

(No Model.)

R. A. HEALY & E. D. CUNDELL,
GAS HEATED FURNACE FOR LIQUEFYING SNOW.

No. 506,498.

Patented Oct. 10, 1893.

Fig 1:

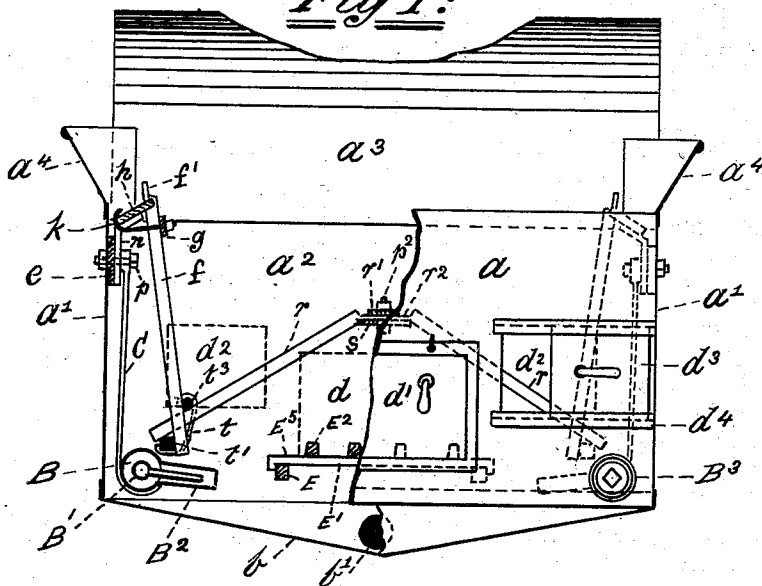
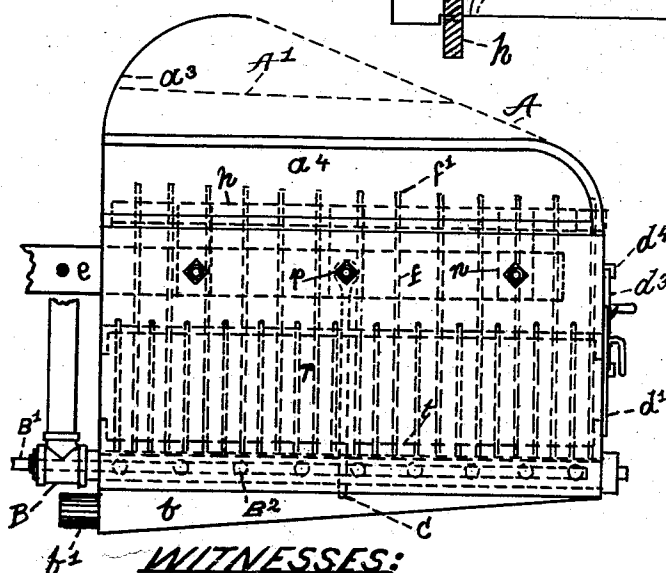


Fig 2:



WITNESSES:

Richard A. Healy Junr
Mathew J. Flaherty

Fig 3:

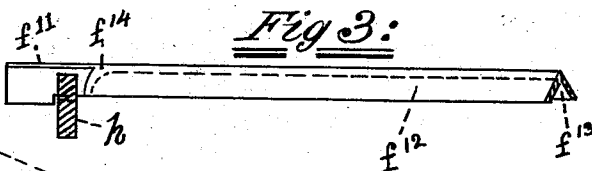
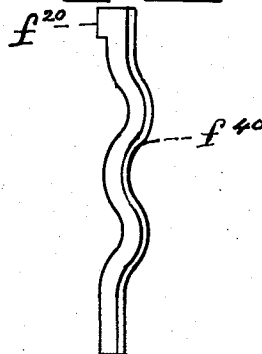


Fig 4:



INVENTORS:

Richard A. Healy
Edward D. Cundell
By Richard A. Healy
Att'y.

UNITED STATES PATENT OFFICE.

RICHARD A. HEALY AND EDWARD D. CUNDELL, OF PATERSON, NEW JERSEY,
ASSIGNORS OF ONE-THIRD TO JOHN HINCHLIFFE, OF SAME PLACE.

GAS-HEATED FURNACE FOR LIQUEFYING SNOW.

SPECIFICATION forming part of Letters Patent No. 506,498, dated October 10, 1893.

Application filed March 6, 1893. Serial No. 464,638. (No model.)

To all whom it may concern:

Be it known that we, RICHARD A. HEALY, and EDWARD D. CUNDELL, citizens of the United States, and residents of the city of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Gas-Heated Furnaces for Liquefying Snow, of which the following is a specification.

Our improvement consists in the arrangement of a system of atmospheric gas burners affixed to suitable air and gas supply tubes arranged within and located at each side near the bottom of a wrought iron box or hopper, provided with a bottom having its floor inclined toward one of its ends, the deeper part being provided with an outlet. Above the burners located upon suitable bearing bars are arranged a number of bars so arranged that when the burners are in operation the snow being thrown upon them the gaseous flame may have free vent and the snow may be readily liquefied. The distance apart and angle at which the bars are laid determine to a great extent the rapidity with which the snow is melted and consequently the amount of duty performed, inasmuch as if the bars are located too close together the snow is apt to form an arch over the bars and melt from beneath, and if too great a distance apart they allow large bodies to fall through the flame to the bottom, only partially liquefied, also the angle at which the bars are arranged tends to facilitate the reduction of the snow. The side bars being nearly vertical and the center ones having but a slight angle give the best results. In use or operation the snow is thrown by shovels or other means into the box and upon the bars and the gaseous flame playing between them and the bars being also at a red heat by reason of the action of the flame on their under sides produces nearly instantaneous liquefaction. We obtain these results by the apparatus illustrated in the drawings accompanying this specification, in which—

Figure 1 is an end view of our newly invented gas heated furnace, partly sectional. Fig. 2 is a side elevation of the same. Fig. 3 is a detail of an angular bar. Fig. 4 is a detail of an irregular or corrugated bar.

