

C. F. SPRINGFELS.
SNOW OR ICE MELTING APPARATUS.

No. 557,163.

Patented Mar. 31, 1896.

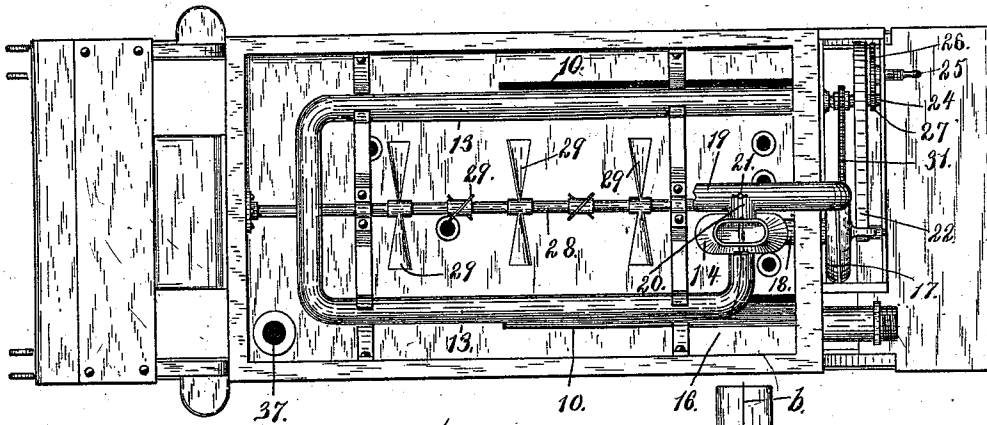


Fig. 1.

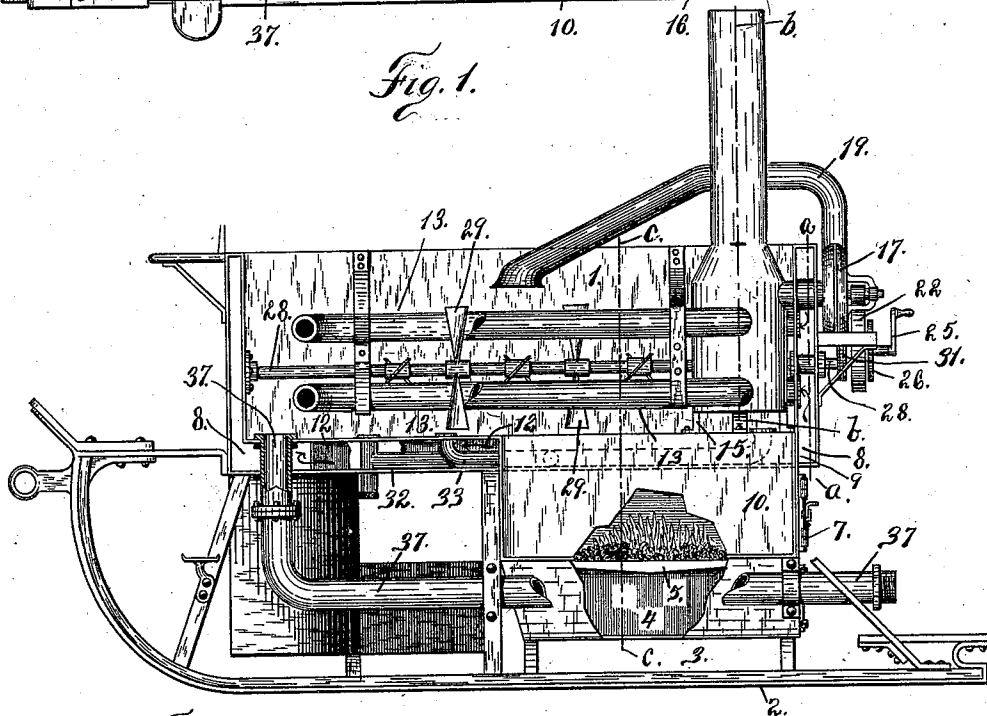


Fig. 2.

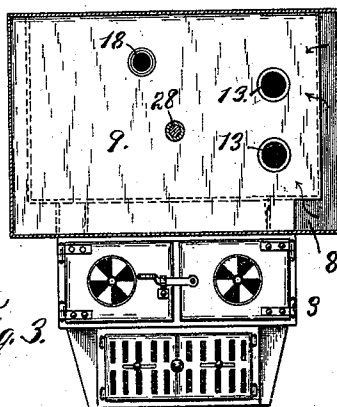


Fig. 3.

