SYSTEM FOR VENTILATING MINES, &c.
APPLICATION FILED NOV. 21, 1906.

Fig. 5.

Fig. 4.

Witnesses

Inventor

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G. M. CAPPELL.
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2 SHEETS—SHEET 2.
To all whom it may concern:

Be it known that I, GEORGE MARIE CAPELL, a resident of Passenham, in the county of Northampton, England, have invented a new and useful Improvement in Systems for Ventilating Mines, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a system for ventilating mines, etc.

The object of my invention is to provide a cheap, simple and efficient system for ventilating mines, in which the pressure of the air sucked from the mine by the fans will be equalized on each fan casing and the air drifts thereto, as well as such a system in which one of the fans will be enabled to exhaust almost as much air from the mine as two, in case one of the fans is not in operation from any cause.

My invention consists, generally stated, in the novel arrangement, construction and combination of parts, as hereinafter more specifically set forth and described and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved system for ventilating mines, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 shows a ground plan view of my improved system for ventilating mines with the walls thereof in section. Fig. 2 is a longitudinal section of the same on the line 2—2 Fig. 1. Fig. 3 is a ground plan view showing another form of my invention with the walls thereof in section. Fig. 4 is a longitudinal section on the line 4—4 Fig. 3.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in said drawings, I represent the usual vertical shaft leading to a mine, and extending out from the top of said shaft and at one side of the same is the main horizontal air passage-way 2, which connects with said shaft and is divided into two horizontal air fan drifts 3 and 4 by a central and vertical division wall 5 located in said way 2 and extending to a point somewhat back of said shaft. Located on each side of the drifts 3 and 4 is a chamber 6 for the reception of the centrifugal or rotary fans 7 and 7' of any approved type, and such fans have the usual fan casing 8 for inclining the fan proper (not shown), while between said chambers and at the end of said drifts are the air locks 9 for the entrance to said fans for any purpose, which locks have the openings 10 in the walls 11 forming the same and such openings are closed by the doors 4' therein. The fans 7 and 7' are operated by means of a shaft 9 mounted within the same and within bearings 10, and a driving pulley 11 is also mounted on each of the shafts 9 for the connection of a rope 12 thereto, which rope leads and is connected to any suitable source of power for revolving each of said shafts through its said rope pulley thereon to thereby operate each of said fans.

Hinged to the walls 2' for forming the passage-way 2 and the inner walls of the chamber 6 are the doors 13 which are self-acting or may be operated in any desired manner, as by a windlass 13' or by any suitable mechanism, and each of these doors is adapted to extend across the air drifts 3 and 4 and be held in their closed positions by a projection 14 formed on the division wall 5. Within this division wall 5 is an air passage-way 15 between the drifts 3 and 4, and within the same is a valve 16 for opening and closing said passage-way which is self-acting or may be operated in any desired manner or by any suitable mechanism. An air passage-way 17 extends through the drifts 3 and 4 and through the wall 5 for forming said drifts, which passage-way opens into casing 8 of each of the fans 7 and 7' by connecting with said fan-casing 8 and is provided with a valve 18 therein. This valve 18 is operated by a handle 19 located in one of the drifts 3 and 4 so as to be within easy reach of the operator entering said drifts through the air locks 9' and from the stand or floor 19' located therein.

The use and operation of my improved system for ventilating mines is as follows:—When the fans 7 and 7', are in operation through their shafts 9, the suction from the said fans will open the doors 13, so that the air from the mine will be drawn up through the mine shaft 1 into the passage-way 2 and thence into the drifts 3 and 4, after which it passes into said fans through the inlets 20 in the walls 2', and from the fans it passes out of the exhaust end 9' thereof, formed by the casing 8, into the chimney passage or open air, as is desired. When the fans 7 and 7' are thus in operation and the air is being drawn into the same through the passage 2 and drifts 3 and 4 from the mine shaft 1, the pressure of the air in these drifts will be equalized by means of the opening of the valve 16 in the passage-way 15.

