

(No Model.)

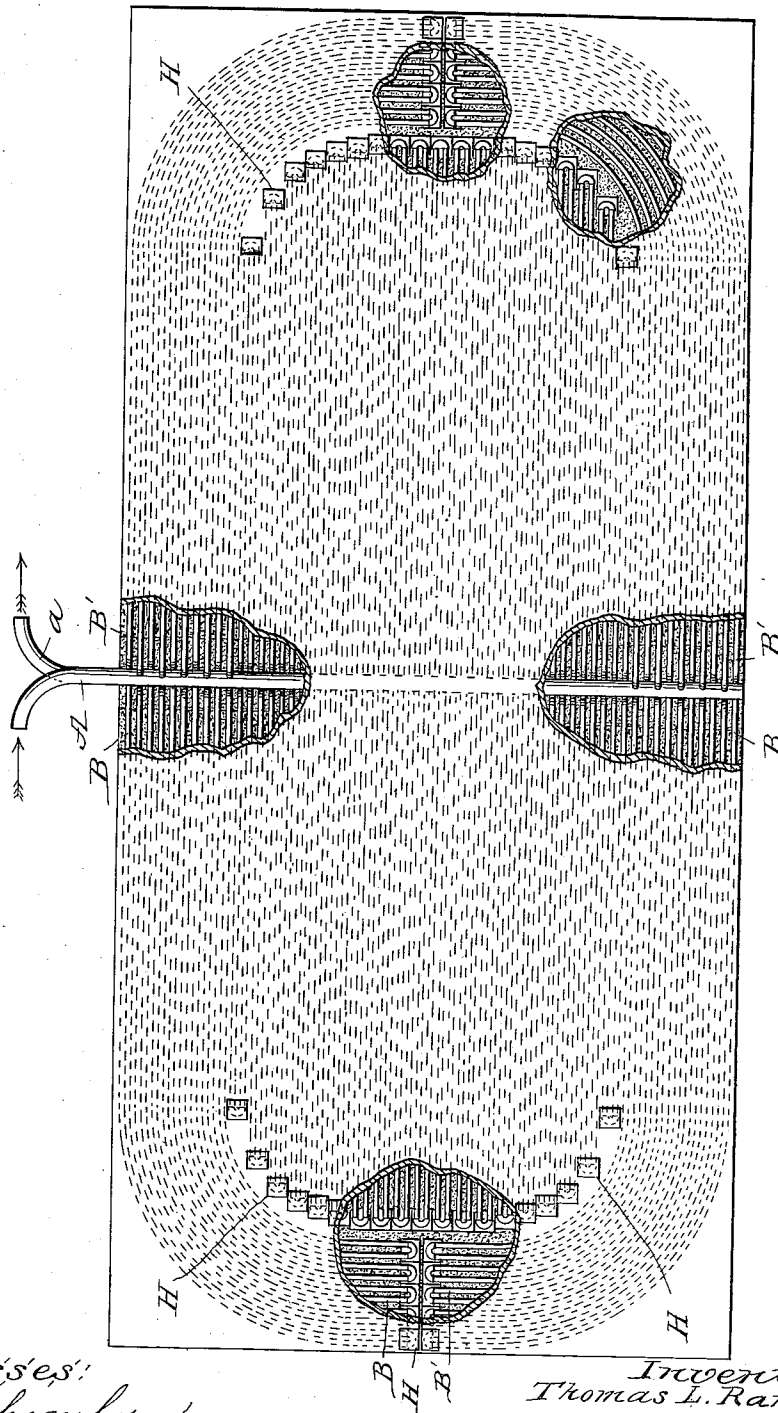
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T. L. RANKIN.
ARTIFICIAL ICE SKATING RINK.

No. 508,755.

Patented Nov. 14, 1893.

Fig. 1.



Witnesses:
Wm. A. Schoenborn.
James P. Mansfield.

Inventor:
Thomas L. Rankin.
by
Alexander S. Howell
his Attorneys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

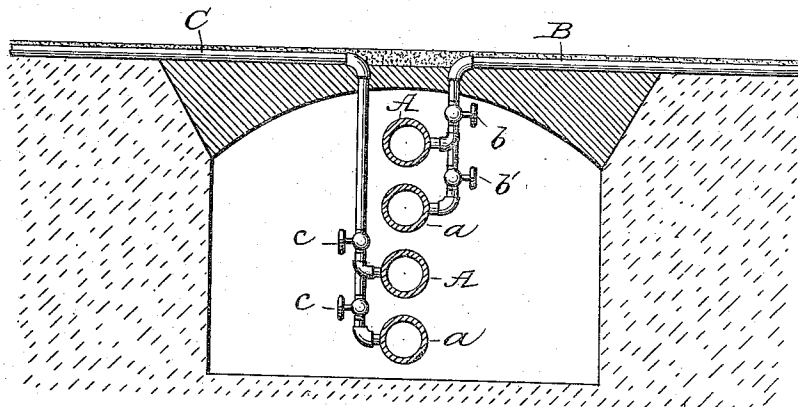


Fig. 3.

