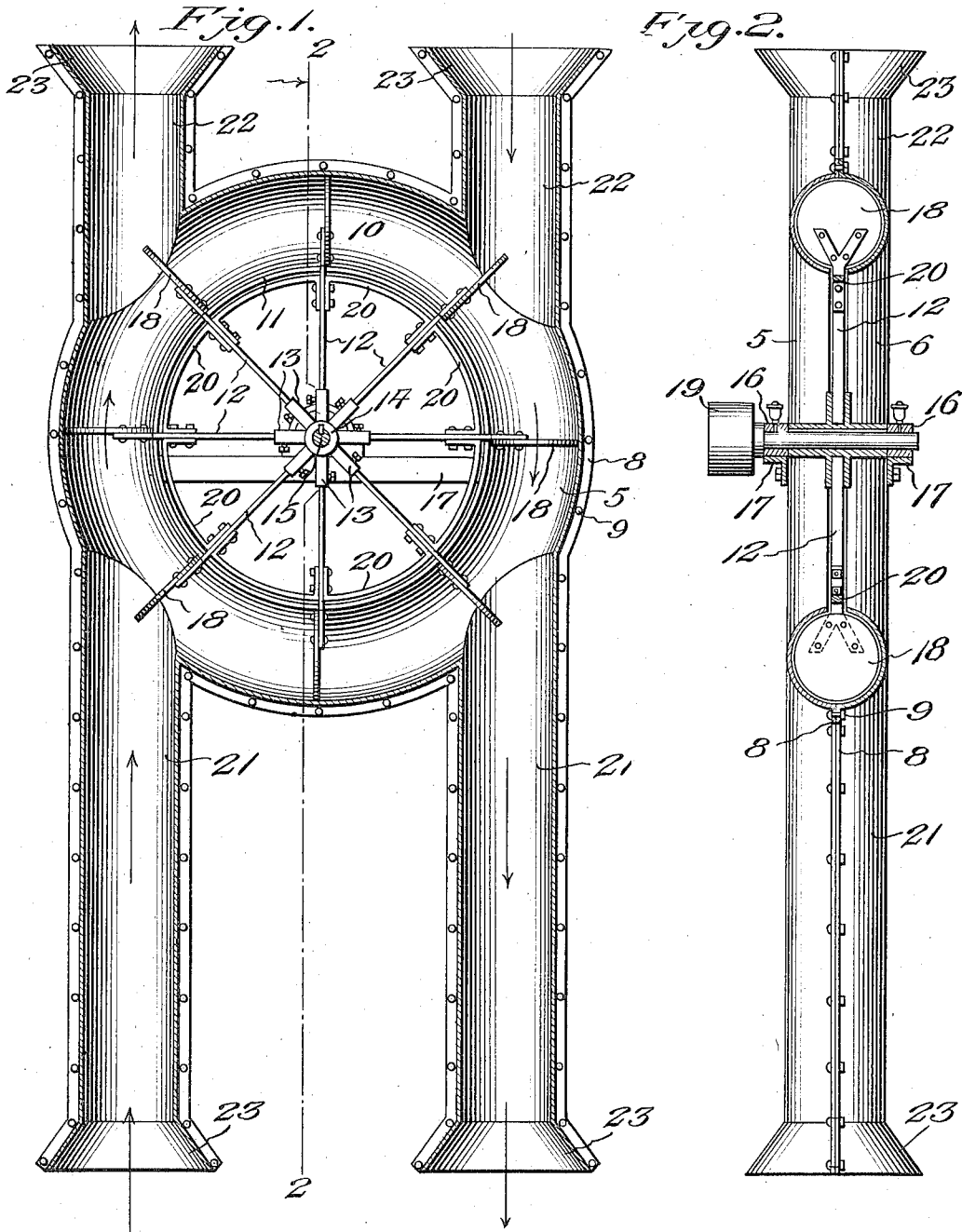


R. CARROLL.
VENTILATING APPARATUS.
APPLICATION FILED DEC. 23, 1910

1,039,025.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.



