

T. O. CARLISLE.  
CUT-OFF FOR FANS.  
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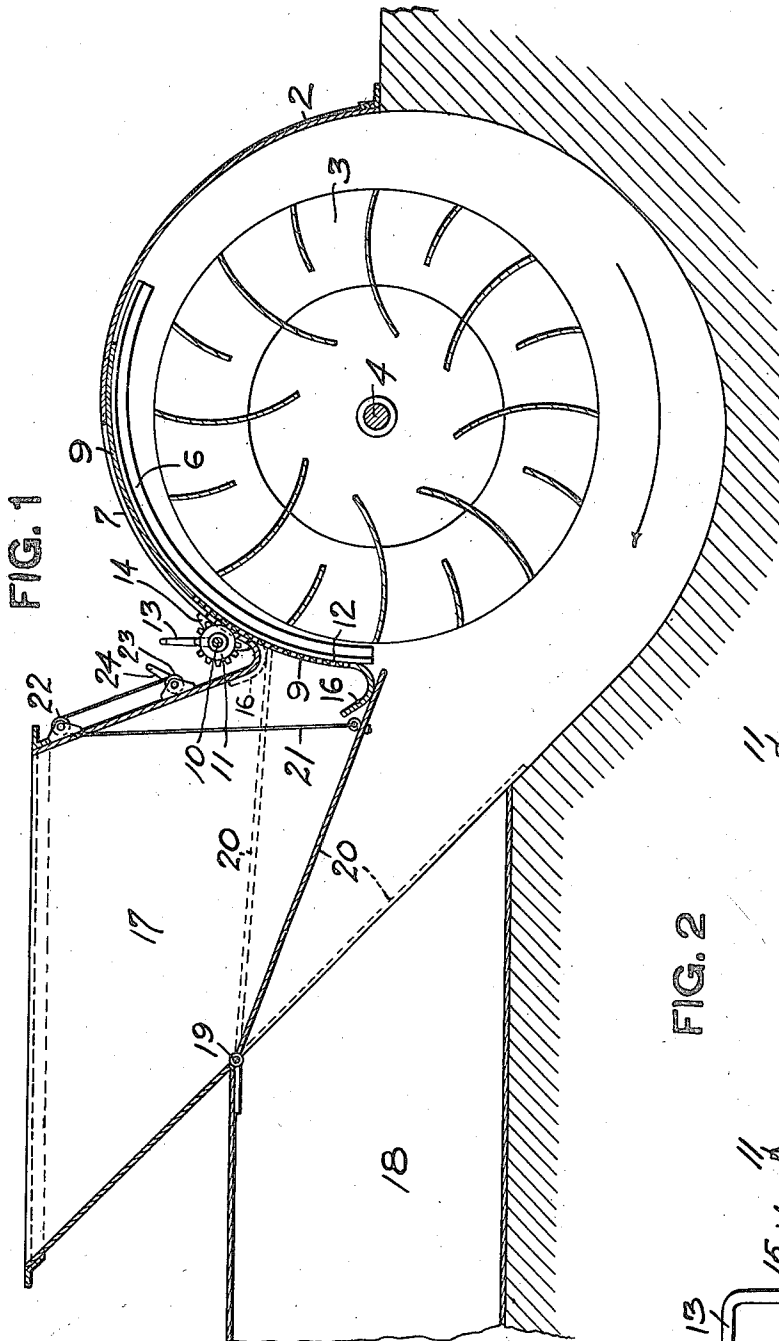
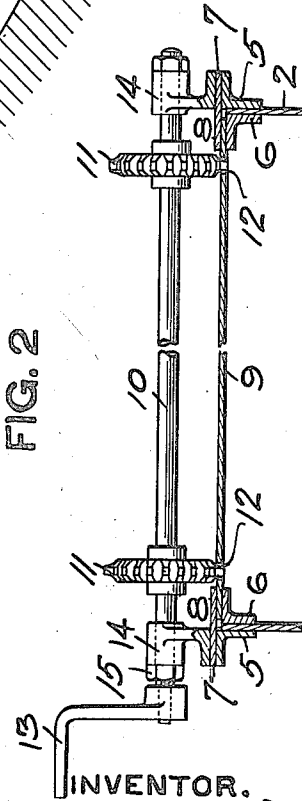


FIG. 1

WITNESSES.

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FIG. 2



INVENTOR.

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# UNITED STATES PATENT OFFICE.

THOMAS O. CARLISLE, OF MONONGAHELA, PENNSYLVANIA.

## CUT-OFF FOR FANS.

960,815.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed October 26, 1909. Serial No. 524,729.

*To all whom it may concern:*

Be it known that I, THOMAS O. CARLISLE, a resident of Monongahela, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Cut-Offs for Fans; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to centrifugal fans for use in connection with mines, or other cases, where it is desired not only to force fresh air into the mine, but also to exhaust the foul air therefrom, its object being to provide a fan of this character of increased efficiency and one that will operate under more nearly perfect conditions.

To these ends my invention comprises, generally stated, a suitable rotary fan inclosed by a casing with fresh air and exhaust passages connected to said casing, together with a movable cut-off plate for changing the point of beginning of the cut-off, and a reversing door operating in connection with said cut-off plate and adapted to engage said plate in one position to close one passage and adapted in the other position to close the other passage.

