

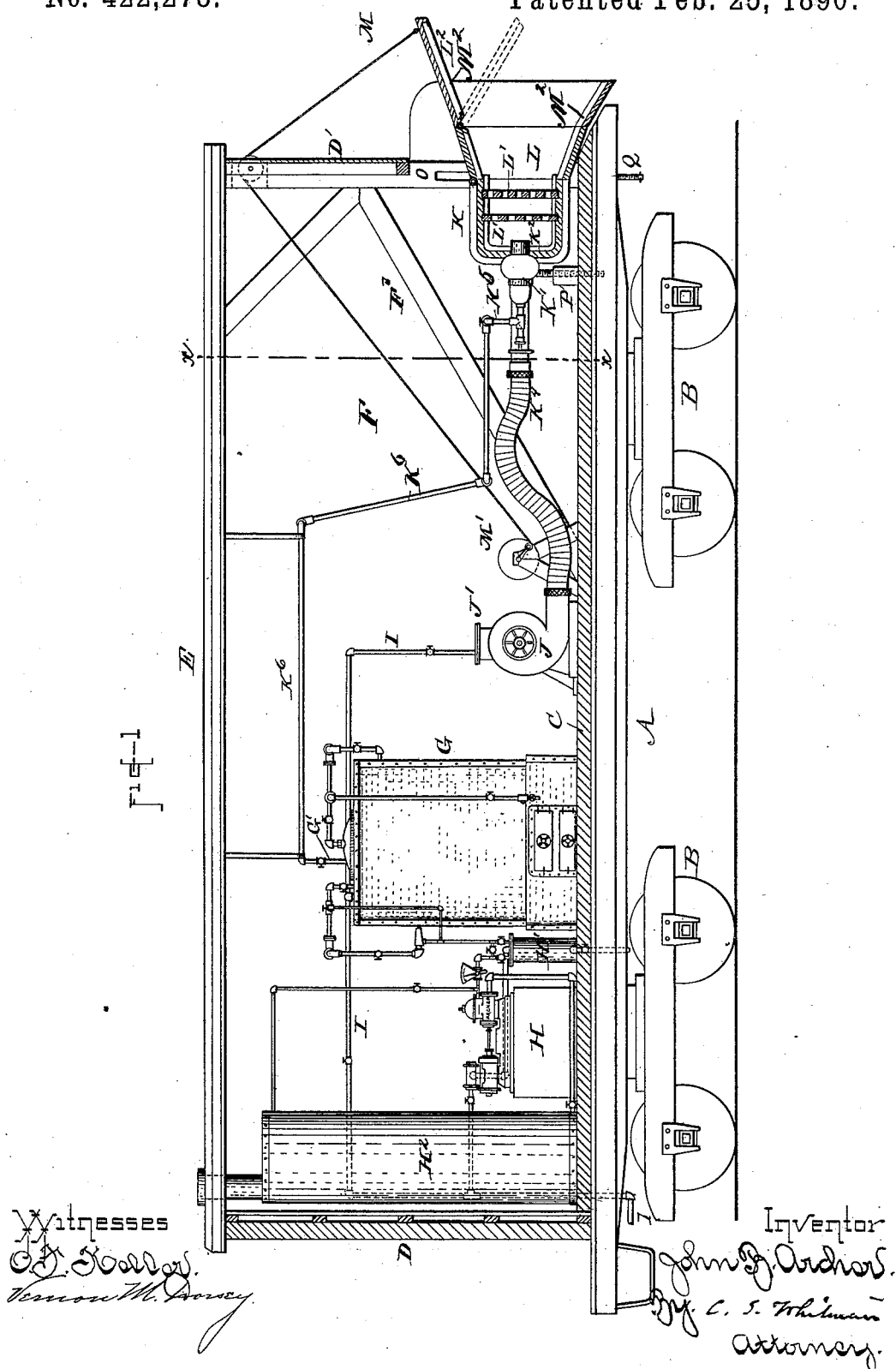
(No Model.)

2 Sheets—Sheet 1.

J. B. ARCHER.  
SNOW AND ICE MELTER.

No. 422,278.

Patented Feb. 25, 1890.



