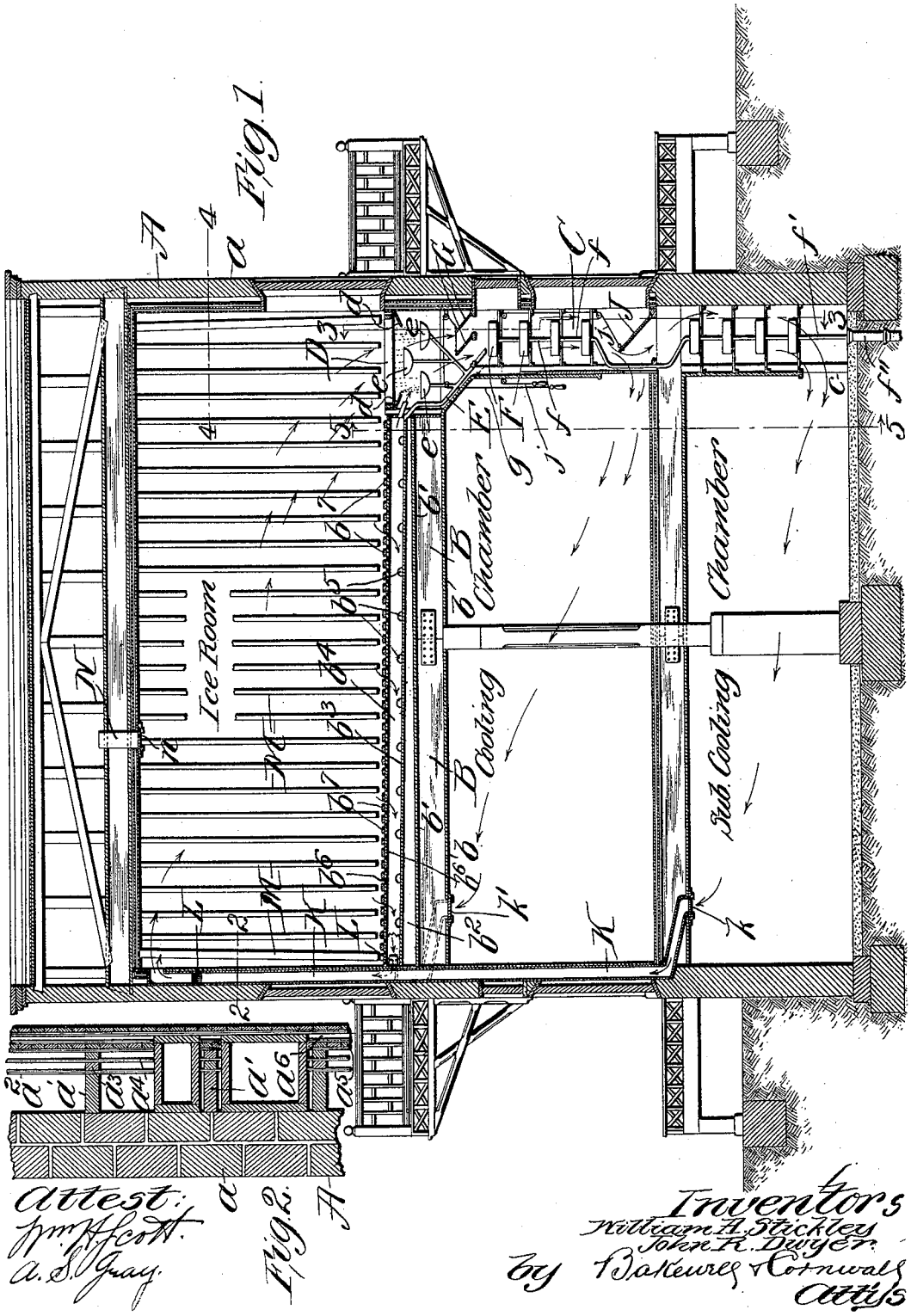
No. 642,730. Patented Feb. 6, 1900.

W. A. STICKLEY & J. R. DWYER.

COOLER.

(Application filed May 22, 1899.)

(No Model.) 2 Sheets—Sheet 1.



Attest:
Wm. H. Coutt.
A. D. Gray.

Inventors
William A. Stickley
John R. Dwyer
By Bakewell & Cornwall
Attys

No. 642,730. Patented Feb. 6, 1900.

