

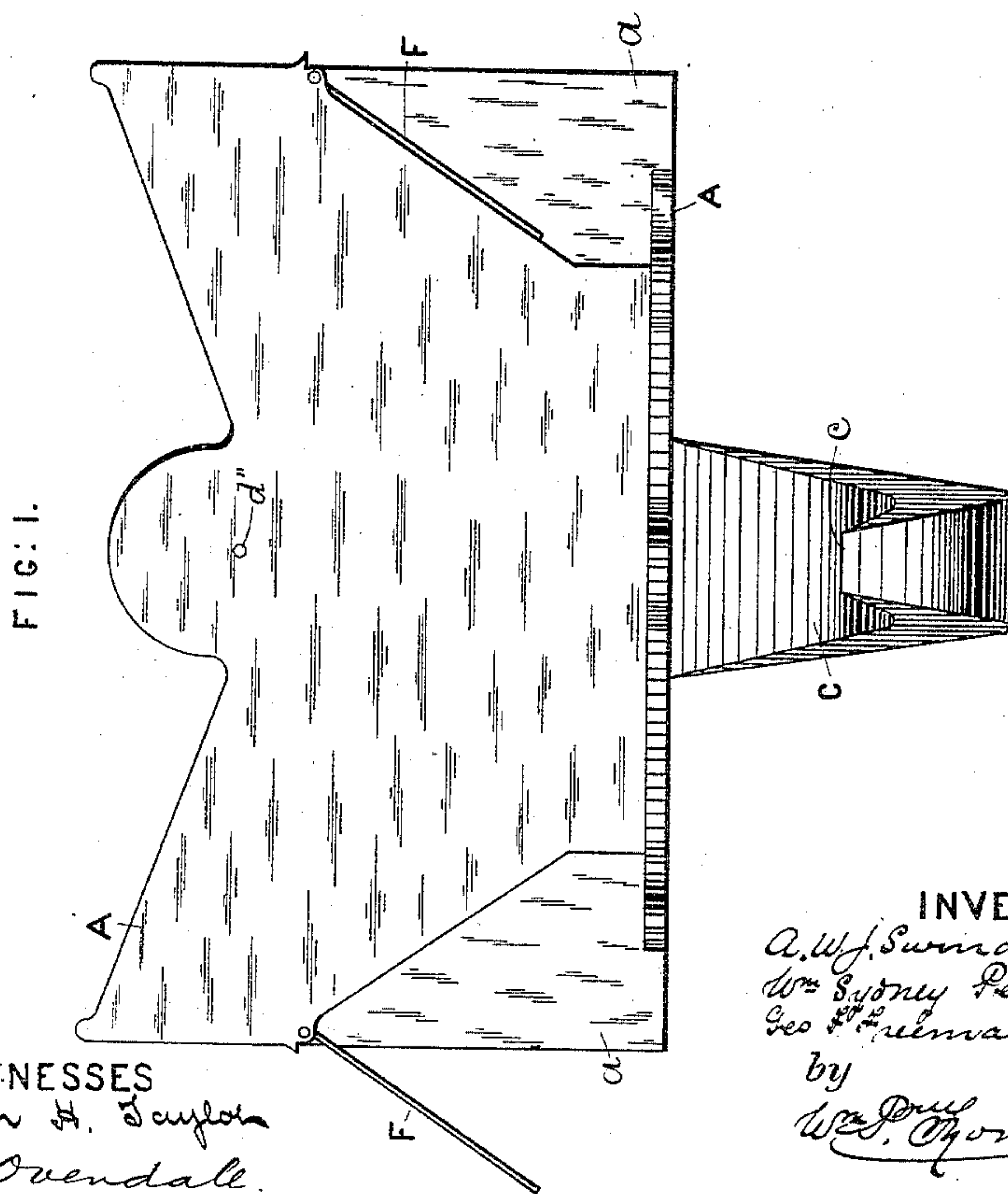
