

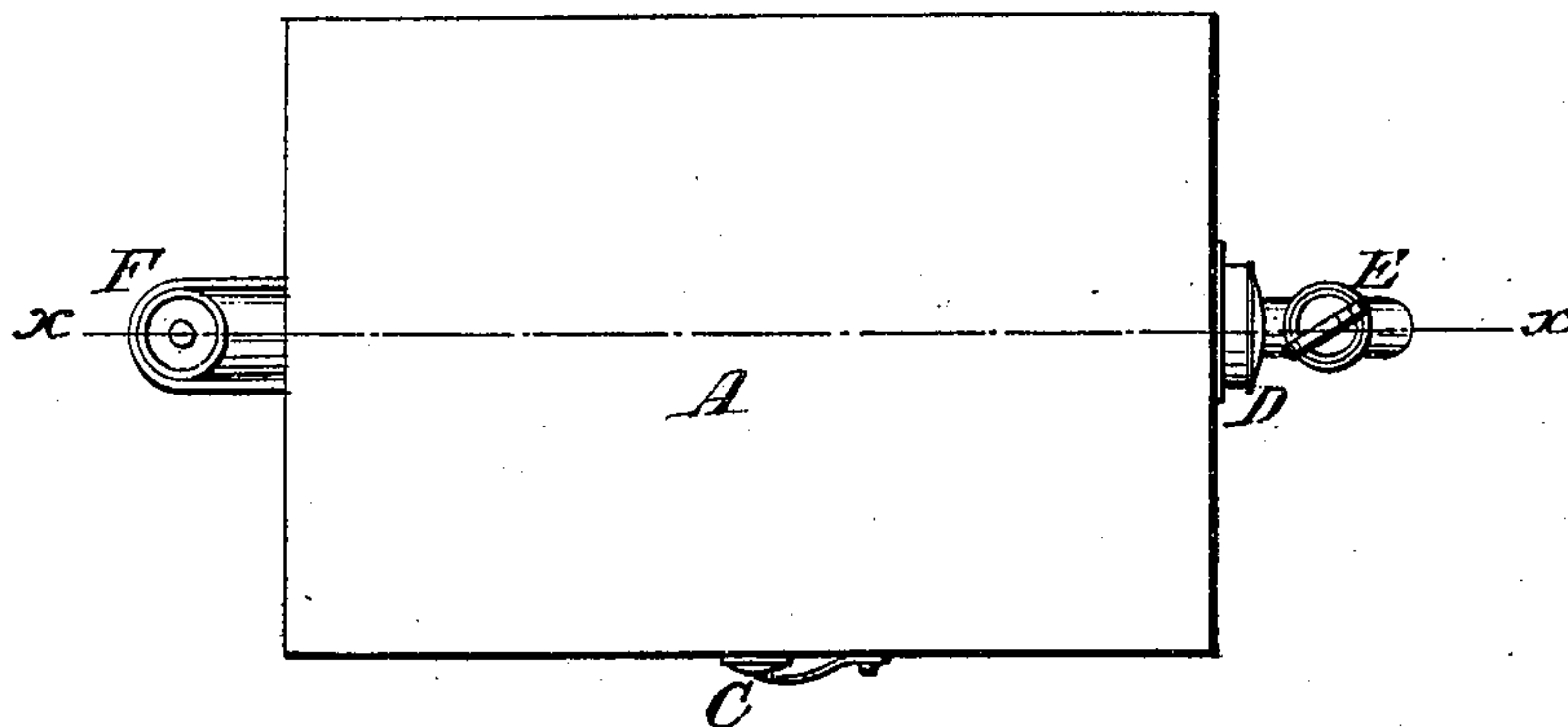
*E. H. Grant.*

*Air-Cooling Cooler.*

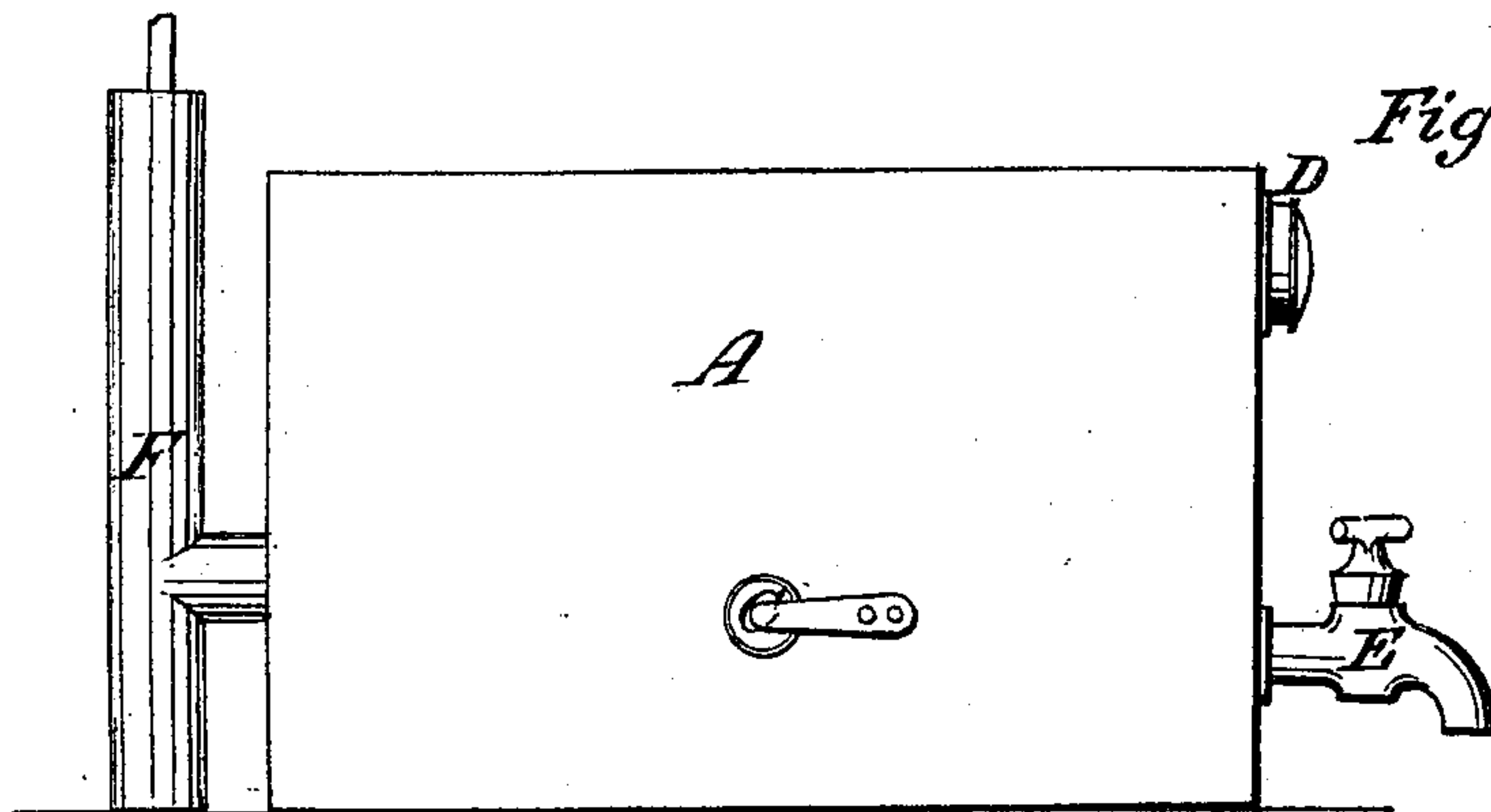
*N<sup>o</sup> 87,041.*

