No. 691,786. Patented Jan. 28, 1902.

J. LEVEY.

COOLING COIL AND TANK.

(Application filed Apr. 1, 1901.)

(No Model.)

Fig. 1.

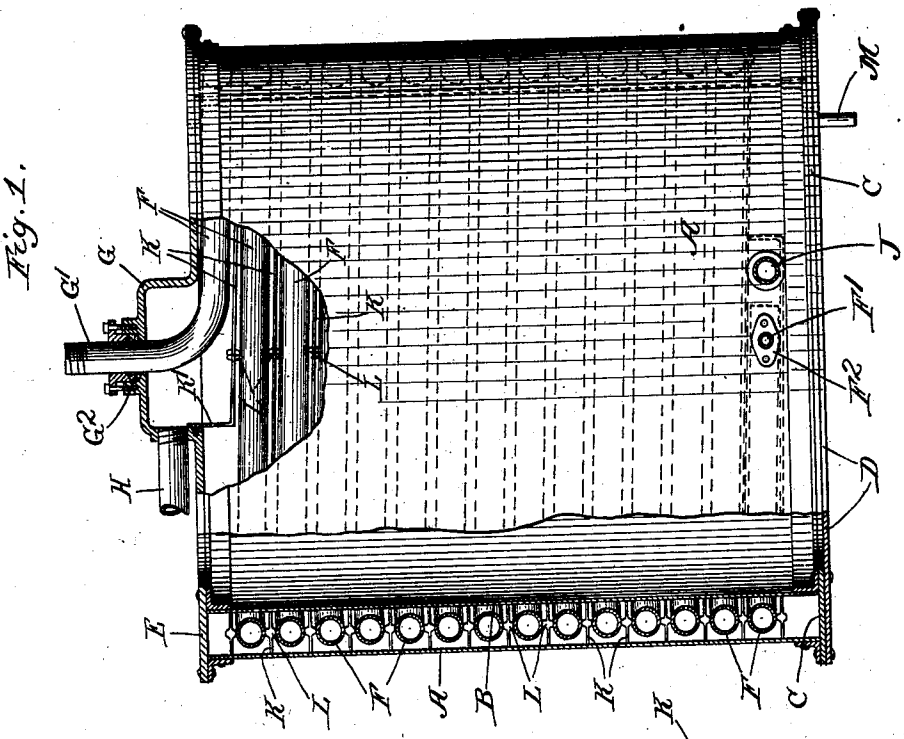


Fig. 2.

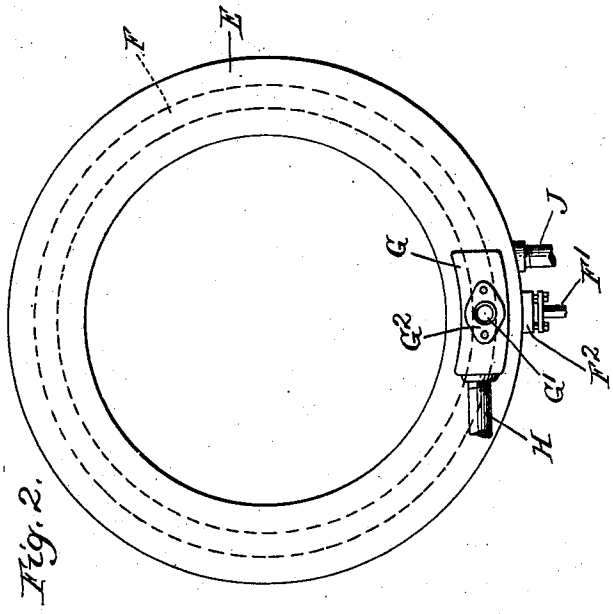
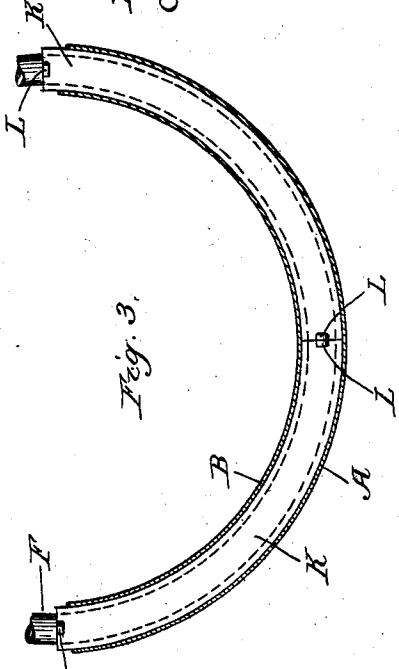


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN LEVEY, OF CHICAGO, ILLINOIS.

COOLING COIL AND TANK.

SPECIFICATION forming part of Letters Patent No. 691,786, dated January 28, 1902.

Application filed April 1, 1901. Serial No. 53,838. (No model.)