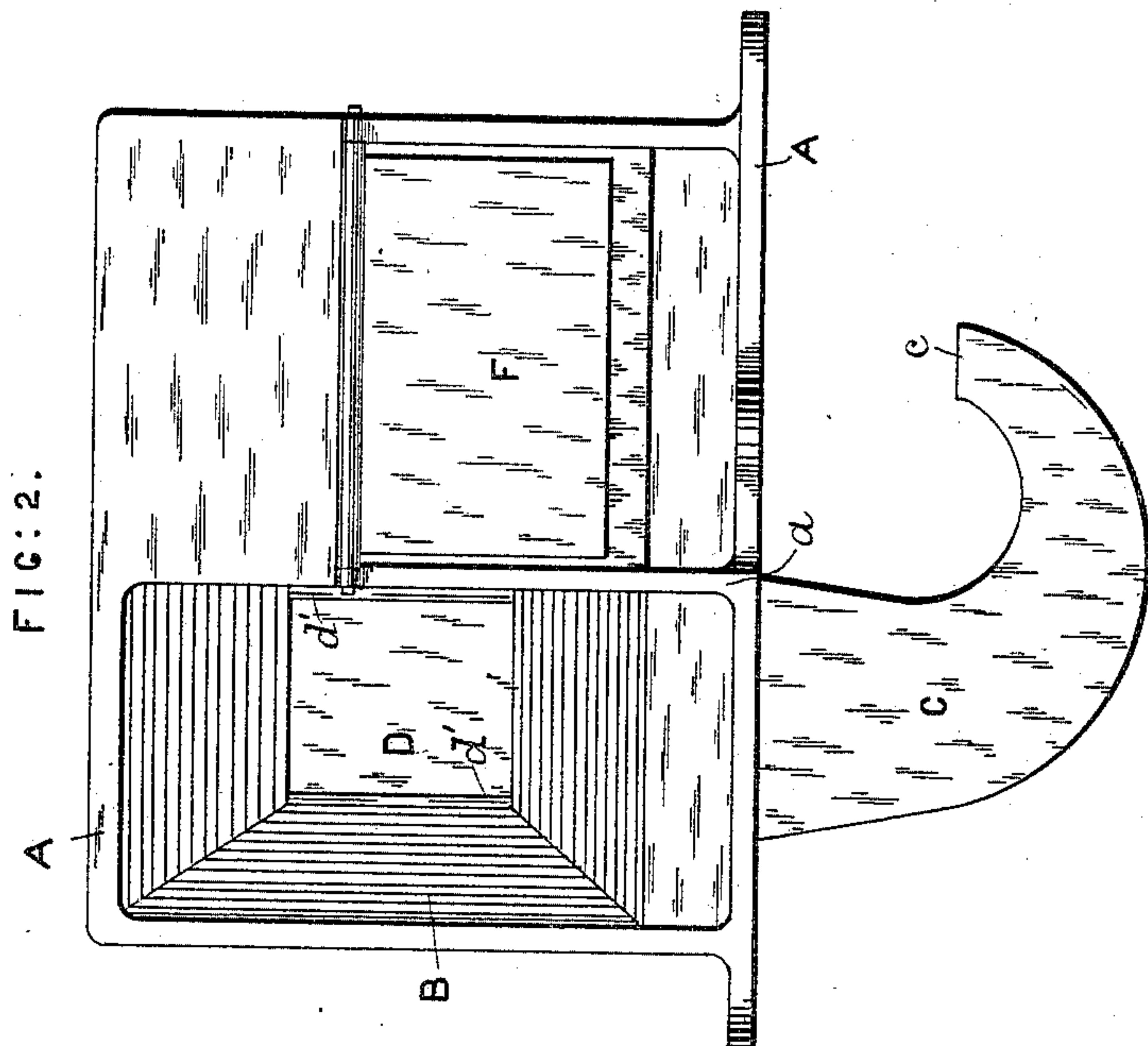
(No Model.)

