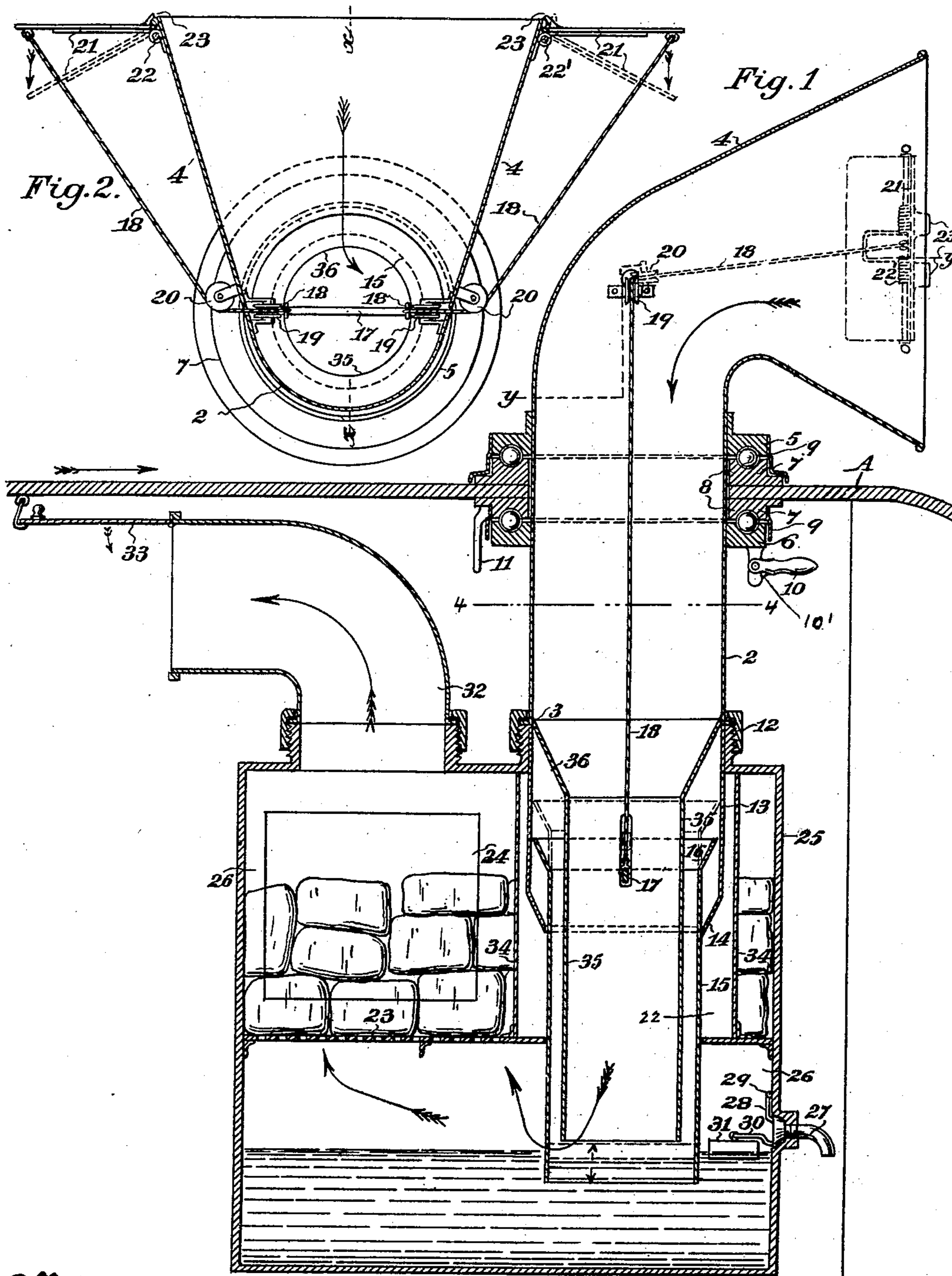
Patented July 23, 1901.