W. A. STICKLEY & J. R. DWYER.

COOLER.

(Application filed May 22, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

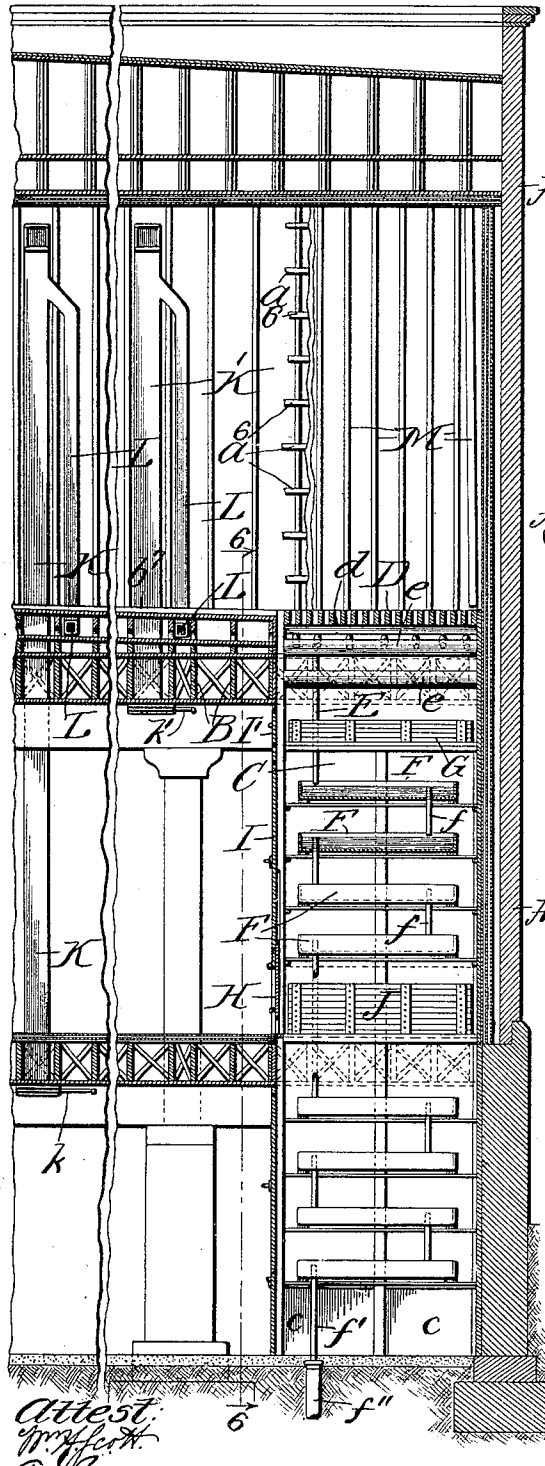


Fig. 4.

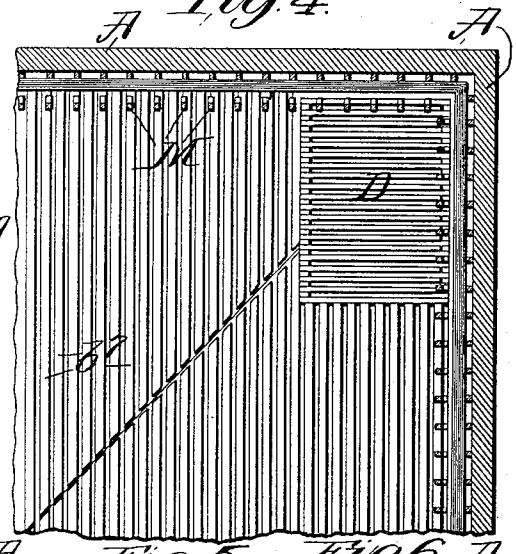


Fig. 5.

