No. 872,199. PATENTED NOV. 26, 1907.

H. I. M. ROSS.

SYSTEM OF DOUBLE VENTILATION.

APPLICATION FILED OCT. 11, 1906.

2 SHEETS—SHEET 1.

FIG. 1

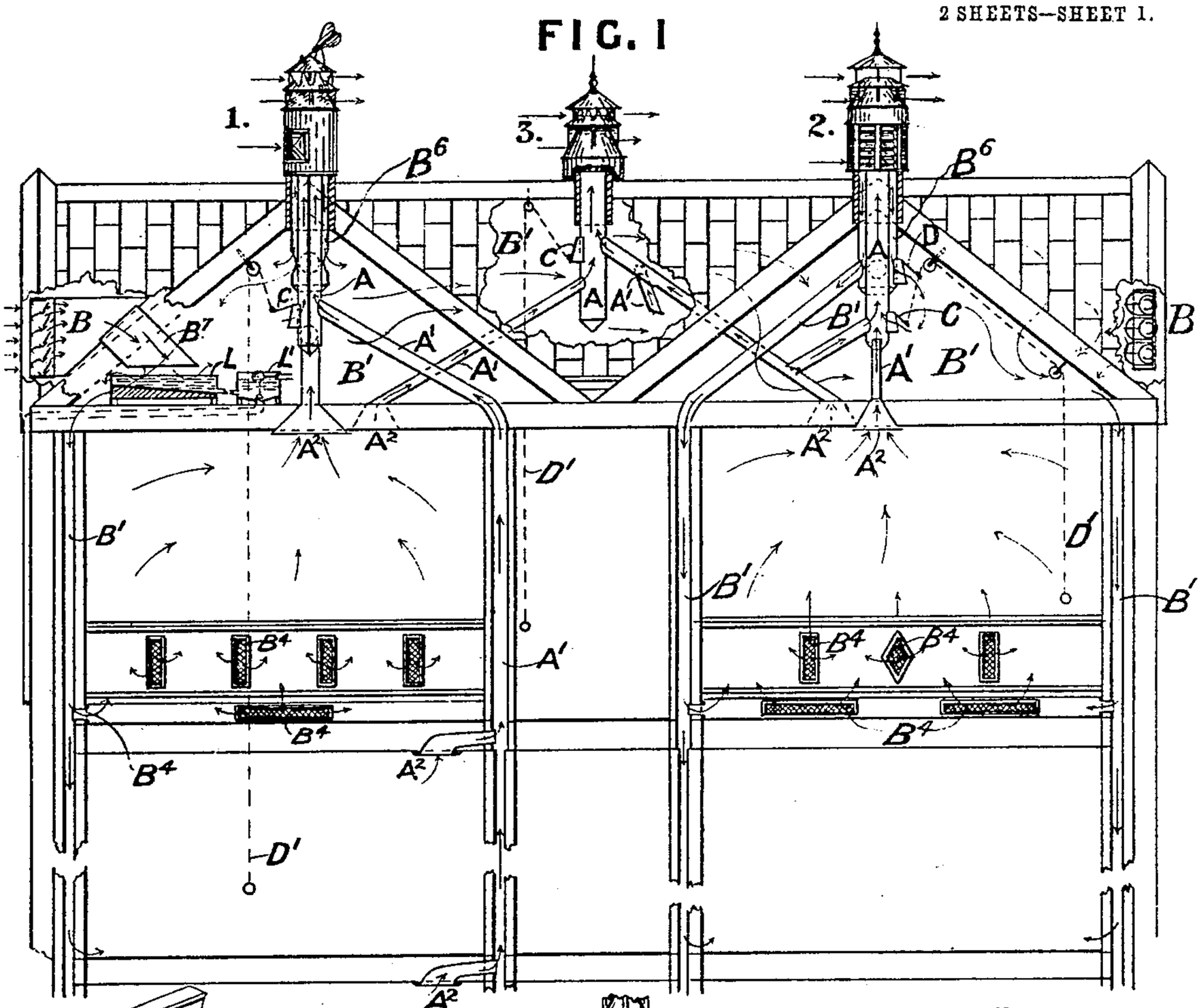


FIG. 2

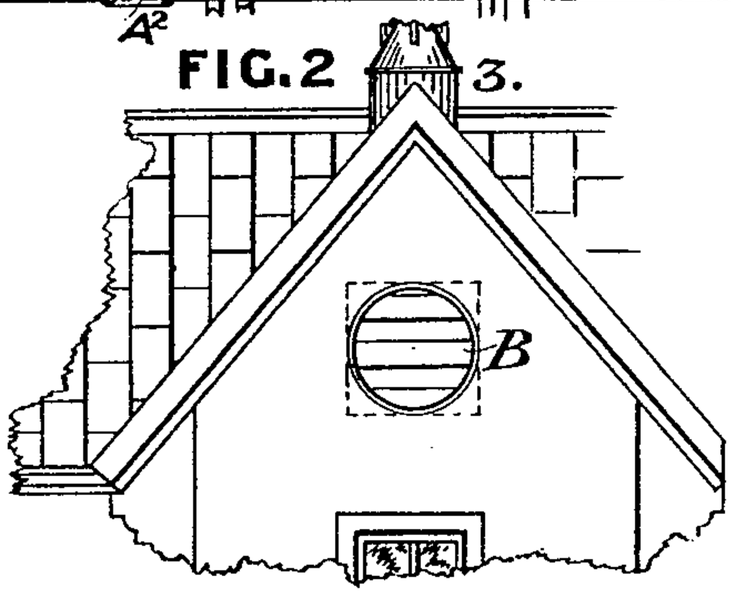


FIG. 3

