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1,623,650

R. D. ANDERSON

EXHAUST FAN OR BLOWER

Filed Sept. 19, 1923

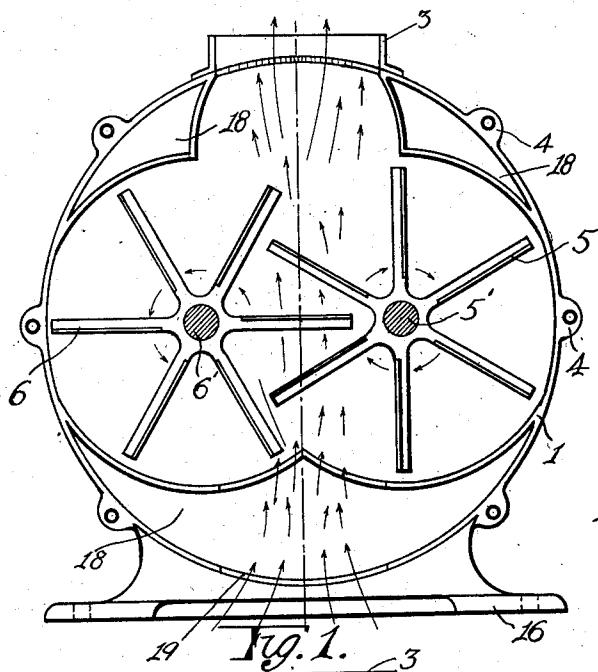


Fig. 1.

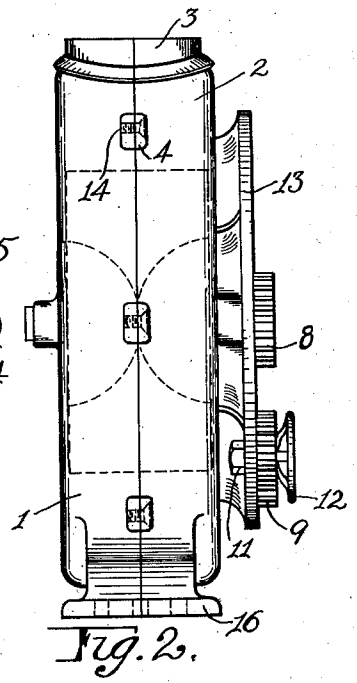


Fig. 2.

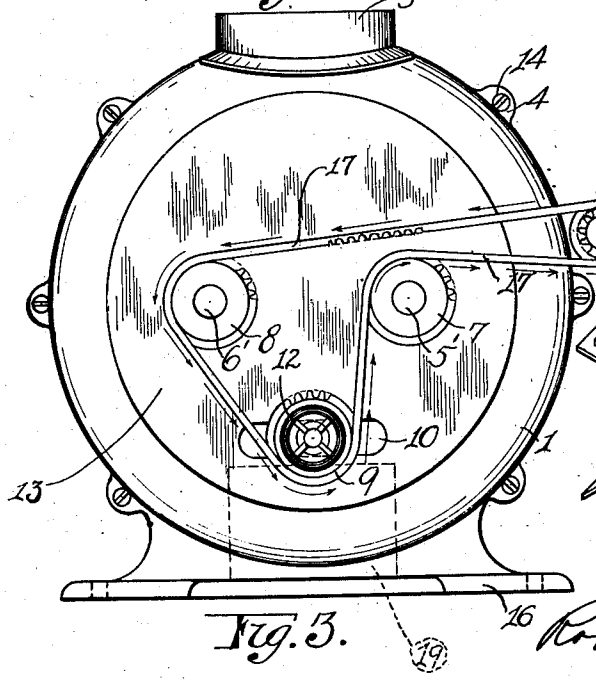
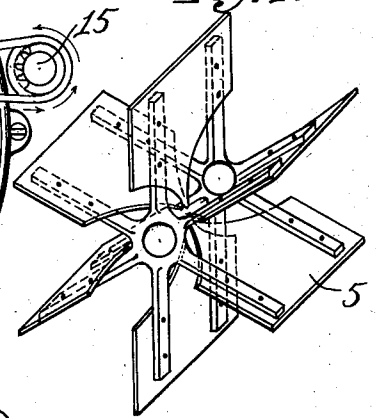


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT DUNBAR ANDERSON, OF SHREVEPORT, LOUISIANA.

EXHAUST FAN OR BLOWER.

Application filed September 19, 1923. Serial No. 663,570.

My invention relates to improvements in exhaust fans or blowers adapted for use in mines and in connection with forges, or for the production of a strong current of air within a suitable transmitting conduit; and the primary object is to provide a simple, durable and exceedingly efficient compound blower.

Another object is to construct a device wherein the suction entrance is at the bottom thereof and the discharge orifice is in a straight line directly above it, and by using the proper discharge conduit fittings, the discharge may be sent in any direction without altering the location of the fan.

