

(No Model.)

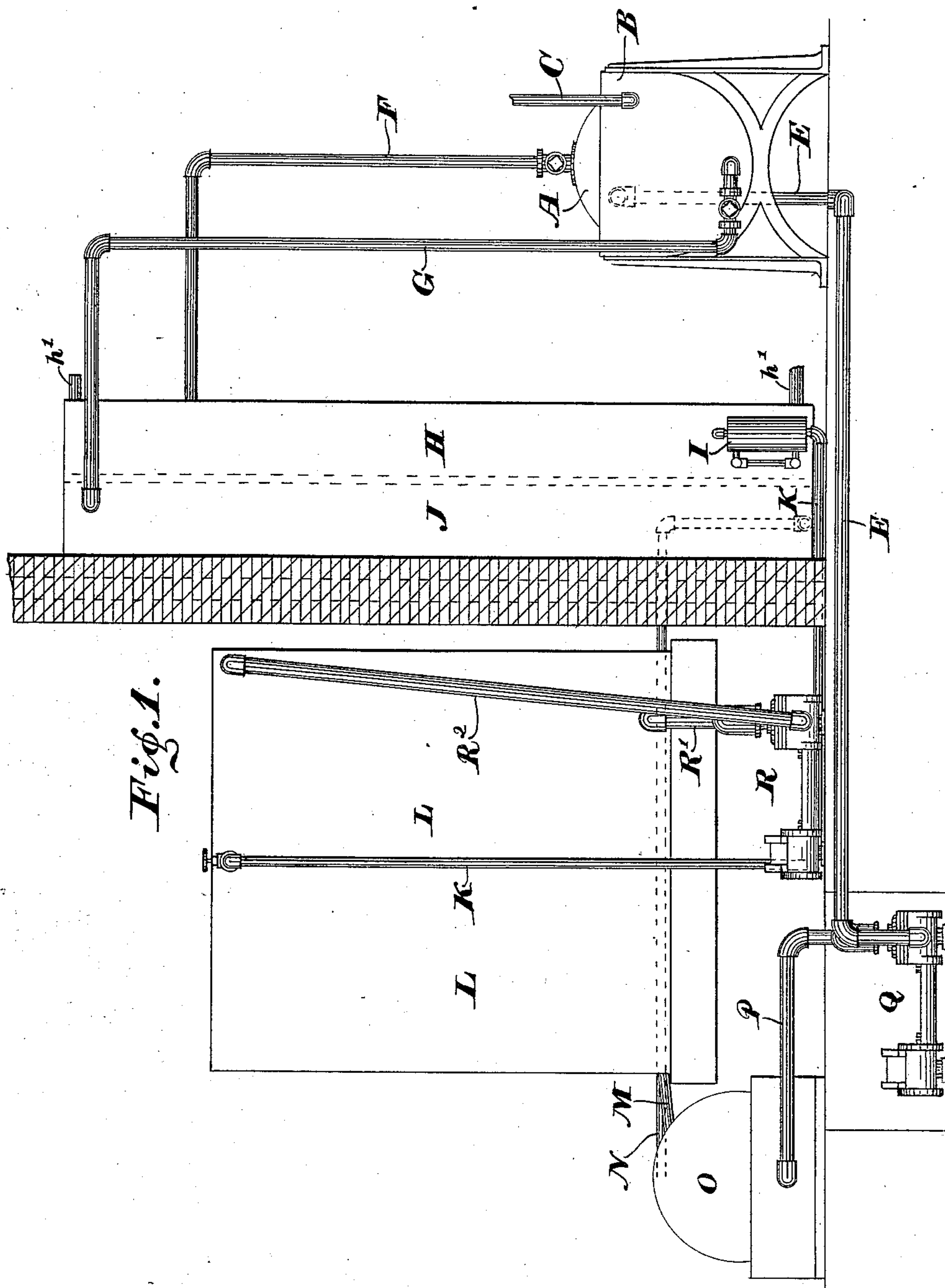
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M. S. ONLY.

### CONDENSER FOR AMMONIA ICE MAKING APPARATUS.

No. 294,763.

Patented Mar. 11, 1884.



*Fig. 1.*

*WITNESSES.*

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*INVENTOR.*

Mahlon S. Conly,  
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(No Model.)