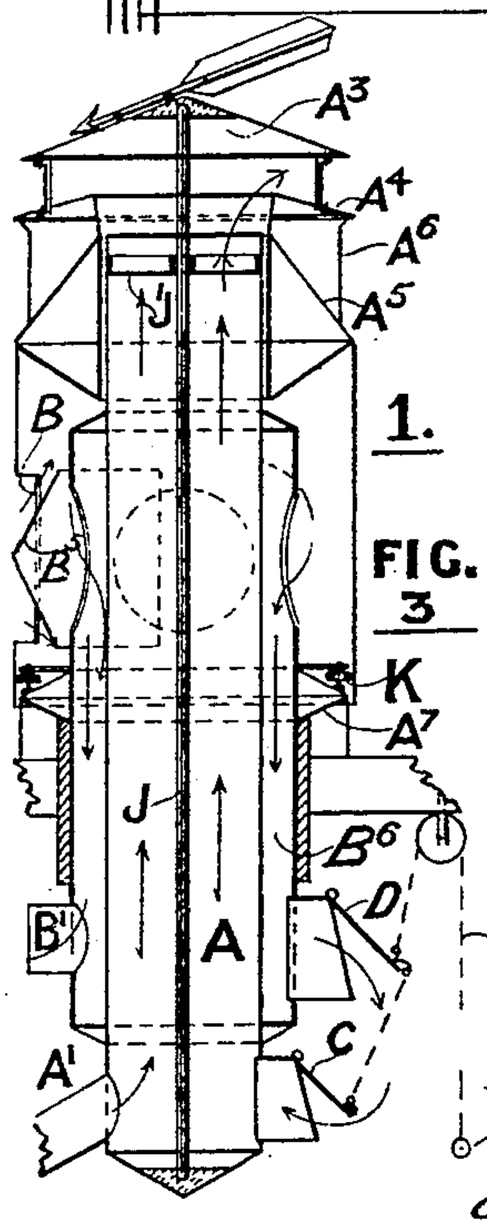


FIG. 4

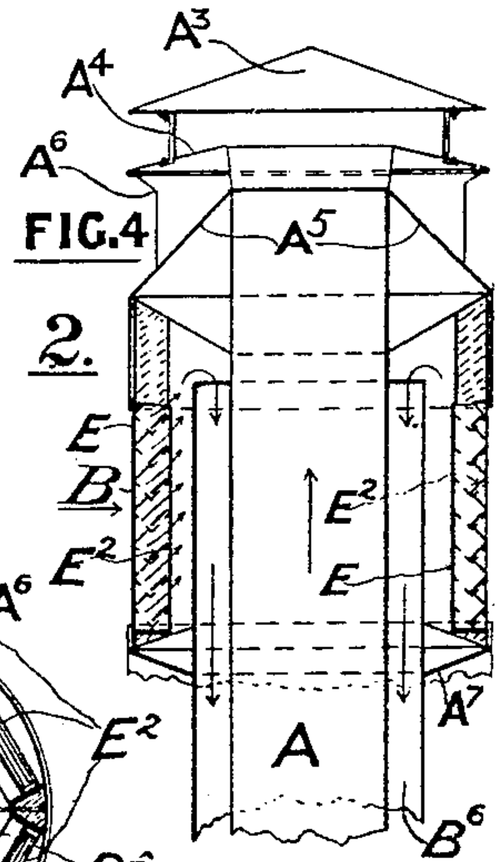


FIG. 5

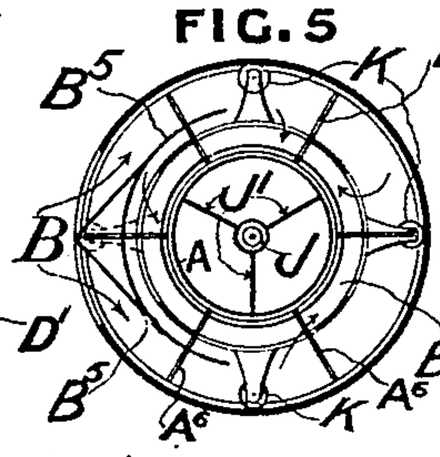
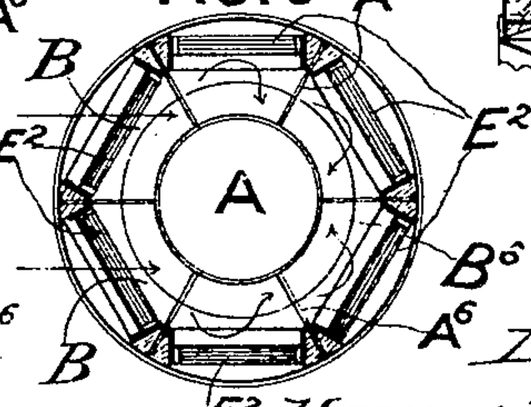


FIG. 6



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2 SHEETS—SHEET 2.

