

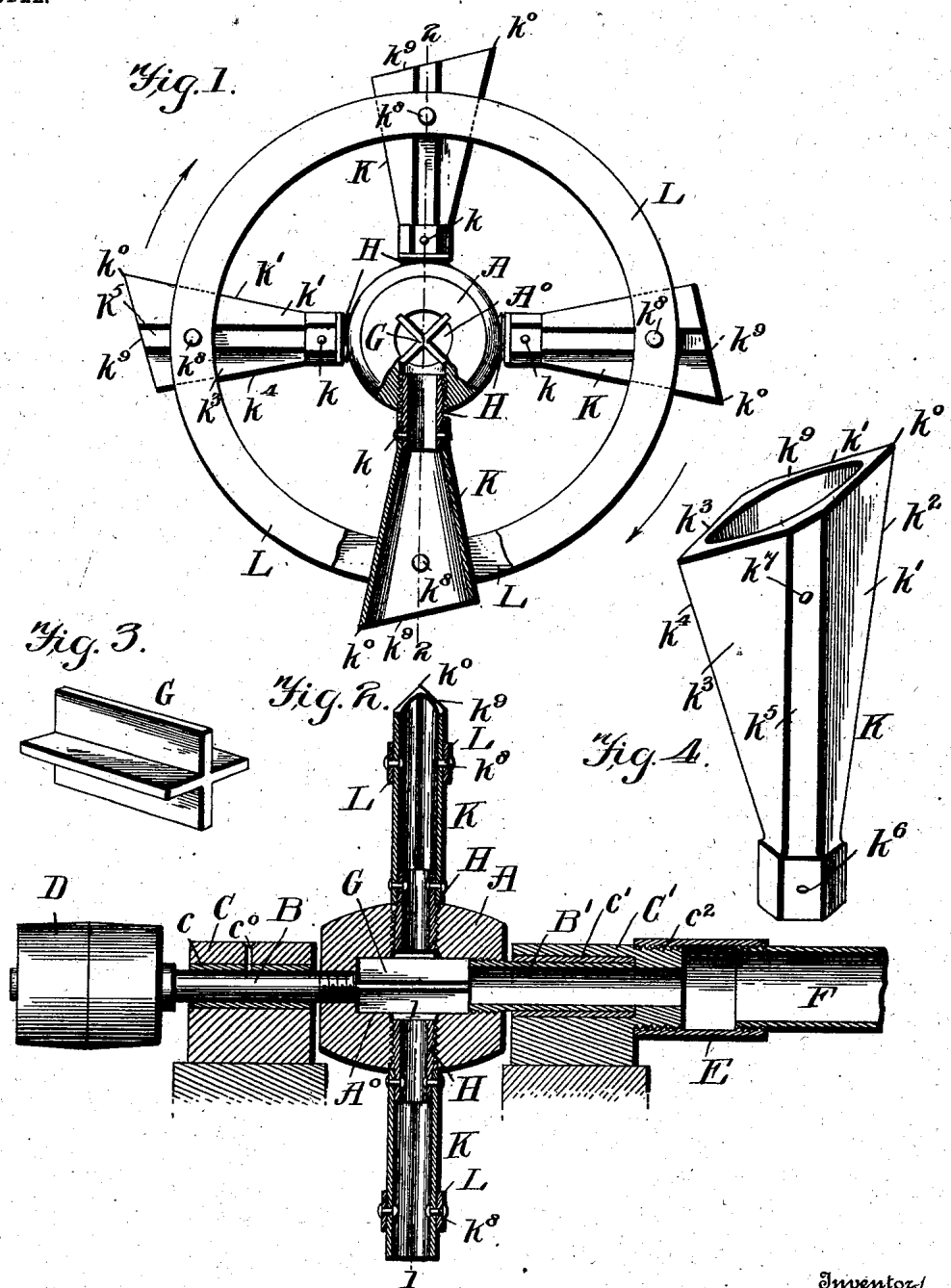
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J. DICKIE & A. F. WILLIAMS.
 ROTARY SUCTION VENTILATOR.