*Patented Feb. 16, 1869.*

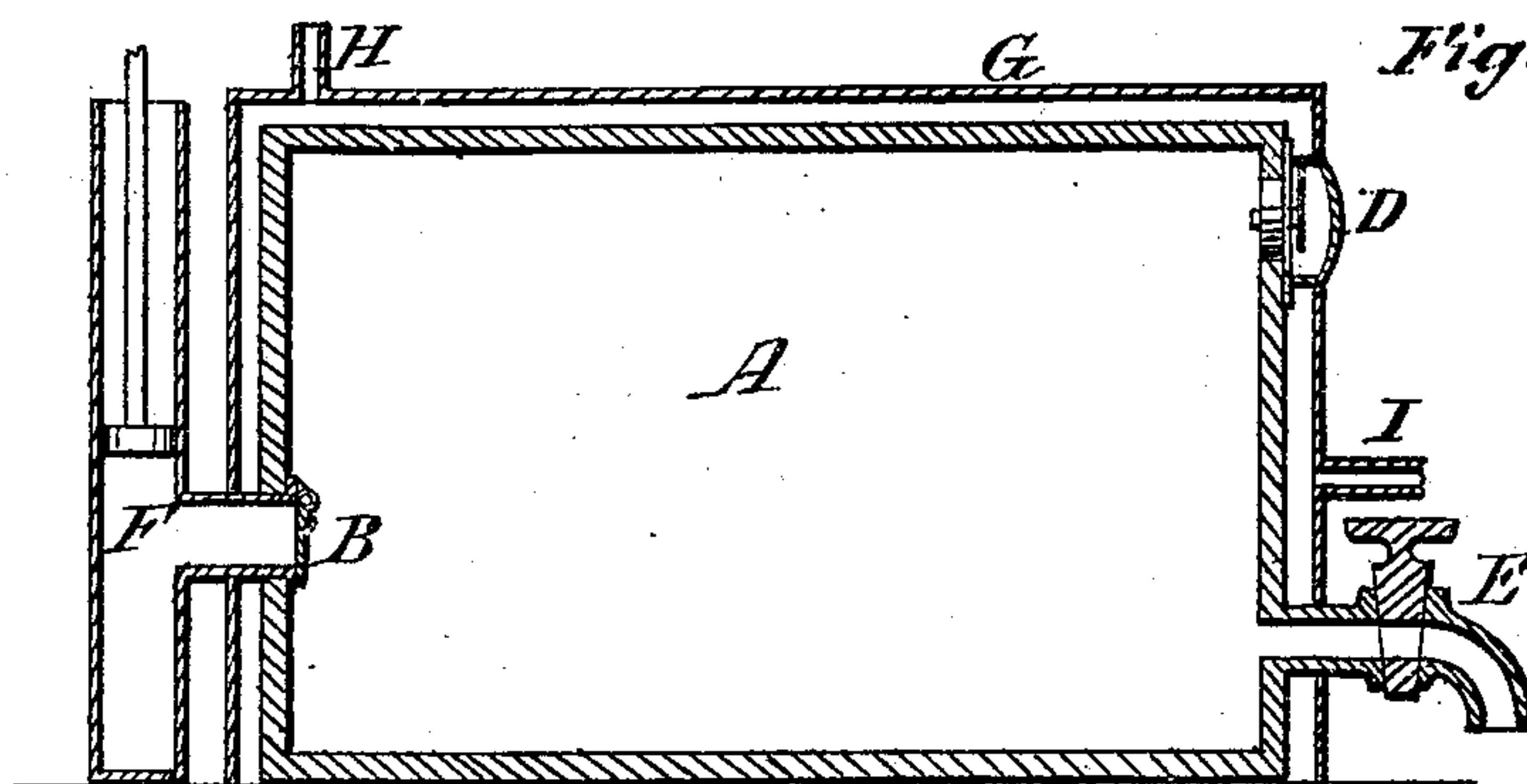
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses.*

*N. D. Miller.*  
*S. Morris Pool*

*Inventor.*

*Edwin T. Grant.*





EDWIN H. GRANT, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 87,041, dated February 16, 1869.