To all whom it may concern:

Be it known that I, JOHN LEVEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Cooling Coils and Tanks, of which the following is a specification.

My invention relates to cooling-coils with or without a tank, and an apparatus containing my invention is adapted for use either for the purpose of cooling compressed and therefore heated fluids, such as ammonia-gas, or for cooling and refrigerating fluids, such as brine or the like.

I do not wish to be limited to any particular use or, indeed, to the precise construction shown, and my illustrations are to be taken as diagrammatic to an extent and intended simply to show a form of my invention which is particularly applicable in connection with ammonia refrigerating-machines. It is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation, with parts broken away, of a cooling coil and tank. Fig. 2 is a plan, and Fig. 3 is a detail.

Like parts are indicated by the same letters in all the figures.

A is a cylinder, preferably of sheet metal; B, a similar cylinder somewhat smaller. The two are connected at the bottom to the annular base-piece C. This annular base-piece may be formed with or without the bottom D. E is a somewhat similar annular part to receive the upper ends of such cylinders. It may or may not be open at the top; but the two parts of such annulus should be connected.

F F are the successive portions of a spiral coil, and this coil terminates at one end at F′, where it emerges through the terminal piece F^2. Thus the coil issues from the outer cylinder A.

G is the wall of a chamber formed on the annulus E, and through it emerges the end G′ of the pipe F. A tight connection can be made by means of the stuffing-boxes G^2.

H is a fluid-discharge pipe which enters at one side of the chamber G, and J is a fluid-supply pipe which passes through the side of the outer cylinder A and opens in close proximity to the pipe F therein.

The successive coils of the pipe are separated from each other by means of the segmental diaphragm-pieces K K. These pieces are preferably in the form each of a quarter-circle of a width equal to the distance between the inner and the outer cylinders and provided each at each end with a projection L. They are put in position as the coil is lowered into the annular space between the two cylinders, and when the whole has been put in position these segmental strips form a spiral passage-way in which lie the successive lengths of the spiral coil. The last segment K is turned up at K′, so as to form one wall of the chamber G. The fluid-inlet pipe J opens into the lowest section or portion of this spiral passage-way. This construction presents two spiral passage-ways—one, that formed by the coil of pipe, being unbroken throughout its length and the other, being formed by the segmental pieces interposed between the pipe portions, is comparatively loose-jointed. To state it in another way, there are two spiral passage-ways, one within the other, so constructed that they can be taken apart and separated for cleaning without injury to either part.

The use and operation of my invention or a device containing it are evident. If it is to be used to cool compressed gas, the latter is introduced through the terminal G′, whence it circulates downwardly and emerges through the terminal F′. At the same time the cooling fluid is introduced through the pipe J and circulates upwardly around the pipe F and passes out through the pipe H. On account of the loose construction of the spiral passage through which this fluid passes it is possible that there may be an escape from one section to another of such spiral passage; but this is a matter of no consequence, so long as there is a substantially continuous current through such outer passage-way. Again, if the device is to be used for cooling fluids, such as brine, the gas can be expanded into the pipe G′ and pipe F, while the brine is made to circulate through the outer passage in the opposite direction. Having these two currents of fluids circulating in opposite directions is for obvious reasons, in most instances, the best method of operation; but if for any reason it seems desirable to have the

currents circulate in the same direction there is nothing to prevent this being done, and, moreover, what I have called the "inlet" and the "outlet" passages may be made to serve, respectively, as the outlet and inlet passages.

The space within the inner cylinder may be used as a storage-tank in some cases, and hence in such cases I provide the bottom D, whereupon the entire device becomes a storage-tank with an outer sheath containing two spiral passages. In the event of the bottom D being provided there should be a draw-off pipe M.

I have not shown valves in any of the pipes or connections; but it will of course be understood that suitable controlling devices must be employed.

I claim—

1. In a cooling device the combination of an annular chamber with a continuous spiral passage therein, and a second spiral passage inclosing the first passage in the annulus, and suitable terminals for both passages, said second spiral passage composed in part of the walls of the annulus and in part of pieces interposed between and supported on the coils of the first spiral passage.

2. In a cooling device the combination of an annular chamber with a continuous spiral passage therein, and a second spiral passage inclosing the first passage in the annulus, and suitable terminals for both passages, said second spiral passage composed in part of the walls of the annulus and in part of segmental pieces interposed between the coils of the first spiral passage.

3. In a cooling device the combination of an annular chamber with a continuous spiral passage therein, and a second spiral passage inclosing the first passage in the annulus, and suitable terminals for both passages, said second spiral passage composed in part of the walls of the annulus and in part of pieces interposed between the coils of the first spiral passage, and projections interposed between such pieces and coils to keep them slightly separated.

4. In a cooling device the combination of a tank with an outer annular sheath, and two spiral passage-ways, one continuous throughout its length, the other containing the first-mentioned spiral passage-ways, and formed of separable pieces, combined with the walls of the sheath.

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Witnesses:
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