Inventor

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Witnesses

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A. O. Sanders

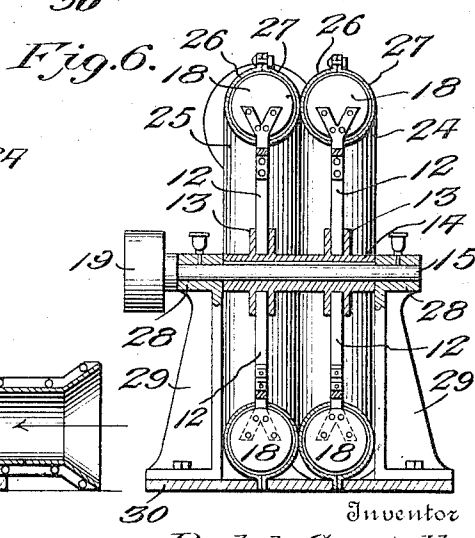
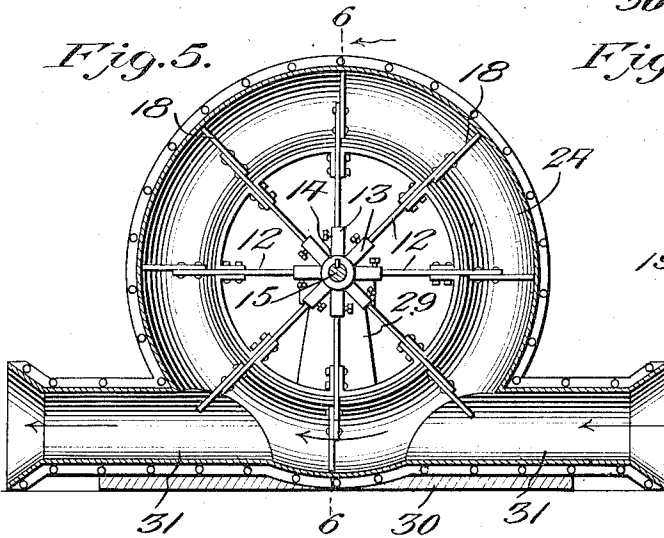
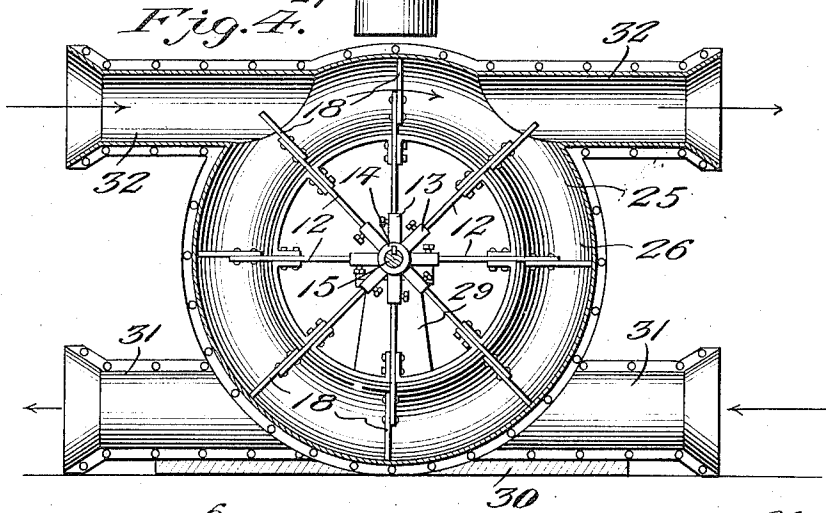
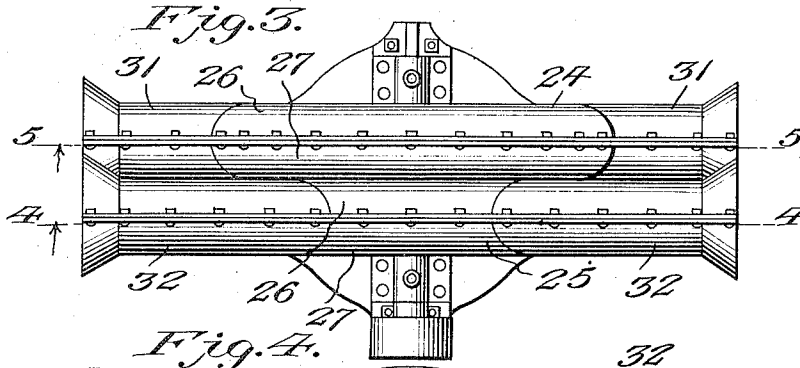
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

RALPH CARROLL, OF SIMMONSVILLE, RHODE ISLAND.