**B. F. CLARKE.**  
**VENTILATOR AND DUST ARRESTER.**

(Application filed Oct. 17, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,

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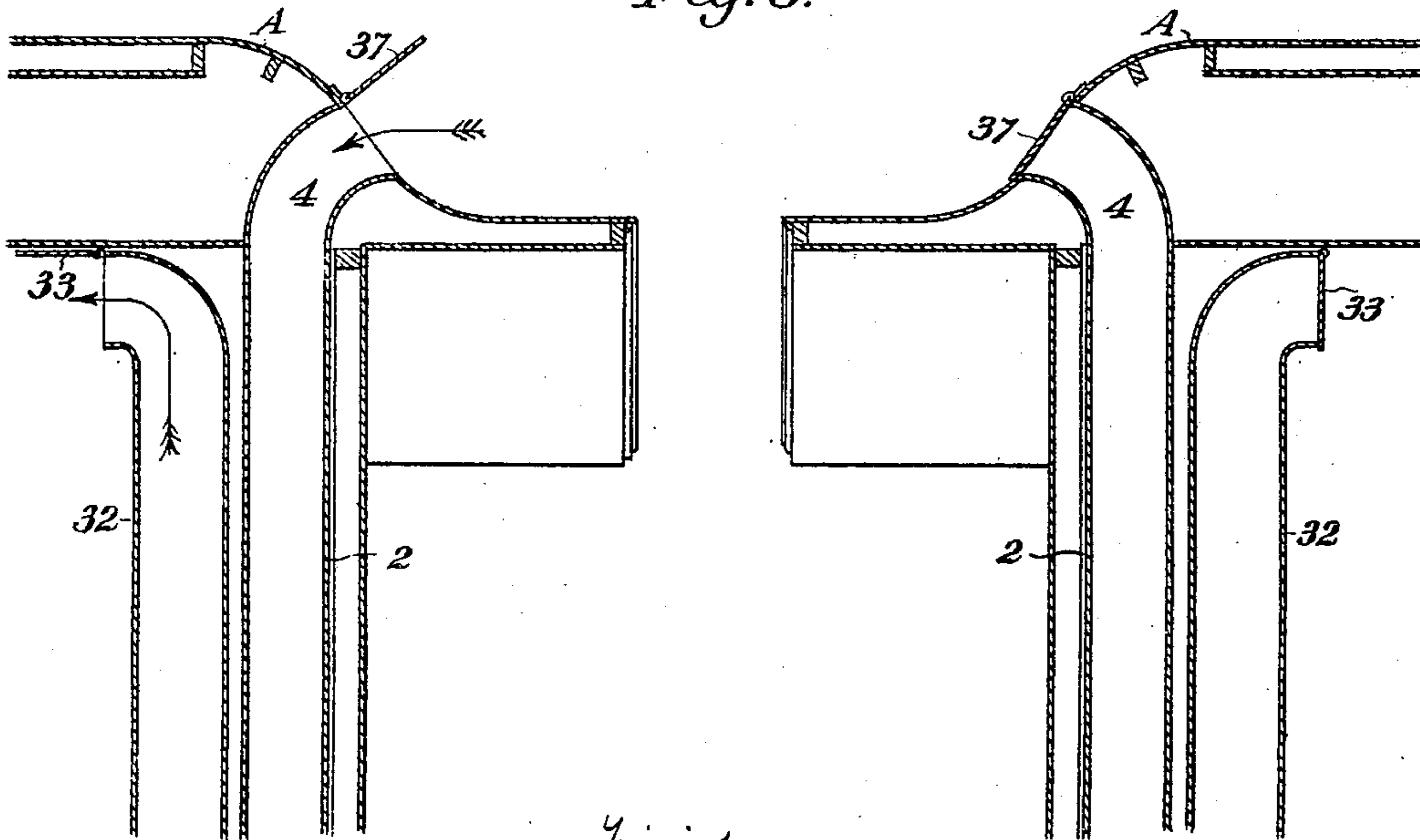