APPLICATION FILED AUG. 1, 1902.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

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ROTARY SUCTION-VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 730,099, dated June 2, 1903.

Application filed August 1, 1902. Serial No. 118,005. (No model.)

To all whom it may concern:

Be it known that we, JOHN DICKIE and ALEXANDER F. WILLIAMS, citizens of the United States, residing at Butte, in the county of Silverbow and State of Montana, have invented certain new and useful Improvements in Rotary Suction-Ventilators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in rotary suction-ventilators.

It consists of an improved suction-ventilator acting on the centrifugal principle in which the air to be drawn out is sucked into the center of the ventilator and is thrown outward from radial and expanding passages.

The invention is intended more especially to draw foul air out of mines, ships, or other partly-closed chambers or cavities, allowing fresh air to flow in and replace that which is sucked out.

Our invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 is an end view, partly in section, of the improved ventilator. Fig. 2 represents a section along the lines 2 2 of Fig. 1. Fig. 3 represents the cruciform deflector used in the center of the hub, and Fig. 4 is a perspective view of one of the rotary blades.

A represents a hub chambered at A^0 and provided with four radial passages connecting with the passages in the blades. To one end of the hub the shaft B is screwed, which is governed by the pulley D. This shaft is mounted in a bushing c in the block C and may be lubricated, as through the holes c^0 . In the opposite end of the hub A the hollow shaft B' is screwed, which is journaled in the bushing c' in the block C'. This block projects outward, as at c^2 , and is screw-threaded to receive the union E, into which union the pipe F is screwed. This pipe leads to that part of the mine, vessel, or chamber from which the impure air is to be exhausted.

In the chamber A^0 of the hub A is mounted the cruciform deflector G, which serves to distribute the air to the four radial passages. The hollow shanks H are screwed into the

walls of the said radial passages in the hub A, and to these shanks H the blades K are secured, as by means of the pins or rivets k . These blades or vanes K are provided with inclined front faces k' , terminating in a cutting edge k^2 , and with inclined rear faces k^3 , terminating in a cutting edge k^4 . The sides of the vanes or blades are preferably flat and are provided with rivet-holes k^6 and k^7 , through which pass the rivets k and k^8 , respectively. The outer edge of the vane slopes from rear to front, terminating in a point k^0 .

Since the vanes are driven at a high rate of speed and there would be a tendency for them to fly out radially or to shake loose in a fore-and-aft direction, we provide stiffening-rings L, which are connected to each of the blades by means of the rivets k^8 . The passage in the vane is ellipsoidal in cross-section and expands outward.

The vanes are driven in the direction indicated by the arrows in Fig. 1. The operation of this is as follows: The shaft B and hub A being rapidly rotated by means of the pulleys D, a partial vacuum will be set up in the passages in the vanes, which will be increased from the peculiar shape of these passages and also from the fact that the face k^9 recedes inward, causing a partial vacuum to take place behind the same when the vane is rapidly rotated. The partial vacuum set up, rotating the apparatus as just described, will cause the air to flow from the pipe F into the chamber in the hub A, where it will be deflected by the cruciform deflector G to the several radial passages, and quite a strong draft will promptly be set up through the pipe F and out to the open air through these radial vanes. By having the vanes with cutting edges in front and behind the resistance of the air on the apparatus will be materially decreased, and thus there will be considerable saving in motive power.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. A suction-ventilator, comprising a hub hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, and radial vanes having cutting edges in the front and rear with an expanding passage there-

through elliptical in cross-section, said vanes being mounted over said radial passages in the hub, substantially as described.

2. A suction-ventilator, comprising a hub 5 hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, and radial vanes, each having an expanding passage therethrough, secured to said hub over 10 said radial passages and each of said vanes having angularly-disposed outer surfaces merging into front and rear cutting edges.

3. A suction-ventilator, comprising a hub 15 hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, and radial vanes, each having an expanding passage therethrough elliptical in cross-section, secured to said hub over said radial passages, 20 said vanes having angularly-disposed outer surfaces merging into front and rear cutting edges.

