

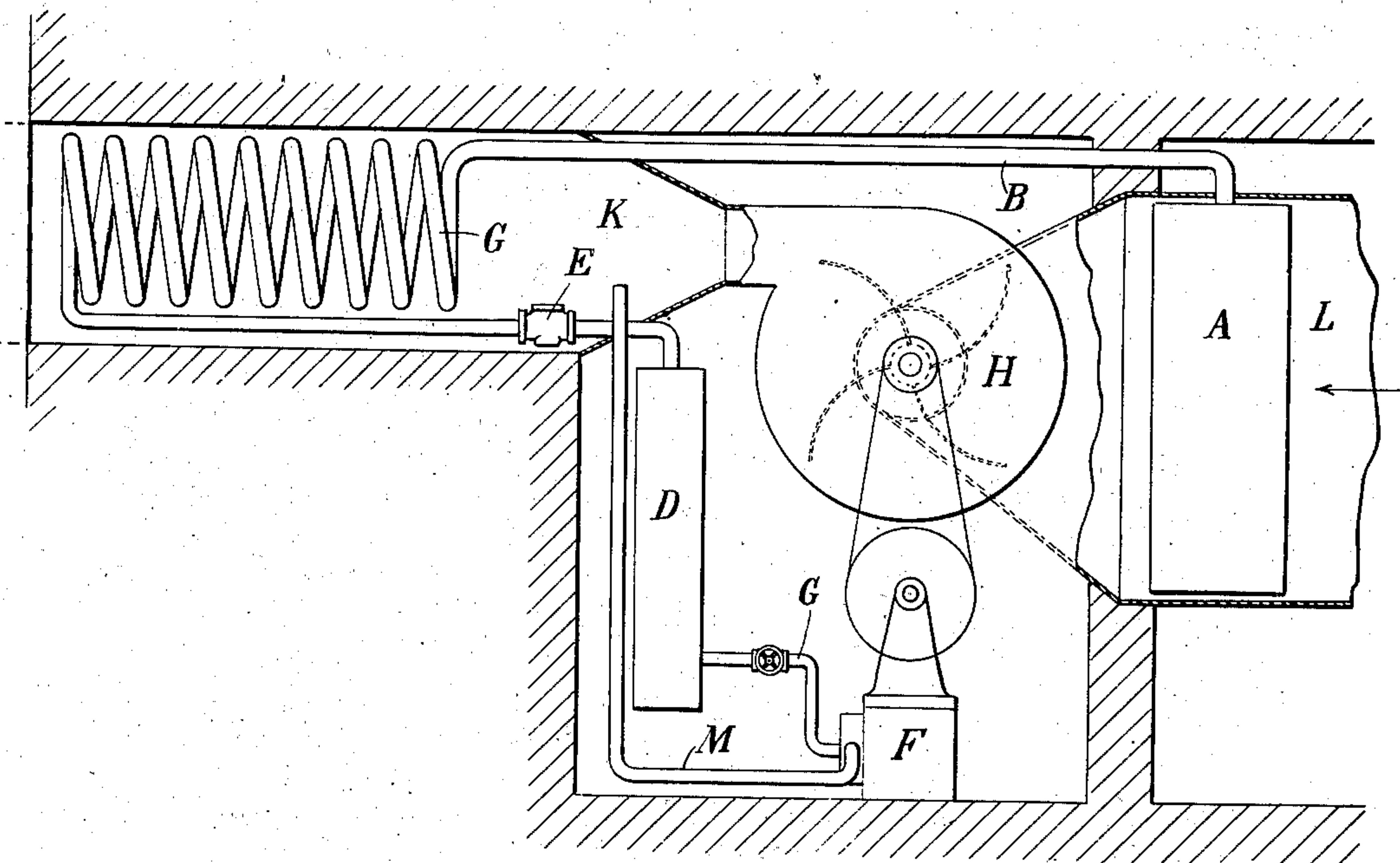
No. 655,148.

Patented July 31, 1900.

W. H. DICKERSON.  
SYSTEM OF COOLING AND VENTILATING.

(Application filed May 31, 1900.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## SYSTEM OF COOLING AND VENTILATING.

SPECIFICATION forming part of Letters Patent No. 655,148, dated July 31, 1900.

Application filed May 31, 1900. Serial No. 18,562. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER H. DICKERSON, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Systems of Cooling and Ventilating, of which the following is a specification, reference being had to the drawing accompanying and forming a part of the same.