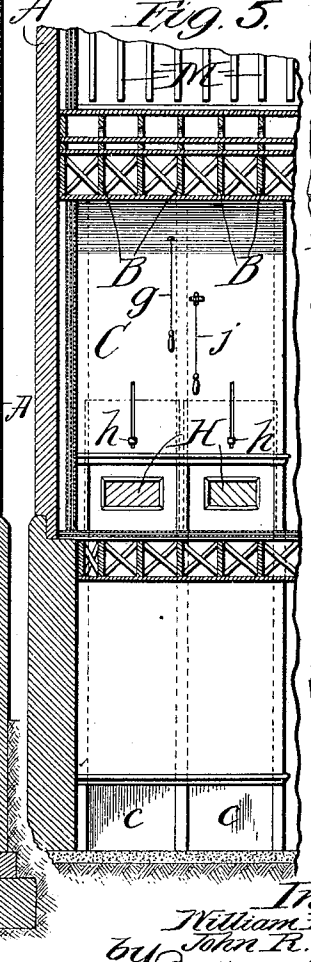
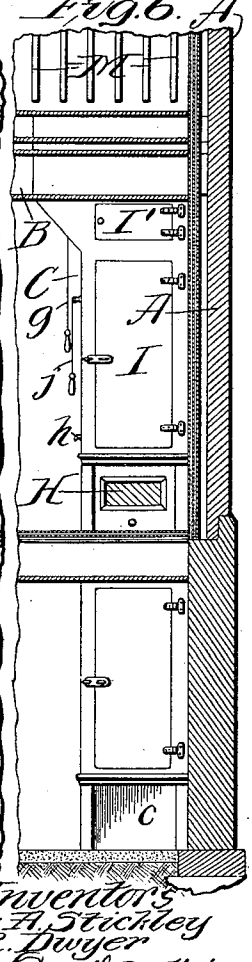


Fig. 6.



Attest.
W. F. Fox.
A. D. Gray.

Inventors
William A. Stickley
John R. Dwyer
by Bakewell & Cromwell Atty's.

UNITED STATES PATENT OFFICE.

WILLIAM A. STICKLEY AND JOHN R. DWYER, OF ST. LOUIS, MISSOURI.

COOLER.

SPECIFICATION forming part of Letters Patent No. 642,730, dated February 6, 1900.

Application filed May 22, 1899. Serial No. 717,762. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. STICKLEY and JOHN R. DWYER, citizens of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Coolers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of our improved cooler. Fig. 2 is an enlarged horizontal sectional view on line 2 2, Fig. 1. Fig. 3 is a sectional view on line 3 3, Fig. 1. Fig. 4 is a sectional view on line 4 4, Fig. 1. Fig. 5 is a sectional view on line 5 5, Fig. 1. Fig. 6 is a sectional view on line 6 6, Fig. 3.

This invention relates to a new and useful improvement in a "cooler," as it is termed, the object being to construct a device of the character described which will be simple and cheap in construction and consume a small quantity of fuel.

With this object in view the invention consists in the construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings the cooler is shown as being built as a separate building, which in operation is usually located close to a railroad and serves as a warehouse or cold storage for perishable articles.

A indicates the side walls, which, as shown in Fig. 2, consist of masonry-work a, preferably of brick. a' represents studding-joists arranged within the masonry-work, on which are suitably fastened non-heat-conducting strips, preferably in the form of paper or felt a^2. Cleats a^3 assist in holding these non-heat-conducting strips in position, and over these cleats is another lining a^4 of non-heat-conducting material. These cleats and linings may be built up to any required thickness, after which double sealing-strips a^5, faced with non-heat-conducting linings, are arranged in position. These sealing-strips are separated by horizontally-arranged cleats a^6. (Shown more clearly in Fig. 3.) A suitable roof is supported by the walls, a false roof or drop-ceiling being preferably constructed under the roof proper for well-known reasons. The spaces in the walls and between the ceiling and roof may be dead-air spaces or may be open at the top and bottom for the purpose of ventilation, as desired.

The cooler as an entirety is divided into several compartments, which we will term the "ice-room," arranged in the upper portion of the cooler, under which is a cooling-chamber, while the lowest compartments may be termed the "subcooling-chamber." The floor of the ice-room is supported by joists B, under which is arranged a suitable ceiling b for the cooling-chamber, while on the joists is arranged a floor b'. On the flooring b' are strips or cleats b^2, the upper faces of which are inclined, as shown in Fig. 1, in order to drain the water into one or more points of the building, as desired. On these strips b^2 is arranged a flooring b^3, above which are strips or cleats b^4, whose lower edges are perforated or notched, as at b^5, to permit the water and cold air on the floor b^3 to pass through said strips and into and from the spaces or chambers formed thereby. Strips b^4 support a perforated flooring b^6, on which are arranged slats b^7 for the ice to rest upon. The drippings from the ice on the slats pass through openings in floor b^6 onto the floor b^3, where said drippings may, according to the inclination of said floor, either run directly to the well or cold-air shaft, in which the drip-pans are located, or may pass through the openings b^5 from one chamber to another under the slatted flooring.