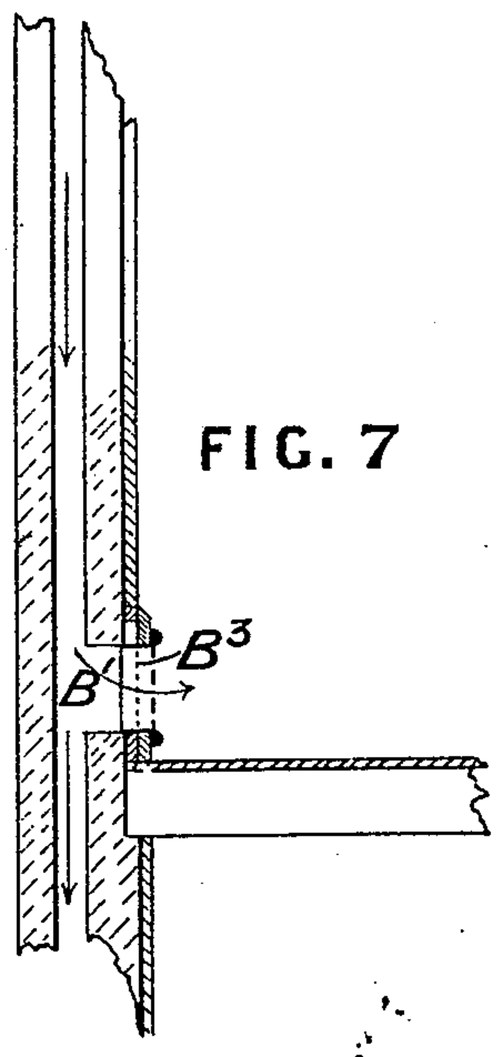

FIG. 7

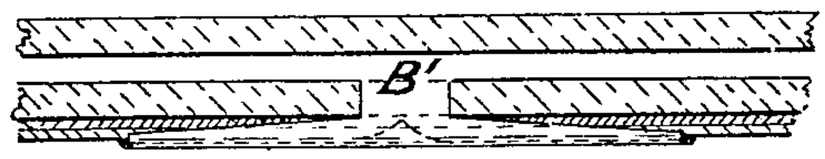

FIG. 8

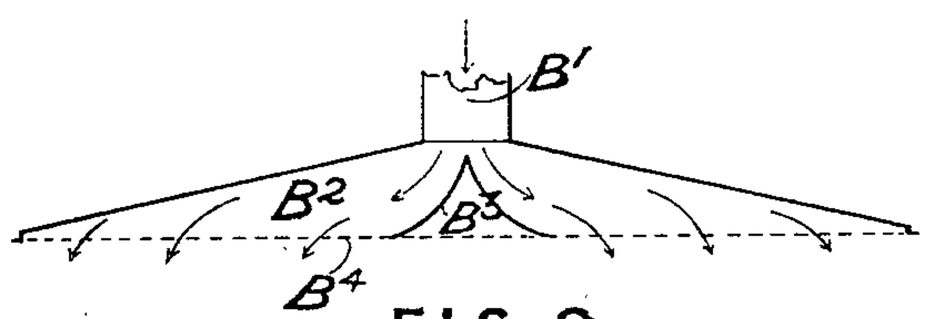

FIG. 9

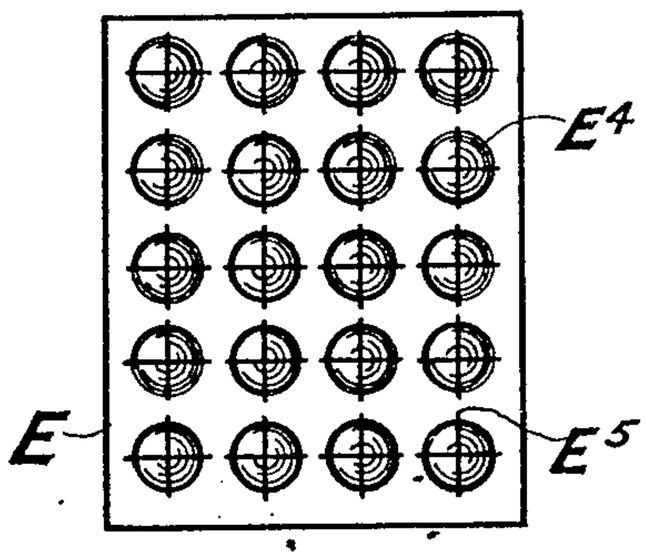

FIG. 10

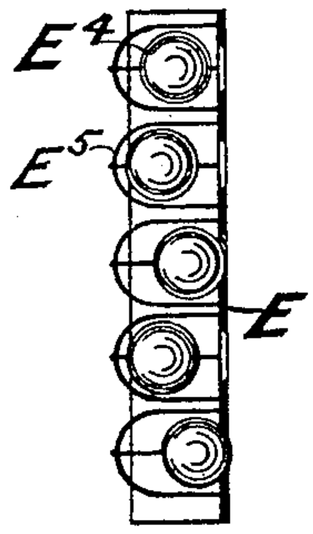

FIG. 11

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UNITED STATES PATENT OFFICE.

HENRY ISMAY MORALEE ROSS, OF DUNEDIN, NEW ZEALAND.

SYSTEM OF DOUBLE VENTILATION.

No. 872,199. Specification of Letters Patent. Patented Nov. 26, 1907.

Application filed October 11, 1906. Serial No. 338,510.

To all whom it may concern:

Be it known that I, HENRY ISMAY MORALEE ROSS, a subject of the King of Great Britain, of 91ª Princess street, in the city of Dunedin, in the British Colony of New Zealand, and whose post-office address is Dunedin, a ventilating-engineer, have invented certain new and useful Improvements in a System of Double-Current Ventilation, of which the following is a specification.

The object of this invention is to set forth an improved system of double current ventilation, either in a compact form from which both the fresh air is forced and directed to apartments and the foul air is withdrawn from same by merely laying pipes to and from these places, or in an extended form where advantage is taken of architectural features as gables, gablets, dormers, turrets &c. which could be arranged to receive the fresh air from all quarters at about roof level while the part of my apparatus that withdraws foul air would be erected where required for that purpose. When too much air is being renewed I partly or wholly short circuit the currents to regulate the air-flow, (which is obviously preferable to closing off any single current as now usually done, and which I wish to avoid.)