4 Sheets—Sheet 1.

A. W. J. SWINDELLS, W. S. PEEL & G. F. FREEMAN.
VENTILATOR FOR CARRIAGES OR MOVING VEHICLES.

No. 442,924.

Patented Dec. 16, 1890.



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Chas. Overdale.

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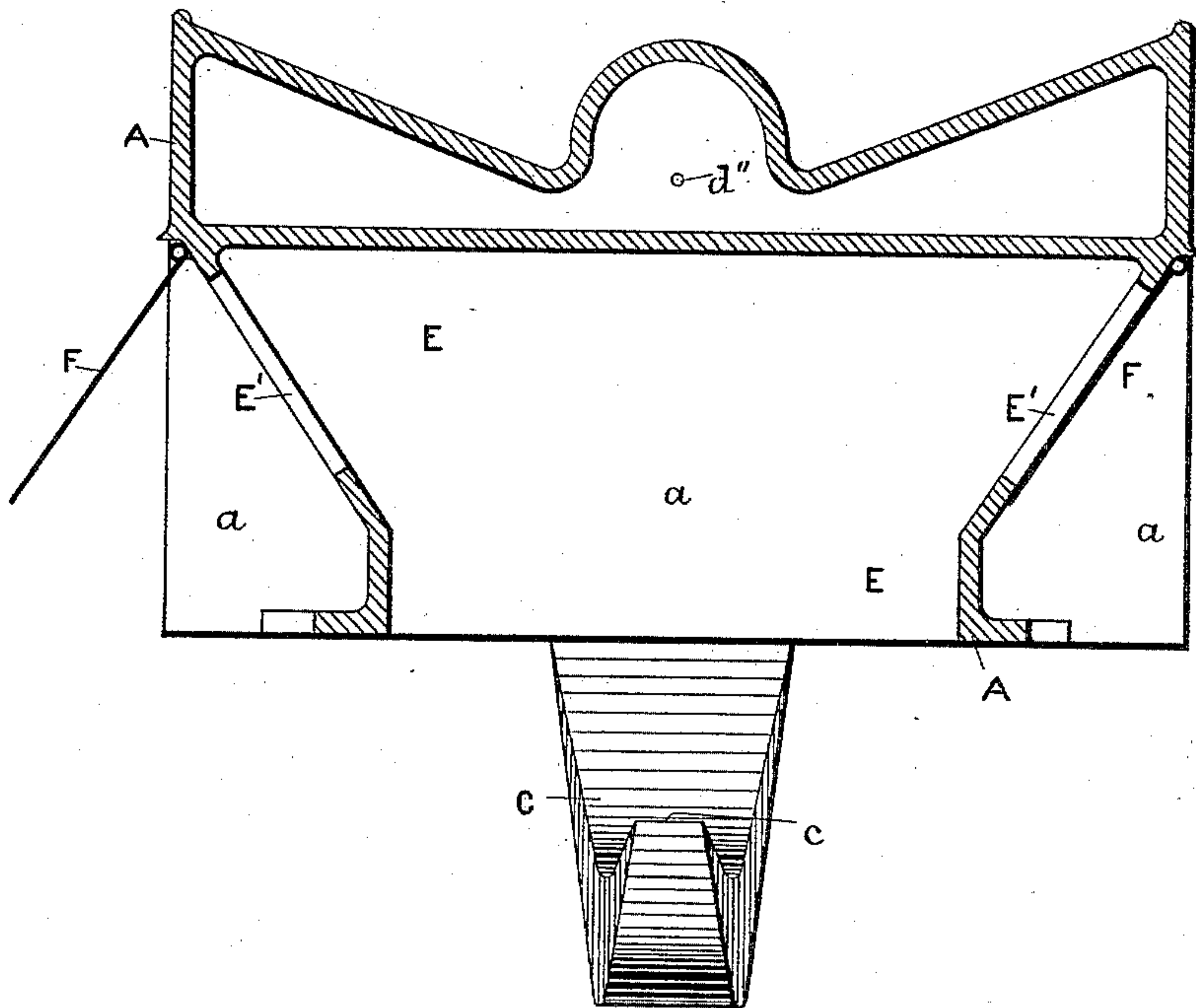


FIG. 3.