VENTILATING APPARATUS.

1,039,025.

Specification of Letters Patent.

Patented Sept. 17, 1912.

Application filed December 23, 1910. Serial No. 598,895.

To all whom it may concern:

Be it known that I, RALPH CARROLL, a citizen of the United States, residing at Simmonsville, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Ventilating Apparatuses, of which the following is a specification.

The invention relates to ventilators, and more especially to the class of fan ventilating apparatus for use in mines, subways, or the like.

The primary object of the invention is the provision of an apparatus of this character in which all foul or impure air may be exhausted from and fresh or pure air admitted into a mine or the like, during the operation thereof, thus assuring perfect ventilation.

Another object of the invention is the provision of a ventilator in which stale or foul air from a mine, subway or the like may be exhausted and the admission simultaneously therewith of fresh air from the atmosphere into such mine, subway or the like, without altering or changing the direction of rotation of the fan or apparatus.

A further object of the invention is the provision of an apparatus in which the continuity in one direction of a fan wheel or wheels will effect the simultaneous admission to and exhaustion from a mine of air, thereby thoroughly ventilating the same and assuring the presence of fresh and pure atmospheric air within such mine, subway or the like.

A still further object of the invention is the provision of a ventilator which is simple in construction, easy of motion, noiseless, and thoroughly efficient in operation, and inexpensive in manufacture.

With these and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claim hereunto appended.

In the drawings: Figure 1 is a vertical longitudinal sectional view through a ventilating apparatus constructed in accordance with the invention. Fig. 2 is a sectional view on the line 2—2 of Fig. 1. Fig. 3 is a top plan view of a slight modification of ventilating apparatus. Fig. 4 is a sectional view on the line 4—4 of Fig. 3. Fig. 5 is a sectional view on the line 5—5 of Fig. 3.

Fig. 6 is a vertical transverse sectional view thereof.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings by numerals, the ventilator apparatus comprises an annular body composed of separable complementary semi-cylindrical shaped sections 5 and 6 respectively, each being formed with an outer peripheral flange 8, these flanges being arranged in parallel contacting relation to each other, and through which are passed bolt members or rivets 9, thereby securing the sections together to form a fan chamber 10. The inner peripheral edges of the sections 5 and 6 are separated to provide an annular slot 11 through which project radially arranged spokes 12, the inner ends thereof being fitted in tubiform sockets 13 projecting radially from the hub 14, the latter being keyed or otherwise secured to a shaft or journal 15 rotatably mounted in bearings 16 carried by cross braces or bars 17, the ends of which are secured to opposite outer faces of the sections 5 and 6 forming the body of the apparatus.

Secured to the outer Y-shaped free ends of the spokes 12 are disk-like fan blades or wings 18, the latter being correspondingly shaped to the fan chamber 10 formed by the sections 5 and 6, and these blades or wings 18 are adapted to revolve within the said fan chamber. The journal or shaft 15 at one end is provided with a belt wheel 19, over which is trained the ordinary driving belt, (not shown), which is operated from any suitable source of motor power.

Spanning the spaces between the spokes 12 and secured to adjacent spokes are sector-shaped brace plates 20, having their opposite ends bent to provide angular securing and reinforcing flanges which are secured to the opposed side faces of the spokes, the said braces being arranged contiguous the annular slot 11 between the sections 5 and 6 and are designed to close the slot, thereby preventing the escape of air currents through the said slot 11 when the blades or wings 18 are revolving within the fan chamber 10 during the operation of the ventilator.