**IMPROVED PROCESS OF COOLING THE ATMOSPHERE IN ROOMS AND OTHER ENCLOSURES.**

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern :*

Be it known that I, EDWIN H. GRANT, of Washington, in the District of Columbia, have invented a new and useful Process for Cooling the Atmosphere in Rooms or other Enclosures, which consists in the use of a current of steam of low temperature, or of such steam commingled with air, as will be hereinafter described; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, and being a part of this specification, said drawing showing one method of applying my process.

Figure 1 is a plan view of my apparatus without the steam-jacket.

Figure 2 is a side elevation of the same portions of my apparatus which are shown in fig. 1.

Figure 3 is a vertical section of my apparatus, including the steam-jacket, or casing G, and its induction-pipe H, and its eduction-pipe I. This view represents a section cut through the lines *x x*, shown in fig. 1.

The same letters indicate like parts in each figure.

The object of my invention is the cooling of air in the rooms of a building, by means of an apparatus placed within or adjacent to such building, or it may be done in any suitable place, and compressed into suitable vessels and transported in such vessels to any place where it may be desirable to use such cooled air.

This cooler or apparatus is so constructed that either common or medicated air can be compressed into it, and can be liberated from it, at will. It cools the atmosphere in the apartment, both by the force of its escaping current, and by the absorption of heat and of moisture, produced by the expansion of compressed air.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct my air-chamber A in any of the known forms, and apply thereto a check-valve, B, a safety-valve, C, a pressure-gauge, with its index or register D, a stop-cock, E, an air-pump, F, and a steam-jacket or casing, G.

This steam-jacket need only be attached whilst the air chamber A is being filled.

The air-chamber A is filled with compressed air by means of an air-pump, F.

The air thus compressed is retained in the air-chamber A by means of the check-valve B.

The quantity of air compressed is indicated on the register of the pressure-gauge D, in the usual manner, and is limited by the safety-valve C.

The compressed air is liberated at will by the stop-cock E.

The heat evolved during the process of compressing the air into the air-chamber A is abstracted by means of a jet of exhaust-steam, or steam of a low temperature, direct from the generator, which may be mingled with a current of air in its passage from the generator, by any of the well-known means, and which is made to pass into the steam-jacket or casing G, and around the air-chamber A, through the induction-pipe H, and allowed to escape through the eduction-pipe I.

These induction and eduction-pipes should be sufficiently large to allow the current of steam, or of steam and air commingled, to pass through them, and through the steam-jacket, at a rate of speed equal to that at which it leaves the generator, so that any sudden development of heat which may be caused by a rapid condensation of air, may be carried off with rapidity, and thus prevented from injuring the joints or other portions of the vessel which contains such compressed air.

It is apparent that steam, in passing through or around a vessel in which air is being compressed, at a rapid rate, will take up and carry away the heat which is developed by such compression, and that air thus situated will soon be reduced to the temperature of the passing current of steam; and it is also apparent that such steam may be used for any purpose to which steam of its temperature is applicable after having been so used.

I am aware that devices for cooling air have been used, in which a current of air, and in some cases a current of water, has been made to flow around and in contact with the vessel which contained the air, but these have failed to answer the desired purpose, for the reason that their affinity for heat, and the comparatively slow motion which is imparted to them, have not enabled them to carry off the heat generated by rapid condensation of the air, with the rapidity required. I, therefore, do not claim the cooling of air by the use of either air or water, used singly; but,

What I do claim, and desire to secure by Letters Patent, is—

1. The process of cooling air by the use of a jet or current of steam, or of steam and air commingled, substantially as described.

2. The combination of the air-chamber A, the check-valve B, the safety-valve C, the pressure-gauge, with its index or register D, the stop-cock E, the air-pump F, substantially as shown and described.

Witnesses:

EDWIN H. GRANT.

HARRY C. RAY,  
JAS. K. MOORE.