

No. 706,327.

Patented Aug. 5, 1902.

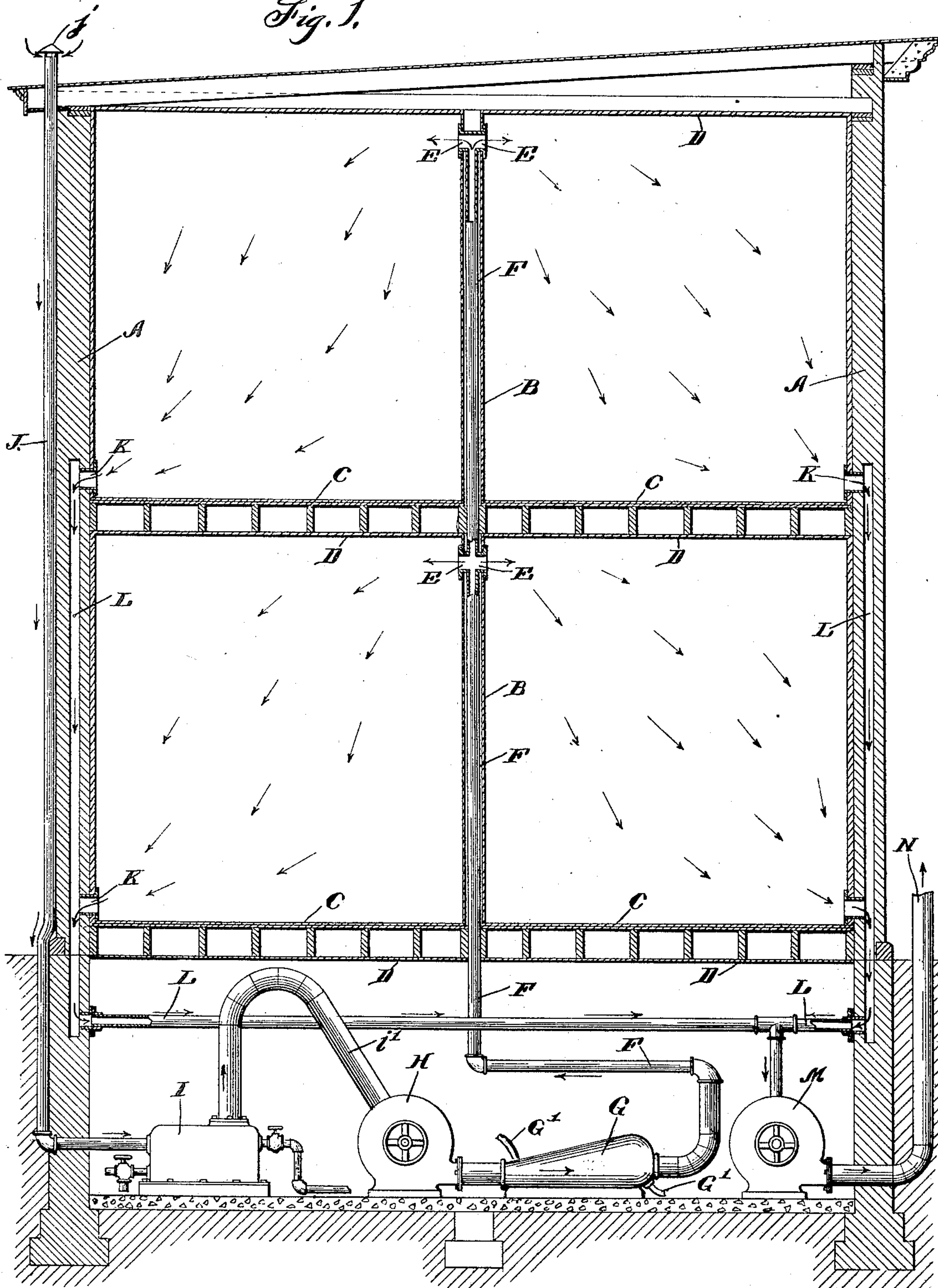
J. E. LAWRENCE.  
COOLING AND VENTILATING SYSTEM.

(Application filed Sept. 6, 1901.)

(No Model.)

