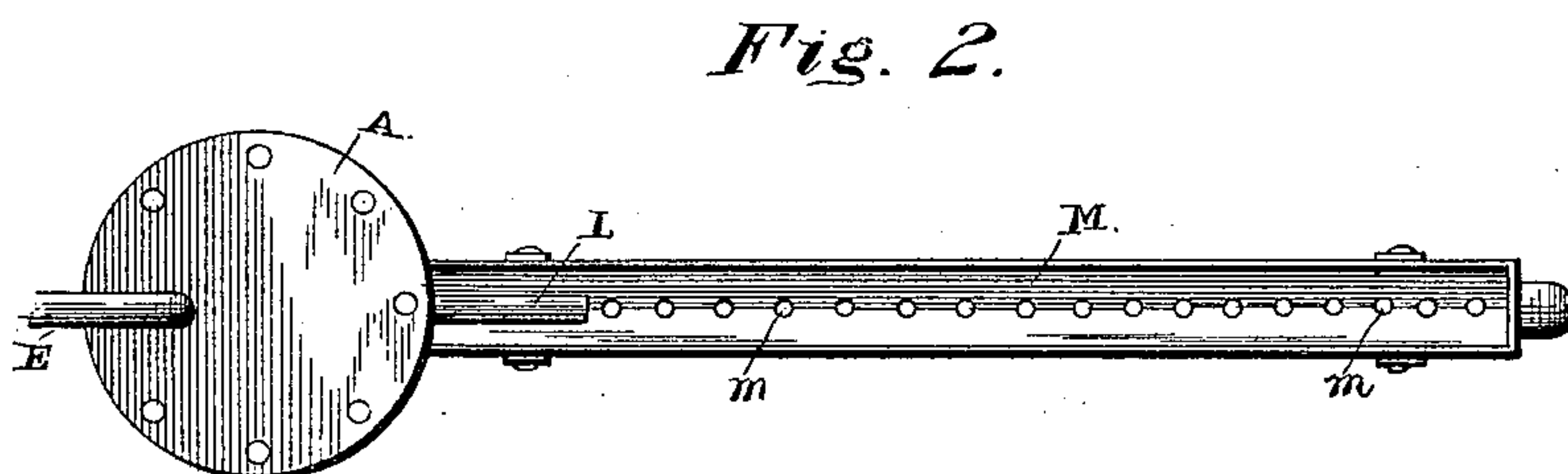
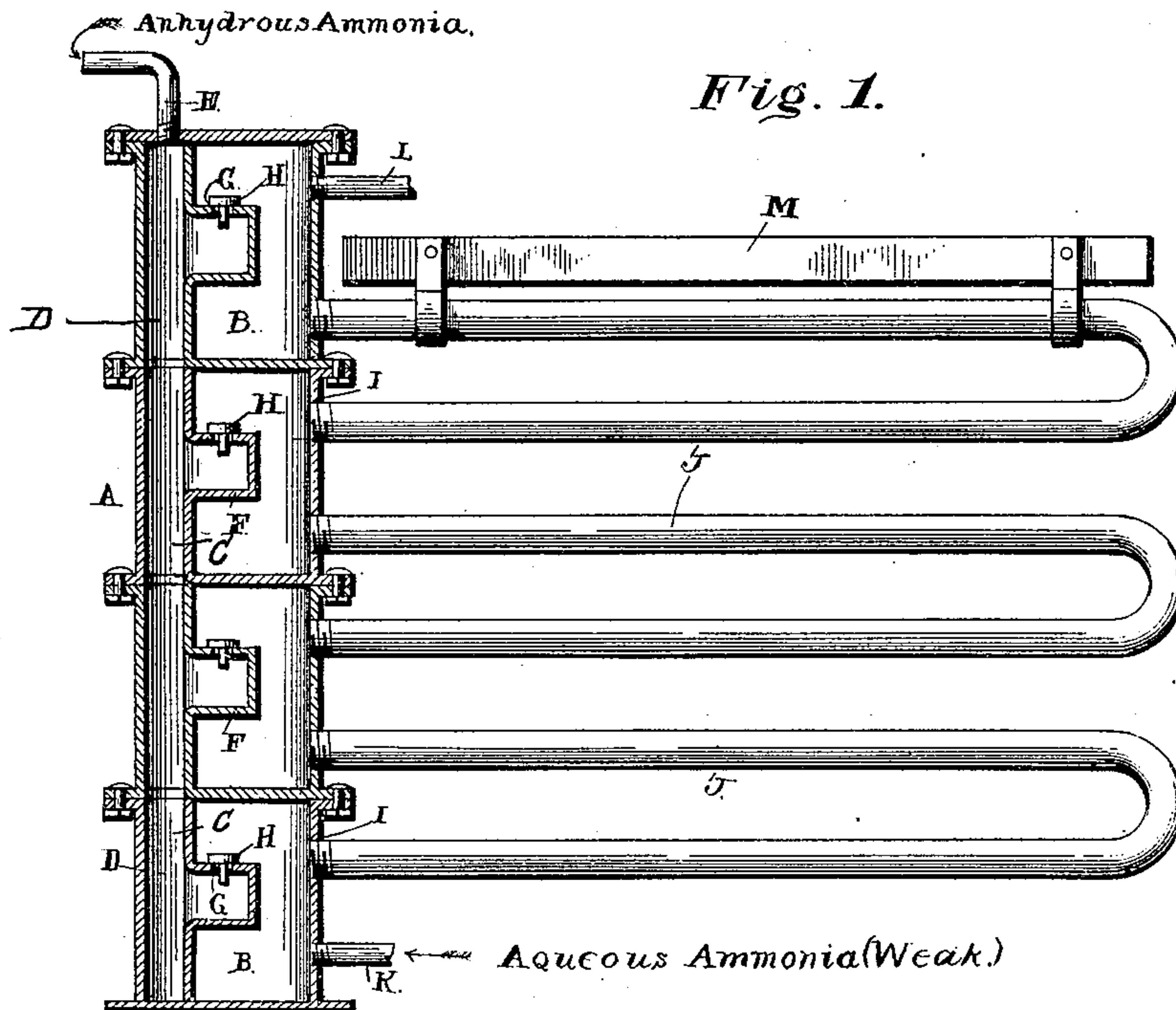


(No Model.)

