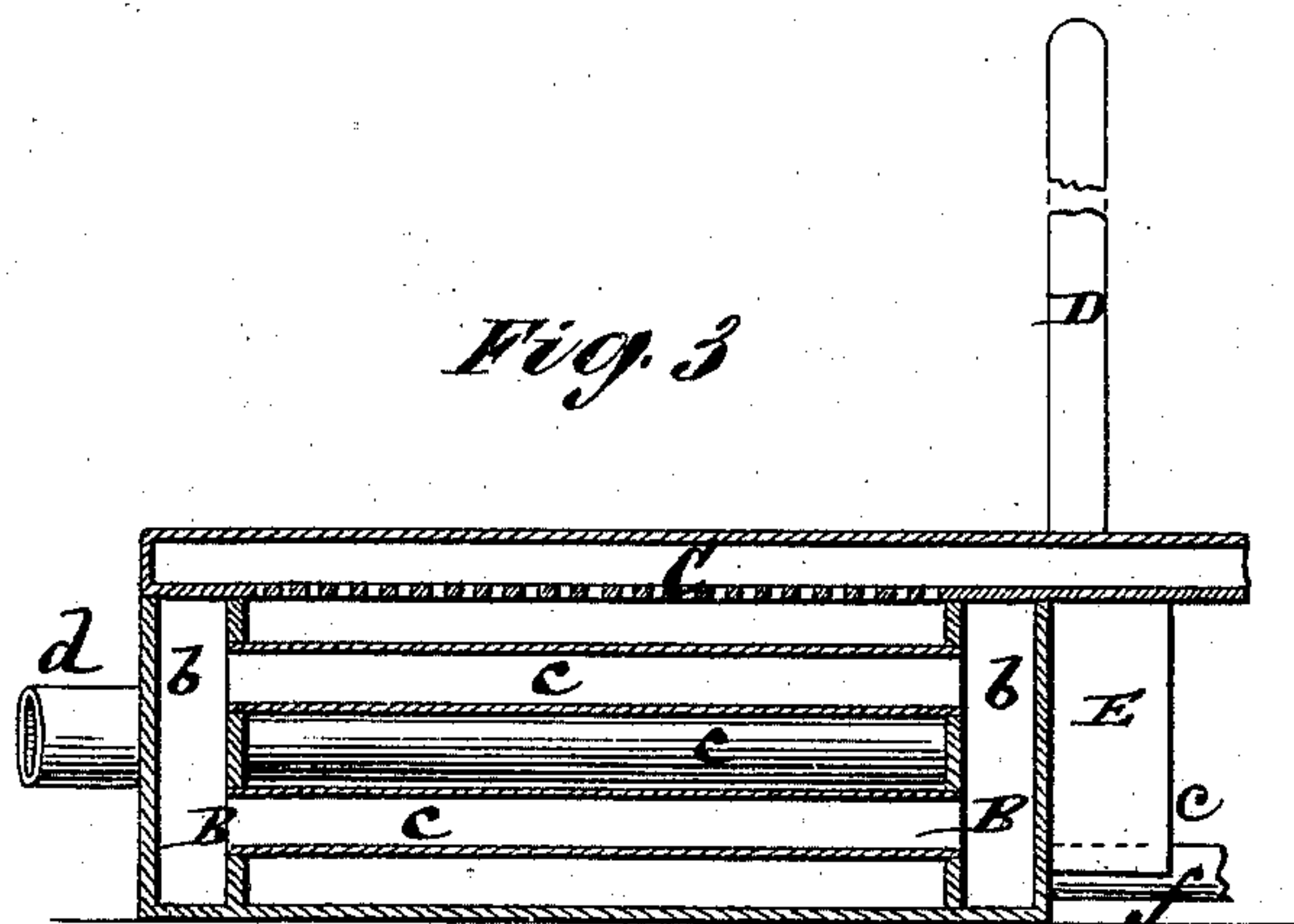