2 Sheets—Sheet 1.

*Fig. 1.*



Witnesses:  
*Dr. L. Perry*  
*H. Weir*

Inventor:  
*Jesse E. Lawrence*  
*by [Signature]*



No. 706,327.

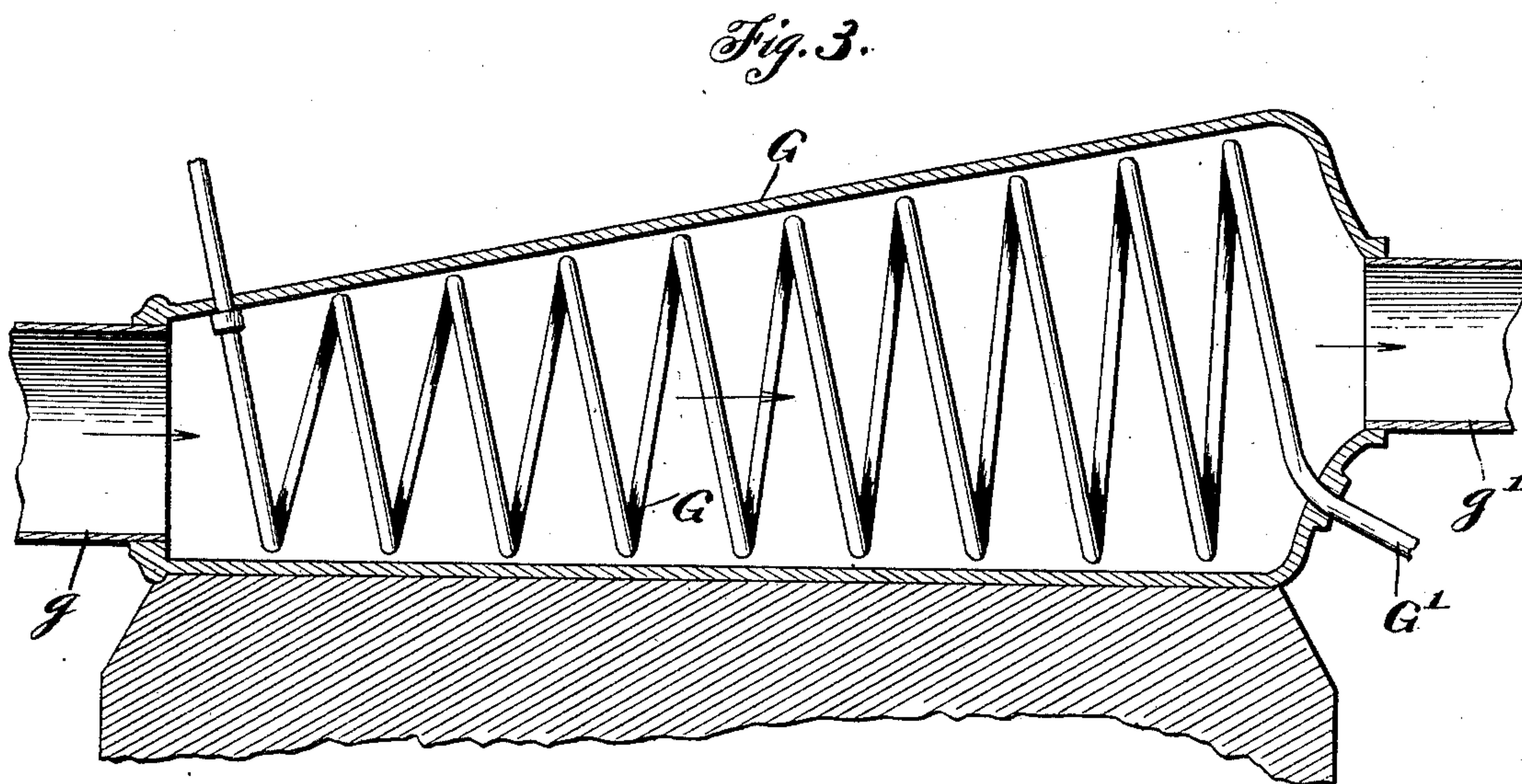
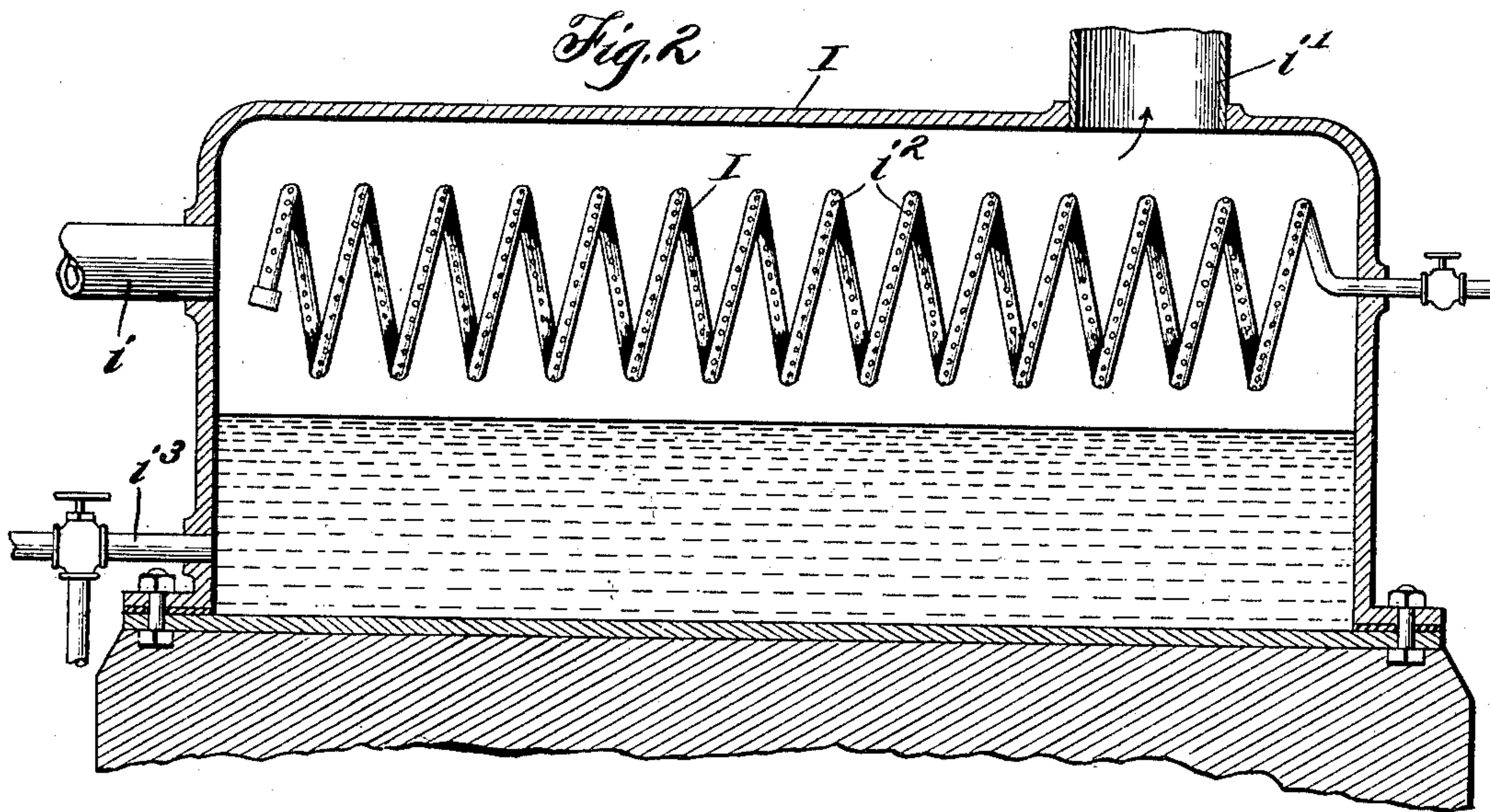
Patented Aug. 5, 1902.