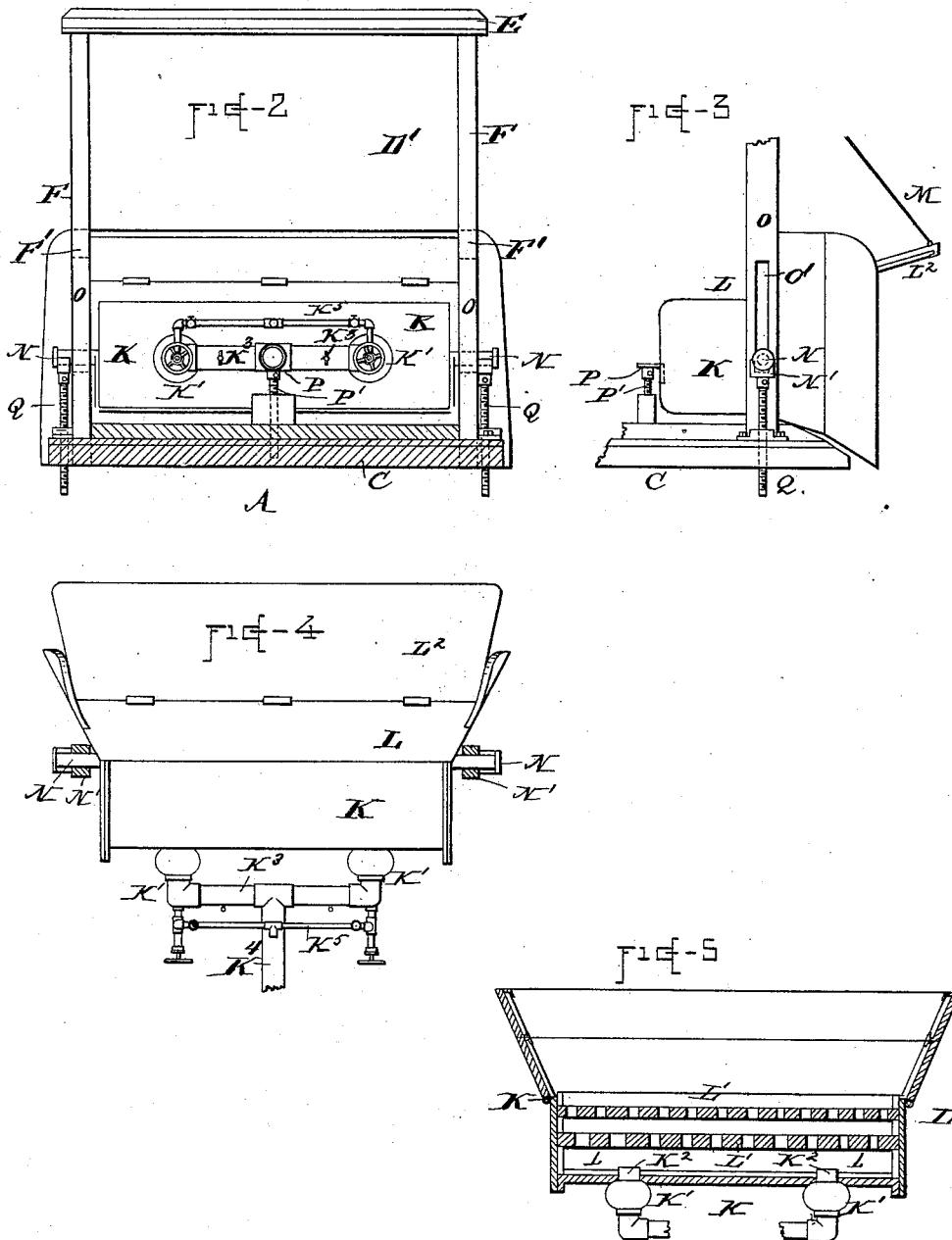
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Witnesses

*W. D. Forges.*  
*Vernon M. Dorsey.*

Inventor

*John B. Archer*  
*By C. S. Whitman*  
*Attorney.*

# UNITED STATES PATENT OFFICE.

JOHN B. ARCHER, OF WASHINGTON, DISTRICT OF COLUMBIA.

## SNOW AND ICE MELTER.

SPECIFICATION forming part of Letters Patent No. 422,278, dated February 25, 1890.

Application filed December 27, 1888. Renewed January 13, 1890. Serial No. 336,717. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN B. ARCHER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Snow and Ice Melters; 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.

