BOYLE'S PATENT

AND

LATEST IMPROVED

FRESH AIR WARMING

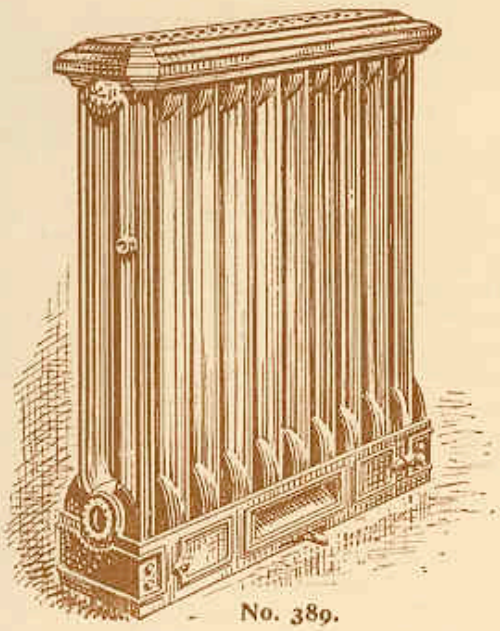
AND

HEATING APPLIANCES.

PART VI.

"Heating should be done by means of radiant heat, and not by means of air previously warmed."— PROFESSOR CORFIELD.

BOYLE'S VENTILATING RADIATOR



No. 389.

The fresh air supply is admitted through the Radiators warmed to a temperature which does not in any way deteriorate it, as is the case with furnace heating when hot air only is employed for heating as well as ventilation purposes.

Full area of heating surfaces guaranteed. All tested to a pressure of 100 lbs.

The Radiator is connected with Right and Left hand threaded nipples.

Each Section is 7 inches wide.

Height from floor to centre of opening is about 5 inches. The Radiator is tapped 1¼ inches, and bushed in accordance with our Standard List unless ordered otherwise. In estimating length of Radiator, allow ½ inch for each bushing.

This Radiator is fitted with our improved Ventilating Base for semi-direct heating. The Air Inlet can be brought up underneath Radiator through floor, or brought in at back of Radiator, above floor level. In ordering, state whether required for bottom or back inlet.

Outside measurements of flange or lip around back air inlet of Ventilating Base, for attaching sheet-iron sleeve or pipe, are:

Base.	Inches.	Base.	Inches.
12-section ...	24⅜ × 3	7-section ...	13⅞ × 3
11-section ...	21½ × 3	6-section ...	8⅞ × 3
10-section ...	18⅜ × 3	5-section ...	8⅞ × 3
9-section ...	15⅜ × 3	4-section ...	6 × 3
8-section ...	15 × 3	3-section ...	3¼ × 3

Bottom of back air inlet opening is ⅜ of an inch above floor level.

Where Air Conduit is brought up through floor, under Radiator, the opening in floor to be covered by dampers in Base should be:

Base.	Inches.	Base.	Inches.
12-section ...	24 × 4⅝	7-section ...	14¼ × 4⅜
11-section ...	21⅛ × 4⅜	6-section ...	8¼ × 4⅜
10-section ...	18 × 4⅝	5-section ...	8¼ × 4⅜
9-section ...	18 × 4⅜	4-section ...	5½ × 4⅜
8-section ...	14¼ × 4⅜	3-section ...	5½ × 4⅜

NOTE.—Radiators larger than 12 sections will have the same size air inlet as a 12-section; the Ventilating Base, however, will extend the entire length of Radiator.

The Radiator is also supplied without Ventilating Base.

PRICE LIST

34½ Inches High.
4½ Square Feet per Section.

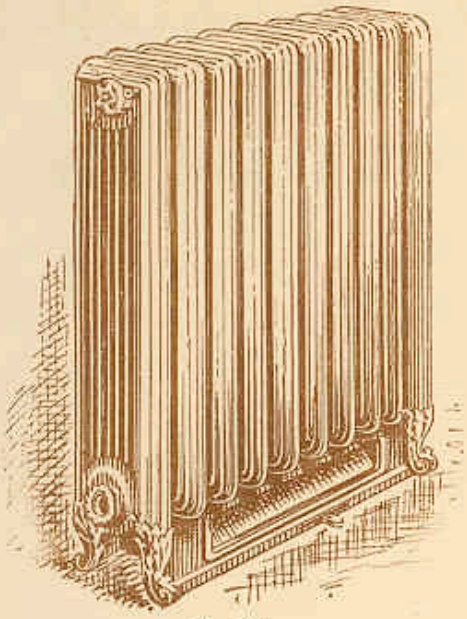
Number of Sections.	Length in Inches.	Heating Surface. sq. ft.	No. 389. £ s. d.
2	6	9	1 5 4
3	9	13½	1 18 0
4	12	18	2 10 8
5	15	22½	3 3 4
6	18	27	3 16 0
7	21	31½	4 8 8
8	24	36	5 1 4
9	27	40½	5 14 0
10	30	45	6 6 8
11	33	49½	6 19 4
12	36	54	7 12 0
13	39	58½	8 4 8
14	42	63	8 17 4
15	45	67½	9 10 0
16	48	72	10 2 8
17	51	76½	10 15 4
18	54	81	11 8 0
19	57	85½	12 0 8
20	60	90	12 13 4

