(No Model.)

H. KROPFF.

COOLING APPARATUS.

No. 268,106. Patented Nov. 28, 1882.

Fig. 1.

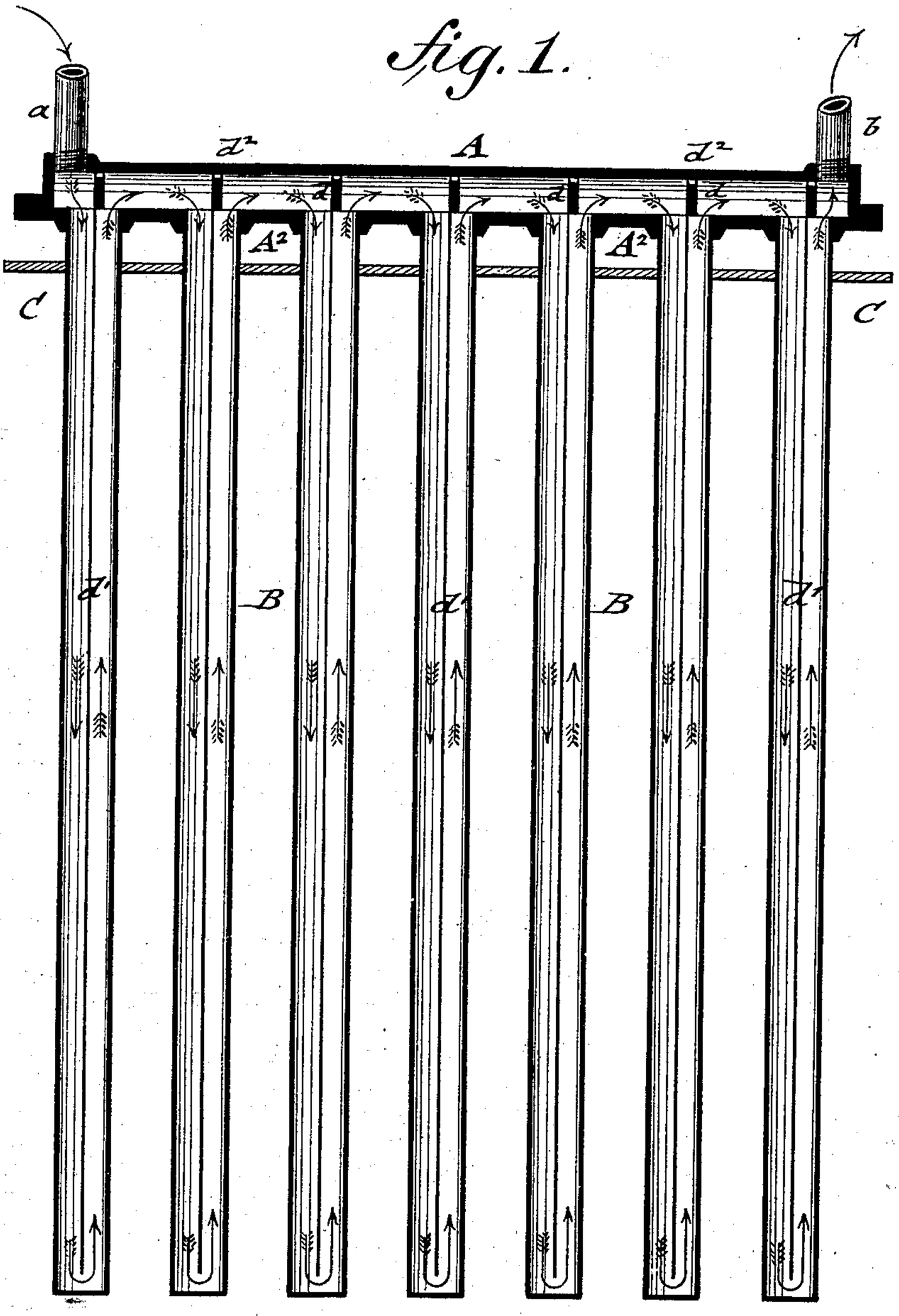
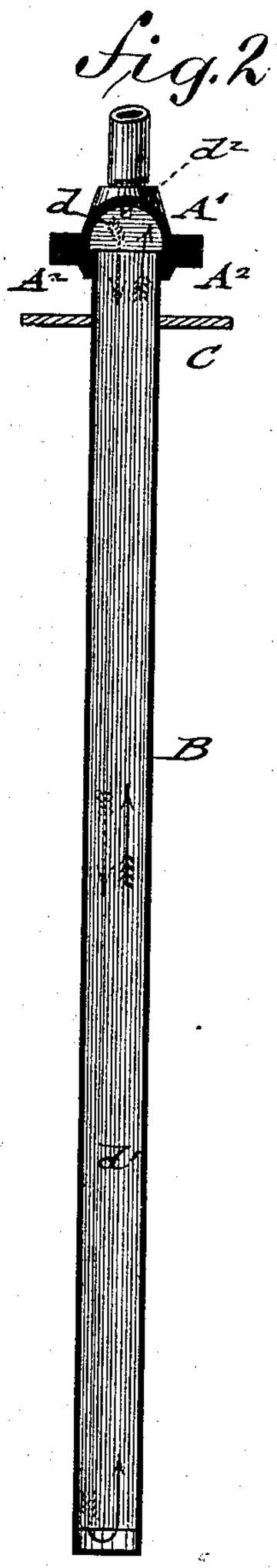


Fig. 2.



