

Green (D. C.)



OFFICE OF THE

# D. C. GREEN VENTILATING COMPANY,

No. 88 Liberty Street.

New York.

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GENTLEMEN :

Allow me to call your attention to my new device for handling large volumes of air for ventilation—approved by sundry experts, some of whom are connected with both the Naval and Treasury departments of our Government.

An engineer of celebrity in the Navy, says: "GREEN'S new method of ventilation will eventually supersede all of the old methods, producing an entire revolution in such matters."

## NATURAL METHODS OF VENTILATION.

### ALSO MECHANICAL METHODS RELYING UPON THE WIND TO OPERATE THEM.

All natural methods of Ventilation—also all mechanical methods relying upon the wind as a power to operate them—such as Windmill Fans put upon the tops of buildings for purposes of **Exhaustion only**, must necessarily fail, not only for the reason that no means are provided to send into the building cool fresh air in summer, and heated fresh air in winter, but in a calm, or with but a slight movement of the air on the outside, they lose their power and so fail to operate; such failure occurring at the very time when an active ventilation is most needed, it is no marvel that complaints are repeatedly heaped upon the head of him, who, knowing better, persuaded the less informed to invest in a method of ventilation which must of necessity prove to be a perpetual failure.

## ORDINARY FAN-BLOWERS FOR VENTILATION.

In the use of ordinary Fan-Blowers for ventilation, it is quite evident that in most cases parties furnishing the plans and executing the same (using the Blowers only to send fresh air into the rooms, and making no provision to eject the foul air from the rooms), do not get before their minds the full thought upon the subject of ventilation, to wit: that a positive and constant circulation must be obtained to secure a perfect ventilation, and that such circulation cannot be obtained in velocities as required, except by an *injection* of fresh air into the room, and an *ejection* of the heated foul air from the room, with the ability of operating both at the same time, and by the same power. The use of the Blower during the summer, under the half thought as aforementioned (only injecting fresh air into the rooms), may be worked in connection with a tolerable circulation, when the weather will admit of the opening of the windows and doors to allow the heated foul air to escape, but when cold weather comes and the Blower can be used only to send in heated air, and the windows and doors cannot be opened as in summer, what then? Of course, an accumulation of heated foul air until the atmosphere becomes oppressive, when, to get a circulation, the windows are thrown open, and a draft of cold air is allowed to enter, to the discomfort and possible injury to many. Then

# EXPLANATION OF ENGRAVING,

## Figs. 1, 2, 3, 4.

The two prominent mechanical devices as seen in cut, are a **Steam Air Pump**, and a new and peculiar **Automatic Air Nozzle** used for multiplying volumes of air sent into or out of the building to be ventilated.

### Steam Air Pump, or Compressor.

The Air Pump, or Compressor, is so common it needs no explanation, except that it is of the same general construction as are the Steam Water Pumps, the only difference being, the cylinder for air is arranged with valves especially designed for air, but still in case of accident to ship it may be used for water, or as a bilge Pump in freeing ship.

### Automatic Air Nozzles.

The Air Nozzles, *A*, Figs. 1 and 2, are provided with a valve, *B*, having an elongated tapering portion, *b*, and a stem, *a*, furnished with a spring which is set or compressed to a given pressure. The valve is surrounded with a series of short radial ribs, having grooves between them which increase in depth toward the inner end of the valve. It will thus be seen that as the valve is pushed out to the pressure desired, and is discharging a full volume of air at a given number of strokes, and the pump is now slowed, by which only one-half the quantity of air passes through the nozzle, the spring begins to act at once, and draws back the valve, and so adjusts the opening of the nozzle to the half volume going out, retaining by such automatic device the same or corresponding pressure on the less, that was expended on the greater volume, and so a corresponding efficiency of induction is given to the half or lesser volume by such automatically adjusting pressure.