Without Ventilating Base 2/3 per Section less.

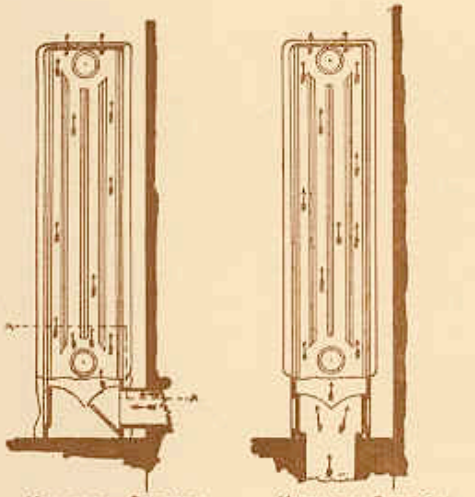
Without Ornamental Top 8d. per Section less.

Other designs of Ventilating and Heating Radiators may be had on application

BOYLE'S VENTILATING RADIATOR



No. 391.



PLAN A A.
Showing Air Passages and Section through waterways.

Other designs of Ventilating and Heating Radiators may be had on application.

The fresh air supply is admitted through the Radiator warmed to a temperature which does not in any way deteriorate it, as is the case with furnace heating, when hot air only is employed for heating as well as ventilation purposes.

It ensures the highest efficiency in the most compact form.

Principle of Construction of Base is such that all the air required for ventilation may be taken from without the building by means of Air Conduit in wall, and distributed through Base into the interior or flue surface of Radiator. When out-door temperature is very low, dampers in Base may be adjusted to any smaller air capacity desired, regulating exactly the heating and ventilating requirements of the room; or, dampers may be entirely closed, the Radiator then acting wholly as a direct radiator.

Leading Features of the Box Base are simplicity of construction, ease of operation, capacity for ample supply of air. Base being wholly under the Radiator, well recessed, is entirely out of the way and not liable to damage. Front of Base, including dampers, may easily be removed for cleaning purposes. Dampers may be operated merely by slight pressure of the foot.

Air Conduit. The sections show views of Radiator and Box Base, with Air Conduit brought up underneath Radiator, through floor or in at back of Radiator, above floor level. In this latter method it is necessary to use a galvanized or sheet-iron sleeve to make connection between flange or collar cast around back air inlet of Base, and a similar collar on back of wall box.

Outside measurements of flange or lip around back air inlet of Ventilating Base, for attaching sheet-iron sleeve or pipe, are:

Base.	Inches.	Base.	Inches.
12-section ...	$24\frac{1}{4} \times 3\frac{1}{4}$	7-section ...	$11\frac{7}{8} \times 3\frac{1}{4}$
11-section ...	$21\frac{1}{4} \times 3\frac{1}{4}$	6-section ...	$9 \times 3\frac{1}{4}$
10-section ...	$18\frac{1}{4} \times 3\frac{1}{4}$	5-section ...	$5\frac{1}{2} \times 3\frac{7}{8}$
9-section ...	$15\frac{1}{4} \times 3\frac{1}{4}$	4-section ...	$5\frac{5}{8} \times 3\frac{1}{4}$
8-section ...	$14\frac{1}{4} \times 3\frac{1}{4}$	3-section ...	$2\frac{3}{4} \times 3\frac{1}{4}$

Where Air Conduit is brought up through floor, under Radiator, the opening in floor to be covered by dampers in Base should be:

Base.	Inches.	Base.	Inches.
12-section ...	$24\frac{1}{8} \times 3\frac{7}{8}$	7-section ...	$11\frac{5}{8} \times 3\frac{7}{8}$
11-section ...	$21\frac{1}{8} \times 3\frac{7}{8}$	6-section ...	$8\frac{1}{2} \times 3\frac{7}{8}$
10-section ...	$18 \times 3\frac{7}{8}$	5-section ...	$6\frac{1}{8} \times 3\frac{1}{2}$
9-section ...	$15\frac{1}{8} \times 3\frac{7}{8}$	4-section ...	$5\frac{1}{2} \times 3\frac{1}{2}$
8-section ...	$14\frac{3}{8} \times 3\frac{7}{8}$	3-section ...	$3\frac{1}{4} \times 3\frac{1}{2}$

BOYLE'S VENTILATING RADIATOR

REGISTERED DESIGN.