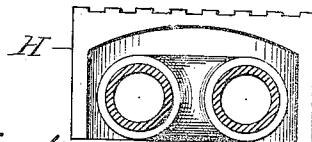
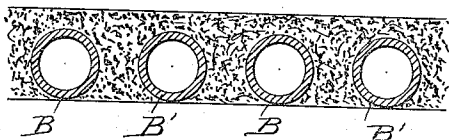


Fig. 4.

Fig. 5.

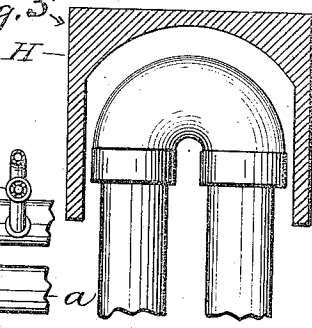
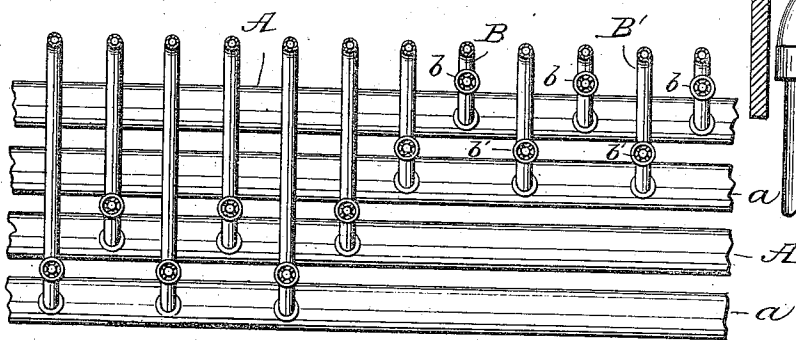


Fig. 6.



Witnesses:
Wm A. Schoenborn.
Jesse R. Mansfield.

Inventor:
Thomas L. Rankin.
by Alexander D. Donnell
his Attorneys.

UNITED STATES PATENT OFFICE.

THOMAS L. RANKIN, OF CHICAGO, ILLINOIS.

ARTIFICIAL-ICE SKATING-RINK.

SPECIFICATION forming part of Letters Patent No. 508,755, dated November 14, 1893.

Application filed February 25, 1893. Serial No. 463,710. (No model.)

To all whom it may concern:

Be it known that I, THOMAS L. RANKIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Artificial-Ice Skating-Rinks and Frosting Surfaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to artificially produced ice skating rinks, toboggan slides, &c., and its object is to provide a skating rink the piping in which will be so arranged that the frosting surface for making ice will appear only in a loop or track of comparatively narrow width extending around and near the outer edge of the main ice floor of the rink, or any desired part of the ice floor only may be utilized. The frosting surface or the entire ice floor may be frosted as may be desired. The subsidiary object is to lessen the expense of maintaining the rink in warm weather by producing only a smaller body of ice for skating, tobogganing, &c., while the other parts of the rink floor may be left without frosting or ice, making more room for spectators and garden purposes, the frosted part of the floor being sufficient to reduce the temperature in the rink to a comfortable degree in warm weather.

Another object is to provide an improved flooring for such rinks by incasing or embedding the pipes in a composition of asphalt or other suitable cement and metallic filings or borings, &c., sufficient to constitute the floor a good conductor and bring the cold to the surface to produce a coating of ice thereon when sprayed with water.

This invention therefore consists, first, in the novel arrangement and combination of the freezing pipe bends or sections; second, in the novel flooring of the rink which is such that it can be used for skating whenever desired, and at other times for any other business purposes, as a public hall, or warehouse, store, &c.; third, in novel means for allowing expansion and contraction of the freezing pipe bends, and in other novel details of con-

struction and combination of parts hereinafter described and claimed.

Referring to the drawings by numerals:— Figure 1 represents a plan view of the ice floor, showing the arrangement of freezing pipe bends or coils, the pipe covering or flooring proper being removed in parts. Fig. 2 is a detail transverse sectional view showing the "headers" and freezing pipe connections therewith. Fig. 3 is a detail enlarged sectional view of the flooring and pipe bends therein. Figs. 4 and 5 are detail views illustrating the metallic caps employed to protect the bends of the freezing pipes and permit expansion thereof. Fig. 6 is a detail view of the connections between the pipe bends and headers.

As shown in the drawings the floor of the rink is illustrated as being rectangular or oval, which is a good form thereof. Transversely under the floor extends two or more feed pipes or "headers" A, and return pipes or "headers" a, a.