### Apparatus as Applied to Building, Fig. 3.

#### INJECTION OF FRESH AIR INTO THE BUILDING.

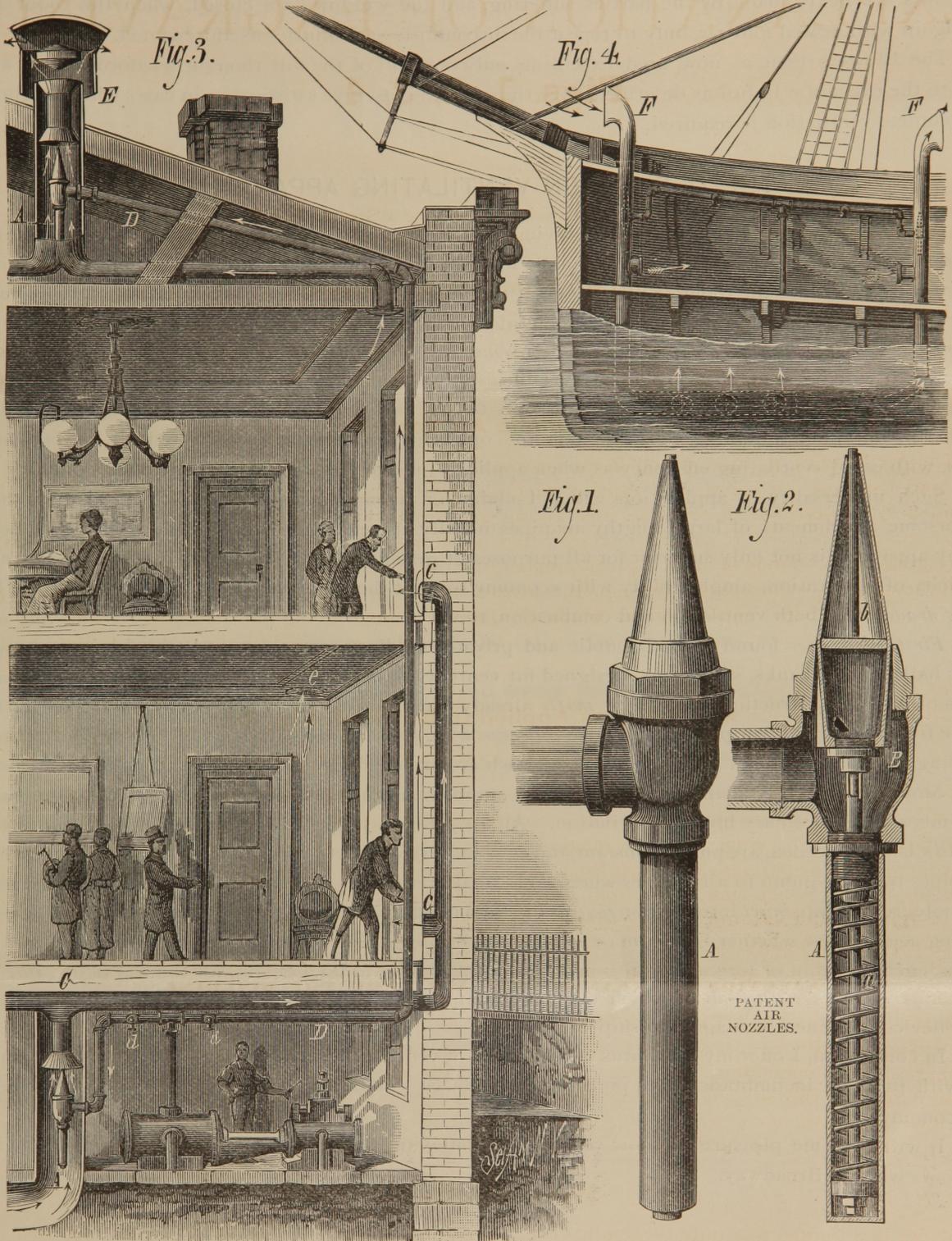
For **INJECTION** the Air Pump sends its quota of air through the left branch of pipe, *D*, to the **INJECTOR NOZZLE**, *A*, in basement, and forces it through said nozzle at a given pressure (seldom over 5 lbs. to the square inch), which volume bears the relation of only about *three per cent.* to the whole quantity of air to be moved, the other 97 parts being drawn from the air shaft below, and passing on the outside of said nozzle is made to join the 3 per cent. of air from pump, making a total of 100 parts, which, by the power of the combined **velocity and volume** of air passing through said nozzles, is **INJECTED** into and through pipe *C*, to the apartments of each story.