DIMENSIONS AND PRICES.

Number of Sections.	Length in Inches.	39½ Inches High. 7 Sq. Feet per Section.				33½ Inches High. 5⅞ Sq. Feet per Section.				27½ Inches High. 4½ Sq. Feet per Section.				21½ Inches High. 3¼ Sq. Feet per Section.			
		Heating Surface.	No. 391.			Heating Surface.	No. 391.			Heating Surface.	No. 391.			Heating Surface.	No. 391.		
		Sq. Ft.	£	s.	d.	Sq. Ft.	£	s.	d.	Sq. Ft.	£	s.	d.	Sq. Ft.	£	s.	d.
2	6	14	1	12	6	11½	1	9	5	9	1	5	6	6½	1	1	10
3	9	21	2	8	9	17¼	2	4	2	13½	1	18	3	9¾	1	12	9
4	12	28	3	5	0	23	2	18	10	18	2	11	0	13	2	3	8
5	15	35	4	1	3	28¾	3	13	7	22½	3	3	9	16¼	2	14	7
6	18	42	4	17	6	34½	4	8	3	27	3	16	6	19½	3	5	6
7	21	49	5	13	9	40¼	5	3	0	31½	4	9	3	22¾	3	16	5
8	24	56	6	10	0	46	5	17	8	36	5	2	0	26	4	7	4
9	27	63	7	6	3	51¾	6	12	3	40½	5	14	9	29¼	4	19	3
10	30	70	8	2	6	57½	7	7	1	45	6	7	6	32½	5	9	2
11	33	77	8	18	9	63¼	8	1	10	49½	7	3	0	35¾	6	0	1
12	36	84	9	15	0	69	8	16	6	54	7	13	0	39	6	11	0
13	39	91	10	11	3	74¾	9	11	3	58½	8	5	9	42¼	7	1	11
14	42	98	11	7	6	80½	10	5	11	63	8	18	6	45½	7	12	10
15	45	105	12	3	9	86¼	10	19	8	67½	9	11	3	48¾	8	3	9
16	48	112	13	0	0	92	11	15	4	72	10	4	0	52	8	14	8
17	51	119	13	16	3	97¾	12	10	1	76½	10	16	9	55¼	9	5	7
18	54	126	14	12	6	103½	13	4	9	81	11	7	3	58½	9	16	6
19	57	133	15	8	9	109¼	13	19	6	85½	12	2	3	61¾	10	7	5
20	60	140	16	5	0	115	14	14	2	90	12	15	0	65	10	15	10
21	63	147	17	1	3	120¾	15	8	11	94½	13	7	9	68¼	11	9	3
22	66	154	17	17	6	126½	16	3	7	99	14	0	6	71½	12	0	2
23	69	161	18	13	9	132¼	16	18	4	103½	14	12	3	74¾	12	11	1
24	72	168	19	10	0	138	17	13	0	108	15	6	0	78	13	2	0
25	75	175	20	6	3	143¾	18	7	9	112½	15	18	9	81¼	13	12	11

Height	39½ Inches.	33½ Inches.	27½ Inches.	21½ Inches.
Price per Section...	16s. 3d.	14s. 9d.	12s. 9d.	10s. 11d.

This Radiator is also supplied without Ventilating Base.

PRICE 2s. 3d. PER SECTION LESS.

Full area of heating surfaces guaranteed. All tested to a pressure of 100 lbs.

The Radiator is connected with Right and Left hand threaded nipples.

Each Section is 8½ inches wide.

Height from floor to centre of opening is about 6 inches. The Radiator is tapped 2 inches and bushed in accordance with our standard list unless ordered otherwise. In estimating length of Radiator allow half an inch for each bushing.

BOYLE'S VENTILATING GRATE

Prices quoted.