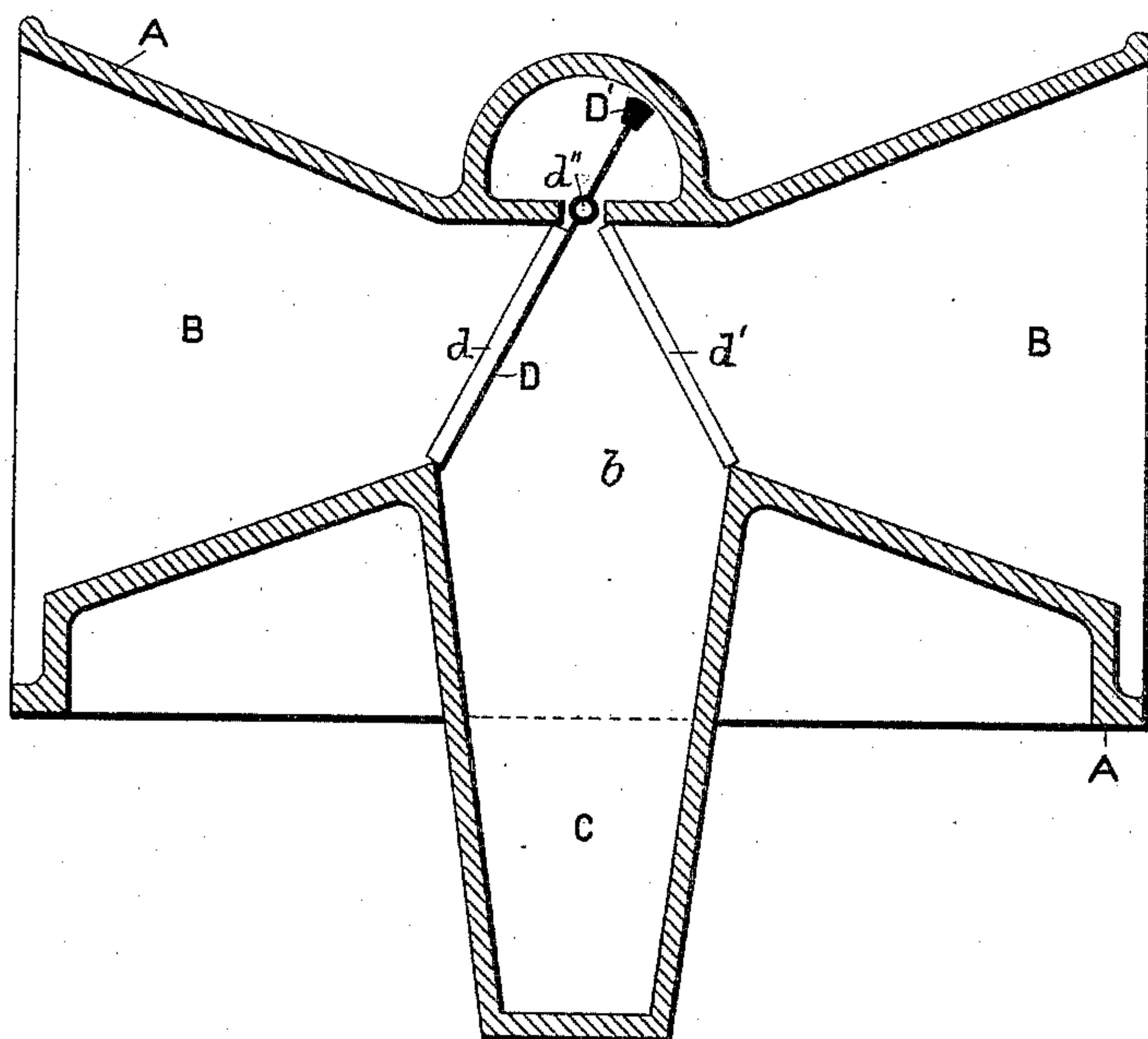


FIG. 4.