C indicates what we have termed a "shaft" or "well," which is covered at its upper end by a slatted hatch-door D. Around door D are water-sheds d for directing the water into the drip-pans, while pipes or suitable conduits E lead from the floor b^3 to spout the water from the drip-pans e into the spouts F, which are so arranged relative to the shaft that they collect all the water falling thereinto, but at the same time permit the cool air to pass downward through the shaft. All the water collected by the pans e for the spouts E is discharged into the upper of a series of pans F, suitably supported, preferably in the center of the shaft, so that the water falling thereinto will pass longitudinally the pan and

out through an overflow-pipe *f*. There are a number of pans F in the shaft, and the overflow-pipes *f* are staggered—that is, placed at opposite ends in alternating pans—so that the water is forced to circulate through the pans in its downward passage. The overflow-pipe *f'* from the lowest pan discharges into a sewer or other conduit-pipe *f''*. The object in having the water circulate in the pans F is to enable the absorption thereby of as many impurities in the descending cold air as possible. It will be noted that spaces are provided on all sides of the pans, which enables the cold water also to absorb the heat from the air and make the air colder in its descent.

In order to control the passage of cold air down the shaft, we arrange a plurality of connected doors G, which are raised or lowered by a cord or chain *g*, extending within the cooling-chamber. The walls of the shaft are provided with openings leading into the cooling-chamber, which openings are controlled by the doors H, of which there are preferably three, (see Figs. 5 and 6,) while the shaft is likewise provided with a door I in its side wall to give access to the pans F and a door I' to give access to the doors or valves G. Doors H are preferably mounted in guideways and are movable in a vertical direction by projections *h*, passing through slots in the walls of the slats. Counterweights for the doors H may be provided, if desired.

Shaft C extends down past the cooling-chamber into the subcooling-chamber, with which it communicates by an opening *c*, and in order to close the lower end of the shaft, so that cold air will be directed into the cooling-chamber, (and cut off air from the subcooling-chamber,) we arrange a valve or door J in said shaft, which is preferably operated by a cord *j*, extended within the cooling-chamber. When doors H are open and valve J closed, the cold air will pass directly into the cooling-chamber. Should door J be open, both the cooling and subcooling-chambers would receive cold air, and by closing the doors H all of the cold air would be forced to descend into the subcooling-chamber.

In order to induce a circulation of air throughout the entire apparatus, we arrange uptake-pipes K and K', leading from the upper portions of the subcooling-chamber and the cooling-chamber, respectively, and discharging into the upper portion of the ice-room. These uptake-pipes which, for the sake of convenience, we will term the "heated-air flues" are preferably provided with slides or doors *k* and *k'* at their lower ends for obvious reasons.

L indicates what we will term "cold-air pipes or flues," whose lower ends lead from the spaces between the strips b^4, under the slatted flooring of the ice-room, and alternately enter the heated-air flues K and K' near their upper ends and at an angle, as shown in Fig. 3. The object of the flues K and K' is to permit the heated air in the upper portions of the cooling-chambers to rise and be discharged into the upper portions of the ice-room while the cold-air flues L have induced in them a circulation due to the action of the heated air in the flues K and K', which results in the cold air from under the slatted floor of the ice-room being drawn up into the heated-air flues, thus reducing the temperature of the air in said flues, so that on entering the ice-room said air will not melt the ice or cause same to become spongy as quickly as if introduced thereon in its warmer state. We also prefer to arrange vertical strips M around the side walls of the ice-room, which are inclined inwardly at their upper ends, the object of said strips being to act as fenders to prevent the ice from breaking through the sealing linings. A vent-pipe N is also preferably introduced through the ceiling of the ice-room for well-known reasons, said vent-pipe being opened and closed by a sliding door *n*.