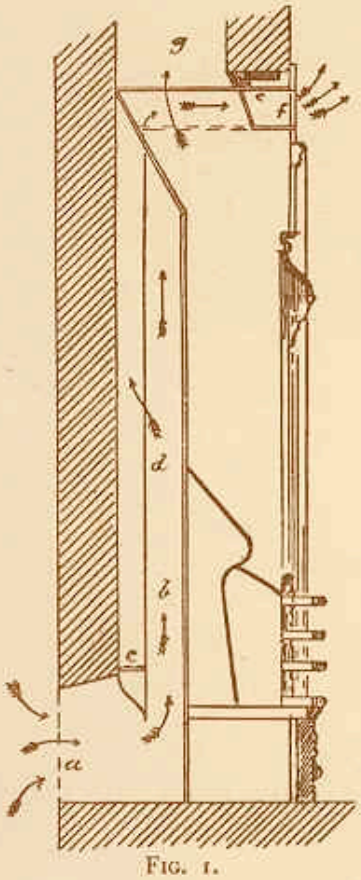


FIG. 1.

No. 420.

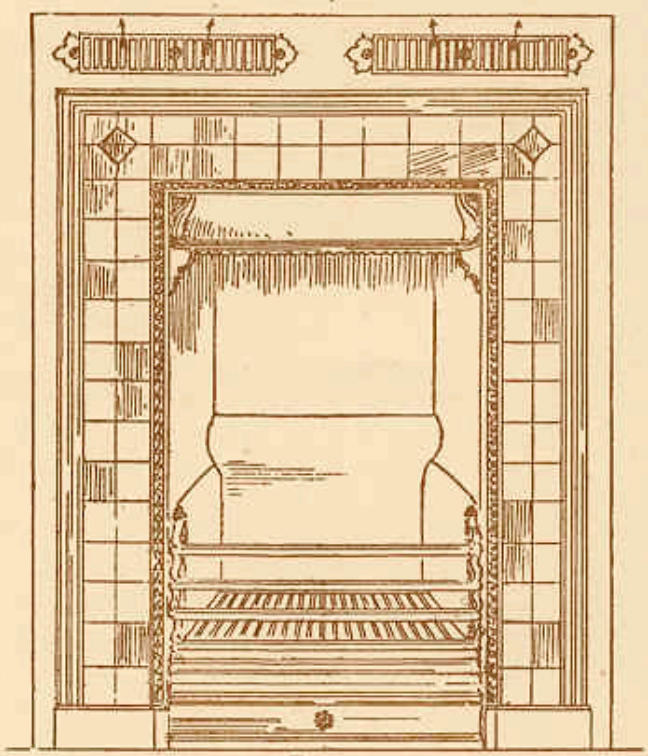


FIG. 2.

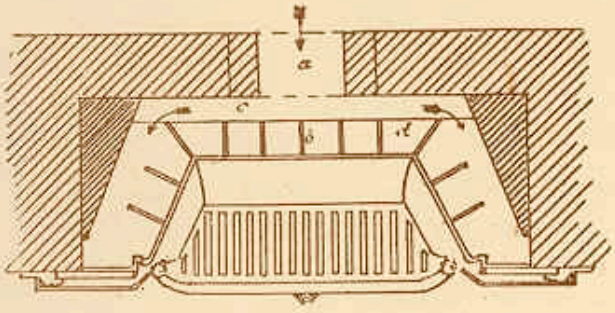


FIG. 3.

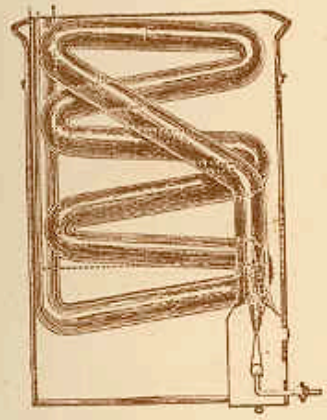
This Grate is arranged to admit a supply of fresh air, filtered and warmed to a comfortable temperature, but not to such a degree as to in any way injure the quality of the air for respiratory purposes.

FIG. 1.—A. Opening through external wall to admit fresh air. B. Gills for warming the fresh air. C. Stop plate to direct the air between the gills. D. Warm air chamber. E. Top of warming chamber. F. Fresh air inlet to room fitted with movable air filter and regulator. G. Smoke flue.

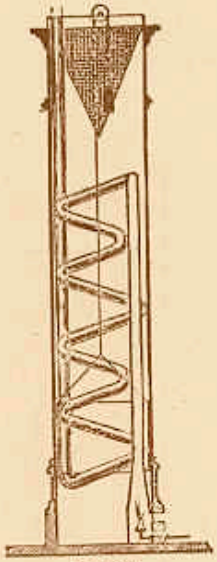
FIG. 2.—Elevation of Grate.

FIG. 3.—Plan of Grate.