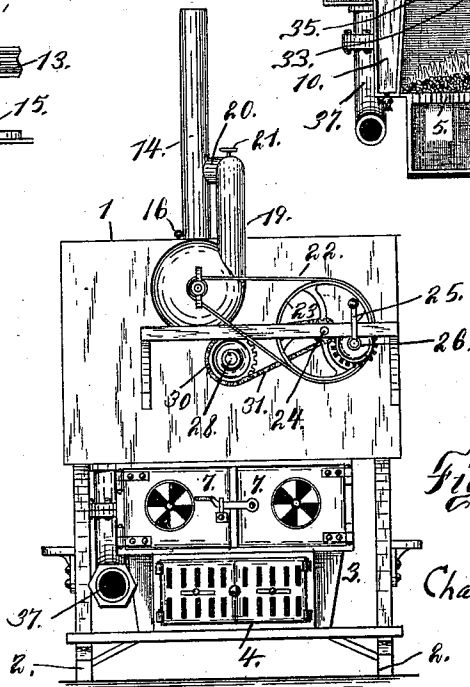
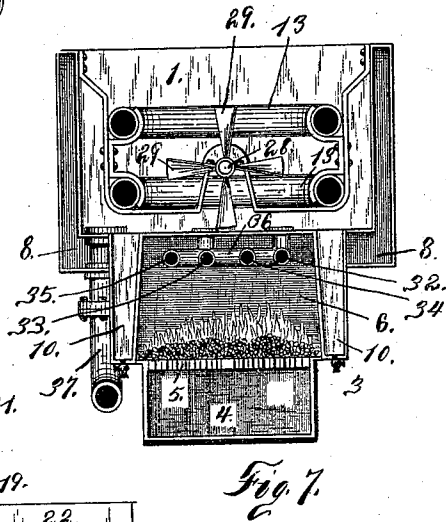
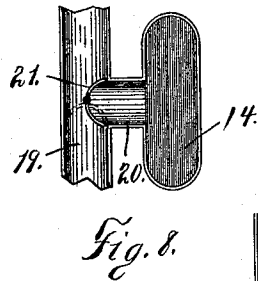
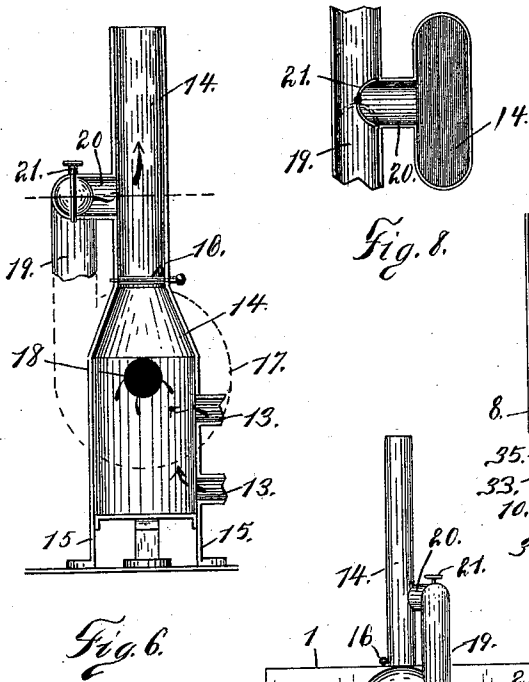
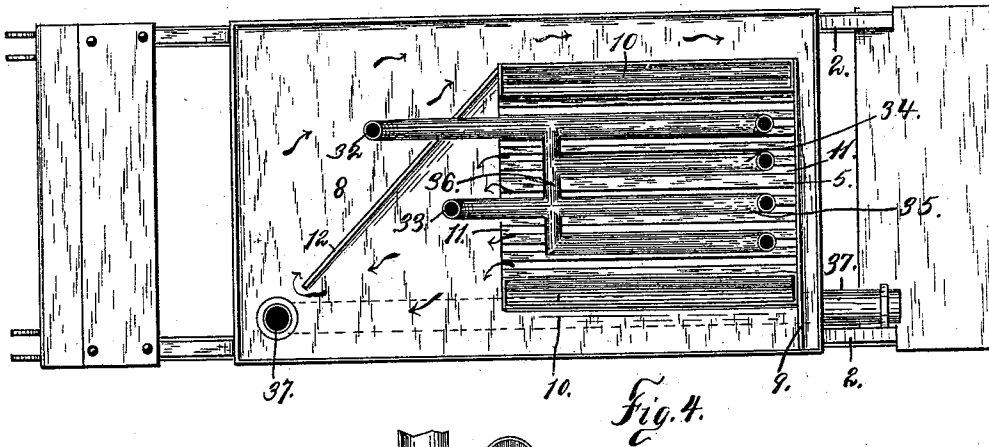
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UNITED STATES PATENT OFFICE.

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SNOW OR ICE MELTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 557,163, dated March 31, 1896.

Application filed August 14, 1895. Serial No. 559,279. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SPRINGFELS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Snow or Ice Melting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, 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, and to figures of reference marked thereon, which form a part of this specification.