When the mine is not in operation, as for instance, over Sunday or holiday, and it is desired to shut off one of the fans 7 and 7', to save expense of operating, as for instance, the fan 7', the other fan 7 in its operation will draw the air from the mine up through the shaft 1 and into the passage-way 2. As the air is thus drawn into the passage-way 2, it will act to open the door 13 in the drift 3 which will allow such air to pass through said drift into the fan 7 through the inlet 20 opening into said fan, and from this fan it can escape out through the end 9' thereof. When the air is thus being drawn from the mine by the fan 7 through shaft 1, passage-way 2 and drift 3, the suction from said fan will act to close the door 13 in the drift 4, with the assistance of the windlass 13', while the valve 16 in the passage-way 15 will also be closed by said suction. The fan 7 can be shut down and the other fan 7' can
be operated singly in like manner to exhaust the air from the mine, and by the use of a single fan in this operation it has been found that about two-thirds of the air exhausted by the two fans can be exhausted by such single fan running at the same speed. When the fans are started and the doors 13 are closed, they will be opened by the draft of air through the passages to the fans, and when it is desired to close either of the passages 3 or 4 from shaft 1, the windlass 13 is operated to wind up the rope and close the door. The pulley attached to door over which rope passes is for the purpose of giving leverage to start the door to close, for if the rope would lay flat, and not on the pulley, it would have no leverage.

In case of a change of speed in either one of the fans 7 and 7' in its operation from any cause, the air from the inner shaft 1 carried to said fans through the drifts 3 and 4 will be equalized in the fan-casings 8 of said fans by entering the passage-way 17 and opening the valve 18 and thereby establishing a communication between the said fans through the air in said passage-way 17 from said fans. When the fans 7 and 7' are running at the same speed in exhausting the air from the mine, as above described, communication between them through the exhausted air from the mine passing through the passage-way 17 is cut off and the valve 18 in said passage-way 17 is then moved to a closed position.

In Figs. 3 and 4 the fans 7 and 7' are shown as being driven by direct motor power by having a motor 21 mounted on each of the shafts 9 for said fans and between the chambers 6 for said fans. In this case, the drifts 3 and 4 extend around said fans or chambers and the inlets 20 lead into said fans through the casings 8 thereof from the walls 3' forming the outer walls of said chamber and the inner walls of said passages. A door 13 is hinged in each of the drifts 3 and 4 and is connected to the windlass 13', while the valved passage-way 15 extends in front of the chambers 6 and connects with said drifts through the inner walls thereof. The valved passage-way 17 connects with and extends directly across and through the walls of said chambers 6 in front of and below said motors 21, and the air locks 3' are formed at the end of the drifts 3 and 4 outside of the chambers 6.

It will be obvious that a number of drifts can lead from the mine shaft and each provided with a fan for ventilating said mine and that the system can be used in ventilating other places, such as buildings, shops, warehouses, etc.

Various other modifications and changes in the design, operation, construction and uses of my improved system for ventilating mines, etc. may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

It will thus be seen that my improved system for ventilating mines, etc. will thoroughly and completely ventilate the mine when in use, and the pressure of the air drawn from the mine by the fans will be thoroughly and completely equalized on each fan and on each drift leading from the mine to its fans, as practical experience with the system has proven. It has also proven that when one fan is out of operation for any cause, the other fan will exhaust about two-thirds of the amount of air from the mine that would be exhausted by the two fans when in use or operation and running at the same speed.

What I claim as my invention and desire to secure by Letters Patent is—

1. In a system for ventilating mines, etc., the combination of two air drifts leading from the mine, a fan connected to each of said drifts, and a main passage-way connected to and between said drifts for equalizing the pressure of the air within said drifts.

2. In a system for ventilating mines, etc., the combination of two air drifts leading from the mine, a fan connected to each of said drifts, and a main passage-way connected to and between said drifts for equalizing the pressure of the air within said casings.

3. In a system for ventilating mines, etc., the combination of two air drifts leading from the mine, a fan connected to each of said drifts, and an air passage-way connected to and between the casings of said fans for equalizing the pressure of the air within said casings.

4. In a system for ventilating mines, etc., the combination of two air drifts leading from the mine, an air passage-way connected to each of said drifts, and a main passage-way connected to and between the casings of said fans for equalizing the pressure of the air within said casings.

5. In testimony whereof, I, the said GEORGE MARIE CAEF., have hereunto set my hand. GEORGE MARIE CAEF.

Witnesses:

J. N. COOK.

WM. R. McCOMMON.