

A. H. BAER.
 AGITATOR FOR REFRIGERATING LIQUIDS.
 APPLICATION FILED JAN. 27, 1905.

953,576.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.

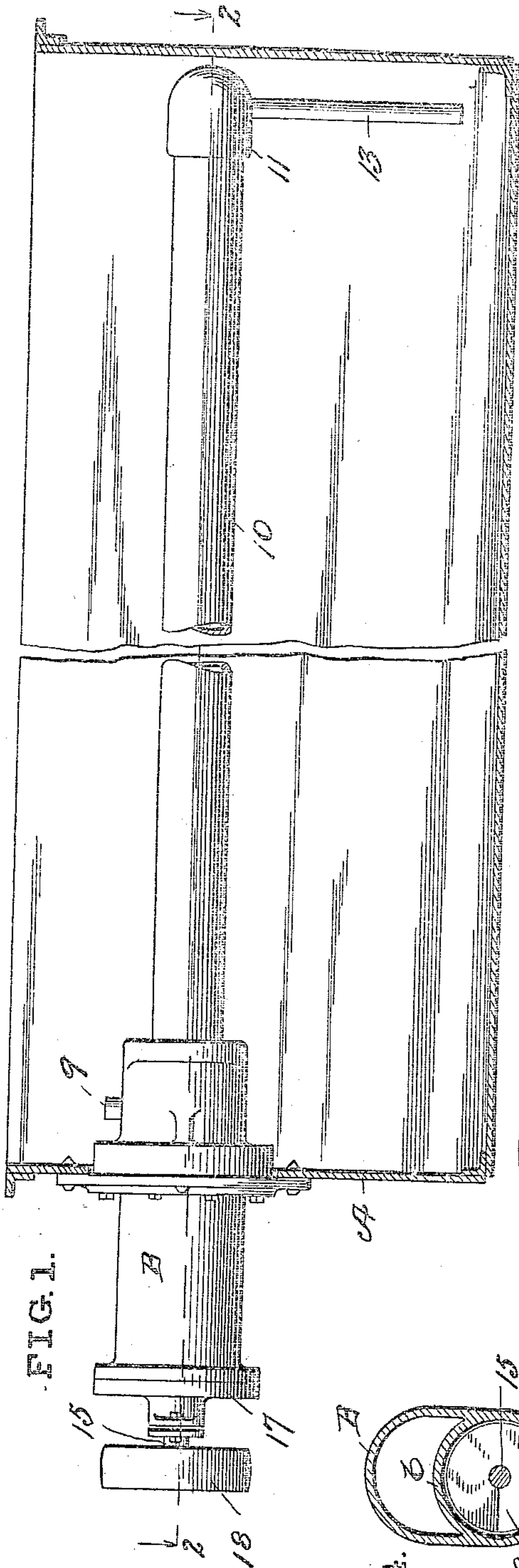


FIG. 1.