My invention relates to portable apparatus for melting snow and ice, its object being to convert the accumulations of snow and ice in the streets of cities into water, which is discharged into the sewers, thereby saving the expense of hauling the same long distances. On the 5th of June, 1894, Letters Patent No. 520,941 were granted to me for an apparatus of this description, which comprised, substantially, a box or receptacle, a furnace located underneath the box or receptacle, a draft-passage occupying a hollow space which covers the bottom of the box or receptacle, such draft-passage extending around a partition-wall in the hollow space and opening at one side of the rear end of the receptacle into the fire-box of the furnace and at the other side of the rear end into the smoke-pipe, and an outlet passage to discharge the melted snow and ice.

The object of my present invention is to improve the above-outlined construction; and to that end it consists in providing a draft-passage which not only occupies the hollow space which covers the bottom of the box or receptacle, (as in my former patent,) but the additional hollow spaces which embrace the sides and ends of the receptacle, and draft-flues which extend from the rear to the front of the receptacle and back to the smoke-stack and above the floor of the receptacle.

My invention consists, additionally, of a system of pipes communicating with the receptacle and located in the hollow space at its bottom to provide for a circulation of the water formed from the melting snow and ice, a fan-blower and valved connections for increasing the draft and discharging the heated air from

the smoke-stack onto the snow and ice in the receptacle to assist in the melting process, and a revolving agitator to stir and separate the snow and ice in the receptacle.

I will now minutely describe the manner in which I have carried out my invention and then claim what I believe to be novel.

In the drawings, Figure 1 is a top plan view of my improved apparatus. Fig. 2 is a side elevation with the side wall of the box or receptacle removed and other parts in section. Fig. 3 is a vertical transverse section taken in the line *a a* of Fig. 2. Fig. 4 is a top plan view just under the floor of the box or receptacle. Fig. 5 is a rear elevation. Fig. 6 is a vertical section taken in the line *b b* of Fig. 2. Fig. 7 is a vertical transverse section taken in the line *c c* of Fig. 2, and Fig. 8 is a horizontal section taken in the line *d d* of Fig. 6.

Referring to the drawings, 1 is the box or receptacle into which the snow or ice to be melted is thrown, and it is preferably mounted upon the runners 2 2, as shown.

3 is a furnace located underneath the box 1 and preferably at its rear end. It has the ash-pit 4, grate-bars 5, and fire-box 6, to which access is obtained through the doors 7. A hollow space or hot-air jacket 8 surrounds the bottom, sides, and ends of the box or receptacle 1, the rear inside wall 9 extending entirely across the hollow space 8, except on one side, as clearly shown in Figs. 3 and 4, to form an exit for the heated air from the jacket.

10 10 are water-jackets which form the walls of the fire-box 6 on each side and communicate with the box 1 above.

11 is a rectangular opening in the floor of the box 1 over the fire-box, through which the heat passes up into the hollow space 8. A deflecting partition-wall 12 extends from one corner of the opening 11 diagonally across the front portion of the hollow space under the floor of box 1 to a point near the corner of such hollow space.

13 13 are two draft-flues which open through the rear wall 9 into the hollow space or hot-air jacket 8. They are suitably supported above the floor of box 1 and extend to the front part of the box along one side, then across and down the other side, where they open into the smoke-stack 14, which has a

closed bottom and is supported on standards 15 resting upon the floor of the box 1. A damper 16 operates across the smoke-stack 14.

17 is a fan-blower secured to the outer end 5 of the box 1 and communicates through pipes 18 with the interior of the smoke-stack 14 below the damper 16. A pipe 19 extends up from the fan-blower 17, crosses near the smoke-stack 14, and extends downwardly at an angle, 10 slightly below the top level of the box 1, and at or near its center a short connecting-pipe 20 joins the pipe 19 with the smoke-stack and is provided with a valve or damper 21.

The fan-blower 17 is operated by the belt 15 22, which passes around a large pulley 23 upon the shaft 24. A crank 25 rigidly secured to the gear-wheel 26, which intermeshes with a small gear 27 upon the shaft 24, serves to revolve the large pulley 23, which in turn 20 operates the fan.

28 is a shaft extending centrally the entire length of the box 1, and it has rigidly mounted upon it a series of agitators 29. The shaft 28 is revolved by means of the gear-wheel 30, 25 rigidly secured thereto, and the sprocket-chain 31 from the shaft 24. A series of pipes for effecting a circulation of the water in box 1 is arranged as follows:

32 and 33 are two pipes of unequal length 30 in the hollow space below the floor of the box 1, their ends extending up through the floor, and 34 and 35 are intermediate shorter pipes, their rear ends extending up through the floor and their forward ends communicating 35 with the longer pipes 32 and 33 through the cross connections 36. The body of this system of pipes is immediately over the opening 11 above the fire-box 6, the forward ends of the longer pipes 32 and 33 extending forward 40 beyond the opening 11, one in advance of the other.

