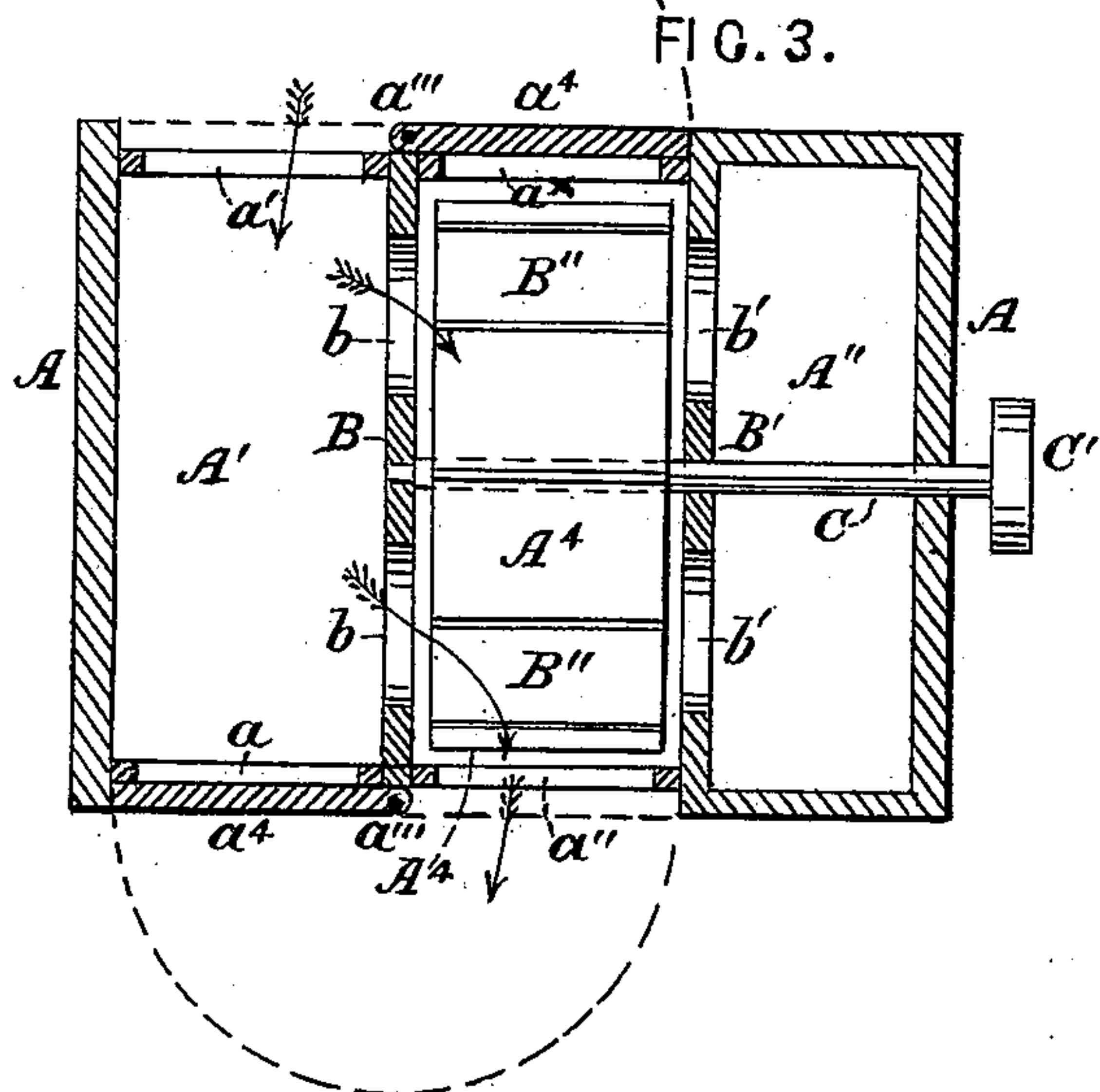
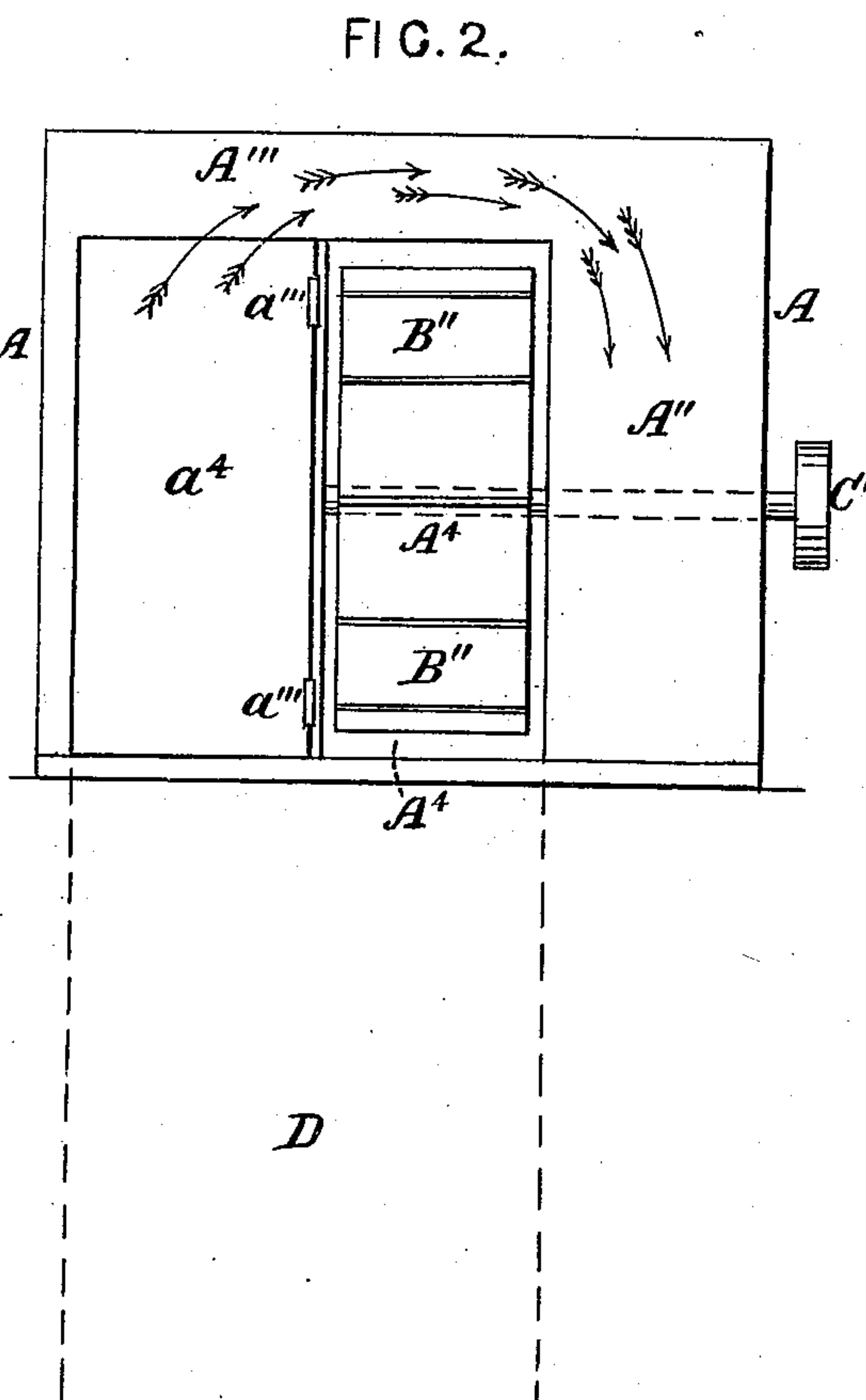