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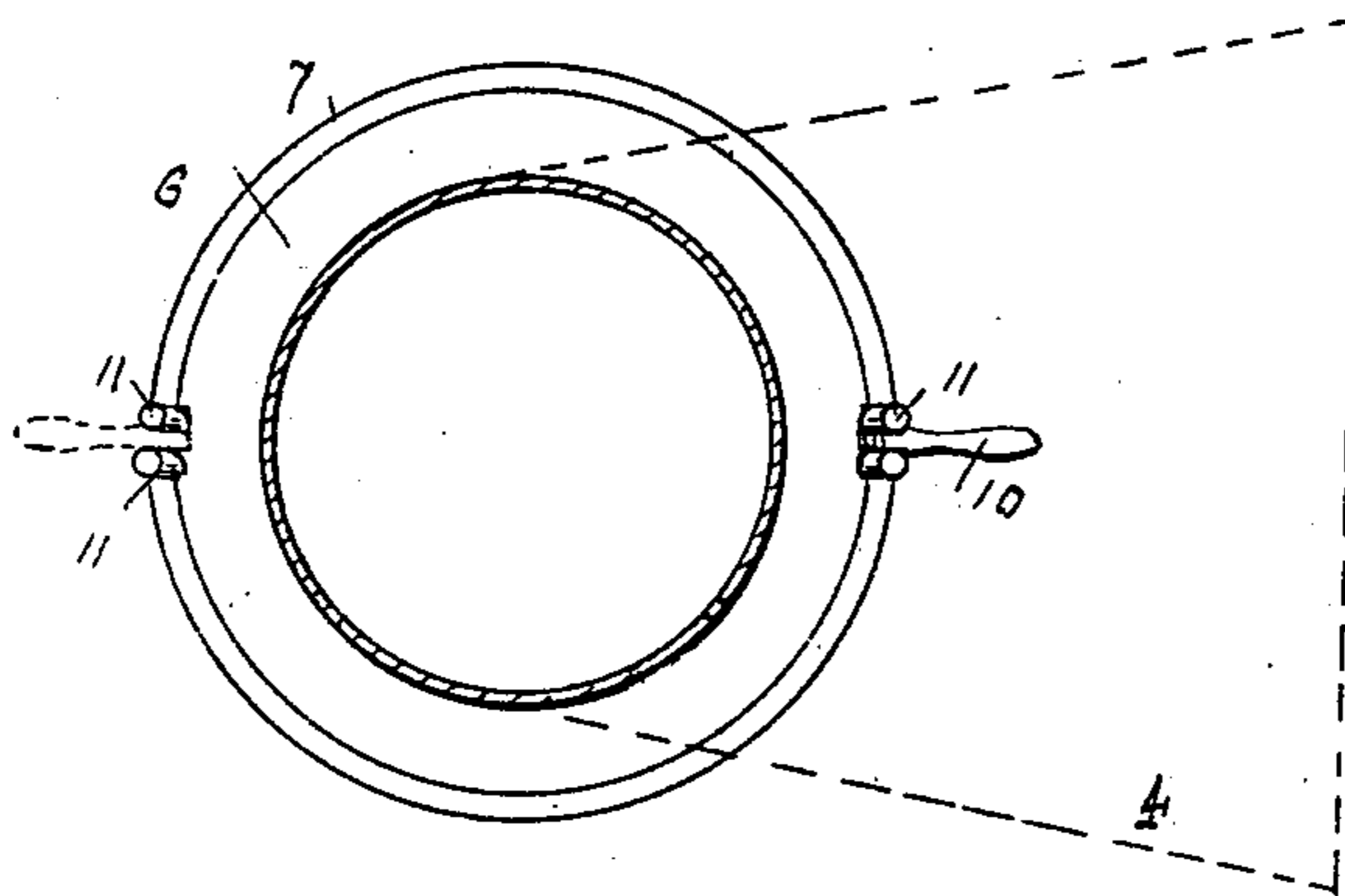
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*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