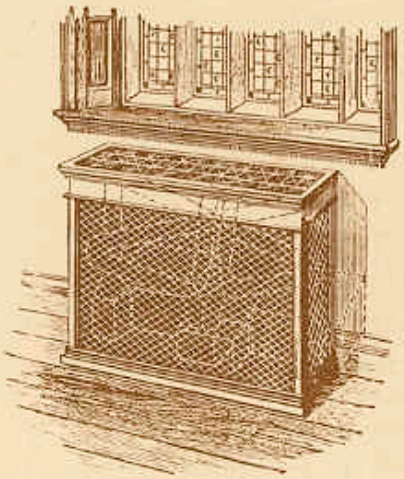
BOYLE'S FRESH AIR WARMING TUBES, BRACKETS, AND CHAMBERS.



BRACKET.
No. 430.



TUBE.
No. 431.



CHAMBER.
No. 432.

These appliances are intended for warming the fresh-air supply to a building by means of an atmospheric or an ordinary gas burner. The arrangement consists of a copper pipe about 2-in. diameter, placed in an inlet Bracket, Tube or Chamber. This pipe is of zigzag shape, causing the incoming air to repeatedly impinge upon it. At the bottom of the Bracket, Tube or Chamber, a cylinder is fixed, in which the burner is placed to heat the copper pipe. The temperature of the incoming air may be regulated as required without the deteriorating effects of furnace heating which results when hot air only is employed for heating as well as for ventilation purposes. The products of combustion do not come into contact or mix with the incoming air.

When available hot water or steam pipes may be fitted into the Bracket, Tube or Chamber.

PRICE LIST

Made in Galvanized Steel, Painted, and fitted with Copper Pipes and Regulating Valves.

BRACKETS.	No. 430.
22 ins. by 14 ins. by 5 ins.	£3 10 0
24 „ „ 16 „ „ 6 „	4 5 0
26 „ „ 18 „ „ 6 „	5 0 0

TUBES.	No. 431.
5 feet 9 ins. by 10 ins. by 5 ins.	£3 10 0
5 „ 9 „ „ 12 „ „ 6 „	4 5 0
5 „ 9 „ „ 14 „ „ 6 „	5 0 0

Fitted with Water Troughs 10s. to 20s. extra, Air Filters 5s. to 10s. extra.

CHAMBERS.		No. 432.	Ornamental Wire Casing, extra.
24 ins. by 24 ins. by 6 ins.	Single Burner	£5 10 0	£1 0 0
30 „ „ 24 „ „ 6 „	Double „	7 0 0	1 5 0

Fitted with Filters 7s. 6d. to 15s. extra.

THE "BOYLE" SYSTEM

OF

VENTILATION

AS APPLIED TO

SEWERS, DRAINS, AND SOIL PIPES.

PART IV.

"Our drains and sewers are so many death traps unless Ventilated in such a manner that all noxious air escaping from them cannot be inhaled by any one." SIR ROBERT RAWLINSON.

With the "Boyle" System of Ventilation for sewers a double power is secured, viz., the aspirating force of the "Air-Pump" Ventilator which is always in action, even when there is absolutely no perceptible movement of the air, and the downward air-propelling action of the downcast ventilator; the principle being a combination of extraction and impulsion by natural means.

THE "BOYLE" SYSTEM OF VENTILATION

As applied to SEWERS (Towns).

AA. Boyle's Patent "Air Pump" Ventilator. (Upcast).

B.B. Upcast Shaft connected with top of Manhole or Sewer, carried up against highest adjacent building.