J. E. LAWRENCE.  
COOLING AND VENTILATING SYSTEM.

(Application filed Sept. 6, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:  
*Ira D. Perry*  
*J. B. Weir*

Inventor:  
*Jesse E. Lawrence*  
*Harry C. Carter*



# UNITED STATES PATENT OFFICE.

JESSE E. LAWRENCE; OF CHICAGO, ILLINOIS.

## COOLING AND VENTILATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 706,327, dated August 5, 1902.

Application filed September 6, 1901. Serial No. 74,531. (No model.)

*To all whom it may concern:*

Be it known that I, JESSE E. LAWRENCE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cooling and Ventilating Systems, of which the following is a specification.

This invention relates to improvements in the apparatus, conduits, and connections necessary to a completely operative cooling and ventilating system, such as is particularly adapted for application to the cooling and ventilating of houses, stores, hotels, apartment, office, and other buildings, and is also applicable to a greater or less degree, according to circumstances, in other situations, such as the cooling and ventilating of steamships, railway-cars, and the like.

The object of the invention is to provide an improved construction in systems of this character by which an ample volume of pure air, thoroughly cleansed and cooled, will be supplied to every desired room or compartment of the building or structure in which the system is installed and by which the heated and impure or foul air will be drawn out from said rooms or compartments.

To this end the invention contemplates a series of ducts and conduits leading from the outer air and preferably from the roof of the building, through a purifier or cleanser and through a refrigerating chamber or cooler to points near the ceilings of the various apartments, and another series of ducts or conduits leading out from points near the floors of the several apartments to a convenient point of discharge, together with suitable fan or other blowers by which air will be supplied through the first and exhausted through the last series of said ducts.

The invention consists in the matters herein set forth, and particularly pointed out in the appended claims, and will be fully understood from the following detailed description of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a building having a cooling and ventilating system embodying my improvements installed therein. Fig. 2 is an enlarged sectional detail of

the air-purifier. Fig. 3 is a similar view of the air-cooler.

In said drawings, A designates side walls, B the interior partitions, C the floors, and D the ceilings, of a building. This building may be of any size and of any number of stories in height and may be divided into any desired number of rooms or compartments, but for simplicity of illustration is herein shown as a two-story structure divided into four rooms. Near the ceiling D of each room is provided a ventilator or register E, communicating by a duct or conduit-pipe F with an apparatus for supplying cool fresh air to the ventilators. As herein shown and as ordinarily will be the case, such apparatus is located in the basement of the building and comprises a cooler G, a fan or blower H, and a purifier I, all of which are connected in series with the pipe F and with an inlet duct or pipe J, leading from the outer air and preferably from a point above the roof of the building, the operation being that by the action of the fan H the air will be drawn in at the top of the duct J, beneath any suitable cap or cover *j* for excluding the weather, and will be passed thence through the purifier I and cooler G into the pipe or duct F and up to and out of the ventilators E. Near the bottom of each apartment will also be provided a register or ventilator K, communicating with ducts or conduit-pipes L, leading to an exhaust-fan M, which is also herein shown as located in the basement of the building in connection with the rest of the apparatus referred to, and by the action of which the warm and foul air from the several compartments will be drawn off through the register K and conduits L and forced out through any suitable discharge-pipe N.

In the general or broad aspect of my invention the particular construction of the several pieces of apparatus referred to is not of importance, it being only necessary that each of these features shall be such as to properly perform its required function in connection with the rest of the apparatus to produce the desired circulation thus above described and to insure the proper cooling and purifying of the air-supply. Thus the blowers H and M may be of any desired type or variety suit-



able for the purpose and are herein illustrated as of the style of the well-known Sturtevant fan-blowers, as to the construction of which no claim of invention is here made.

5 The particular cooler and purifier herein illustrated, however, are of my own design and embody various features of advantage which make them particularly applicable for use in this connection, although, as above stated,  
10 other forms of such devices may be employed to achieve the same general result in a greater or less degree. Such improved cooler G (better shown in Fig. 3) consists of an elongated closed chamber having air-pipe connections  
15  $g$  and  $g'$  at its opposite ends and provided interiorly with a coil of pipe  $G'$ , through and around which air entering through the inlet  $g$  must circulate before it passes out through the outlet  $g'$ . This coil  $G$  is designed to be  
20 connected with the cooling-pipes of any suitable refrigerating-machine, (not herein illustrated,) and will thus be supplied with a continuous circulation of a freezing mixture, such as cold brine or ammonia, by which the  
25 temperature of the coil may be maintained low enough to properly cool the air flowing through the chamber, the diameter of the latter and of its inclosed coil being herein shown as gradually increasing toward the outlet end  
30 of the chamber for the purpose of subjecting the air as it progresses from the inlet to the outlet of the chamber to a gradually-increasing refrigerating effect.