BENJAMIN F. CLARKE, OF SAN FRANCISCO, CALIFORNIA.

## VENTILATOR AND DUST-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 679,108, dated July 23, 1901.

Application filed October 17, 1900. Serial No. 33,317. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN F. CLARKE, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Ventilators and Dust-Arresters; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved car-ventilator, whereby air cleansed of its impurities and cooled is admitted to the car.

It consists of an air-inlet, a water-chamber, a governing device by which the end of the air-inlet is automatically lowered into or withdrawn from the water, a cooling-chamber through which the air passes before entering the car, and of details more fully to be set forth in the following specification and accompanying drawings, in which—

Figure 1 is a longitudinal section on the line  $x x$ , Fig. 2, of my improved ventilator dust-arrester. Fig. 2 is a horizontal section on the line  $y y$  of Fig. 1. Fig. 3 is a modification of my invention. Fig. 4 is a horizontal section looking upward on the line 4 4 of Fig. 1.

A represents the roof of a car, through which passes the air-tube 2, having a flange 3 at its lower end and its upper end opening out into the funnel 4. That this funnel may face in any direction desired I provide bearings, in which this funnel-tube is turnable. These bearings have the parts 5 and 6 secured to the tube, and their counterparts 7 are secured to the roof. Antifrictional balls run in the races 8. As a guard against entry of dust, &c., to these bearings I provide the shields 9 upon the parts 5 and 6 or 7. The funnel is intended to face in the direction of travel or of the air-current. That it may be easily turned and secured I have shown a handle 10, engaging some well-known form of device, the one herein shown including spaced lugs 11, between which the handle is pivoted and adapted to be held by a spring at 10' in an appropriate manner. Below the tube 2 and joined thereto by the cap or collar 12 is a pipe 13, extending into the air-chamber 22 and having an interior cone-shaped flange 14 at its lower end. There is sufficient play between the cap 12 and the flanged end of 2 to permit the latter to turn freely. Suspended in 13 is a pipe 15, having a cone-shaped up-

per end 16. The outer edge of the cone 16 bears upon the interior of the pipe 13, and the edge of the flange 14 bears upon the exterior of pipe 15, so that practically an airtight joint is formed, yet allowing a free sliding movement and guidance of the pipes. The pipe 15 is suspended by the cords 18, suitably attached, as at 17. These cords pass up through the pipe 2 and around sheaves 19 and 20 and pass out through slots in opposite sides of the funnel and attach, respectively, to the wings 21. These wings are pivoted upon the edges of the funnel and are under ordinary conditions of rest kept extended in a line approximately continuous with the plane of the funnel edge by means of springs, as 21', and lugs 23 upon these wings bearing against the edge of the funnel prevent the wings opening out farther.

The air-chamber 25 is divided into two compartments by the horizontal perforated partition 23. A hole is left in this partition large enough for the free vertical movement of pipe 15. Through a door 24, having a suitable packing about its edges, by which the passage-way may be made air-tight, ice is admitted to the upper compartment 25 when deemed necessary for cooling the air. The lower compartment 26 contains water. As the accumulation of water from the melting ice will be continuous, I arrange a cock 27 and a float-valve, by which the water is allowed to flow off whenever it rises above a certain point. This valve consists of the plate 28, pivoted above the orifice at 29 and having a lower angular extension 30, attaching to a float 31. As a protection against the jamming of ice against the pipe 15 and its connections I provide a tube or casing 34, which encircles these parts.

32 is an air-outlet pipe having similar connections as pipes 2 and 13.

At 33 is arranged a gate by which the volume of air to be admitted to the car is regulated.

The arrangement of the pipe 15, cords 18, and wings 21 is such that when the wings are extended the lower end of 15 will be above the water, but as the wings are pressed back against the sides of the funnel the end of 15 is submerged.

Thus is seen the principle of operation.

As the funnel will always be turned in the direction of travel, the pressure of the air as the train rushes forward forces the wings back and permits submergence of the end of the pipe 15. No matter how much soot or dust may be taken in through the funnel, this is all arrested in the water-tank, and the air passes thence through the ice-chamber, cooled and cleansed, into the car.

10 The object of having a governor by which the pipe 15 is to be raised and lowered is to provide for ventilation when the car is at rest. Were the air-inlet pipe continually submerged and the air not entering under any pressure, the water would act as a seal and no ventilation or draft would take place; but by the withdrawal of the pipe from the water natural air-currents effect the purposes desired.

20 To prevent dust or cinders collecting in the slidable joint between the pipes 13 and 15, a fixed tube 35 may extend down inside the tube 15, and its upper end may diverge or be funnel-shaped, as at 36. The outer periphery of the funnel is hermetically secured to the interior of the passage 13 above the highest point to which the top of the tube 15 will rise, and it thus directs the dust or cinders down through the interior of 15 and away from the joint.

30 The exterior air-inlet 4, as shown in Fig. 1, is independent and turnable with relation to the car; but in building new cars it may, if desired, be built into or with the roof of the car at either or both ends. In such a construction as shown in Fig. 3 a movable gate, as 37, serves to close the rear opening when the first one is in use. The particular arrangement of the conducting-passages may also depend upon the interior arrangement of the car or other conditions.