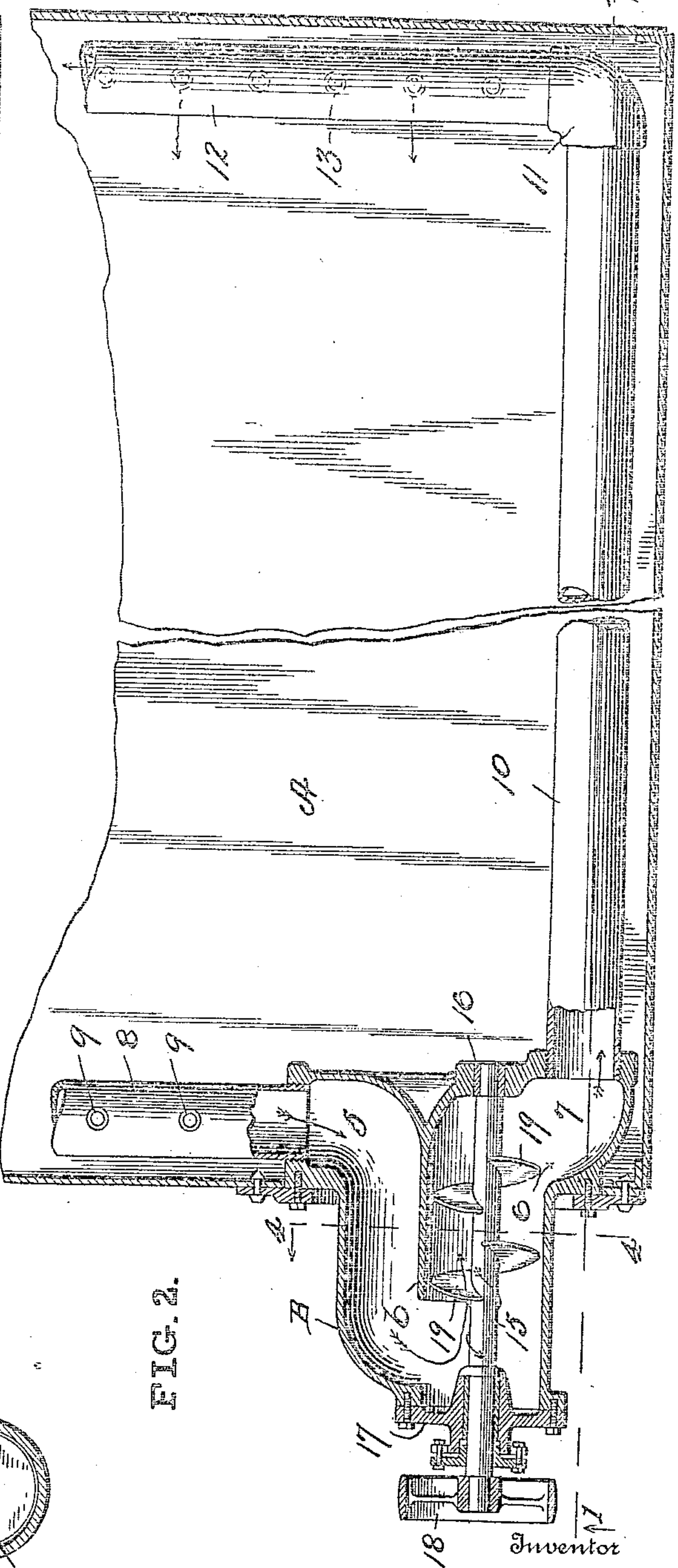


FIG. 2.