4. A suction-ventilator, comprising a hub 25 hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in the central cavity in said hub, and radial vanes having an expanding passage therethrough secured to 30 said hub over said radial passage, substantially as described.

5. A suction-ventilator, comprising a hub 35 hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in the central cavity in said hub, and radial vanes having cutting edges in the front and rear with an 40 expanding passage therethrough elliptical in cross-section, said vanes being mounted over said radial passages in the hub, substantially as described.

6. A suction-ventilator, comprising a hub 45 hollow in the center with radial passages leading from said central cavity with means for rotating said hub, a hollow shaft forming one of the journals of said hub, radial vanes having angularly-disposed outer surfaces merging 50 into cutting edges in the front and rear with an expanding passage therethrough elliptical in cross-section, said vanes being mounted over said radial passages in the hub, and stiffening-rings connecting said vanes, 55 substantially as described.

7. A suction-ventilator, comprising a hub 60 hollow in the center with radial passages leading from said central cavity with means for rotating said hub, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in the central cavity in said hub, radial vanes having an expanding passage 65 therethrough secured to said hub over said radial passage and stiffening-rings connecting said vanes, substantially as described.

8. A suction-ventilator, comprising a hub hollow in the center with radial passages leading from said central cavity with means for

rotating said hub, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in the central cavity in said 70 hub, radial vanes having cutting edges in the front and rear with an expanding passage therethrough elliptical in cross-section, said vanes being mounted over said radial passages in the hub, and stiffening-rings connecting said vanes, substantially as described. 75

9. A suction-ventilator, comprising a hub 80 hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in the central cavity in said hub, and radial vanes each having an air-passage therethrough, secured to 85 said hub over said radial passage, substantially as described.

10. A suction-ventilator, comprising a hub 90 hollow in the center with radial passages leading from said central cavity, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in the central cavity in said hub, and radial vanes having cutting edges in the front and rear, each having an air-passage therethrough, said vanes 95 being mounted over said radial passages in the hub, substantially as described.

11. A suction-ventilator, comprising a hub 100 provided with a central cavity with radial passages leading therefrom, a hollow shaft forming one of the journals of said hub, and radial vanes, each having an air-passage therethrough, secured to said hub over said radial 105 passages, said vanes having front and rear cutting edges and an end surface sloping from the front to the rear cutting edge.

12. A suction-ventilator, comprising a hub 110 provided with a central cavity with radial passages leading therefrom, a hollow shaft forming one of the journals of said hub, and radial vanes, each provided with passages longitudinally therethrough, secured to said 115 hub over said radial passages, said vanes having angularly-disposed outer side surfaces merging into front and rear cutting edges and an end surface sloping from the front to the rear cutting edge.

13. A suction-ventilator, comprising a hub 120 having a central cavity with radial passages leading therefrom, a hollow shaft forming one of the journals of said hub, and radial vanes, each having an expanding passage longitudinally therethrough elliptical in cross-section, secured to said hub over said radial passages, 125 said vanes having angularly-disposed outer side surfaces merging into front and rear cutting edges and an end surface sloping from the front to the rear cutting edge.

14. A suction-ventilator, comprising a hub 130 having a central cavity with radial passages leading therefrom, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in said central cavity, and radial vanes each having an air-passage longitudinally therethrough secured to said hub over said radial passages, said vanes having

angularly-disposed outer surfaces merging into front and rear cutting edges.

15. A suction-ventilator, comprising a hub having a central cavity with radial passages leading therefrom, a hollow shaft forming one of the journals of said hub, a cruciform deflector mounted in said central cavity, radial vanes each having an air-passage longitudinally therethrough secured to said hub over said radial passages, said vanes having angularly-disposed outer surfaces merging into

front and rear cutting edges, and an end surface sloping from the front to the rear cutting edge.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN DICKIE.

ALEX. F. WILLIAMS.

Witnesses:

J. R. CREIGHTON,
HUGH MCGEE.