

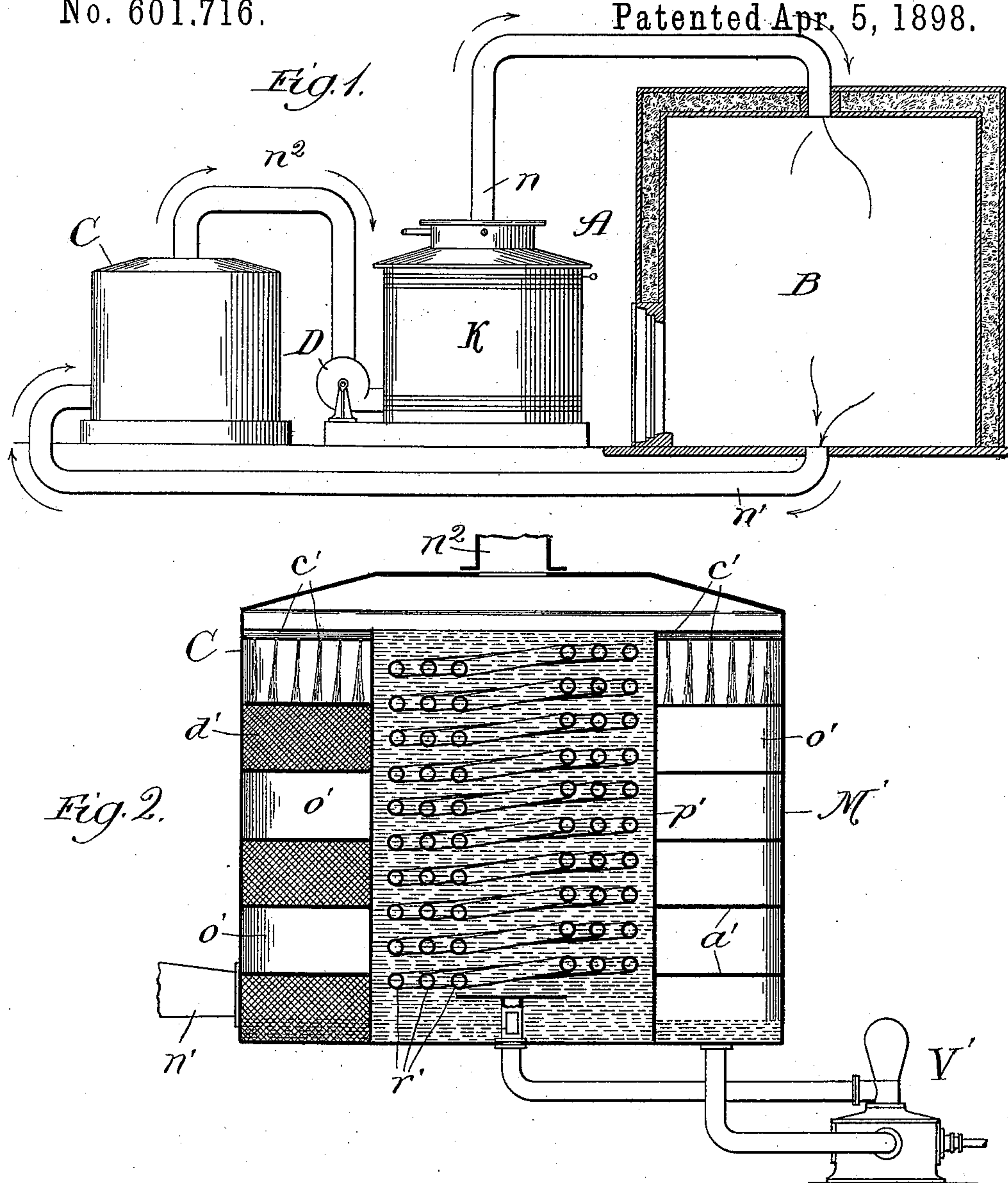
(No Model.)

2 Sheets—Sheet 1.

J. SEDLACEK.
CONDENSING WATER AND AIR COOLING APPARATUS FOR REFRIGERATING
MACHINES.

No. 601,716.

Patented Apr. 5, 1898.