F. KAISER.
AMMONIA ABSORBER.

No. 481,955.

Patented Sept. 6, 1892.



Witnesses

Chas A. Ford
D. O. Walchaupt

Inventor

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UNITED STATES PATENT OFFICE.

FREDRICK KAISER, OF KNOXVILLE, TENNESSEE.

AMMONIA-ABSORBER.

SPECIFICATION forming part of Letters Patent No. 481,955, dated September 6, 1892.

Application filed January 25, 1892. Serial No. 419,197. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK KAISER, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Ammonia-Absorber, of which the following is a specification.

This invention relates to ammonia-absorbers; and it has for its object to provide an improved absorber to be used in connection with ammonia-absorption ice-machines, which shall be simple, durable, and effective in operation, which will concentrate the ammonia to a considerable degree, and which is highly desirable in machines of this character.

With these and many other objects in view, which will readily appear as the nature of the invention is fully understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view of an absorber constructed in accordance with my invention. Fig. 2 is a top plan view of the same.

Referring to the accompanying drawings, A represents a vertical absorbing-cylinder comprising a series of separate and independent cylindrical absorption vessels or chambers B, mounted one upon the other to form the single absorbing-cylinder A. Each of the chambers B is provided with a side gas passage or space C, which communicates with the other passages and forms a continuous passage or space D for the anhydrous ammonia or spent gas, which is fed into said vertical pipe or passage through the inlet E at the top of said cylinder and communicating with said vertical passage or pipe. Each of the said chambers B is provided with the offstanding valve-chambers F, projecting from the pipe D centrally within each of said chambers and provided with a top valve-opening G, within which works the upwardly-working check-valve H. The said check-valve while allowing the ammonia-gas to escape therethrough into the chambers at the same time prevents the weak ammonia-water from escaping back into the vertical gas-pipe, it being of course understood that the gas can only come in contact with the weak liquor when the pressure of the gas is sufficient to overcome the weight

of the valve and the pressure of the liquor in the absorbing-chamber. The chambers B are each provided with the side circulating-openings I, which are located in the sides thereof opposite to the section of pipe C therein, and said openings are connected in pairs by the horizontal cooling and circulating pipes J, extending out in a horizontal plane to one side of the receiver or cylinder A. The said cooling-pipes J are each provided with a return-bend and are arranged in pairs—that is, connecting the uppermost circulating-opening I of the lower vessel B with the lower circulating-opening I of the vessel directly above the same, thus providing a continuous circulation from the lower vessel or chamber through the series of cooling-pipes and intermediate chambers to the top chamber of the receiver. The weak ammonia-water is fed in the lower inlet-pipe K into the lowermost vessel B. At the same time the anhydrous ammonia is fed into the vertical pipe or passage or space D from the top of the cylinder. Passing through the space D the said anhydrous ammonia passes through the various check-valves into the body of the several chambers or vessels B when the pressure of the gas is sufficient, as before referred to. The anhydrous ammonia is thus absorbed by the weak ammonia-water which is passing through said chambers. The weak ammonia-water from its inlet gains strength as it passes from one chamber to another until passing through the outlet L in the top vessel B the same has acquired sufficient strength for the purposes for which it is used. A V-shaped trough M is arranged longitudinally of the whole length of the upper pair of cooling-pipes and is provided with a series of distributing-perforations *m*, through which the water passes onto said pipes and trickles thereover, thus cooling the ammonia-water passing therethrough.

The construction, operation, and advantages of the herein-described ammonia-absorber are thought to be apparent.

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

1. In an ammonia-absorber, the combination of a cylinder or receiver having an inner gas-space having an upper inlet, interior valve-chambers leading from said space into the

body of the receiver, cooling circulating-pipes connected with said receiver, and inlet and discharge solution pipes connected to said receiver, substantially as set forth.

5 2. In an ammonia-absorber, the combination of a cylindrical vessel comprising a series of independent chambers, one above the other, a continuous gas-space running the entire length of said vessel and through said
10 chambers and provided with valved escape-openings, cooling-pipes connecting said chambers with each other, and inlet and discharge pipes located at the bottom and top of said vessel, substantially as set forth.

15 3. In an ammonia-absorber, the combination of a vessel comprising a series of independent chambers, one above the other, a continuous gas-space having an upper inlet and

running the entire length of said vessel through said various chambers, offstanding 20 valve-chambers projecting within each chamber from said space and provided with valved escape-openings, horizontal cooling-pipes having return-bends and connecting said chambers in series with each other, and inlet and 25 discharge pipes located at the bottom and top of said vessel, respectively, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 30 the presence of two witnesses.

FREDRICK KAISER.

Witnesses:

J. A. ROBERTS,
E. W. ADAMS.