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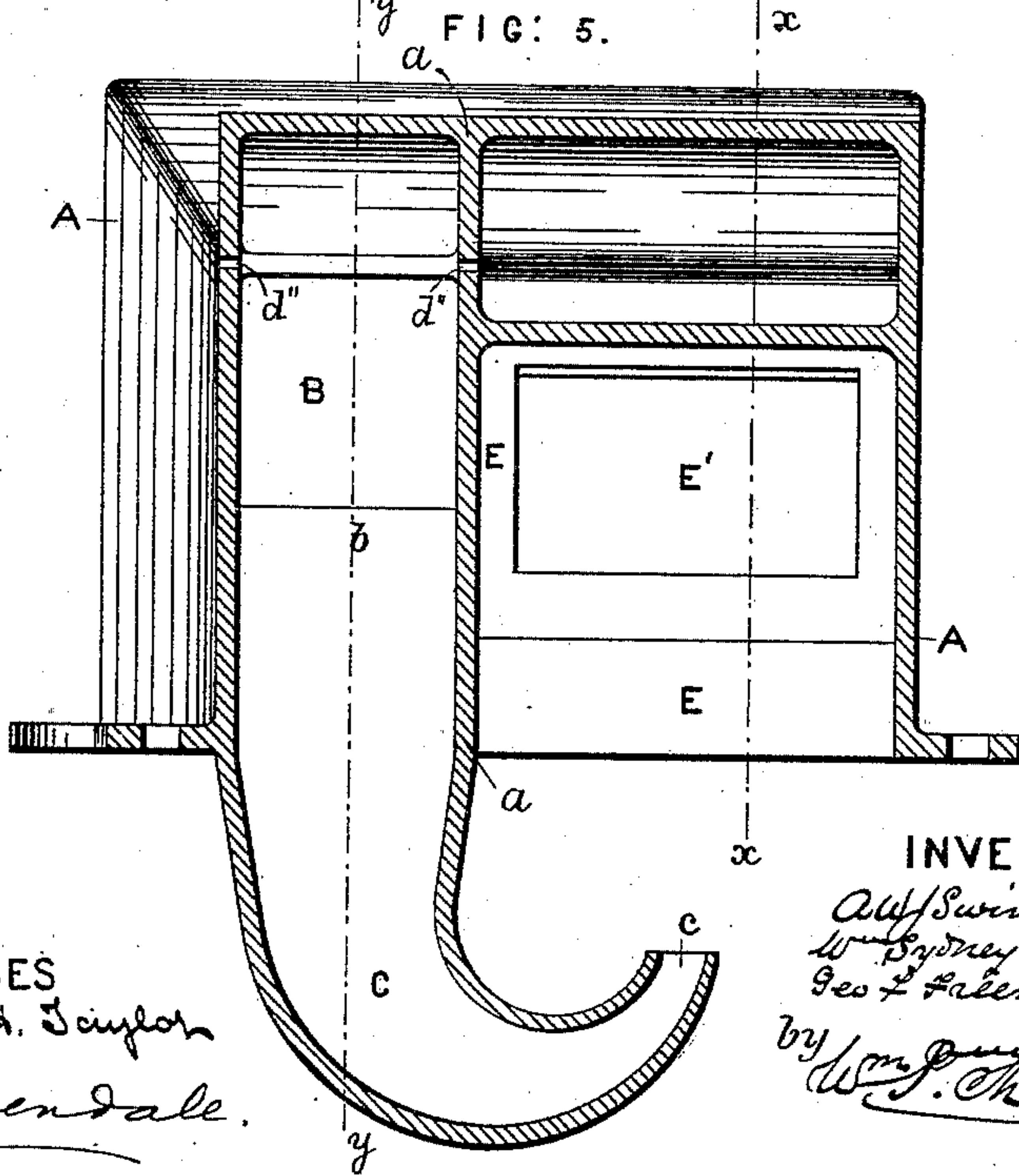
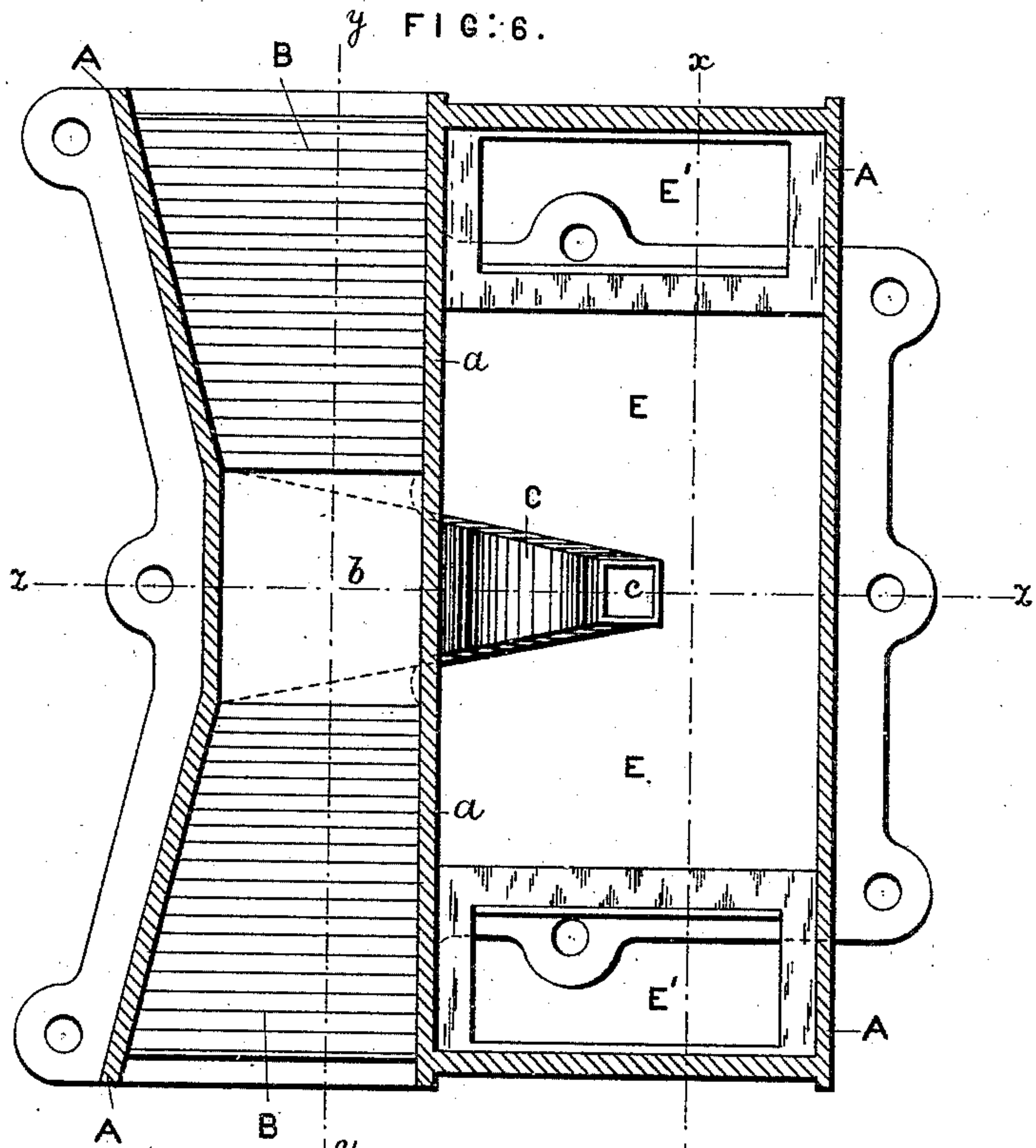