Referring to the accompanying drawing, Figure 1 is a vertical side elevation of my improved cut-off; Fig. 2 is a detail showing the mechanism for moving said cut-off.

I have illustrated my invention in connection with an ordinary type of fan and the numeral 2 designates a suitable casing which contains the fan 3 mounted on the shaft 4, which may be connected up to any suitable source of power. The arrangements of the vanes or buckets of the fan may be varied to suit conditions and I do not wish to limit myself in any way to any particular arrangement as the construction of the fan forms no part of my present invention.

The angles 5 and 6 are secured to the sides of the casing and the angles 6 form, in connection with the strips 7 of the casing, the guides 8 for the cut-off plate 9. The cut-off plate is adapted to move in said guides and said cut-off plate is bent to conform to the curve of the casing. To provide for the movement of the cut-off plate 9, I employ the shaft 10 carrying the toothed wheel 11 whose teeth mesh with the perforations 12 formed in the cut-off plate which forms a rack-face. At either or both ends of the shaft 10 I provide a crank 13. The shaft 10 is mounted in suitable bearings 14 on the

casing and the lock-nut 15 on said shaft is adapted to be tightened up against one of the bearings to lock the shaft in position when once the cut-off plate has been adjusted properly. The cut-off plate is provided at its outer end with the outwardly projecting portion 16.

In connection with the casing 2 there are the exhaust flue 17 and the fresh-air passage 18 all as in the ordinary construction of this type of fan. The exhaust flue 17 leads to the atmosphere and acts as an exhaust or escape for foul air or gases, while the fresh air passage 18 is for delivering fresh air to the mine. Hinged at 19 is the gate or door 20 which is adapted to change the fan from a blower to an exhauster or vice versa. A cord or cable 21 is connected to the door 20 and said cable passes up over the pulley 22 and is wound around the drum 23 which is operated by the handle 24.

In Fig. 1 the door is indicated in full lines as bearing against the inwardly extending portion 16 of the cut-off plate 9, and the fan under such conditions is used for blower, the fresh air being blown out through the passage 18. The cut-off plate 9 may, however, be lowered in case it is found desirable, or said cut-off plate may be moved up to the position indicated in dotted lines Fig. 1, which is the ordinary point of cut off on ordinary fans of this character. In that case the door 20 is raised to the position indicated in dotted lines where the fan is to be used for blowing. In case, however, the fan is to be used for exhausting the door 20 is swung down to the position indicated in dotted lines Fig. 1, where the blowing or fresh-air passage is cut off and the exhaust-passage 17 opened.

The movement of the cut-off plate is a very simple matter as it is only necessary for the operator to turn the shaft 11 when the cut-off plate may be moved and adjusted at any desired position. The cut-off plate can also be used to regulate the flow of air independently of the reversing door by moving said cut-off plate the required amount to give the proper results.

By my invention, I am enabled to vary the point of the beginning of cut-off thereby increasing the efficiency of the fan, making it adaptable for different conditions under which the fan is operated, and making the fan as efficient when blowing as when exhausting.

What I claim is:

1. In a centrifugal fan, the combination  
of a suitable casing having exhaust and  
fresh air flues communicating therewith, a  
5 door for closing one or the other of said  
flues, means for varying the point of cut-  
off, and said door being adapted to engage  
said means at the point of cut-off.
2. In a centrifugal fan, the combination  
10 of a suitable casing having exhaust and  
fresh air flues communicating therewith, a  
door for closing one or the other of said  
flues, and a movable cut-off plate, said door  
being adapted to engage said cut-off plate.
- 15 3. In a centrifugal fan, the combination  
of a suitable casing having exhaust and  
fresh air flues communicating therewith,  
guides on said casing, a movable cut-off  
plate engaging said guides, means for mov-  
20 ing said plate, and a door for closing one or  
the other of said flues adapted to engage  
said movable cut-off plate.
4. In a centrifugal fan, the combination  
of a suitable casing having exhaust and  
25 fresh air flues communicating therewith,  
guides on said casing, a movable cut-off  
plate engaging said guides, a toothed wheel  
engaging said cut-off plate, and a door for  
closing one or the other of said flues adapted  
30 to engage said cut-off plate.
5. In a centrifugal fan, the combination

of a suitable casing having exhaust and  
fresh air flues communicating therewith,  
guides on said casing, a movable cut-off  
plate in said guides having a rack face, a 35  
toothed wheel adapted to engage said rack  
face, and a door for closing one or the other  
of said flues adapted to engage said cut-off  
plate.

6. In a centrifugal fan, the combination 40  
of a suitable casing having exhaust and  
fresh air flues communicating therewith,  
guides on said casing, a movable cut-off  
plate engaging said guides, said plate having  
a rack face, a rotary shaft mounted on said 45  
casing, a toothed wheel on said shaft en-  
gaging said rack face, and a door for clos-  
ing one or the other of said flues adapted  
to engage said cut-off plate.

7. In a centrifugal-fan, the combination 50  
of a suitable casing, exhaust and fresh-air  
flues, a movable cut-off plate having an out-  
wardly extending end portion, and a re-  
versing-door adapted to engage said out-  
wardly extending portion of said cut-off 55  
plate.

In testimony whereof, I the said THOMAS  
O. CARLISLE have hereunto set my hand.

THOMAS O. CARLISLE.

Witnesses:

ROBERT C. TOTTEN,  
J. F. WILL.