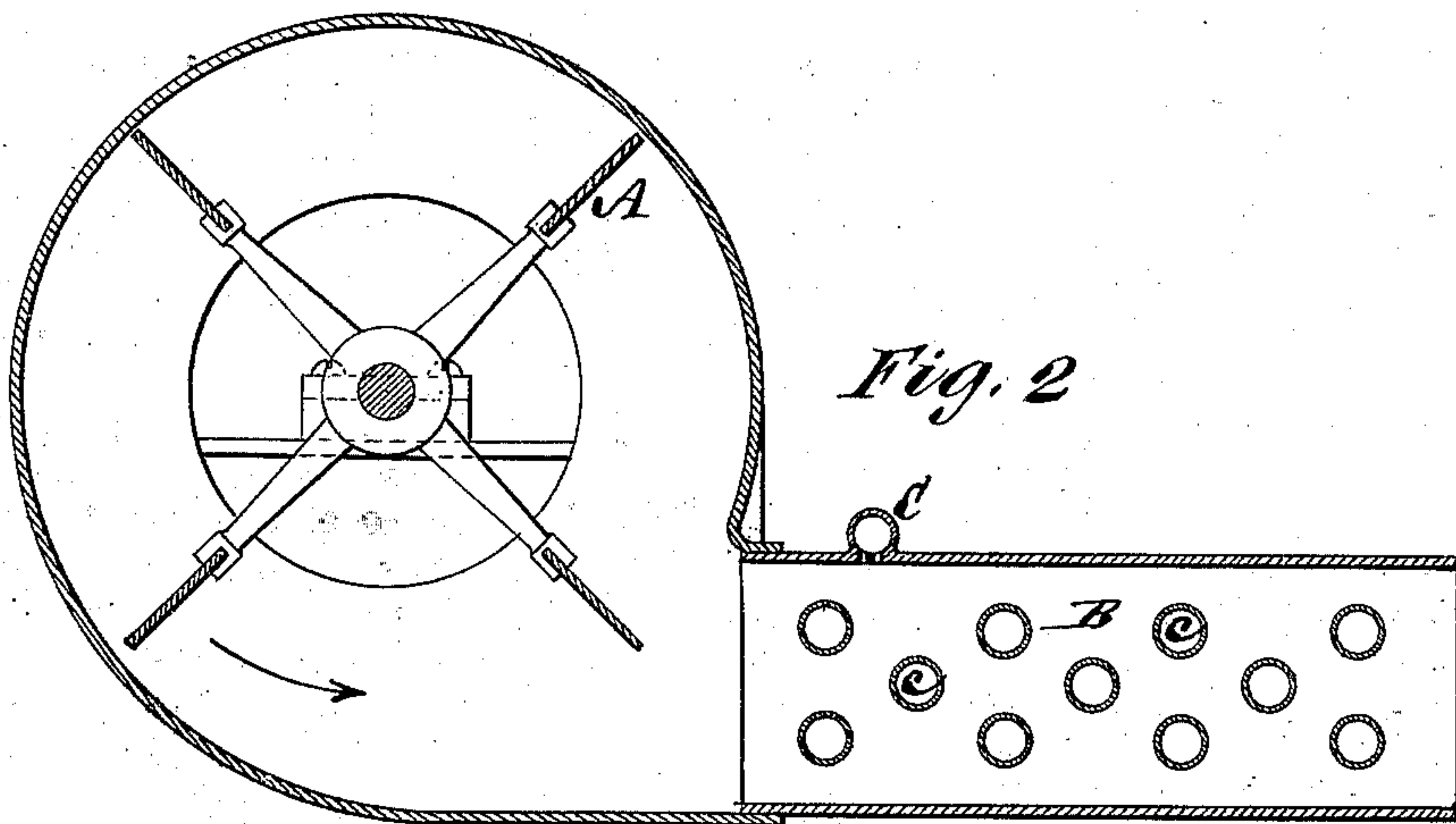