B, B', represent return bends or coils of pipe the adjoining ends of which are respectively connected to headers A, a, so that there will be a circulation of freezing mixture through each pipe bend from a feed header A to a return header a. Suitable valves b, b', are put in the ends of each pipe bend adjoining headers A, a, respectively so that any pipe bend or number of pipe bends may be cut out of the circuit. The pipe bends B, B', are as shown bent into quarter-oval shape and are so laid that they together form a complete oval extending around and near the outer edge of the ice floor. In practice I would have these pipe bends underlie a track about twelve feet wide all around the floor. The central portion of the floor within pipes B is covered by a series of longitudinally arranged return bend pipes C, C, connected to headers A, a, substantially like pipes B, B', and having valves c in their extremities adjoining the headers whereby any of them can be "cut out" if desired. The pipe bends C gradually lengthen from side to center owing to the oval form of space occupied thereby as shown. The headers A, a, may occupy a chamber below the level of the ice floor so

that the attendants may readily get at valves *b, b', c*, or the said valves may be covered by metallic caps which will be covered by the ice formed on the surface of the floor, and by having the valves and headers in a chamber beneath the floor the valves can be manipulated at any time without injury to the ice on the floor, and the surface of the floor be unbroken at center. The bend of each pipe at the end opposite the valve is covered by a metallic hood *H* shown more clearly in Figs. 4 and 5 which permits the pipe coils to expand and contract without injury to them or to the flooring. The tops of these caps are flush with the surface of the ice floor, and as the cold brine or gas, or other freezing mixture is circulated through the pipes before any water is put on the floor, contraction of the pipes will occur before any freezing or surface ice making takes place.

The freezing pipes may be covered in any suitable manner as with iron plates or with other substances or material to make the freezing surface or ice floor, which will allow the building, when the freezing pipes are disused or ice is not made, to be employed as a commercial house, or public hall, &c., but I preferably employ a mixture of asphaltum or other suitable cement, and metallic filings, such as iron borings, chips or turnings, which is packed evenly around and over the freezing pipes and leveled off about even with the surface of the hoods *H, H'*. This makes a firm solid flooring unbroken and homogeneous except where the hoods *H* are used. The metallic filings, &c., should be used in such quantities as to make the floor a good conductor of cold and heat, so that the cold will be quickly brought to the surface and freeze water sprayed thereon when the freezing mixture is circulated through the pipes.

In operating the invention the ice flooring is inclosed in a suitable building, and if brine is used as the freezing mixture it will be pumped into the feed headers *A* from a brine tank, cooled by piping in which gas is evaporated as in any ordinary ice machine, and return to the tank for re-cooling from the return headers *a*. If direct expansion methods are used the liquid gas will be fed into the feed headers, and the expanded gas return to the machine through the return headers.

Of course if desired the headers *a* may be connected to the pump, and the headers *A* to the tank, thus reversing the currents through the pipes.

As large ice plants are now becoming common in all cities, this style of rink will be very practical to use in connection therewith, as in the winter time the entire ice floor may be used as a rink without lessening the desired output of the plant; and in the summer time we can make a combination of a garden and skating rink with ice surface only around the sides, which will not require enough refrigerating power to materially interfere with the ice making capacity of the plant, thus

utilizing refrigerating plants already established for skating in the winter on a large scale, and in the summer sufficient to get a cool room for a pleasure garden and rink.

The flooring is such that the building can be employed for business or other purposes, like ordinary buildings when it is not desired to use the place as an ice rink or refrigerator warehouse, and this peculiar feature of the ice flooring I consider a valuable feature of the invention.

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

1. The combination of a floor suitable for business or other purposes, with a series of freezing pipes under said floor or embedded therein and means for controlling the circulation of freezing liquid through various divisions of such pipes whereby independently of each other part of or the entire surface of such floor can be frosted and ice formed thereon when desired, substantially as and for the purpose described.

2. The combination in an artificial ice skating rink with an ice floor of a series of freezing pipes arranged to produce a continuous frosted surface track near the edge of the floor while the center of the floor is unfrosted, substantially as described.

3. The combination in an artificial ice skating rink of an ice floor having a series of freezing pipes arranged to produce a continuous frosted surface track near the edge of the floor, and other freezing pipes lying within the "track" and adapted to produce the complete frosting of the surface said series of pipes being independently controlled so as to freeze the center, the edge, or the entire surface of the rink substantially as specified.

4. The combination with a series of freezing pipe sections, capable of independent control so as to freeze the center, the edge, or the entire surface of the rink of a solid frosting surface or heat conducting floor in contact with said pipes and cooled thereby, substantially as described.

5. In an artificial ice skating rink, a floor formed of metallic particles and a binding substance and a series of freezing liquid circulating pipes in said floor, substantially as described.

6. The combination in an artificial ice skating rink of an ice floor consisting of a series of freezing pipes arranged to produce a continuous frosted surface track near the edge of the floor, and the "feed" and "return" headers, and the valved connection between them and each of said pipes, and the frosting surface overlying the freezing pipes, substantially as set forth.

7. The combination in an artificial ice skating rink of an ice floor having a series of freezing pipes arranged to produce a continuous frosted surface track near the edge of the floor, and other freezing pipes lying within the track and adapted to produce the com-

plete frosting of the surface of the floor in
conjunction with the first set of pipes, and
the feed and return headers underlying the
floor and respectively connected to the sev-
5 eral pipe bends or coils, and the frosting sur-
face overlying the freezing pipes, all con-
structed and arranged to operate substan-
tially as and for the purpose described.

In testimony that I claim the foregoing as
my own I affix my signature in presence of two 10
witnesses.

THOMAS L. RANKIN.

Witnesses:

C. L. CROUCH,
M. A. HAKEY.