37 is a discharge-pipe by means of which the melted snow and ice is drawn off. To this pipe can be attached a hose to carry the 45 water to an adjoining sewer.

In operation a hot fire is made and maintained in the furnace and the products of combustion pass up through the opening 11 into the hollow space or hot-air jacket 8. They 50 pass around the deflecting partition-wall 12 and along the draft-passage at the opposite side of such wall to the rear of the box, then into and around the draft-flues 13 to the smoke-stack 14, from which they pass up and 55 out of the same, the damper 16 being left open.

When operating the fan-blower to increase the draft in starting the fire, the damper 16 is closed and the damper 21 is in the position shown in dotted lines in Fig. 8. The air is 60 then drawn from the smoke-stack in and through the fan-blower 17 and is forced through pipe 19 into and out from the upper part of the stack. On turning the damper into the position shown in full lines in Fig. 8 65 the hot air cannot pass into the upper part of the smoke-stack, as before, but is forced the entire length of the pipe 19 and rushes

down in contact with the snow and ice in the box 1, thus assisting in the melting process. At the same time that the fan is being operated the shaft 28 is caused to revolve and the 70 attached agitators stir and separate the melting snow and ice. The water in the circulating-pipes 32, 33, 34, and 35 being heated to the highest temperature at their rear ends, 75 causes it to rise into the box 1 through their rear openings, and the colder water from the front of the box is drawn in through the forward openings in the pipes 32 and 33, which causes a constant circulation, and in this man- 80 ner perceptibly assists in raising the temperature of the water.

With my improved apparatus operated as just described a maximum amount of heat 85 from the furnace is utilized for melting the snow and ice thrown into the box, thus making it an extremely serviceable apparatus for disposing of the accumulations of snow and ice in the streets of cities, and dispensing entirely with the carting away of the same, as 90 is now the practice.

I claim—

1. A portable snow and ice melting apparatus consisting of a box or receptacle, a furnace located underneath the box or receptacle 95 a draft-passage occupying a hollow space which covers the bottom of the box or receptacle, such draft-passage extending around a partition-wall in the hollow space below the bottom of the box or receptacle and opening 100 at one end into the fire-box of the furnace and communicating at the other end with draft-flues which extend from the rear to the front of the box or receptacle and back to the smoke-stack and above the floor of the recep- 105 tacle.

2. A portable snow and ice melting apparatus consisting of a box or receptacle with hollow bottom, sides and ends and a deflecting partition-wall in the hollow bottom, forming a draft-passage which opens at one end 110 into the fire-box of the furnace and communicates at the other end with draft-flues which extend from the rear to the front of the box or receptacle and back to the smoke-stack 115 and above the floor of the receptacle.

3. A portable snow and ice melting apparatus consisting of a box or receptacle having hollow bottom sides and ends and a deflecting partition-wall in the hollow bottom, forming a draft-passage which opens at one end 120 into the fire-box of the furnace and communicates at the other end with draft-flues which extend from the rear to the front of the box or receptacle and back to the smoke-stack 125 and above the floor of the box or receptacle and water-jackets forming the sides of the fire-box and opening into the box or receptacle.

4. A portable snow and ice melting apparatus consisting of a box or receptacle having 130 hollow bottom sides and ends and a deflecting partition-wall in the hollow bottom, forming a draft-passage which opens at one end into the fire-box of the furnace and commu-

nicates at the other end with draft-flues which extend from the rear to the front of the box or receptacle and back to the smoke-stack and above the floor of the box or receptacle, and a system of pipes communicating at their ends with the box or receptacle and located in the hollow space at its bottom to provide for a circulation of the water therein as and for the purpose stated.

5. A portable snow and ice melting apparatus consisting of a box or receptacle having hollow bottom, sides, and ends and a deflecting partition-wall, forming a draft-passage which opens at one end into the fire-box of the furnace and communicates at the other end with draft-flues which extend from the rear to the front of the box or receptacle and back to the smoke-pipe and above the floor of the box or receptacle and a fan-blower and valved connections with the smoke-stack, to increase the draft and discharge the heated air from the smoke-stack onto the contents

of the box or receptacle as and for the purpose stated.

6. A portable snow and ice melting apparatus consisting of a box or receptacle having hollow bottom, sides, and ends and a deflecting partition-wall forming a draft-passage which opens at one end into the fire-box of the furnace and communicates at the other end with draft-flues which extend from the rear to the front of the box or receptacle and back to the smoke-stack and above the floor of the box or receptacle and a revolving agitator to stir and separate the snow and ice in the box or receptacle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES F. SPRINGFELS.

Witnesses:

W. T. MILLER,
C. B. BUTLER.