My improved purifier (better shown in Fig. 2) consists of a water-tight outer casing or  
35 tank having near its opposite ends inlet and outlet connections  $i$  and  $i'$ . In the upper portion of this tank is provided a spraying-coil  $I$ , having a great number of minute perforations  $i^2$ , through which water supplied to the  
40 coil from any suitable pump or source of pressure will be discharged in fine streams and in all directions, so as to maintain the upper portion of the tank completely filled, as it  
45 were, with a fine spray through which the current of air must pass. This spraying of the air serves to wash out of it practically all of the soot and dust which may be contained therein, and as a certain amount of the spray-  
50 water will be absorbed by the passing current of air the latter will have its temperature considerably lowered, owing to the well-known cooling effect of evaporation. To a certain extent this purifier will also act as a  
55 cooler and will furnish the air to the cooler proper,  $G$ , at a temperature much lower than the outside air, so that a considerable saving in the amount of cooling mixtures required to be circulated through the cooler  $G$  will thus  
60 be effected. The remainder of the spray-water will gather in the bottom of the tank and be drawn off through any suitable valve-controlled outlet-pipe  $i^3$ , which may be connected with a boiler or feed-pump, so that no  
65 waste of water will result from its being thus used for purifying the air. It will also be noted in this connection that the air-outlet  $l'$

is located in the top of the cooler-tank and that the pipe leading therefrom to the fan  $H$  extends vertically upward for a considerable  
70 distance before turning downwardly to meet the fan. This construction affords opportunity for any excess of water which may be carried up with the air-current to drop back  
75 into the tank, and thus prevents an undue amount of moisture from being discharged into the rooms.

The operation of my improved system as a whole will now be readily understood. Fresh air from outside the building will be  
80 drawn in by the fan  $H$  and having passed through the cooler and purifier will be discharged into each room of the building at a point near its ceiling and in volumes which may be varied according to the weather to  
85 maintain the temperature as low as desired and fulfil the requirements of good ventilation, the impure and more or less heated air which has previously entered the room being  
90 simultaneously drawn off through the register near its floor by the action of the fan  $M$ . As hereinbefore suggested, this system is capable of extension to buildings of any size and height, and its various conduits may be  
95 carried up through the walls and partitions of the building, or, if necessary, may be provided in the form of pipes separate from the walls, in which case, however, they will preferably be located closely adjacent to the walls  
100 in order that they may take up as little room as possible. The necessary character and construction of the piping and conduits and the nature of the material employed, therefore, are not of the essence of the invention  
105 and may be varied as desired to suit the requirements of each particular situation. Any suitable styles and varieties of registers or refrigerators may also be used, and the volume of air supplied may be arranged to be  
110 controlled either by the closing or opening the registers of each compartment or by controlling the machinery to vary the workings of the apparatus as a whole.

It will be understood that various changes may be made in the details of the construction shown without departure from the broad  
115 spirit of the invention claimed.

I claim as my invention—

1. In a ventilating system, the combination of a series of ducts leading to the various  
120 rooms of a structure, a blower for forcing air through said ducts, and a purifying and cooling apparatus consisting of a vessel having the air-inlet at one end and the air-outlet at the opposite end, and a water-coil supported  
125 with its axis in the path of the air-current, so that the air will pass through the space inclosed by the coil on its way through the apparatus, said coil being provided with numerous fine perforations, for the purposes set  
130 forth.

2. In a ventilating system for buildings, the combination of a series of fresh-air ducts leading to the various rooms, a cooler connected



to these ducts, a blower connected to the cooler, a purifying apparatus consisting of a vessel having an air-inlet at one end and an air-outlet at the opposite end, this outlet rising vertically directly from the vessel and then extended downward to the blower, a pipe for supplying water to the vessel and means for drawing off water from the vessel, a water-coil connected to the supply-pipe and supported within the vessel above the water therein and with its axis in the path of the air-current and provided with numerous per-

forations throughout its length, and means for exhausting the vitiated air from the various rooms of the building, for the purposes set forth.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two subscribing witnesses, this 31st day of August, A. D. 1901.

J. E. LAWRENCE.

Witnesses:

HENRY W. CARTER,  
L. J. LAWRENCE.