Witnesses:
E. C. Gaylord,
Lute J. Allen

Inventor:
Julius Sedlacek,
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Attorneys

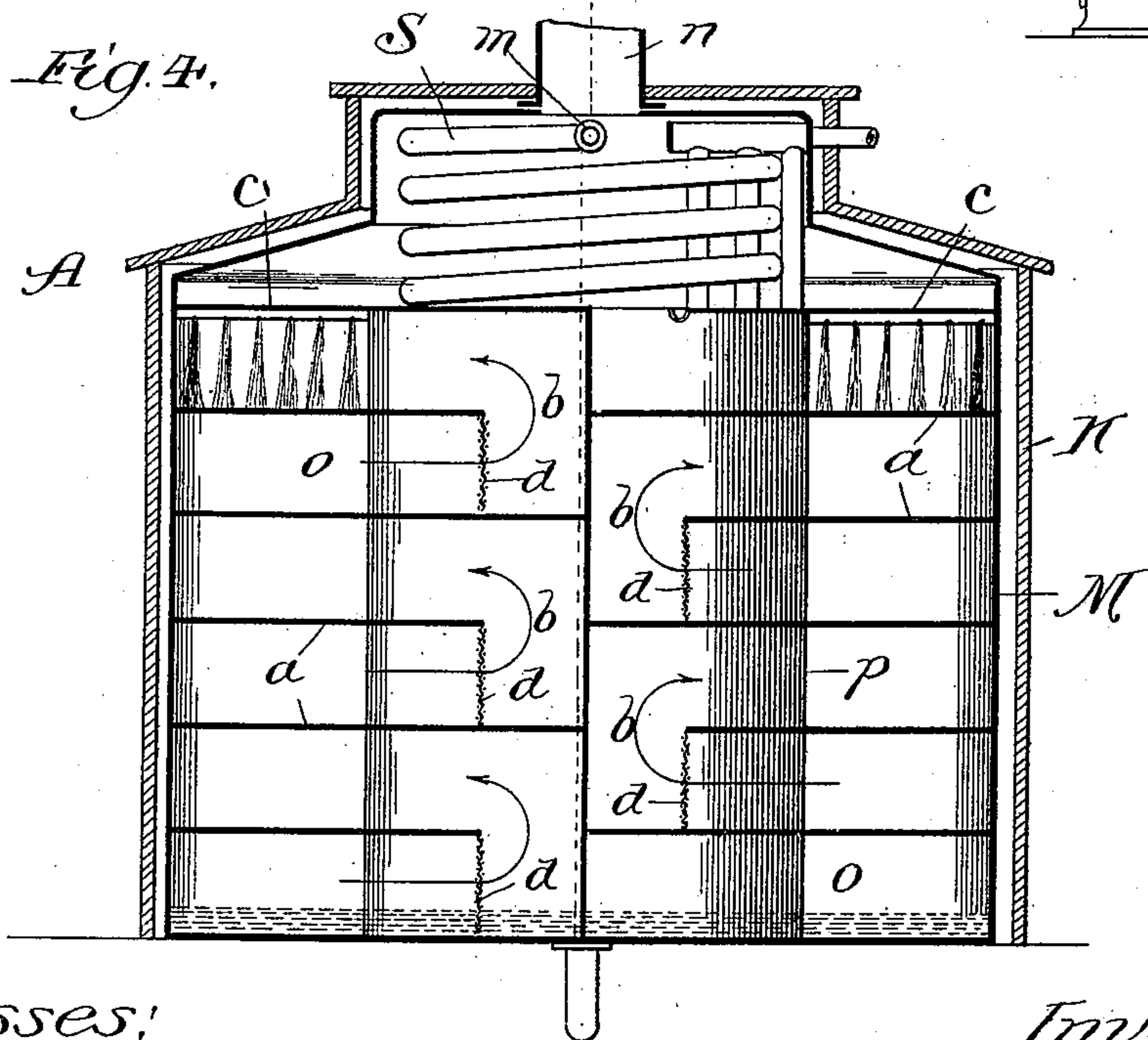
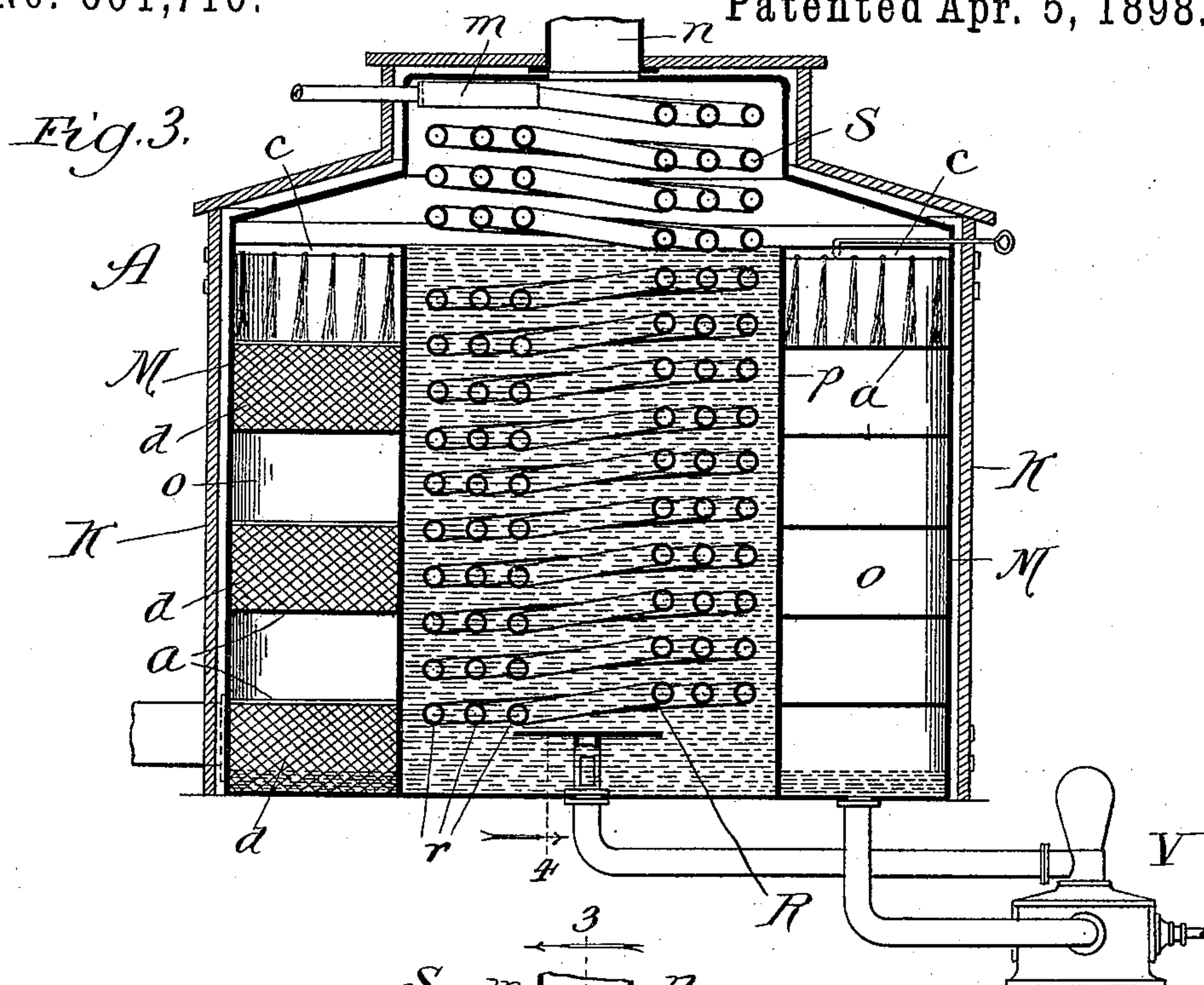
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MACHINES.