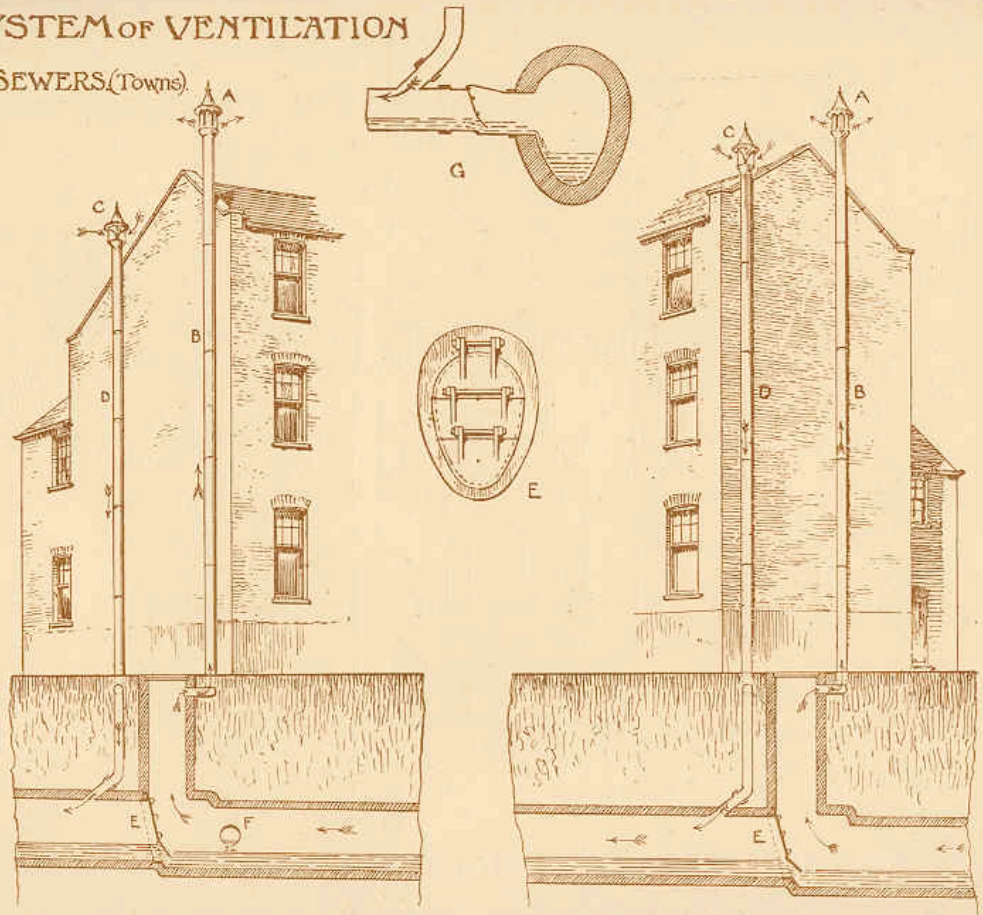
C.C. Boyle's Patent Downcast Ventilator, for catching the wind from every quarter and driving it down the Shaft into the Sewer, which is divided into sections, each about 300 feet in length, by Boyle's Triple Flight Flap valves E E.

Each section is ventilated separately.

The sizes of the ventilators and diameters of pipes are determined by the size of the Sewer.

F. Connection of Branch Sewer with Main Sewer.

G. Section of Branch Sewer connected with Main Sewer.



The air being driven in at one end of the section of a sewer and extracted at the other maintains a continuous through current in a given direction.

The above diagram shows the air being admitted at the lower end of the section and extracted at the upper end, but this arrangement may be reversed, it being as yet an unsettled question amongst sanitary engineers as to whether the air supply should pass up the sewer or down the sewer to secure the best results.

With the "Boyle" System of Ventilation for sewers all smells or noxious gases arising from the sewers being delivered above the housetops, they cannot prove either a source of annoyance or a danger to health, as is notoriously the case where street ventilators alone are employed.