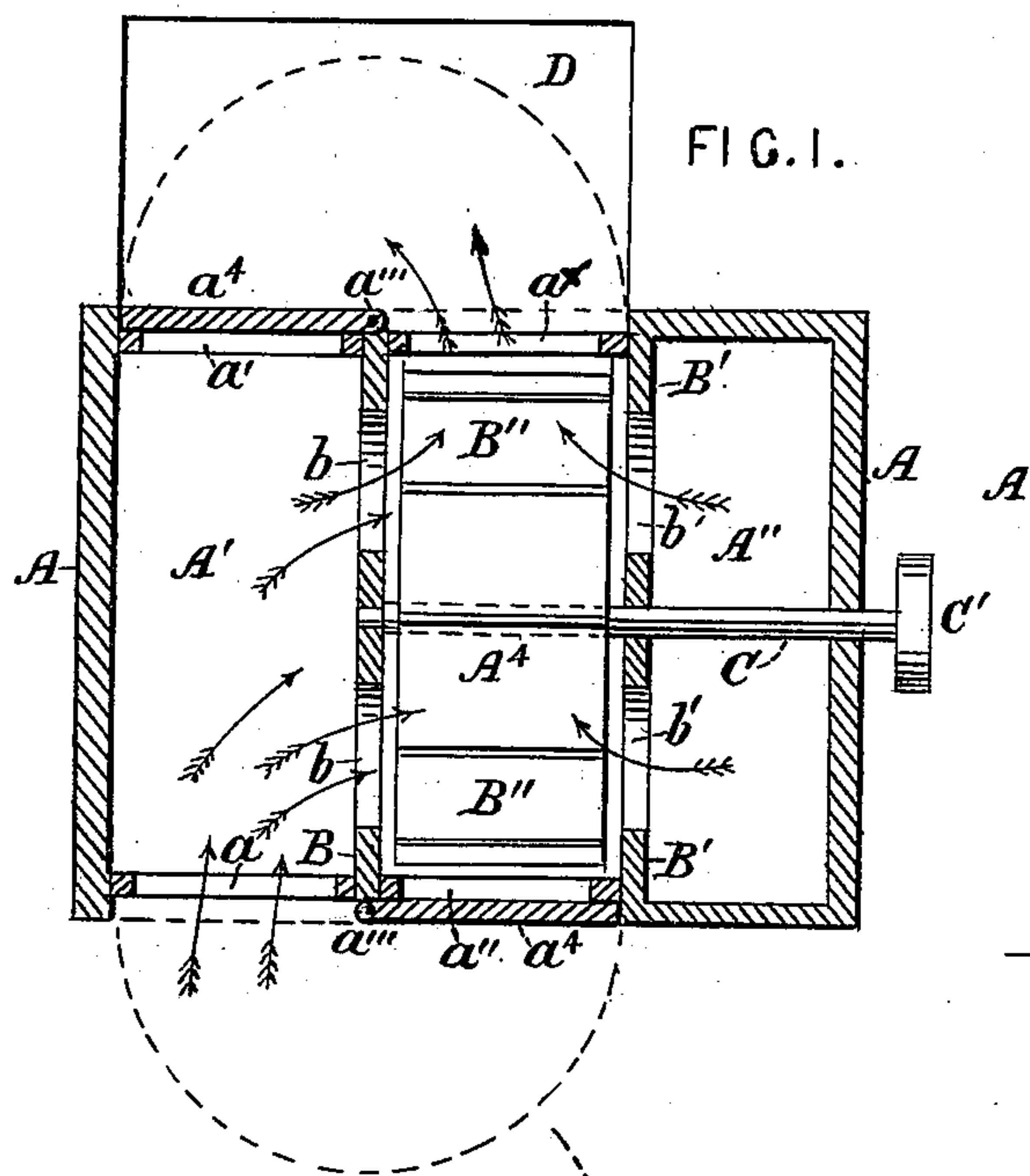


