(No Model.)

# R. A. HEALY & E. D. CUNDELL.

## PILOT SHOE FOR SNOW MELTING MACHINES.

No. 506,500. Patented Oct. 10, 1893.

*Fig 1:*

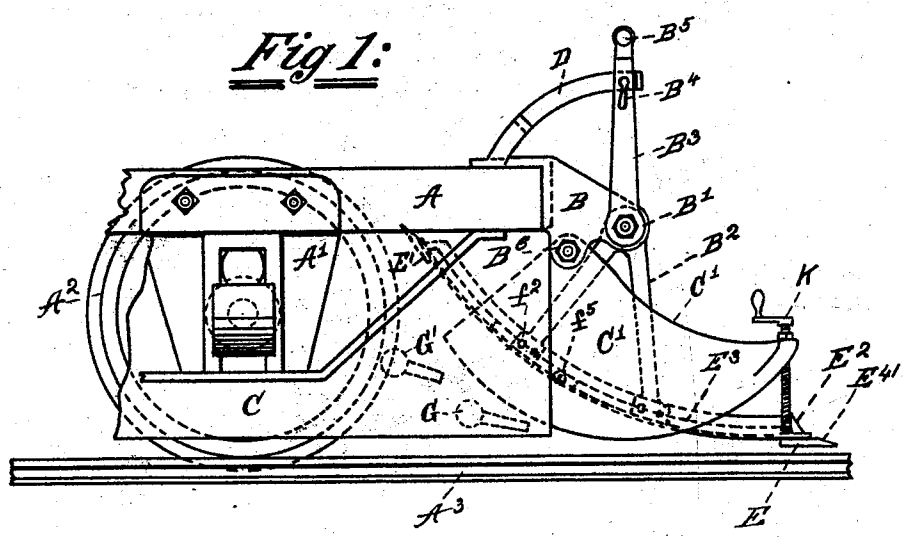



*Fig 2:*

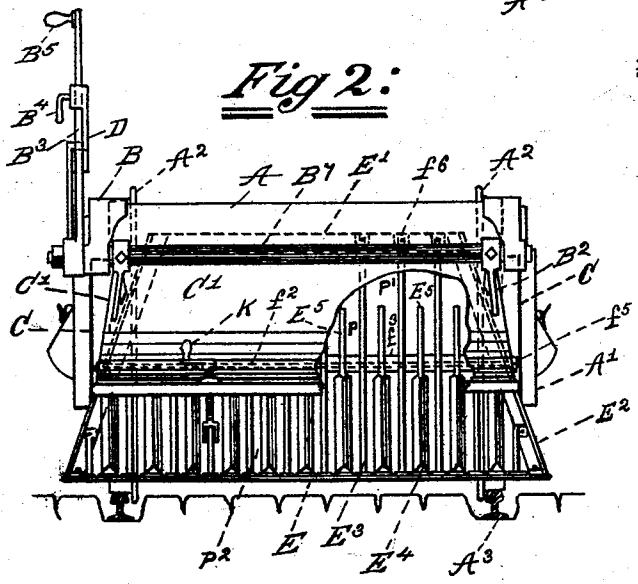
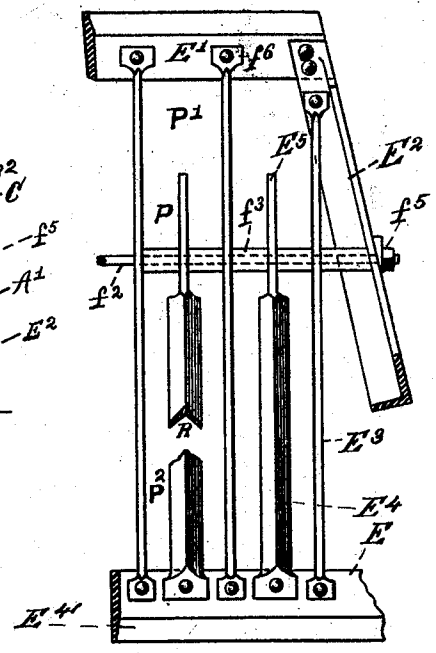



*Fig 3:*

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# 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.

## PILOT-SHOE FOR SNOW-MELTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 506,500, dated October 10, 1893.

Application filed March 27, 1893. Serial No. 467,815. (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, residing in the city of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Adjustable Pilot-Shoes for Snow-Melting Machines, of which the following is a specification.

The object of our invention is to rapidly liquefy and remove snow from the surface of railroad tracks, streets, roads, &c., and our device is so arranged that the same may be effectually performed.

The drawings that accompany this specification illustrate in Figure 1 a side elevation of our device mounted upon a railroad truck. Fig. 2 is a front elevation of the same. Fig. 3 is a detail drawing showing the method of arranging the grate bars forming the working face of the pilot shoe and means of rigidly securing the same.

Similar letters have reference to similar parts in each of the drawings.

In construction our device consists of a pendent frame of a curved form longitudinally suspended on bearings formed on a shaft supported by brackets secured to the front and rear ends of a railroad car or other wheeled vehicle beneath which are located a number of atmospheric gas burners the flame from which heats the bars forming the pilot shoe and also passes through between the various bars.