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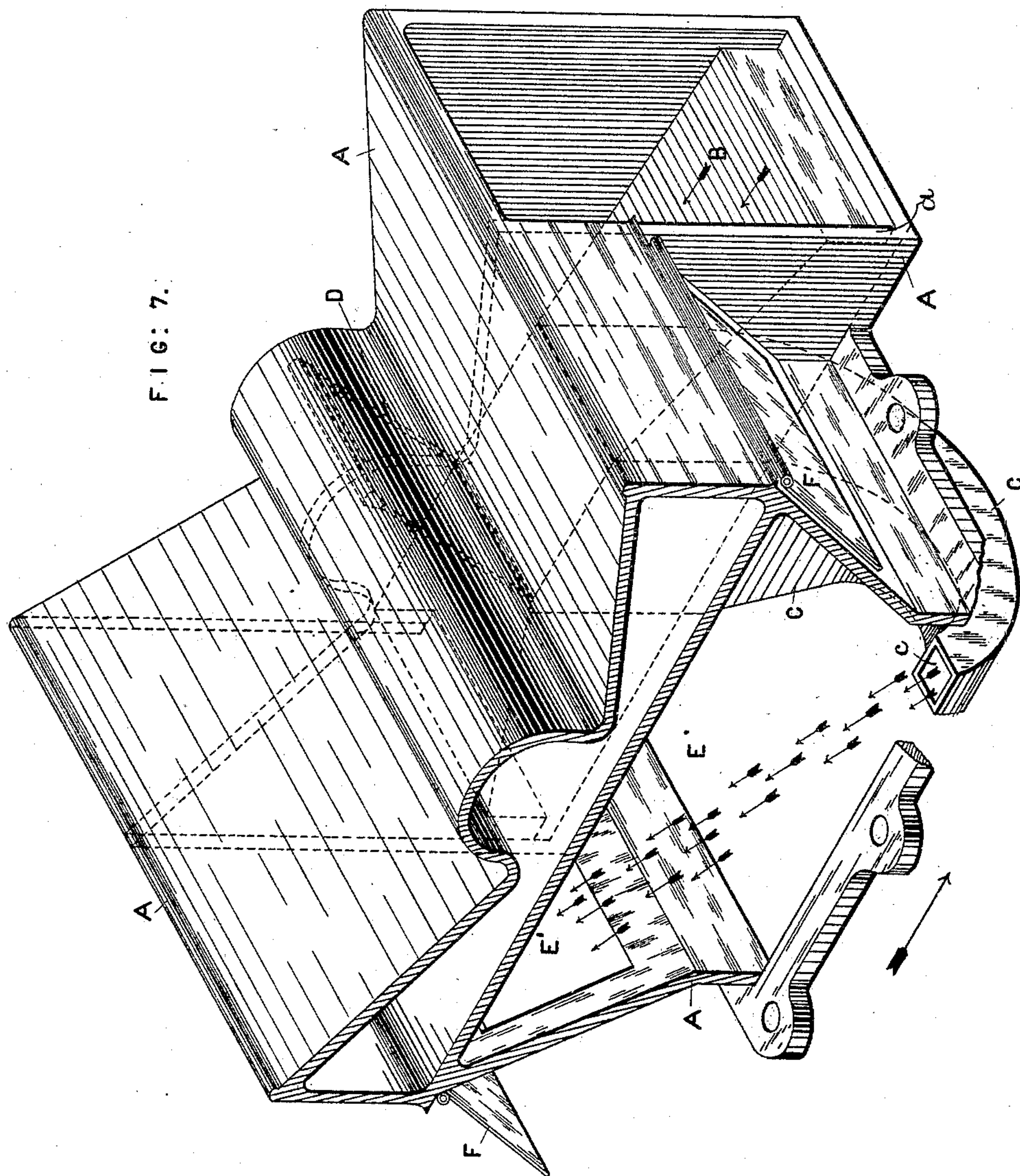
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UNITED STATES PATENT OFFICE.