WITNESSES:

Fol. N. Rosenbaum.

Otto Risch.

INVENTOR.

Hermann Kropff

BY Paul Goepel.

ATTORNEY

UNITED STATES PATENT OFFICE.

HERMANN KROPFF, OF NEW YORK, N. Y.

COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 268,106, dated November 28, 1882.

Application filed August 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, HERMANN KROPFF, of New York, in the county and State of New York, have invented certain new and useful Improvements in Cooling Apparatus, of which the following is a specification.

This invention relates to an improved apparatus for cooling beer and other liquids, as well as for making large cakes of clear ice; and the invention consists of a supply-chamber with an induction and eduction pipe, and transverse partitions with downwardly-extending diaphragms, forming extensions of the transverse partitions. The bottom of the supply-chamber is provided with downwardly-extending pipes which inclose the diaphragms, and are of somewhat greater length than the same. The transverse partitions are provided with air-openings, so that the air can pass directly through the supply-chamber to the eduction-pipe. An exterior perforated plate moves along the pipes and serves for cleaning the exterior surface of the same.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved cooling apparatus, and Fig. 2 is a vertical transverse section of the same.

Similar letters of reference indicate corresponding parts.

The cooling apparatus consists of a supply-chamber, A, which is made of semicircular, oblong, or other cross-section, and which is composed of a top plate, A′, and a bottom plate, A^2, which are tightly connected together by rivets or otherwise. The supply-chamber A is provided with an induction-pipe, *a*, and with an eduction-pipe, *b*, arranged at opposite ends, for the ice-water or other refrigerating-liquid. The top plate, A′, of the supply-chamber is provided with transverse partitions *d*, and the bottom plate, A^2, with as many downwardly-extending cooling-pipes B as there are transverse partitions *d*, the latter being arranged so as to extend centrally across the upper ends of the pipes B. To the transverse partitions *d* are applied sheet-metal diaphragms *d′*, which extend centrally through the pipes B, to a point near the bottom thereof, as shown clearly in Fig. 1.

The refrigerating-liquid is supplied through the pipe *a*, and passes successively, by means of the partitions *d*, diaphragms *d′*, and the intermediate spaces in the supply-chamber A, through the cooling-pipes B until it passes off through the eduction-pipe *b*. If any air is carried with the refrigerating-liquid into the cooling apparatus, it passes through small holes d^2 in the transverse partitions *d* directly to the eduction-pipe *b*, without being compelled to pass with the liquid through the cooling-pipes of the apparatus and impede the motion of the same.

An exterior plate, C, with as many openings as there are cooling-pipes, is arranged around the same, and serves for cleaning the exterior surface of the pipes.

If the apparatus be used for cooling wort, it is suspended in the fermenting-tub. It may also be used for cooling paraffine, oils, and other substances. If it be used for the manufacture of clear ice, the refrigerating-liquid consists of a chilled solution of chloride of calcium. In this case the apparatus is hung into the water to be frozen, which latter is agitated during freezing. The lower ends of the pipes B are in this case closed by screw-plugs. A clear block of ice forms around the pipes, which block may be made of any size, if two or more cooling apparatus are used sidewise of each other. When the block is frozen the plugs at the lower ends of the cooling-pipes are screwed off, so that the brine can run out. Steam is then admitted into the apparatus, which heats the pipes, so that the block of ice can be removed therefrom. The cylindrical openings in the block are then filled with water, which freezes by the low temperature of the ice, forming thus a perfectly clear and solid block.

The apparatus can be readily cleaned at the inside by disconnecting the bottom plate, with the pipes, from the top plate and its diaphragms. As the pipes have a large cooling-surface which is distributed in the wort to be cooled, they are more efficient for cooling purposes than the floats now in use for cooling purposes.

The cooling apparatus is strong, durable, and compact, and conveniently handled in being placed in or removed from the fermenting-vats.

I am aware that a cooling apparatus has been patented consisting of pumps for compressing gas, and tubes for confining, regulating, and directing the degree of expansion in different parts of the containing vessels or tubes, so that

such a range of temperatures of external surfaces is secured as to avoid the formation of snow from the moisture condensed or precipitated from the atmosphere thereon.

I am also aware that an apparatus has been patented consisting of plates which form a set of zigzag passages, through which hot beer is made to course, and another set of plates which form channels contiguous to the hot-beer channels, through which a stream of cold water is made to pass, but both the apparatus and their operations differ essentially from the devices and operation of my invention, as herein described, and particularly pointed out in the claims.

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

1. The combination of a supply-chamber, A, having transverse partitions *d*, provided with air-openings d^2, diaphragms d', extending downwardly in line therewith, and cooling-pipes B, attached to the bottom of the supply-chamber and inclosing said diaphragms, substantially as specified.

2. The combination of a supply-chamber, A, having transverse diaphragm *d*, and centrally-partitioned cooling-pipes B, with an exterior perforated cleaning-plate C, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HERMANN KROPFF.

Witnesses:

PAUL GOEPEL,

CARL KARP.