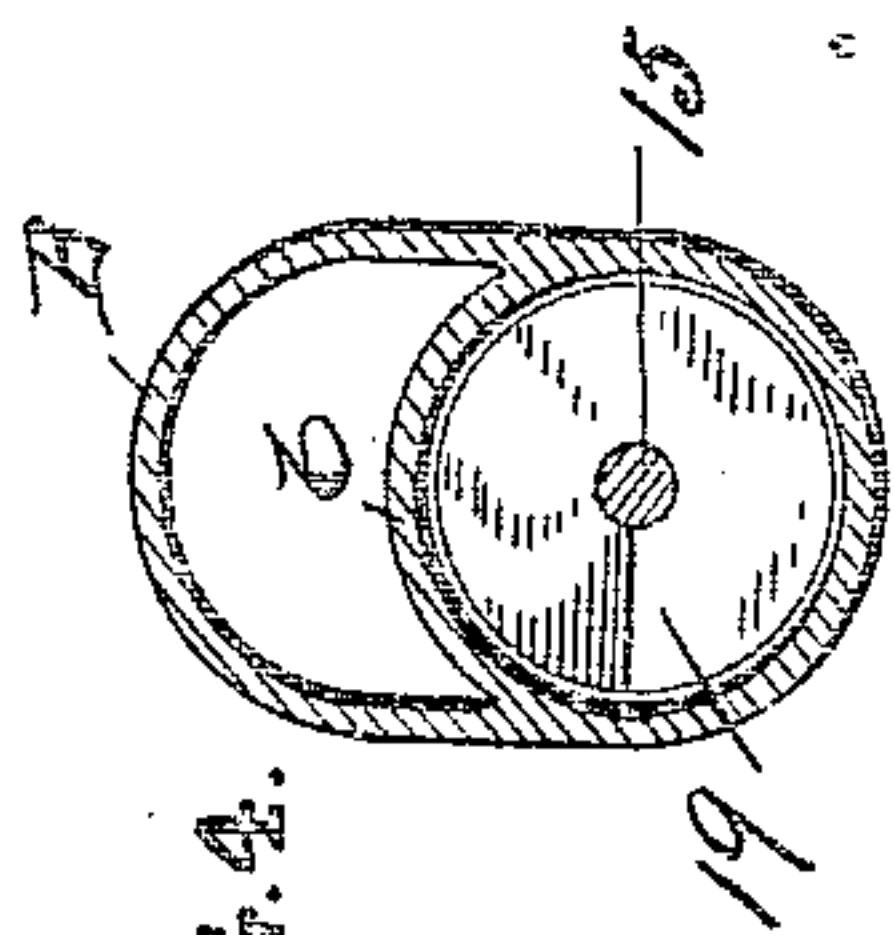


FIG. 4.

Witnesses
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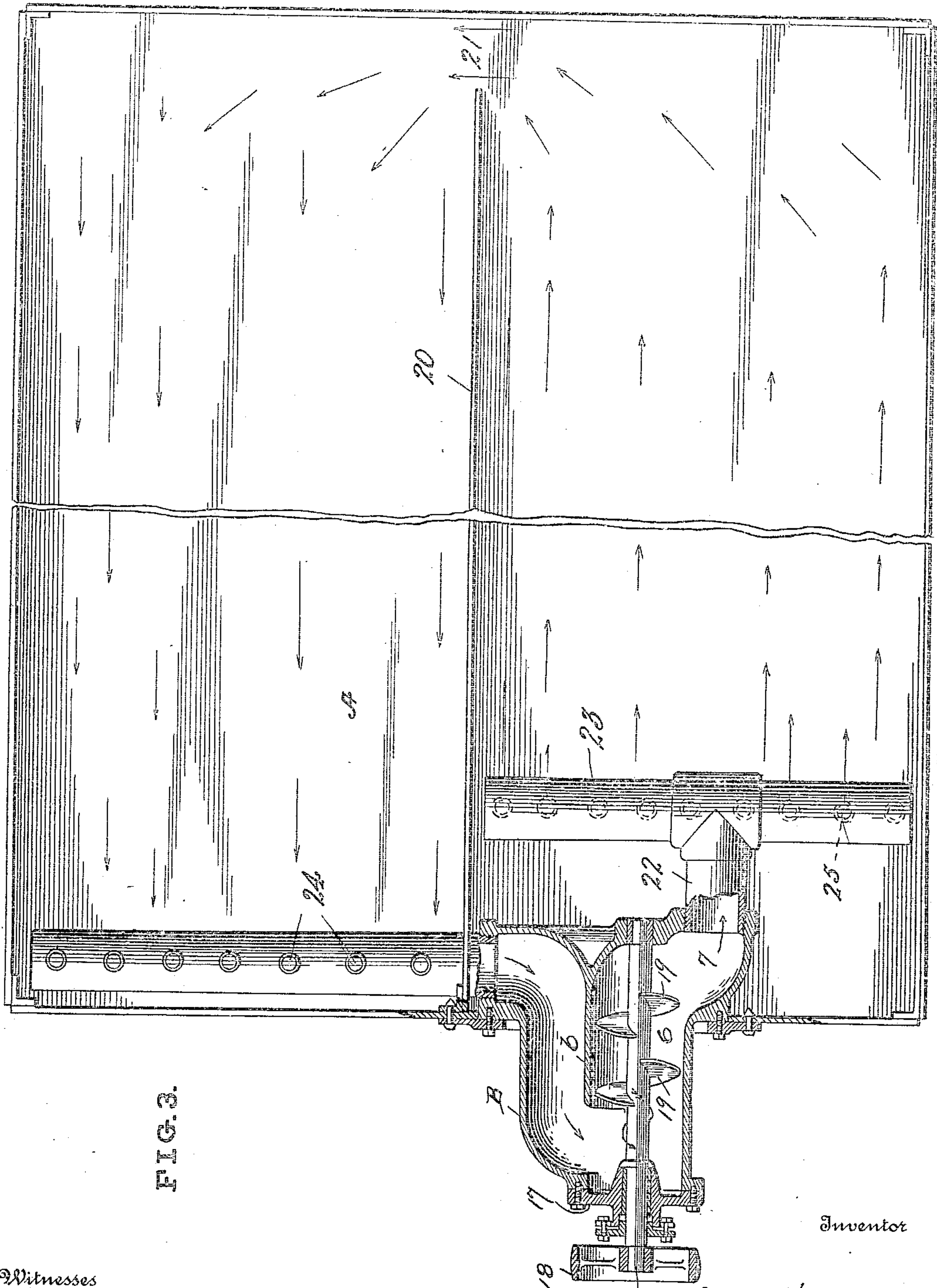


FIG. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

ALVIN H. BAER, OF WAYNESBORO, PENNSYLVANIA, ASSIGNOR TO FRICK COMPANY,
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AGITATOR FOR REFRIGERATING LIQUIDS.