ARNOLD W. J. SWINDELLS, WILLIAM SYDNEY PEEL, AND GEORGE F. FREEMAN, OF MANCHESTER, ENGLAND.

VENTILATOR FOR CARRIAGES OR MOVING VEHICLES.

SPECIFICATION forming part of Letters Patent No. 442,924, dated December 16, 1890.

Application filed April 11, 1890. Serial No. 347,448. (No model.)

To all whom it may concern:

Be it known that we, ARNOLD WILLIAM JAMES SWINDELLS, of Manchester, in the county of Lancaster, England, WILLIAM SYDNEY PEEL, of Manchester aforesaid, and GEORGE FREDERICK FREEMAN, of Manchester aforesaid, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Ventilators for Carriages or Moving Vehicles, of which the following is a specification.

The object of this invention is to provide a ventilator for moving vehicles, whereby the movement thereof is utilized to induce or set up a current from the interior to the exterior, which acts to withdraw or exhaust the vitiated air.

It consists, essentially, of a ventilator constructed with two compartments—one an inlet and the other an outlet—placed side by side in the same plane and separated the one from the other by a division plate or diaphragm, a bent or curved injection-pipe with a contracted orifice leading from the one and opening at a distance from the mouth of the other, through which a current of air is by the movement of the vehicle impelled or injected into the interior in the direction of the outlet, thereby inducing an outward current of the foul or vitiated air contained in the compartment.

It will be fully described with reference to the accompanying drawings, which as an example show the apparatus as applied to the roof of a railway-carriage.

Figure 1 is a side elevation; Fig. 2, an end elevation; Fig. 3, a side elevation in section through the outlet-chamber E; Fig. 4, a side elevation in section through the air-passage B; Fig. 5, an end elevation in section through the tube C; Fig. 6, a plan in section with top removed; Fig. 7, a perspective view with side removed.

The apparatus is constructed with a metallic or other casing A, and is divided into two parts or compartments by a division plate or diaphragm, one forming an inlet, through which a current of air is impelled as the vehicle moves, and the other an outlet, into which the air is injected by a curved tapering passage or pipe C.