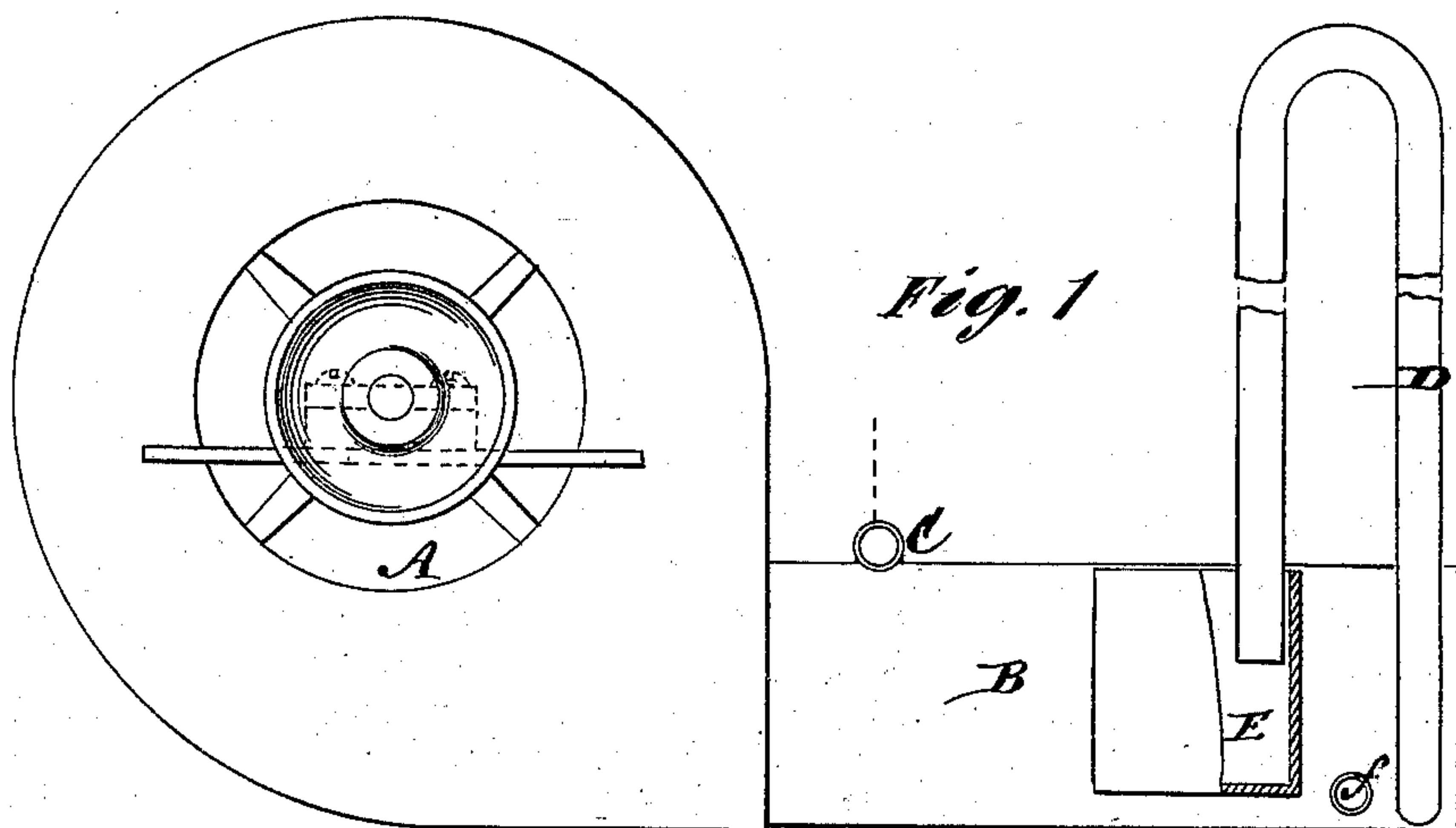