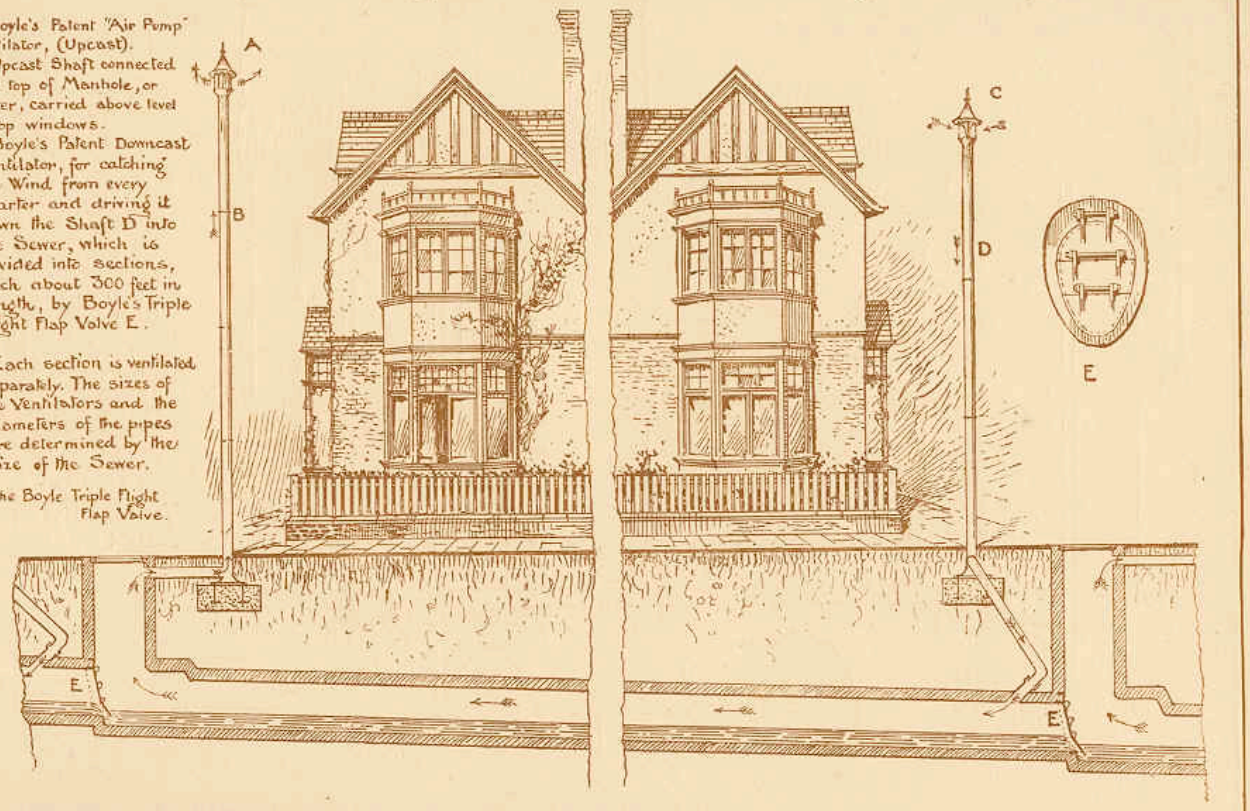
THE BOYLE SYSTEM OF VENTILATION

As applied to SEWERS (Suburban).

A. Boyle's Patent "Air Pump" Ventilator, (Upcast).
B. Upcast Shaft connected with top of Manhole, or Sewer, carried above level of top windows.
C. Boyle's Patent Downcast Ventilator, for catching the Wind from every quarter and driving it down the Shaft D into the Sewer, which is divided into sections, each about 300 feet in length, by Boyle's Triple Flight Flap Valve E.

Each section is ventilated separately. The sizes of the Ventilators and the diameters of the pipes are determined by the size of the Sewer.

E. The Boyle Triple Flight Flap Valve.



The advantages of the "Boyle" System of Ventilation for sewers are that it is economical and easily applied, is entirely self-acting, is always in operation, has no movable parts, cannot get out of order, requires no attention, and there is no after-cost for its maintenance.