The inlet part of the apparatus is constructed with a double head or air-passage B, preferably with flaring ends or trumpet-mouths, gradually converging to the center, terminating in or opening into a curved or bent tube or air-passage C. The air tube or passage C projects inward from the head or passage B, and is curved or bent until the inner orifice *c* faces in the same direction as its outer orifice *b* and opens opposite the center of the outlet part of the apparatus, but at a point some distance from or below it. The curved air tube or passage C tapers or gradually contracts throughout its length from the orifice *b* to the orifice *c* in order to increase the velocity of the current of air passing through it. The double head or air-passage B is provided in the center with a hinged flap or valve D, which directs the current of air entering the head or passage B at either end into the tube or passage C, so although the head or air-passage B is open at both ends there is no current through it from end to end; but all the air that enters the passage B issues from the inner contracted orifice *c* of the curved air-tube C. The pieces *d d'* provide a seating at either side of the orifice *b* of the tube C for the flap-valve D. The flap-valve D is pivoted at *d''*, and is preferably made with a counterweight D' at the top, which holds or retains it against the seating at either side until reversed by the reverse movement of the vehicle. We prefer to make the head or passage B inclined inward from each end, as shown, though, if desired, it may be made quite straight.

The outlet part of the apparatus is constructed with a chamber E, provided with an opening E' at each end. The openings E' are each covered with a flap valve or door F, hinged to the outside, so as to close by the pressure of the air caused by the movement of the vehicle against it. The mouth of the chamber E is placed over and at some distance above the contracted orifice *c* of the air-passage C, so that the current of air passes direct from the inlet to the outlet part of the apparatus, at the same time inducing an outward current from the other parts of the interior of the compartment.

If desired, a movable flap-door may be

hinged or pivoted in the chamber E to direct the outward current of air to the open flap-door F, which would be moved first to one side and then to the other as one or other of the flap-doors F were opened or closed. Each compartment has two openings facing in opposite directions, the corresponding openings of the two compartments being placed side by side.

The apparatus, as shown in the drawings, is designed to be fitted to the roof of the carriage by, however, making it somewhat longer and of less depth. It may be constructed so as to be applied to the sides or doors of railway-carriages, where the present ventilator is usually situated. The opening in the carriage roof or door leading to the ventilator may be covered with a sliding or rotating shutter, by means of which the ventilator can be opened or closed, as desired.

In operation the ventilator is attached to the carriage with its longitudinal axis in the direction of movement. As the vehicle moves forward and the force or pressure of the wind comes against the ventilator, a current of air is impelled or forced through the air-passage B and injection-tube C, issuing from the contracted orifice *c* of the latter with considerable force and velocity. The current of air issuing from the contracted orifice of the air-tube C rushes up into the chamber E and out through one of the openings E', at the same time inducing such a current from the interior of the carriage as to force out and carry with it a large volume of the foul or vitiated air. The small arrows show the direction of the currents of air and the large arrow the direction of movement of the vehicle.

What we claim, and desire to secure by Letters Patent, is—

1. An exhaust-ventilator for vehicles, constructed, as shown, with the inlet and outlet compartments in one structure, situated in the same plane and separated by a division plate or diaphragm, each compartment having two opposite openings, the corresponding openings in each being placed side by side, and with a curved or bent contracted injection-tube which leads from the inlet-compartment to the mouth of the outlet-compartment, placed with its contracted orifice at a distance from the mouth of the outlet-compartment, leaving a space, substantially as specified.

2. An exhaust-ventilator for vehicles, having the inlet-compartment B, with two openings in opposite directions controlled by a central flap-valve and the outlet-compartment with two openings in opposite directions, each controlled by a flap-valve disposed side by side in the same plane and separated by a division-plate, the corresponding openings in each compartment being placed adjoining each other, and a bent injection-pipe C, communicating from one compartment to the other, the contracted orifice being situated with a space between it and the mouth of the outlet-compartment.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

A. W. J. SWINDELLS.
W. SYDNEY PEEL.
GEO. F. FREEMAN.

Witnesses:

J. OWDEN O'BRIEN,
WILLIAM H. TAYLOR.