No. 601,716.

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Witnesses:
E. C. Chayford,
L. J. Miller.

Inventor:
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UNITED STATES PATENT OFFICE.

JULIUS SEDLACEK, OF NUREMBERG, GERMANY.

CONDENSING-WATER AND AIR COOLING APPARATUS FOR REFRIGERATING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 601,716, dated April 5, 1898.

Application filed February 26, 1897. Serial No. 625,129. (No model.) Patented in France December 21, 1892, No. 226,556; in Germany January 13, 1893, No. 72,657; in Italy March 28, 1893, No. 1,194; in Austria-Hungary May 6, 1893, No. 1,089 and No. 5,637, and August 30, 1893, No. 10,239 and No. 19,809; in Switzerland July 22, 1893, No. 7,363, and June 25, 1894, No. 8,798; in Belgium August 25, 1894, No. 85,843, and in England May 14, 1895, No. 9,530.

To all whom it may concern:

Be it known that I, JULIUS SEDLACEK, a subject of the Emperor of Austria-Hungary, residing at Nuremberg, in the Kingdom of Bavaria, Empire of Germany, have invented a new and useful Improvement in Condensing-Water and Air Cooling Apparatus for Refrigerating-Machines, (for which I have obtained Letters Patent as follows: in Germany, No. 72,657, of January 13, 1893; in England, No. 9,530, of May 14, 1895; in France, No. 226,556, of December 21, 1892; in Switzerland, No. 7,363, of July 22, 1893, and No. 8,798, of June 25, 1894; in Italy, No. 1,194, of March 28, 1893; in Belgium, No. 85,843, of August 25, 1894; in Austria-Hungary, No. 1,089/5,637, of May 6, 1893, and No. 10,239/19,809, of August 30, 1893,) of which the following is a specification.

The object of my invention is to provide an improved construction of apparatus for cooling (and incidentally purifying) air, and to that end utilizing otherwise waste cold radiating from the refrigerator, and for cooling the condenser-water.

Referring to the accompanying drawings, Figure 1 shows my improved apparatus, by a view in elevation, as connected with a room to be cooled, shown in sectional elevation. Fig. 2 is a view in sectional elevation of the condenser-water cooler; Fig. 3, a similar view of the air cooler and purifier, the section being taken at the line 3 on Fig. 4 and viewed in the direction indicated by an arrow; and Fig. 4, a section taken at the line 4 on Fig. 3 and viewed in the direction indicated by an arrow.

A is the air-cooler, comprising a metallic shell M, which should be incased in a wooden shell K, with a dead-air space between the two, and centrally within the shell M is the refrigerator proper, formed with the coiled pipes *r*, incased in a metallic shell *p*, for containing the brine or other liquid medium to be rendered cold by the expansion into gas in the pipe-coils of the liquid carbonic acid or ammonia employed for refrigeration.

The space between the outer and inner shells M and *p* is divided into a vertical series of circumferential chambers *o*, formed with sheet-metal rings *a*, supported at suitable intervals

apart, said chambers intercommunicating from one to the other through openings *b*, affording a circuitous passage through them. The brine or other liquid is circulated continuously through the chambers *o* and inner shell *p* by the action of a suitable force-pump V, which forces it upward through the interior of the shell *p* to the upper end thereof, where it flows over suitably-supported perforated troughs *c*, whence it falls circuitously through the chambers *o*, accumulating in the lowermost chamber, from which it is withdrawn by the action of the pump to be again forced through the inner shell. In traversing its upward course from the pump the liquid is rendered cold by contact with the refrigerator R, and in falling through the chambers *o* it is subjected to the further influence of cold radiating from the shell *p*.

Screens *d* are shown to be interposed in chambers *o*, for a purpose hereinafter described.

Air is forced by means of a blower D into the lowermost chamber *o* to rise against the downflow through the chambers of the cooling liquid, which renders the air cold, being supplemented by the cold radiating from the outer surface of the shell *p*. The screens *d* in the chambers *o* tend to divide the air and liquid, with the result of affording greater surface contact between the two to enhance the cooling effect upon the air. The moisture-laden cold air in leaving the cooler A through a pipe *n*, leading from its upper end, passes over pipe-coils S, forming a section of the coils of the refrigerator R and to which the supply of the refrigerating medium (carbonic acid or ammonia) is supplied through a manifold *m*. The air is thereby dried and further purified, the moisture depositing upon the coils S and being congealed thereon in the form of frost. The pipe *n* leads to a storage-chamber B and introduces therein for its refrigerating effect the purified, cooled, and dried air.