J. A. H. ELLIS.
Atmospheric Condensers.

No. 150,850.

Patented May 12, 1874.



Witnesses.
Michael Ryan
Fred Hays

J. A. H. Ellis
by his attorney
Brown & Allen

UNITED STATES PATENT OFFICE.

JOEL A. H. ELLIS, OF SPRINGFIELD, VERMONT, ASSIGNOR TO THE VAPOR-ENGINE COMPANY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ATMOSPHERIC CONDENSERS.

Specification forming part of Letters Patent No. **150,850**, dated May 12, 1874; application filed October 7, 1873.

To all whom it may concern:

Be it known that I, JOEL A. H. ELLIS, of Springfield, in the county of Windsor and State of Vermont, have invented an Improvement in Atmospheric Condensers, of which the following is a specification:

This invention relates to surface-condensers mainly designed for use where water is scarce, and in which a current of air is brought to bear upon the pipes or passages through which the steam or vapor to be condensed is circulated or passed. The use of such condensers, and of my improvement, is not restricted, the same being applicable not only to steam and different vapor engines, but to condensing purposes generally.

The invention consists in a combination, with such surface-condensers, of a water sprinkler or distributor, arranged to saturate or moisten the atmospheric current of air at the time of, or previous to, its (the latter's) action on the condensing-surfaces, whereby the condensing pipes or passages are kept constantly wet externally in relation to the surfaces with which the steam or vapor to be condensed comes in contact, thereby causing a rapid evaporation to take place from or by the flow of the air over or about the warm wet passages, and rapidly carrying away the heat, and so condensing the steam or other vapor circulating through the passages.

I do not restrict my invention to any particular device for producing the atmospheric current, nor yet to any particular construction of surface-condenser, nor to a specific arrangement of the water sprinkler or distributor.

Figure 1 represents a side elevation of a condenser in illustration of my invention; Fig. 2, a vertical section of the same in a plane parallel to Fig. 1, and Fig. 3 a transverse section on the line *x x*.

Similar letters of reference indicate corresponding parts.

A is a revolving fan, and B a tubular or surface condenser, through the sides *b* and tubes *c* of which the steam or vapor to be condensed, entering at *d*, passes, the water or product of condensation being drawn off at an outlet, *f*. The fan A establishes a current of

air about or around and over the external surfaces of the condensing-passages, and partially effects the requisite condensation. To complete or perfect the latter, however, I arrange, at any suitable point between the fan and the condenser, or over the condenser, in proximity to the fan, a perforated water-tube, C, which serves to sprinkle a slight shower of water into the current of air as the latter passes through the condenser. This keeps the outer surfaces of the pipes *c* and walls of the condenser constantly wet, thereby producing a rapid evaporation, the heat becoming latent in the vapor which is produced, being rapidly carried away from said pipes and walls, and causing a much more perfect and rapid condensation of the steam or vapor in the passages of the condenser, and requiring a much smaller amount of air for the purpose than if the current of air alone were used. The water required to thus saturate or moisten the current of air may be very small, as it only requires a quantity sufficient to supply the amount evaporated.

In the place of an air-pump to maintain a vacuum in the condenser, a Toricellian tube, D, may be used to automatically effect a like result, said tube consisting of an inverted U-shaped pipe of the necessary height, and the one end of which connects with the condenser, while the other enters a liquid sealing-chamber, E. The steam or vapor to be condensed is first blown through the tube D before turning water onto the distributor C, and allowed to condense in the sealing-leg of said tube, and caused to maintain a vacuum, as in similar attachments to other condensers.

I claim as my invention and desire to secure by Letters Patent—

The combination, with an atmospheric condenser, of a water sprinkler or distributor, arranged to saturate or moisten, outside of the pipes or passages in which the steam or vapor is condensed, the current of air as it passes to or through the condenser, substantially as and for the purpose herein set forth.

JOEL A. H. ELLIS.

Witnesses:

MICHAEL RYAN,
FRED. HAYNES.