For supplying fresh air in equal quantities to that which is withdrawn, I form inlets, either facing in all directions, generally furnishing same with specially constructed rocking or ball valves, or in the cowls that revolve, an inlet that automatically faces the wind. The inlet that faces the air-current readily admits same while in the fixed cowls all others automatically close preventing its egress, so that said current is diverted to the places to be ventilated. The fresh and foul air currents are worked at about the same elevation, preferably about roof level, thus insuring equal working and equal pressure of both currents, and also obtaining the air where freshest instead of from lower down where it might be contaminated. Where desired air may be made to impinge on trays of water before being admitted to a compartment.

Referring to the accompanying drawing of 2 sheets:—Figure 1 is a section of a building showing my complete system of ventilation and showing three cowls and two extended inlets, together with a water tray in position for trapping dust. Fig. 2 is an elevation of part of a gable showing an extended inlet. Fig. 3 is a longitudinal section of a revolving cowl and Fig. 5 is a plan of same. Fig. 4 is a longitudinal section of part of a fixed cowl fitted with automatic valves that open only to advancing air, and Fig. 6 is a plan of same. Fig. 7 is a longitudinal section of a wall flue or cavity showing fresh air inlet at skirting level and Fig. 8 is a plan of same. Fig. 9 is an enlarged plan of the air distributing box shown in Fig. 8. Fig. 10 is an elevation of a set of light ball valves and Fig. 11 is a sectional elevation or end section of the frame with the balls shown in elevation in their frames.