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

45 1. A ventilator consisting of an air-inlet, an air-chamber containing water, one end of said inlet adapted to be submerged within the water, devices exposed to exterior wind-pressure for automatically moving the air-inlet with relation to the water in the chamber and means for delivering the air from the chamber.

50 2. A ventilator consisting of an air-inlet, an air-chamber containing water, a governing device exposed to and actuated by exterior wind-pressure whereby one end of the air-inlet is automatically submerged in the water, means for cooling the air within the chamber, and a delivery-tube leading from the air-chamber.

60 3. A ventilator consisting of a turnable air-inlet tube having a funnel-shaped mouth, connections of this tube with an air-chamber, and a tube slidable in an extension of the air-inlet tube within the chamber, this slidable tube having a governing device exposed to and actuated by exterior wind-pressure by which said tube is automatically submerged

in water contained in the bottom of the air-chamber, and means for delivering the air from the chamber.

70 4. A ventilator combining an air-inlet tube, bearings in which this tube is turnable and means for holding the tube in position, an air-chamber and a pipe therein to which the lower end of the inlet-tube is turnably connected, a tube within the chamber and continuous with the pipe, a pipe slidable with relation to the interior tube, a governor by which this pipe is automatically submerged in water contained in the lower part of the chamber, means for cooling the air in the chamber, and a delivery-tube leading from the chamber.

80 5. A ventilator having in combination a turnable air-inlet tube, whose lower end is outwardly flanged, a cap joining this tube turnably to a tubular projection upon an air-chamber, a pipe forming a continuation of this tubular projection within the chamber, having on its lower end a cone-shaped flange, a pipe slidable in this tube and extending below it, and having a cone-shaped upper end, a governing device by which this pipe is automatically submerged or withdrawn from water contained within the air-chamber, means for regulating this quantity of water, and an air-passage leading from the chamber.

90 6. A ventilator consisting in the combination of a turnable air-inlet connected with an air-chamber, a pipe slidable in an extension of the air-inlet and within the chamber and devices controlled by the pressure of wind whereby said pipe is adapted to be automatically submerged in water contained in the bottom of the chamber, a horizontal perforated partition in the chamber forming an upper compartment therein and adapted to receive a cooling substance as ice, a protecting-casing about the above-mentioned pipe, an air-outlet, and means for regulating the amount of water in the chamber.

100 7. In a car-ventilator, the combination of an air-inlet tube having a funnel-mouth projecting without the car, said funnel and tube turnable in the direction of travel, wings hinged upon the edges of the funnel, and means for distending them in a plane approximately at right angles with the funnel-mouth, an air-chamber with which the air-tube is turnably connected, a tube within the air-chamber and in line with the air-tube, a pipe slidable in this tube and having connections with the wings by which the pipe is submerged in water contained in the bottom of the air-chamber, when the wings are pressed back against the sides of the funnel by the pressure of the air upon these wings, as the car moves forward, wings returning as the air-pressure is reduced whereby the pipe is withdrawn from the water, a cooling-compartment within the chamber, an air-discharge outlet and means by which the amount of water in the chamber is regulated.

110 8. In a car-ventilator, the combination of an air-inlet tube having a funnel projecting

above the roof of the car and turnable in bearings upon the car, means upon these bearings by which the tube is secured with its funnel in the direction of travel, wings hinged  
5 upon the edges of the funnel having springs by which they are normally retained in a plane approximately transverse to the funnel-mouth, an exterior flange upon the lower end of the inlet-tube, a cap fitting this flange and  
10 joining the tube to the air-chamber, a tube within the chamber in line with the inlet-tube having a cone-shaped flange on the lower edge, a pipe slidable in said tube having a cone-shaped flange upon its upper end, cords  
15 by which the pipe is held in suspension, said cords attached to the outer edges of the wings

upon the funnel, whereby the pipe is automatically submerged or withdrawn from the water in the bottom of the air-chamber, an ice-compartment in the air-chamber and 20 above the water whereby the air is cooled before being delivered into the car, an air-discharge pipe, a controlling-gate therefor, and a float-valve by which the water in the air-chamber is prevented from rising above a cer- 25 tain height.

In witness whereof I have hereunto set my hand.

BENJAMIN F. CLARKE.

Witnesses:

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CHAS. E. TOWNSEND.