A further object is the construction of a blower adapted for large blast and comparative low pressure, wherein the twin fans are overlapping so that the periphery of one fan is approximately near the axis of the other fan blades; thereby rendering a degree of efficiency heretofore not obtained with compound fans wherein the fan blades do not overlap.

Other objects and uses of the improved fan will become apparent in the following specification.

In the drawing—

Figure 1 is a side elevation of the fan with one of the halves of the case removed, showing the interrelation of the twin fans;

Figure 2 is a profile view of the fan in the entirety with the exception of the drive chain;

Figure 3 is the side elevation opposite to that shown in Figure 1, showing the interrelation of the drive sprocket wheels;

Figure 4 is a perspective view of one of the twin fans.

Referring now more particularly to the drawing, 1 represents the circular body part of the fan case and may be composed of either sheet steel or cast steel, preferably the latter. This fan case 1 is parted centrally of the outer periphery so that two cup-shaped members are apparent when the fan case is disassembled. To insure an airtight joint when the two halves of the case 1 are brought together, a gasket (not shown) of the customary construction may be interposed in the union. Outwardly projecting lobes 4 are provided circumferentially of the case 1 at regularly spaced intervals, the lobes of one side of the case 1 being adapted to receive screws 14 which pass through the unthreaded lobes of the other side of the case 1. The lower portion of the case 1 is flared to provide a footing 16 for the fan, similar to the well known construction of fan and motor bases. A vertical discharge spout 3 is disposed at the top of the fan case 1, and this may be either formed integral with the case 1, or detachable, depending on the nature of construction of the case 1. Likewise, an intake port 19 is provided at the central lower part of the case 1 of approximately the same size as the discharge spout 3; and it will be seen that this intake port is vertically aligned with the exhaust port 3. Thus no unnecessary resistance will be offered to a moving current of air through the blower. In the interior of the case 1, and with the axes of revolution parallel and in the same horizontal plane are mounted the twin fans 5 and 6 on the shafts 5′ and 6′ respectively, the shafts 5′ and 6′ being journaled for rotation in suitable bearings in the halves of the case 1. The blades of the two fans are equal in number and overlap or intermesh, and it will be apparent from Figure 1 that the fans 5 and 6 are so fan timed that the blade of one fan projects directly between the two blades of the other, and consequently there will be no interference between the blades thereof by virtue of the same speed which both fans 5 and 6 respectively travel. In Figure 4 it will be seen how the fan blades 5 (and likewise 6 not shown) converge to the axis of rotation, which is purposely so designed to prevent any back pressure which might develop in the meshing interaction of the blades of the opposite fans.

On the drive side of the fan, the case 1 has mounted thereon a flanged plate 13 for the twofold purpose of providing bearings for the shafts 5′ and 6′ respectively, and to provide a surface adjacent to which the sprocket wheels 7 and 8 respectively may be mounted. These sprocket wheels 7 and 8 are designed for a silent chain drive and are by necessity both of the same diameter. Directly underneath and in a central position between the wheels 7 and 8 is an idler sprocket wheel 9 adapted to be engaged by the same chain that projects the wheels 7 and 8. This idler 9 is adjustably disposed within the plate 13 so that any wear or slack developed in the course of operation may be taken up. A connecting drive chain 17 is provided, and it will be seen from Figure 3 that the chain 17 may be tightened by

moving the sprocket 9 with the corresponding support 11 to the right within the slot 10 of the plate 13. After the chain is of the desired tautness, the hand wheel 12 is then drawn up to lock the pin 11 in position, but still allowing free movement to the wheel 9, similar to the well known construction of idlers.

The course of travel of the chain 17 may be readily traced by following the arrows in Figure 3 where it will be seen that the chain is also trained around the sprocket wheel 15 which represents the outside source of power.

To eliminate all the unused air spaces within the case 1, I fill in the spandrels 18 surrounding the fans 5 and 6 respectively.

I am aware that compound suction and blower fans have been devised, and therefore I do not claim broadly the construction of such a device; but I do claim the specific constructions shown in the accompanying drawings, in which the fan blades of compound fans interact and overlap each other.

While I have herein described a certain specific manner and method of constructing and assembling the elements of my invention, it is understood that I may vary from the same in minor details, not departing from the spirit of my invention, so as best to construct a practical device for the purpose intended, as defined in the appended claim.

I claim:

In an exhaust fan or blower, the combination with a casing, shafts journaled transversely said casing on either side thereof, and means for rotating said shafts in opposing directions, of fan blades mounted on said shafts, said fan blades being formed so as to converge to the axis of rotation of said shafts, for the purpose as described.

In testimony whereof I affix my signature.

ROBERT DUNBAR ANDERSON.