Projecting outwardly in opposite directions from the fan chamber 10 are parallel long and short flues 21 and 22, respectively, the same being provided with flared mouth

extremities 23, and these flues communicate directly with the fan chamber 10, so that air will enter and be discharged from the fan chamber at diagonally opposite points thereof, during continued revolution of the blades or wings 18 in one direction within said chamber.

The ventilating apparatus is adapted to be positioned at the entrance of a mine or subway, the positioning of the apparatus may be accomplished in any desirable manner. Thus when the apparatus is positioned at the entrance to the subway or mine, and the shaft 15 is being rotatably driven, the fan blades or wings 18 will be caused to revolve at a uniform speed within the fan chamber 10 formed by the sections 5 and 6, whereupon currents of air from the atmosphere will be sucked in through one of the short flues 22 and directed through one of the long flues 21 parallel with the said short flues into the mine or subway. Simultaneously with the ingress of air from the atmosphere into the mine or subway, all foul or impure air will be drawn through the other long flue 22 and directed upwardly from the short flue 22 in alinement therewith, whence it will be exhausted to the atmosphere. Therefore, it will be seen that as the fan blades or wings 18 revolve in one direction within the fan chamber 10, air from the atmosphere will be driven or admitted into the mine or subway, and simultaneously stale or foul air present therein will be exhausted by the ventilating apparatus to the atmosphere, thus assuring perfect ventilation to the mine or subway.

In Figs. 3, 4, 5 and 6, there is shown a slight modification of the ventilating apparatus, wherein in substitute for the single fan chamber, there are provided contiguous independent fan chambers 24 and 25 formed by pairs of semi-cylindrical-shaped sections 26 and 27, respectively, the latter being identical in construction to the sections 5 and 6 of the ventilating apparatus shown in Figs. 1 and 2 of the drawings. Simultaneously revoluble in these fan chambers 24 and 25 are the disk-like fan blades or wings 18, the latter being secured to the free ends of the spokes 12 which are connected at their inner ends in tubiform sockets 13 integral with and projecting radially from the hub 14. However, the hub 14 shown in Figs. 3, 4, 5 and 6 is of considerably greater length than the hub shown in Figs. 1 and 2, thus serving to support the spokes 12 carrying the fan blades or wings 18 in the respective fan chambers 24 and

25. This hub is fixed to the driven shaft or journal 15 provided with the belt pulley or wheel 19, the shaft 15 being journaled in bearings 28 formed at the upper ends of standards 29 fixed to a base 30 of any desirable construction. Projecting in opposite directions from one point of the fan chamber 24 are alining flues 31, through which is directed an air current during the revolution of the fan blades or wings 18 within the chamber 24, thus driving the air current in one direction. Projecting in opposite directions at one point from the chamber 25, which point is diametrically opposed to the points of connection of the flues 31 with the chamber 24, are alining flues 32, through which is directed an air current during the revolution of the fan blades or wings 18 in the chamber 25, these blades or wings 18 being revoluble in the same direction of movement of the blades or wings 18 in the chamber 24. Thus, it will be seen that air currents passing through the flues 31 communicating with the chambers 24 and 25 respectively, will travel in opposite directions, thereby enabling the exhaustion of foul or stale air from a mine or subway, and the simultaneous admission of pure or fresh air from the atmosphere to the same.

What is claimed is:

In a ventilating apparatus of the character set forth including a casing having its inner peripheral edges separated to provide an annular slot, brackets formed on the casing, a driving shaft journaled centrally with respect to the casing, a hub fixed to the driving shaft and having radial socket extensions, spokes formed with a Y-shaped outer end, the inner ends of said spokes being detachably fitted in the socket extensions and their Y-shaped outer ends projecting through the annular slot through the interior of the casing, blades secured to the Y-shaped outer ends of the spokes and movable in the casing, sector shaped braces having their opposite free ends bent to provide securing and reinforcing angular flanges, and means passing through said flanges for securing the same to the opposed side faces of said spokes and positioning said braces in close contact with the peripheral slot of the casing.

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

RALPH CARROLL.

Witnesses:

HIRAM KIMBALL,
JAMES W. McDOLLE.