The "Boyle" Double and Single Action Systems of Soil Pipe Ventilation

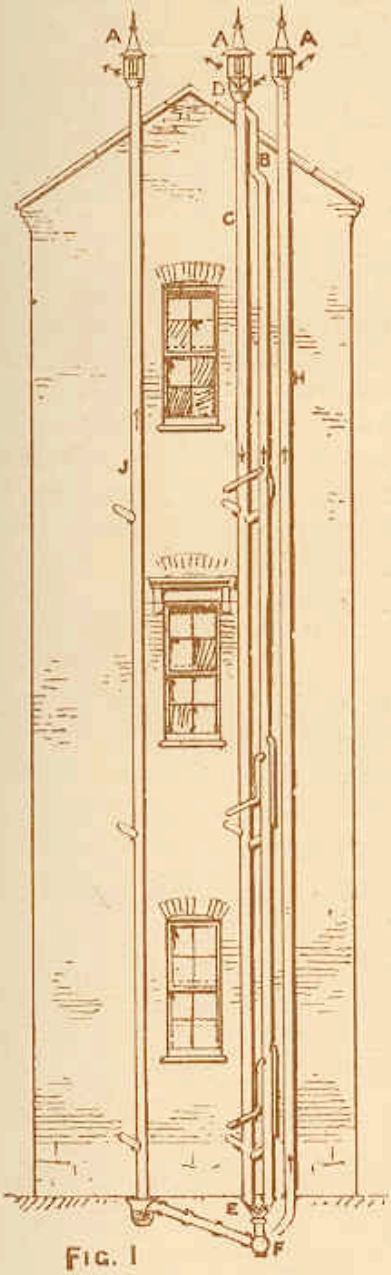


Fig. 1

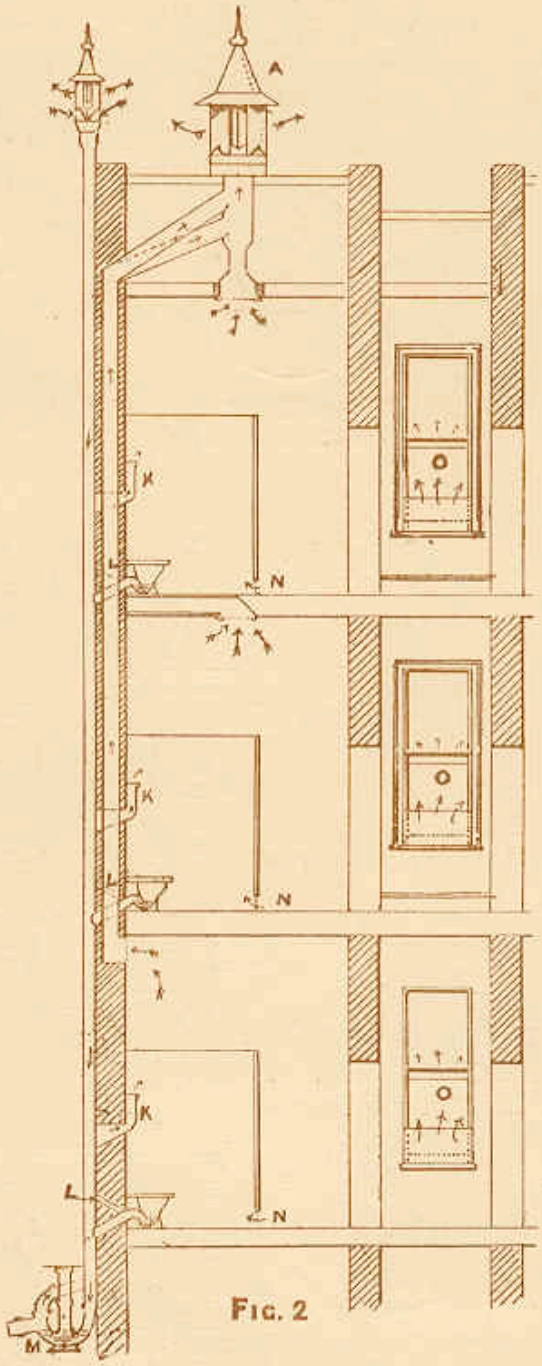


Fig. 2

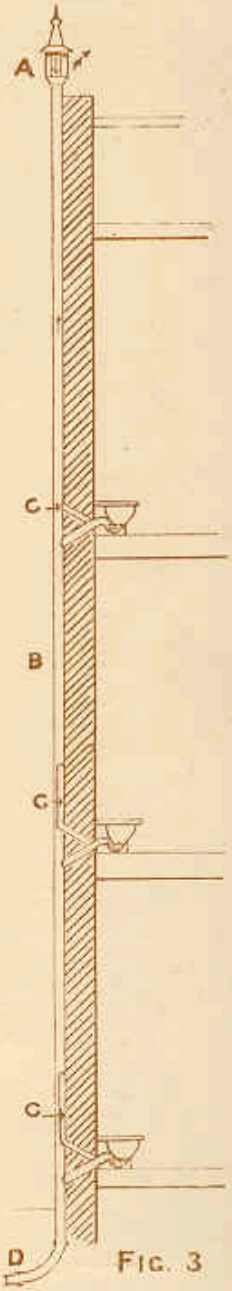


Fig. 3

Fig. 1.—Elevation of Double Action System. With this system a double power is obtained, the aspirating force of the "Air-Pump" Ventilator **A** acting upon the up-cast pipe **B**, and the pressure of the air down the soil pipe **C** as it enters through the down-cast Ventilator **D** attached to the bottom of the "Air-Pump" Ventilator, and which catches the wind from every quarter, maintaining a through current at the junction **E** immediately above the Disconnecting Trap **F**. The air inlet being above the roof there is not the same danger from escaping noxious gases as when the inlet is at or a little above ground level. **H** Ventilating Pipe connected with drain. **J** Waste Pipe running into open gulley connected with drain.

Fig. 2.—Section showing the ventilation of soil pipe with the "Boyle" Double Action System, also ventilation of W.C.'s with Boyle's Patent "Air-Pump" Ventilator **A** and air inlets **KK**. **LL** 2 in. pipes connected with upcast shafts for the ventilation of discharge pipes and to prevent syphoning of traps. **M** Disconnecting Trap with inspection chamber.

Fig. 3.—Section of Single Action System. **A** Boyle's Patent "Air-Pump" Ventilator (upcast). **B** Soil Pipe. **CC** Ventilating Pipes connected with discharge pipes to prevent syphoning of traps. **D** Drain Pipe.