953,576.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed January 27, 1905. Serial No. 242,874.

To all whom it may concern:

Be it known that I, ALVIN H. BAER, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Agitators for Refrigerating Liquids, of which the following is a specification.

In the operation of ice making or refrigerating plants, the efficiency of the apparatus is materially increased by the thorough, uniform and continuous agitation of the refrigerating liquids, which result in maintaining a substantially uniform temperature of said liquid in all parts of the tank containing the same, whereas, without such agitation, the variation in the temperature between the top of the tank, where it is the highest and the bottom of the tank where it is the lowest, is considerable.

The object of my said invention is therefore, to provide an improved construction of agitator for tanks containing such liquids, whereby the desired result may be secured and without undue increase in the cost of the apparatus, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a longitudinal vertical section through the freezing tank, or the tank containing the refrigerating liquid of the ice making or refrigerating plant, as seen when looking in the direction indicated by the arrows from the dotted line 1—1 in Fig. 2, the agitator being shown in elevation, and the central portion of the tank being broken out in order that it may be shown on a larger scale. Fig. 2 a horizontal section as seen when looking in the direction indicated by the arrows from the dotted line 2—2 in Fig. 1, the tank being broken away on one side as well as in the center, to enable the apparatus to be shown on a larger scale, and the agitator pipes being also shown in elevation for the greater portion of their length within the tank. Fig. 3 a view in general similar to Fig. 2, but showing the entire width of the tank, which is of a modified construction, and also show-

ing a modified arrangement of the agitator, and Fig. 4 a detail cross section looking in the direction indicated by the arrow from the dotted line 4—4 in Fig. 2.

In said drawings the portions marked A represent the tank proper, and B the shell or casing of the agitator. The tank A is, as shown, built of metal plates and angle bars riveted together, which is a suitable construction, but it may be any suitable tank for the purpose. The agitator casing B is a casting of the form shown, adapted to be secured by a water tight joint within an aperture in one end of the tank, suitable flanges being provided for riveting and securing the parts together, as shown. It is oblong in cross-section, as shown in Fig. 4, and has a central partition *b* semi-circular in cross-section as indicated in Fig. 4, on one side of which is an inlet passage 5 and on the other side of which is the cylindrical agitating chamber 6, terminating in a discharge outlet 7. Said partition *b* extends from the inner end of casing B toward its outer end leaving an opening from inlet passage 5 to chamber 6 beyond its outer end, as shown, it being of sufficient length to form the short cylinder 6, within which the agitator blades may operate. Connected with the outer end of the inlet 5, which is horizontal and turned to extend parallel with the end of the tank, is an inlet main 8 having a number of vertical inlet pipes 9 connected therewith at intervals across its top. Said inlet pipes 9 are open and the outer end of the main 8 is closed. The discharge outlet 7 extends in a direction parallel with the side of the tank and a discharge main 10 is connected thereto and extends lengthwise of the tank to its opposite end where it is connected by a right-angle elbow 11 with another pipe 12, which extends at right angles with pipe 10 across the end of the tank opposite to the end containing the inlet main 8. A series of small outlet pipes 13 extend downwardly from the under side of said pipe 12 to near the bottom of the tank, their inner ends being opened and the outer end of pipe 12 being closed.

The agitator proper consists of a shaft 15

journaled at its inner end in a bearing 16 in the inner end of the casing B centrally of the cylinder 6 and at its outer end in a bearing formed in the head 17 of said casing.

5 A pulley 18 is mounted on the extreme outer end of said shaft by which it may be driven from any source of power (not shown). Helical shaped propeller blades 19 are mounted on said shaft within the cylinder 10 6, being arranged at a suitable distance from each other.