(No Model.)

L. L. GRAVES & J. KANGLEY.
APPARATUS FOR VENTILATING MINES.

No. 336,914.

Patented Mar. 2, 1886.



WITNESSES

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LOUIS L. GRAVES AND JOHN KANGLEY, OF STREATOR, ILLINOIS.

APPARATUS FOR VENTILATING MINES.

SPECIFICATION forming part of Letters Patent No. 336,914, dated March 2, 1886.

Application filed November 24, 1884. Renewed January 23, 1886. Serial No. 189,451. (No model.)

To all whom it may concern:

Be it known that we, LOUIS L. GRAVES and JOHN KANGLEY, citizens of the United States, residing at Streator, in the county of La Salle and State of Illinois, have invented certain new and useful Improvements in Apparatus for Ventilating Mines, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to improvements in apparatus for ventilating mine-shafts and mine-galleries, either by forcing good air into the mine or exhausting bad air from the mine by a single revolving fan; and it consists in the construction and relative arrangement of the operating parts with the shaft of the mine and the air-chambers that receive the air to be acted upon by a revolving fan, as will be fully hereinafter described.

In the drawings, Figure 1 represents a horizontal section of the apparatus as applied to a mine-shaft. Fig. 2 represents a side elevation of the same, and Fig. 3 represents a horizontal section with the air-valves reversed in their positions from that seen in Fig. 1.

A represents the casing that incloses the air-chambers and the revolving fan.