#### EJECTION OF HEATED FOUL AIR FROM THE BUILDING.

In the process of **EJECTION**, the Pump sends its quota of air through the right-hand branch of pipe *D*, which extends to the **EJECTOR NOZZLE**, *A*, in the ventilating shaft, *E*, at the top of the building, and said ventilating shaft, *E*, communicating with registers *e*, in ceilings or walls of different apartments, the air from pump, passing through said **ejector nozzle**, *A*, with the same power of velocity and volume combined as described in process of "*Injection*," induces a strong upward current or draught, which draws the heated foul air from the apartments, and throws it out through ventilating shaft, *E*, at top of building.

### Steamship, Fig. 4.

Shows in a limited way only the application to the hold of a ship. The Air Pump is supposed to be located in the Engine Room, and sending its air forward by a small pipe seen under second deck, which passing up to a pipe under main deck, it branches each way, running forward to nozzle located in ventilating shaft, *F*, which nozzle, pointing downward, **INJECTS** fresh air into the hold, and the branch running aft connects with nozzle in ventilating shaft, *F*, which nozzle, pointing upwards, **EJECTS** the foul air from the hold, securing ample ventilation with the hatches closed. Also applicable to all parts of the ship.



**D. C. GREEN'S NEW SYSTEM OF VENTILATION.**

PATENTED NOVEMBER, 1879.

complaints are justly made by the parties suffering, and the windows are closed, when the room is soon filled again with heated foul air, only to repeat the discomforts and injuries as aforementioned.

The Blowers, then, as now used, executing only one-half of the full thought as aforementioned, and not suited to the execution in full as described, have thus far failed to give satisfaction in cases where a thorough and complete ventilation is required.

## THE D. C. GREEN VENTILATING APPARATUS.

In working my apparatus (as per engraving on third page), I use steam power in connection with a *direct acting Pressure Air Pump*, in its most simple form (without shafting pulleys or belts), by which I can at will, *inject* fresh air into the room or rooms, and at the same time *eject* the heated foul air from the room, and so by either a perceptible or imperceptible circulation as may be desired, secure a perfect condition of ventilation, *all of which is accomplished with windows and doors closed*. Furthermore, by said illustrated engraving, it will be seen, that my process enables me to send the compressed air from pump to my air-nozzles through small wrought iron pipes, not only to any part of building in which the pump is located, but also to buildings adjoining or more remote; operating the nozzles in each and all for *injection* and *ejection*, with equal ventilating efficiency as when applied to nozzles located in proximity with pump.

Such universality of application which I claim for my apparatus over all others, also without the cumbersome attachments of large lengthy air-pipes usually affixed to the ordinary blower; it will be seen, that my apparatus is not only superior for all purposes of general ventilation, but that it stands alone in its simplicity of application, ample ability with economy to meet the following peculiar demands in the line of *forcing draughts* for both ventilation and combustion, to wit:

*First*.—All *flues* found in both public and private buildings, say court and school-houses, hospitals, public halls, hotels, banks, stores, etc., designed for ventilation, but found inactive because of adverse atmospheres or wrong construction—*ventilating shafts* already constructed, into which air pipes are led either to receive fresh air or discharge foul air; also *chimneys* with, perhaps, long horizontal subterranean passages requiring additional draught for combustion, all such are made efficient by the application of my apparatus.

*Second*.—Eminently adapted to the wants of steamships, where room cannot be given for the cumbersome methods of ordinary blower ventilation. All *air pipes* on ships found to be inefficient at a time when air below is most needed, are put in constant and efficient service by carrying compressed air in small wrought iron pipes from air-pump to air nozzles wherever located in said *air-pipes*, and so at such points whether near or remote from pump, *inject* into ship or *eject* from ship currents of air in greater or less quantities as desired, securing at all times, whether in a calm or a blow, conditions of ventilation suited to the comfort and health of passengers in cabin or fore-castle—also maintain a circulation in hold of ship for the wants of *cattle, fruits* or other *perishable freights*—all of which may be accomplished with cabins and hatches tightly closed, and so my device is eminently adapted to ship ventilation.

In conclusion, I offer my apparatus and methods of ventilation to meet every conceivable want in such line, with the least incumbrance from pipes and machinery, combined with the greatest possible efficiency and economy.

It will give me pleasure to show you my apparatus in operation at my office, No. 88 Liberty Street, two doors west of Broadway.

Respectfully yours,

D. C. GREEN,  
For the D. C. Green Ventilating Company.

P. S.—A note to me naming day and hour of an intended call, will receive my special attention. Usually in office from 12 M. to 2 P. M.

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