In Fig. 1 A represents a platform frame mounted on the wheels $A^2$ located in the axles that are journaled in the boxes A′ and which run upon the rails $A^3$. To the front of, at each side and also the rear ends of the frames A brackets B are secured by bolts and nuts the outer ends of which form bearings for the shaft $B^7$ the outer end of which is formed square to engage the end of the lever $B^8$ being secured by the nut B′. Lever $B^8$ is provided with a handle $B^5$ and a locking device $B^4$ to securely fasten the same to the quadrant arch bar D which is bolted to the side frames A. The brackets B are also fitted with studs $B^6$ upon which is pivoted the apron or cover C′ the sides of which are curved at their lower edges, and slide between the cover plates C which line each side of the frame A at its under side. The apron or cover C′ may be locked by a suitable bolt K loosely in contact with the pilot shoe so that the throat or opening for entrance of the snow may be enlarged or diminished. Secured by keys and located on the shaft $B^7$ and inside the brackets B. B. Fig. 2 quadrant arms $B^3$ $B^3$ are fastened to the side angle bars $E^2$ $E^2$ at their lower ends by bolts or rivets $f'$. The shoe itself is formed by the angle iron sides $E^2$ $E^2$ and the lower front bar E which has its front edge beveled $E^{41}$ to cut into snow when packed by vehicles as well as to lead the snow up the inclined curved outer surface of the shoe. The upper bar E′ is shorter than the lower bar E so that when the bars E. E′ are bolted to the side bars $E^2$ $E^2$ at their outer ends the shoe presents an unequal form as shown in Fig. 2 as well as a curved form as in Fig. 1. The grating between the side bars $E^2$ $E^2$ is formed of curved bars of flat iron $E^3$ flattened down at each end $f^6$ $f^6$ and riveted to the bars E and E′ by the rivets $f$. Between the bars $E^3$ $E^3$ Figs. 2 and 3 angle iron bars $E^4$ are located on an inverted plane so that the under side may present a hollow groove R to the flame from the burners G. G′. and the upper an angular form to facilitate the liquefaction of the snow. Both ends of the curved bars $E^3$ are flattened down and riveted to the bars E E′ by the rivets $f^6$ and also one end of the angle bar $E^4$ is flattened and the same means used for securing the same to the bar E, the upper end being held in alignment by the bolt $f^2$. Bars $E^4$ are formed of angle iron, one end being flattened down and the other closed together, as at $E^5$, Fig. 3, and in which a hole is drilled to receive the rod $f^2$. Bars $E^3$ have similar holes to receive rod $f^2$ which is passed transversely through the whole system of bars $E^3$ $E^4$ as well as the side angle bars $E^2$. Each end of the rod $f^2$ is secured by the nuts $f^5$. Thimbles $F^3$ are located on the rod $f^2$ between the bars $E^2$, $E^3$ and $E^4$ to separate and hold them in line firmly together, so that the resulting spaces between the bars may be wide at the upper end P′, narrower at the middle P and narrow at the lower or front end $P^2$ as in Figs. 2 and 3. The side bars $E^2$, angle grate bars $E^4$ and flat extended bars $E^3$ are all curved

to the same radius on their under edges so as to be symmetrical, and spaced apart a suitable distance to fully permit the gaseous flame from the burners G. G'. to pass through as well as the water that may be produced by liquefaction. It is obvious that with this arrangement of grate bar surface there are three different widths of space in the grate, namely at the front end, middle, and outer or upper end, which latter is the widest for the purpose. We will now describe its use.

The burners being supplied with ignited gas and the truck or platform moving forward the shoe being locked by the lever $B^2$ and its adjustment quadrant D with set screw $B^4$ as shown in Fig. 1 the beveled edged front bar enters beneath the accummulated snow and raises it on to the gratings or bars $E^3$ $E^4$. The momentum of the vehicle drives the snow upward over the angle bars $E^3$ and between bars $E^3$ and $E^4$ as well as the side bars $E^2$. The gaseous flame liquefies the snow, and what part may escape liquefaction on the bars falls through the upper openings into the flame direct, which being confined from escape by the apron $C^2$ and side shields C renders the space so confined a heating chamber of great intensity. The pilot shoe being pivotally hung upon the bar or shaft $B^7$ is capable of adjustment by its lever $B^3$ for any height required between the road $A^3$ and the front bar E and also can be reversed in cases where the vehicle runs the other way in which case the rear pilot shoe is lowered down as in Fig. 1.

Having fully described the construction and use of our newly-invented pilot-shoe for snow-melting machines, what we claim, and desire to secure by Letters Patent, is as follows:

1. An adjustable pilot shoe formed by unequal sided angle bars curved to a radius of any diameter and flat bars with beveled edges riveted or bolted together, to which are secured alternately curved flat bars and curved angle bars, angle bars flattened at one end to form an extended bar, separating thimbles with tie rod and adjusting nuts, the under side of angle bars forming a cavity when adjusted in shoe and the upper side forming inclined surfaces, quadrant suspension bars pivoted upon a horizontal shaft located in bearings and mounted on the front of a wheeled vehicle, adjusting lever with its arch bar and locking device substantially as specified.

2. The combination of the bars $E^2$ $E^2$, E and E' grate bars $E^3$, $E^4$, thimbles $F^3$ tie rod $F^2$ quadrant suspending bars $B^2$ $B^2$ shaft $B^7$ lever $B^3$ locking device $B^4$ arch bar D bearings B secured to the frame A, apron C' with its pivots $B^6$ adjusting bolt K, with a vehicle mounted on wheels, substantially as specified.

3. The combination of a melting shoe formed of the outer frame bars $E^2$ $E^2$, E and E' within which are assembled alternately flat and angle bars $E^3$ $E^4$ formed in such a manner that three different widths of opening may be presented to the substance operated upon at different parts of the shoe vertically and longitudinally substantially as specified.

4. The combination of an adjustable pilot shoe formed of iron bars with an apron or cover forming a cover or chamber above the bars and at each side so arranged that any desirable height of opening for admission of snow may be effectually obtained, substantially as and for the purposes specified.

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Witnesses:
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MATHEW J. FLAHERTY.