Like reference characters designate corresponding parts throughout the views.

A is the foul air exhaust pipe or conduit and A^1 branches drawing up the foul air from any apartment; A^2 is a bell-mouth leading into A^1.

A^3 is a cap, A^4 A^5 and A^6 are concentrating deflecting planes for creating a blowpipe action over the top of the exhaust tube A.

A^7 is a ring shaped cone arranged within the revolving case of the cowl leaving sufficient space between to allow any drip water entering at the inlet to get outside.

B B are inlets arranged around a fixed cowl, facing several ways, or on one side of a revolving cowl or distributed if arranged in extended form as in Fig. 4.

B^1 are fresh air pipes, or roof or wall spaces where available, for conducting the air from cowls to apartments.

B^2 are distributing boxes (Fig. 9) for receiving fresh air from pipes, roof or wall spaces B^1.

B^3 are deflecting plates for insuring a more uniform distribution of fresh air, preferably through gratings B^4 B^4 as shown.

B^5 is a weather guard placed within the inlet of a revolving cowl.

B^6 is a larger pipe encircling pipe A for conducting the fresh air currents from cowl inlets to pipes, roof or wall spaces, thence to apartments below.

B^7 is a deflecting tube for directing air on to water contained in trays &c.

C is a door in pipe A and D is a door in pipe B^6, for regulating the flow of air within the apartments below, by short-circuiting a portion of the air within the roof, both being

actuated together by cord D^1. When a roof space is used instead of pipes B^1, the door C is sufficient.

E are valve frames, either fitted with rocking valves E^2 or ball valves E^4 working in wire cages E^5 in a cowl or in extended inlets. In Fig. 3 the inlet portion of the cowl revolves on rod J supported where needed by bearings J^1 and running in the usual step with guide rollers K K to steady the cowl.

L is a water tray preferably with sloping bottom connected to cistern L^1, several such connections may be made to one cistern which is capable of being flushed. Arrows show directions of the double air currents under various conditions. The cowl marked 1 in Fig. 1 is a revolving one. Cowl 2 is a fixed one with automatic valves. Cowl 3 is an exhaust one similar in construction to the top portion of cowls 1 and 2. Doors C and D when open as shown under cowl 2, and door C under cowl 1, short circuit part of currents for regulating the ventilation of apartments; these doors when closed cause the whole of the air to flow through the apartments to be ventilated.

Revolving cowl 1, fixed cowl with automatic valves 2, and exhaust cowl 3, together with the extended inlets B B, Figs. 1 and 2, are all parts of one system as shown in Fig. 1, but are capable of separate use according to the size and style of architecture of the building to be ventilated. The idea is to take advantage of every suitable feature in a building for the introduction of as much fresh air into it as possible. Where the requirements are great, to confine inlets to cowls alone would necessitate making cowls unduly large or so numerous as to materially weaken the structure, in such cases the various arrangements shown in Fig. 1 are used in combination, the fixed or revolving cowls being placed over that portion of the building where the demand for air is least and the extended inlets in combination with larger exhausts would be placed over that part where demand was greatest. For instance in a school consisting of hall and smaller rooms under same roof the greatest demand would be for the hall and it is for such places that extended inlets and exhaust cowls as 3, Fig. 1, would prove most useful.

Having now described my said invention what I desire to protect by Letters Patent of the United States of America, is

1. In a double current system of ventilation including one or more apartments, the combination of a plurality of deflecting planes for inducing a current of foul air, an annular chamber having valved openings for admitting fresh air and directing the same to said apartments, and means in the roof for short-circuiting said currents of air.

2. In a double current system of ventilation including one or more apartments, the combination of a plurality of fresh air inlets adapted to automatically open to admit air, a plurality of fresh air inlets adapted to automatically close to oppose the exit of said air, a foul air cowl and pipe in communication with said inlets, and means for short-circuiting said currents of air.

3. In a double current system of ventilation including one or more apartments, the combination of a revolving cowl for automatically exhausting the foul air, a fresh air inlet carried by said cowl, and deflecting means for said fresh air.

4. In a double current system of ventilation including one or more apartments, the combination of a plurality of gratings, and distributing air boxes arranged to equalize the flow of air through said gratings.

5. In a double current system of ventilation including one or more apartments, the combination of a revolving cowl, a fixed cowl having automatic valves, an exhaust cowl and extended inlets, distributing boxes for said inlets, a flushing cistern, dust arresting water trays connected with said cistern, and means for short-circuiting the air currents.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

HENRY ISMAY MORALEE ROSS.

Witnesses:

HENTON MACAULAY DAVEY,

FRANCIS WILLIAM PAYNE.