It will be observed from the above that when ice is introduced into the ice-room, which ice in devices of this character is known as the "fuel," the temperature of the air in said ice-room will be reduced, its only outlet being through the shaft C. Valve G being open, the air descends said shaft, its impurities being absorbed by the water in the drip-pans and its temperature being further reduced by coming in contact with the cold water contained in said pans. The cold air can be admitted or shut off into or from either or both cooling-chambers, and upon absorbing heat from the articles in said cooling-chambers will rise and pass upwardly through the flues, called herein the "heated-air" flues. These heated-air flues conduct the air upwardly into the upper portion of the ice-room, but before discharging the heated air into the ice-room mingle cold air from under the slatted floor of the ice-room with said heated air, resulting in reducing the temperature of the heated air before the same comes in contact with the ice.

We are aware that minor changes in the arrangement, construction, and combination of our device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of our invention.

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

1. In an apparatus of the character described, the combination with the walls of an ice-room, of a floor for said ice-room comprising joists B, flooring b', inclined strips b^2, flooring b^3, supporting-strips b^4, provided with notches b^5 in their lower edges, a perforated flooring b^6, and slats b^7 arranged on said perforated flooring, substantially as described.

2. In an apparatus of the character described, the combination with an ice-room, of a shaft leading from said room at one side thereof and terminating at its upper end on the plane of the floor of the room, a grated

hatch-door covering said shaft, an inclined floor leading to said shaft, and drip-pans arranged in said shaft one above the other, and overflows at the alternate ends of said pans, substantially as described.

3. In an apparatus of the character described, the combination with an ice-room, of inclined slats or fenders arranged around the side walls thereof, substantially as described.

4. In an apparatus of the character described, the combination with an ice-room, of slats or fenders arranged around the side walls thereof away from engagement with said walls and at an inclination thereto, substantially as described.

5. In an apparatus of the character described, the combination with an ice-room, of a cooling-chamber separated therefrom, a cold-air flue leading from the ice-room into the cooling-chamber, a second flue leading from the upper portion of the cooling-chamber at a point distant from the cold-air flue into the upper portion of the ice-room, and an auxiliary or supplemental flue leading from the lower portion of the ice-room into the said second-mentioned flue at a point below the entrance of the same into the ice-room, substantially as described.

6. In an apparatus of the character described, the combination with an ice-room, of a cooling-chamber, a flue extending from the ice-room into the cooling-chamber at one end thereof, a flue leading from the upper portion of the cooling-chamber at the opposite end thereof into the upper portion of the ice-room, and an auxiliary or supplemental flue leading from the lower portion of the ice-room into the second-mentioned flue, at a point intermediate the ends of the same, substantially as described.

7. In an apparatus of the character described, the combination with an ice-room and a cooling-chamber and a cold-air flue connecting the same at one end thereof, of a flue K′ leading from the upper portion of the cooling-chamber at a point opposite the cold-air flue into the upper portion of the ice-room, and a flue L leading from the lower portion of the ice-room and entering the flue K′ at a point slightly short of its extreme upper end at an angle thereto so as to cause a circulation through the flue L to enter the flue K′ by reason of the suction created by the circulation primarily in said flue K, substantially as described.

8. In an apparatus of the character described, the combination with an ice-room and a number of cooling-chambers, a shaft leading from said ice-room, doors in said shaft for directing cold air into one or all of said cooling-chambers, flues leading from the upper portions of all of said cooling-chambers into the upper portion of the ice-room, said flues conducting heated air from the cooling-chambers into the ice-room and flues leading from the lower portion of the ice-room into the heated-air flues at points below the entrance of said heated-air flues into the ice-room, substantially as described.

9. In an apparatus of the character described, the combination with an ice-room and a plurality of cooling-chambers, a shaft leading from said ice-room, doors in said shaft for directing cold air into one or all of said cooling-chambers, flues leading from the upper portions of all of said cooling-chambers into the upper portion of the ice-room conducting heated air into the ice-room, flues leading from the lower portion of the ice-room and connected with the heated-air flues from the cooling-chambers at points intermediate the ends of the same, and means for controlling the admission of heated air into said flues, substantially as described.

In testimony whereof we hereunto affix our signatures, in the presence of two witnesses, this 16th day of May, 1899.

WILLIAM A. STICKLEY.
JOHN R. DWYER.

Witnesses:
F. R. CORNWALL,
A. S. GRAY.