For the purpose of cooling the water used for condensing the gas after the latter has been utilized by its expansion for its refrigerating effect and compressed and which is commonly allowed to run off a condenser

similar in construction to the cooler already described is employed. The condenser C, the details of which are illustrated in Fig. 2, comprises a set of coils r' , surrounded by a metallic shell p' , these being inclosed in an outer metallic shell M' , between which and the shell p' are provided chambers o' , formed, like the chambers o , of sheet-metal rings a' , the chambers intercommunicating through a circuitous passage afforded by suitably-placed openings (not shown, owing to the nature of the view selected for illustration in Fig. 2, but like those in the air-cooler) and having interposed in them the screens d' . A force-pump V' produces a continuous circulation of the liquid up through the shell p' , from the top of which it flows over suitably-supported perforated troughs c' and down through the chambers o' to the lowermost thereof, whence it is again forced upward by the action of the pump. For cooling the condenser liquid I utilize the surplus and otherwise waste cold of the air employed for its refrigerating effect in the chamber B, leading therefrom the air through a pipe n' into the condenser C near its base, and from the upper end of which there leads a pipe n^2 into the base portion of the cooler A, the last-named pipe containing the blower D for the entire system of pipes n , n' , and n^2 , which connect the cooler A, the condenser C, and the room B to direct the air from the latter into the condenser, from the condenser into the cooler A, and thence back into the room. The liquid in falling from the perforated troughs c' through the chamber o' is encountered by the uprising cold air from the pipe n' , which air imparts its cold to the liquid, thereby adapting the latter to cool and condense the refrigerant in the coils r' , which may communicate with the coils in the cooler A in an ordinary manner through the pumping apparatus commonly employed in ice and refrigerating machines.

The air employed for cooling the liquid in the condenser C might be taken from the surrounding atmosphere, though it is preferable to employ that used in the room B, whereby the desired continuous air circulation is attained through the apparatus.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a refrigerating apparatus, an air-cooler comprising, in combination, a refrigerator R having the surrounding shell p incased in a shell M, a vertical series of intercommunicating chambers o between said shells, means for forcing air upward through said chambers, a pump for forcing the liquid upward through said refrigerator to fall through said chambers, and thereby produce

a continuous circulation of the liquid, and an outlet for the air, substantially as described.

2. In a refrigerating apparatus, an air-cooler comprising, in combination, a refrigerator R having the surrounding shell p incased in a shell M, a vertical series of intercommunicating chambers o between said shells, coiled pipe S in the upper part of the cooler in the path to the air-outlet n therefrom and affording a drier, means for forcing air upward through said chambers to said outlet, and a pump for forcing the liquid upward through said refrigerator to fall through said chambers and thereby produce a continuous circulation of the liquid, substantially as described.

3. In a refrigerating apparatus, a condenser C comprising, in combination, the coiled pipe r' incased in a shell p' surrounded by a shell M' , a vertical series of intercommunicating chambers o' between said shells, means for forcing air upward through said chambers, and a pump for forcing the liquid upward through said shell p' to fall through said chambers and thereby produce a continuous circulation of the liquid, substantially as described.

4. In a refrigerating apparatus, the combination of an air-cooler A having an outlet n and containing the refrigerator R and the intercommunicating chambers o surrounding said refrigerator, means for forcing air upward through said chambers, a pump for forcing the liquid upward through said refrigerator to fall through said chambers and thereby produce a continuous circulation of the liquid, and a condenser C having an outlet n^2 in its upper end communicating with said cooler near its base, said condenser containing the incased coiled pipe r' and the circumferential intercommunicating chambers o' and communicating from its base portion with the outlet n of said cooler, and a pump for forcing the liquid upward through the incasement of said coiled pipe to fall through said chambers and thereby produce a continuous circulation of the liquid, substantially as described.

5. In a refrigerating apparatus, the combination of an air-cooler A, a condenser C communicating from its upper end with the cooler at its base, a blower D in said communication, a chamber B communicating with said cooler at its upper end and with said condenser at its base, and pumping means for circulating the liquid of the air-cooler and condenser through each, substantially as described.

JULIUS SEDLACEK.

In presence of—

MAX ABEL,

DAVID MEINECKE.