My invention resides in a combination of devices adapted and arranged for coöperative action in a system of cooling and ventilating buildings or inclosed spaces generally—such as the interiors of cars, ships, mines, and the like—and is designed to utilize the energy stored in a liquefied gas, such as atmospheric air and the cold produced by the evaporation and expansion of the same.

My improvement, stated in general terms, consists in the combination, with a receiver for containing the liquid air, of an air-motor connected therewith through suitable intermediate expansion coils or chambers, and a blower or fan which is driven by the motor and which is arranged to produce a current of air over the expansion-coil, so as to impart to the latter sufficient heat to effect the expansion of the air therein and be delivered at a reduced temperature into the room or other space which is to be cooled and ventilated.

The arrangement of the apparatus for carrying out this invention and the construction of the same, so far as is necessary to a full understanding of the invention, are illustrated in the accompanying drawing, which shows the devices in side elevation, the inclosing chamber and conduits being shown in section.

A designates a receiver capable of containing a given quantity of liquid air. This receiver may be insulated by a jacket of felt or the like to an extent sufficient for the purposes of each particular case to insure the proper rate of evaporation of its contents. A pipe B leads from the upper portion of the receiver A to an expansion-coil C, which latter connects with a reservoir D for containing the expanded and compressed air. It is desirable to interpose a reducing-valve E between the coil C and the reservoir D.

F is an air-motor, with a valve-controlled

connection G with the reservoir D and geared or connected in any suitable manner with a rotary blower or fan H.

The blower H forces air through a flue or conduit K into the room or other space which is to be ventilated and takes up air from the chamber in which it is located, the supply being drawn in through a suitable air box or flue L.

The main feature of novelty of the system consists in a disposition of the above-described devices, substantially such as is shown in the drawing—that is to say, the liquid-air receiver or tank is placed in a position in which the warm air drawn in by the blower will impinge upon it in such manner as to cause it to evaporate off with sufficient rapidity to properly operate the blower. The expansion-coils C are located in the conduit, through which air is forced by the blower, so that by the absorption of heat from the latter the air in said coils is raised in temperature and expanded. This expanded air on reaching the reservoir D is still further expanded by the absorption of heat from the incoming air and exerts a sufficiently-high pressure to run the motor F. The exhaust M from the motor is preferably led to the air-flue K, as the air which issues from it is perfectly dry and cold.

It will be understood that the specific arrangement of the apparatus may be greatly varied without departure from the invention, the essential feature of which is to operate the motor that drives the fan by the expansion of liquefied or highly-condensed air or gas and to produce such expansion by the absorption of heat from the air set in circulation by the action of the blower, so that the blast or current of air delivered will be correspondingly cooled. So far, therefore, as the attainment of this object is concerned it is obvious that the primary evaporation of the liquid air may be effected in any desired way and any suitable means employed for controlling the pressure of the expanded air or utilizing it in the operation of the devices which maintain its circulation.

What I claim as my invention is—

1. The combination of a ventilating blower or fan, a motor for driving the same, a re-



ceiver for liquid air connected with the motor, and expansion-coils intermediate to the receiver and motor, and exposed to the current of air produced by the blower, as set forth.

5 2. The combination of a ventilating blower or fan, a motor for driving the same, a receiver for liquid air connected with the motor, and expansion-coils intermediate to the receiver and motor and placed in the flue  
10 through which the air is forced by the blower, as set forth.

3. The combination of a ventilating blower or fan, a motor for driving the same, a receiver for liquid air, expansion-coils located  
15 in the flue through which air is forced by the blower, and a reservoir for compressed air, the liquid-air receiver being connected with the motor through the said coils and reservoir, as set forth.

20 4. The combination of a ventilating blower or fan, a motor for driving the same, a receiver for liquid air, exposed to the current of air which is drawn into the blower, expansion-coils located in the flue through which  
25 air is forced by the blower, and a reservoir for compressed air, the liquid-air receiver be-

ing connected with the motor through the said coils and reservoir, as set forth.

5. The combination of a ventilating blower or fan, a motor for driving the same, a receiver for liquid air connected with the motor, expansion-coils in the flue through which air is forced by the blower, and forming part  
30 of the connection between the liquid-air receiver and the motor, and an exhaust-pipe  
35 from the motor opening into the air-flue, as set forth.

6. The combination of a ventilating blower or fan, a motor for driving the same, a receiver for liquid air connected with the motor, expansion-coils, and a reservoir for compressed air intermediate to the receiver and motor, the expansion-coils being located in the flue through which air is forced by the blower, and the reservoir and liquid-air receiver being exposed to the air drawn into  
40 the blower, as set forth.

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Witnesses:

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