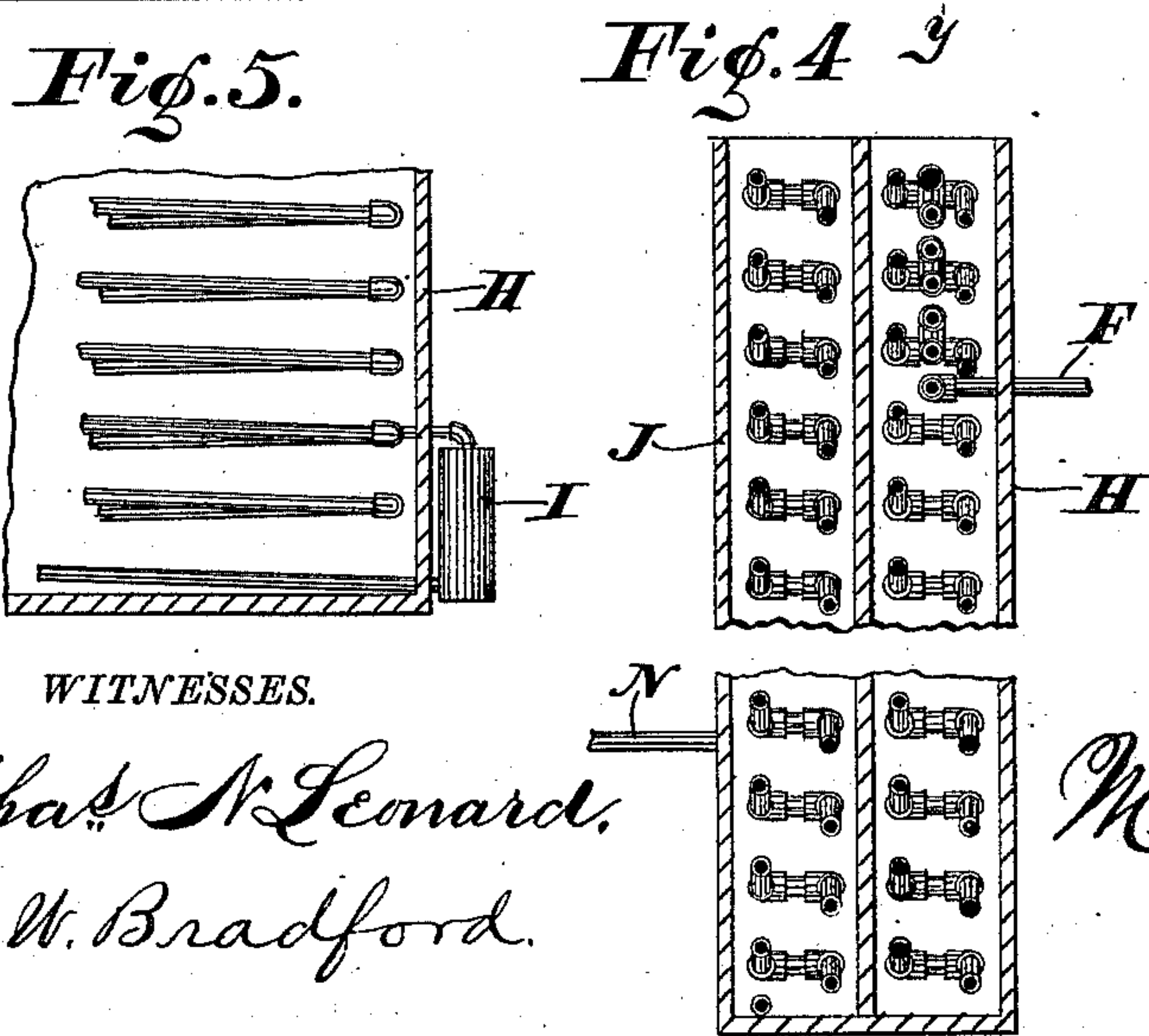
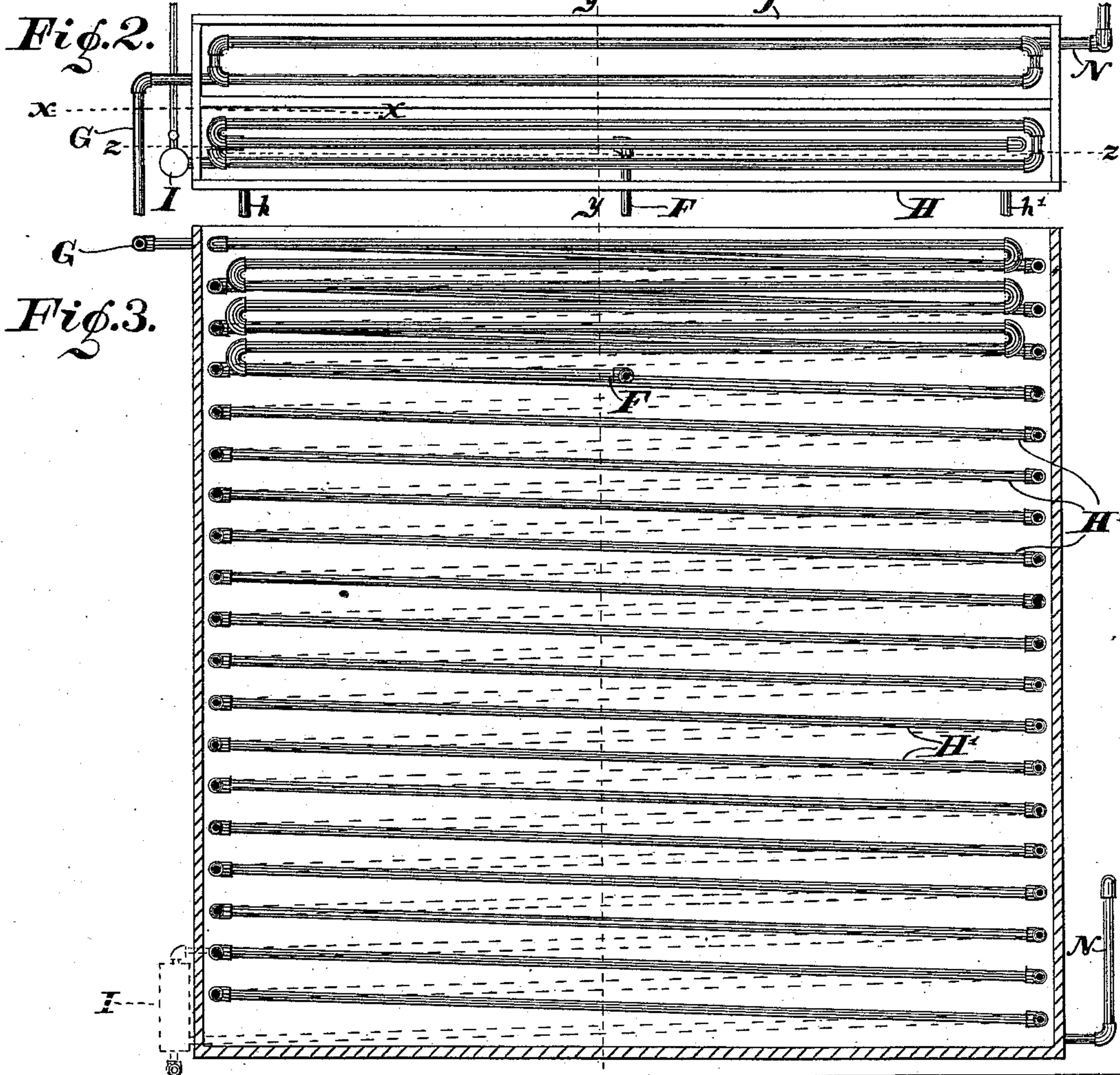
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# UNITED STATES PATENT OFFICE.