In operation, the apparatus being constructed as shown in Figs. 1 and 2, and the tank filled with the refrigerating liquid, said liquid flows through the pipes 9 into main 15 8 and fills the agitator casing and pipes. Shaft 15 being started in motion, as indicated by the arrow, the liquid within the cylinder 6 is driven through the outlet 7 20 and main 10 into the main 12 where it is discharged through the pipes 13 toward and near the bottom of the tank. The liquid contained in the cylinder being thus forced out, the liquid from the upper portion of the 25 tank is drawn in through pipes 9 and main 8, thus creating a circulation from the top to the bottom of the tank and from one end of the tank to the other. The liquid discharged through the pipes 13 commingles with the 30 coldest liquid in the tank, which is always at the bottom, and the warmer liquid is drawn in continuously from the top, thus creating a constant circulation and maintaining a substantially even temperature in all parts 35 of the tank with the consequent material advantages.

In the construction shown in Fig. 3 the operation is substantially the same in effect but the form of the tank is somewhat modified. It has a central longitudinal partition 40 20 extending nearly to the end of the tank opposite that to which the agitator is attached but leaving a passage way 21 between the end of said partition and the end of said 45 tank. The inlet pipe extends through said partition 20, an opening being provided therefor, which may be packed to form a close joint. Said inlet pipe, the agitator casing and the agitator are of the same construction and arrangement as described for 50 the principal views. The outlet however is connected by a short pipe 22 with an outlet main 23 extending across the compartment of the tank within which the liquid is discharged at the same end of the tank which 55 contains the inlet pipe. The vertical inlet pipes 24 and outlet pipes 25 of the respective mains are arranged as described for the principal views. In operation the liquid is 60 forced downwardly into the bottom of the tank on one side of the partition and drawn in from the top of the tank on the opposite side of the partition at the same end of the tank, the result being that the liquid flows

around the end of partition 20 through the 65 passage 21 making a similar circulation of the fluid from one end of the tank to the other and from its top to its bottom, and resulting in the same character of agitation as when the principal construction is used. 70

It is obvious that other modifications in form and arrangement may be devised without departing from my invention.

Having thus fully described my said invention, what I claim as new and desire to 75 secure by Letters Patent, is:—

1. The combination, with a refrigerating tank, of an agitator connected therewith, having an inlet comprising a pipe extending into the tank and having inlet openings near 80 the top of said tank and an outlet comprising a pipe leading to within said tank and having discharge openings near the bottom of said tank, said inlet being thus arranged to take the liquid from near the top of the 85 tank and said outlet to discharge the liquid toward and near the bottom of the tank, and a propeller within the agitator casing adapted to keep said liquid in circulation, substantially as set forth. 90

2. The combination, with a refrigerating tank, of an agitator comprising a casing attached to said tank and having an inlet pipe extending to within said tank and arranged to take the liquid from the upper portion of 95 said tank at one end and an outlet pipe extending to the opposite end of said tank and having downwardly extending branches arranged to discharge said liquid into the lower portion of said tank, and a propeller 100 within said casing adapted to keep said liquid in circulation, substantially as set forth.

3. The combination, with a refrigerating tank, of an agitator therefor comprising a 105 casing attached to one end of said tank, and formed with an inlet communicating with a main extending across a portion of one end of said tank having a series of upwardly projecting inlet pipes and an outlet extending to the opposite end of said tank and communicating with a transverse main having a series of downwardly projecting outlet pipes, said casing containing a cylindrical 110 portion, a screw propeller mounted within said portion, means for driving said propeller, and said means, substantially as set forth. 115

4. In a refrigerating tank, the combination of the agitator comprising a casing attached to said tank and having an inlet and an outlet communicating therewith, the inlet consisting of a main extending across one end of said tank with a series of pipes extending upwardly from its top and the outlet consisting of a main extending to the opposite end of said tank and connected with a transverse pipe extending across said op- 120 125

posite end, said transverse pipe being provided with a series of downwardly projecting pipes, a propeller mounted within said casing, and means for driving said propeller,
5 substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Waynesboro, Pennsyl-

vania, this 21st day of January, A. D. nineteen hundred and five.

ALVIN H. BAER. [L. s.]

Witnesses:

W. H. MANNS,
H. D. FRICK.