A' and A'' are air-chambers—one on either side of the revolving fan—and A''' is an air-chamber or passage over the fan-case, and through which air can pass from chamber A' to chamber A'', thence into the fan, to be either drawn from or forced into the mine-shaft.

a a' are air-openings in chamber A' opposite each other, and a'' a^x are air-openings in fan-chamber A⁴.

a⁴ a⁴ are swinging doors or valves, pivoted at a''', to swing in either direction and cover an air-opening, a, a'', or a^x.

B and B' are transverse partitions across the casing A, between which is the fan-chamber A⁴, and in which is the revolving fan B''.

b b are openings in partition B for the passage of air from chamber A' into the fan-chamber A⁴, to be acted upon by the revolving fan B'', and b' b' are similar openings in partition B', for the passage of air from chamber A'' into the fan-chamber A⁴, to be acted upon by the fan B'' in its revolutions.

C is a horizontal fan-shaft that passes transversely through chambers A'' and A⁴, has prop-

er bearings in casing A, and partitions B and B', and to which shaft, within chamber A⁴, the fan B'' is attached to shaft C.

C' is a pulley fast upon the end or other convenient part of shaft C, for the purpose of revolving fan B'', and is revolved by a belt put in motion by any convenient power.

D represents the air-shaft or mine-shaft, and our device for ventilating the shaft and its mine-galleries is placed at one side of the shaft, instead of directly over it, as has heretofore been the practice.

Our construction and arrangement is made, as above described, for the purpose of allowing escape from the mine of the miners therein whenever, by accident, such escape is necessary, as the ventilating device is entirely out of the way of the ingress and egress of the miners or other persons going into or coming out of the mine, and by our construction and arrangement of the operating devices of the ventilator air is forced into the shaft D by means of the revolving fan B'', through the opening a of chamber A', thence a part of the air passes from chamber A' through openings b b in partition B to the fan, while another portion passes over the fan-chamber A⁴, through chamber A''', into chamber A'', thence into the fan-chamber through openings b' in partition B', and thence is forced by the revolution of the fan B'' through opening a^x into the shaft D.

When it is desired to exhaust the air from the mine and its galleries, a valve or door, a⁴, is turned to close the air-opening a into chamber A', and valve or door a⁴, next the shaft, is turned to close opening a^x of the fan-chamber next the shaft, leaving the opening a' on the side of chamber A' next the shaft D open. Without changing the revolution of fan B'', the air will be drawn up out of shaft D into chamber A', thence into the fan-chamber A⁴, through openings b b', then forced out of the fan-chamber by the fan B'' through the opening a'' of the fan chamber. This change from a force fan or blower to an exhaust or suction fan is wholly due to the simple construction of the parts and the changing of two valves or doors to cover or leave open the air-passages into and out of the chambers of the device.

The fan B'' may be constructed in any known

and approved manner, either by radial, curved, or scoop-shaped blades, by which the best results may be obtained.

We are aware of Patent No. 176,756, dated 5 May 2, 1876, in which two fan-heads or fans are used, drawing the air from one side only of the fan-chamber, while by the construction above described but one fan is used, taking air to the fan from both sides of the fan-chamber, 10 and we lay no claim to the construction therein shown or described.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

15 1. In an apparatus for ventilating mines, the combination of the air-chamber A', having opposite openings *a a'*, air-chamber A''' over the fan-chamber, and air-chamber A'', having openings *b'* into fan-chamber A⁴, having a re- 20 volving fan, B'', therein, with the doors or valves *a⁴ a⁴*, and arranged with relation to the mine-shaft substantially as described.

2. In an apparatus for ventilating mines, the combination of the pivoted doors or valves *a⁴* 25 *a⁴*, one upon each of the opposite sides of the

chamber A', and arranged to cover openings *a* and *a'* of said chamber or to swing to cover openings *a''* and *a^x* of fan-chamber A⁴, or to cover one opening in chamber A' and one opening in chamber A⁴, as described. 30

3. In an apparatus for ventilating mines, the combination of air chamber A', having air-openings *a* and *a'* on opposite sides thereof, fan chamber A⁴, having air-openings *a''* and *a^x* on opposite sides thereof, and a fan, B'', re- 35 volving in one direction only therein, air-chamber A'', and connecting air-chamber A''' to chambers A' and A'', air-openings *b b* from chamber A' into fan-chamber B'', and air-openings *b' b'* from chamber A'' into fan-cham- 40 ber B'', with the pivoted doors or valves *a⁴ a⁴*, to cover openings *a a^x* or *a* and *a''*, substantially as described.

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

LOUIS L. GRAVES.
JOHN KANGLEY.

Witnesses:

G. L. RICHARDS,
J. W. MOONE.