MAHLON S. CONLY, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF TWO-THIRDS  
TO THOMAS H. BUTLER AND ORANGE R. WEAVER, BOTH OF SAME  
PLACE.

## CONDENSER FOR AMMONIA ICE-MAKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 294,763, dated March 11, 1884.

Application filed August 10, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, MAHLON S. CONLY, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Condensers for Ammonia Ice-Making Apparatus, of which the following is a specification.

The general process of forming ice by the use of ammonia, and which consists, essentially, in producing in a "retort" ammonia-gas from liquid ammonia or ammonia and water, passing the same through a cooler, and thereby condensing it, then passing it through a series of large pipes in the "refrigerator," where it expands and absorbs heat, and finally passing it into an "absorber," where it is taken up by water and put in condition to be again passed into the retort and through the same process, is no part of my present invention, and will not be further described herein.

My present invention consists in an improvement in the construction of that portion of an ice-making apparatus known as the "condenser," whereby the volatilized gas from the retort will be condensed and stored in the reservoir, and such aqueous vapors as may have passed out with it will be returned to the retort, as will be hereinafter more particularly set forth.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of a complete apparatus for producing ice, of which my improved condenser forms a part; Fig. 2, a top or plan view of my improved condenser; Fig. 3, a longitudinal vertical section of the same, looking upwardly from the dotted line *z z* in Fig. 2; Fig. 4, a transverse vertical sectional view, looking to the right from the dotted line *y y*, the middle portion being broken out; and Fig. 5, a detail view of the lower corner of the condenser, looking toward the liquid-gas reservoir from the dotted line *x x* in Fig. 2.

In said drawings, the portions marked A represent the shell of the retort; B, a casing surrounding the same; C, the hot-water inlet;

E, the aqua-ammonia inlet-pipe; F, the ammonia-gas outlet; G, the weak aqua-ammonia outlet; H, the condenser for the ammonia-gas; I, the liquid-gas reservoir; J, the cooler for the weak aqua-ammonia; K, a pipe leading from the liquid-gas reservoir to the refrigerator; L, said refrigerator; M, a pipe leading from the refrigerator to the absorber; N, a pipe leading from the cooler J to the absorber; O, said absorber; P, a pipe leading from said absorber to a force-pump; Q, said force-pump, which draws the aqua-ammonia from the absorber through pipe P, and forces it to the retort through pipe E, and R a "circulation-pump" attached to the refrigerator by pipes R' R', which is for the sole purpose of keeping the salt-water therein in circulation.

As my present invention relates only to the condenser, the other parts will not be further described, except incidentally in describing the invention.

The condenser H is, as shown, a rectangular box or tank, provided with a manifold of piping, H', the inclination of a portion of which is upward from the entrance, where it is connected with the pipe F, which leads from the retort, until it reaches the top of the condenser, when it is downward to the bottom, where it connects with the liquid-gas reservoir I. A constant stream of cold water enters this tank near its bottom through a pipe, *h*, and, pressing up around the piping H', escapes at the top through an overflow-pipe, *h'*.

The effect and operation of this construction of condenser are as follows: The gas from the retort coming into the piping H' from the F continues upward to the top of the tank, and then its course is changed toward the bottom, passing back and forth through the coils until it reaches the liquid-gas reservoir. As the water is gradually heated as it rises upward, it is not cold enough around that portion of the pipe, the inclination of which is upward, to condense the pure gas, but is sufficiently cold to condense what aqueous vapors there may be before the extreme top is reached, thus causing them to flow back through the pipe F to the retort, and separating them from



the pure gas, which continues, as before described, downward, gradually condensing as it comes in contact with the colder water until at the bottom, where it meets the coldest water, it becomes liquefied and passes out into the liquid-gas reservoir.

By means of this construction, as will be readily understood, the space usually occupied by the water which is produced by the condensation of the aqueous vapors is saved for the pure ammonia-gas, and the gas, being thus rendered substantially pure, is correspondingly more effective in performing its functions than where such vapors are allowed to become mingled with it.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an ice-making apparatus, a condenser a portion of the coils of which convey the gas received from the retort upwardly from the receiving-point to the top of said condenser, and the remaining portion of which convey the gas downwardly to the liquid-gas reservoir, substantially as described, and for the purposes specified.

2. A condenser for an ice-making apparatus, the coils of which are arranged in two divisions, one of which carries the gas upward to

the top of the condenser through water of a temperature low enough to condense whatever aqueous vapors it may contain before reaching said top, and thus cause the products of said vapors to run back into the retort, and the other division of which conveys the gas downward through water of a constantly-decreasing temperature, whereby it is gradually condensed until it becomes liquid gas and flows out into the liquid-gas reservoir, substantially as set forth.

3. The combination, in a gas-condenser, of an outside casing, a gas-inlet pipe, a series of ascending pipes, with which said gas-inlet communicates, a series of descending pipes, with which the ascending pipes communicate, a liquid-gas reservoir, with which the descending pipes communicate, a cold-water inflow-pipe entering at or near the bottom of the casing, and a water-overflow pipe passing out at or near the top of the casing, substantially as described, and for the purposes specified.

In testimony whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 4th day of August, A. D. 1883.

MAHLON S. CONLY. [L. S.]

In presence of—

C. BRADFORD,

E. W. BRADFORD.