Similar letters have reference to similar parts.

The construction of our newly invented device is as follows and consists of a plate iron box bolted or riveted together at the several joints, the sides a' a' , front end a , back end a^2 , shield a^3 and bottom b with its outlet b' forming an inclosure within which the several rows of bars are located. To the sides a' a' are secured by suitable bolts P bars e which are intended to attach the device to a suitable carriage at their extended ends as shown in Fig. 2. To the bars e and secured by the bolts p brackets or knees n are located which the notched bars h are fastened by bolts or rivets. The bars h are notched to the width of the thickness of bars f and spaced the necessary distance apart on their outer edges as shown in Figs. 1 and 3. The upper edge of the bar f is flattened down to form a lip which engages in the notch and keeps the same in firm embrace and bars g secured by the hook bolt k secure the whole of the bars on each side. The lower ends of the bars f are held against the bars t' by the hook bolts t which bear upon the round bars t^3 resting on the bars f and r at the angle of their passing one another. The bars t' t' and also the bars E , E and S form stays to unite the two ends a , a^2 rigidly together secured by either bolts or rivets. Resting loosely upon the bars E , E is a cradle formed of longitudinal bars E^5 and cross bars E^2 upon which ice or heavy lump snow may be melted the same being fed through the door opening d in the end a the door d' being hooked on to pins riveted to the plate. Cleaning openings d^2 d^2 are also provided in the end a opposite the junction of the bars f and r to remove any unflammable substance that may accumulate. Openings d^2 d^2 are covered by the doors d^3 d^3 which slide within the slide grooves d^4 riveted to the outer side of the end plate a , Fig. 1. Suspended from the bar S which is notched on each of its edges similar to bars h and h , the bars r are located, the middle and upper portions r^3 being flattened to lie upon the bar S and secured in position by the covering bar r' which is bolted to the bar S by the bolt p^2 . Suspended by the rods C by the hooks formed on their lower ends

and the bolts p are the pipes B B having secured to their outer diameters longitudinally a number of burners $B^2 B^2$, &c., which are fed with gas by the tubes B' located within the air tubes $B^2 B^2$ the outer ends of which are covered by the caps B^3 as shown in Figs. 1 and 2.

The sides of the furnace are provided with the wing plates a^4 , a^4 , and when in use covered by movable cover plates A. A' indicated by dotted lines on Fig. 2 secured to the wings a^4 , a^4 and the shield a^3 by bolts, a space or opening being left on each side and the end for the admittance of the snow to be melted, the water from which falling upon the inclined floor or bottom b passes out through the outlet b' and is conducted by a rubber hose to a suitable location.

The cover plates A. A' and the curved form of the shield a^3 are intended to deflect and prevent the escape of heated air and inflammable gases.

Having described the use and construction of our newly-invented gas-heated furnace for liquefying snow, what we claim, and desire to secure by Letters Patent, is as follows:

1. In a melting furnace for liquefying snow, a hopper having an inclined bottom and provided with an outlet, in combination with a series of inclined side-bars secured to each side within said hopper, a further series of inverted V-shaped bars, supported at an inclination from the center in said hopper, the lower ends of which pass between the lower ends of said inclined side-bars, forming a cradle to receive snow or ice thrown into the hopper and a number of burners located beneath said system of interlocking bars, substantially as shown and described.

2. The combination of the hopper or box, consisting of the end plates a , a^2 , and side plates a' , a' , wings a^4 , a^4 , shield a^3 , cover plates

A. A', bottom b , with its outlet b' , with the carrying bars E. e, brackets n , hook bolts k , notched supporting bars h , covering bars g , bolts p , and suspension rod C substantially as specified.

3. The combination of the supporting and stiffening bars E, cradle bars E' , E^5 , E^2 with a wrought iron melting box substantially as specified.

4. The combination of a hopper or wrought iron box having located within its interior space gridiron bars secured to the same by hook bolts and notched bars, of the air tubes B supported by the suspension rods C. C. inner gas tube B' , burners B^2 cap B^3 substantially as specified.

5. The combination of a melting furnace formed of iron plates, bars f , f , and r supporting bars h , h and S covering bars g , g , and r' bolts p , p , p^2 , end plates of furnace provided with openings, d , d^2 , d^2 , covered by the hooked door d' , and sliding doors d^3 , d^3 located in the grooved slides d^4 , d^4 substantially as specified.

6. A corrugated bar f^{40} provided at its upper end with a projecting and engaging lip at its upper end f^{20} in combination with a melting furnace.

7. A bar formed of angle iron one end f^{11} projecting to form an engaging lip, and flattened at f^{14} to engage and interlock with bar h , the upper side f^{12} being used for contact with snow, and the hollow under side f^{13} forming a conducting channel for heated gases, or flame, in combination with a wrought iron box, or hopper substantially, as, and for the purpose specified.

RICHARD A. HEALY.
EDWARD D. CUNDELL.

Witnesses:

MATHEW J. FLAHERTY,
R. V. BUTLER.