My invention relates to appliances for melting and removing snow and ice from roads and railroad-tracks; and it consists of a vehicle adapted to be moved thereon, an apparatus for producing fuel-gas—such as that described in an application filed by me on the 21st day of February, 1888, and serially numbered 264,822, or in another application filed by me on the 18th day of July, 1888, and serially numbered 280,314—an air-blower, and a burner connected with the gas-producer and air-blower capable of vertical adjustments and provided with means for mixing the supply of air and gas furnished by the gas-producer and air-blower, and of a vehicle upon which the several parts are mounted, whereby an intensely-hot flame will be thrown in front thereof as the vehicle is propelled, melting the snow and ice which may be upon the road or track.

This invention also comprises other novel features of construction and arrangement, and to the end that my invention may be fully understood I will describe in detail its construction, having reference to the accompanying drawings, in which similar parts are designated by similar letters, and in which—

Figure 1 is a longitudinal section of a snow-melter embodying my invention adapted to railroad use. Fig. 2 is a cross-section thereof on the line  $xx$  of Fig. 1. Fig. 3 is a detail side view of the adjustable burner. Fig. 4 is a plan view thereof, and Fig. 5 is a horizontal section of the same.

In the adaption of the invention for railroad use thus illustrated in the drawings, the vehicle A, on which the flame producing and directing apparatus is arranged, is provided, like an ordinary railroad-car, with flanged-wheel trucks B and constructed with a floor C, end walls D D', roof E, and side walls F

and trusses F', and is adapted to be propelled from behind by a locomotive up to the snow and ice which it is desired to remove; but any other vehicle may be substituted for that shown which is suited to the use to which it is to be put, and any other motive power may be employed.

On the floor C, in the central portion thereof, is placed a fuel-gas-producing apparatus G, substantially like that described in my hereinbefore-mentioned application for Letters Patent, which is, with its oil-pump H and oil-heater H', supplied with live steam by a pipe I from the following locomotive or steam-boiler placed on the vehicle or car, and with hydrocarbon oil from a tank H<sup>2</sup>, arranged at the rear end of the vehicle A. An air-blower J is also placed on the floor C and is arranged to be driven by steam-engine J', also receiving its motive power from the following locomotive, or a boiler mounted upon the vehicle itself may supply all the steam that may be required for any of the purposes of this invention.

On the floor C, at the front end of the vehicle, is arranged a burner K, which is composed of a series of air and gas supply regulators and mixers K', similar to those described in application, Serial No. 272,903, filed by me in the United States Patent Office on the 5th day of May, 1888, and of a single flame-jet L, arranged and extending transversely across the front of the floor C and opening forward, through the back of which jet L the nozzles K<sup>2</sup> of the regulators and mixers K' are introduced so as to point forward.

The air-induction ports of the several regulators and mixers K' are connected to a common cross-pipe K<sup>3</sup>, which is in turn connected by a wire-armored or otherwise flexible air-pipe K<sup>4</sup> with the air-discharge of the blower J. The gas-induction ports of the several regulators and mixers K' are likewise connected to a common cross-pipe K<sup>5</sup>, which is connected with the gas-outlet G' of the gas-producer G by a flexible pipe K<sup>6</sup>, which may consist of a metallic pipe K<sup>6</sup>, formed of a number of continuous but independent sections supported from the roof E and connected by universal joints, by which construction, together with the flexible air-

connecting pipe K<sup>4</sup>, allowance is made for the adjustment of the burner in directing the flame, as hereinafter described.

Within the jet L are arranged a number 5 of (in this case two) upright transverse perforated diaphragms L', of refractory material, in the front of the nozzles K<sup>2</sup>. Against these diaphragms the streams of mingled air and gas issuing under pressure from the nozzles 10 K<sup>2</sup> impinge before passing through the perforations, thereby causing a more thorough intermixture of the gas and air before passing through the outer diaphragm, and when ignited outside the same generating a solid 15 intensely-hot flame of wide area, shooting from the jet a long distance in front of the car, under the action of which the snow and ice obstructing the road or way of the vehicle will disappear and be converted into water 20 and vapor. The mouth of the jet L is made flaring downward and laterally to spread the flame and to cause it to clear a space sufficient to permit the free passage of the vehicle, and the lid L<sup>2</sup> is hinged to swing vertically, and is connected to a chain M, passing 25 over the windlass M' or other appropriate adjusting device, so that it can be adjusted angularly to deflect the flame more or less downward, according to the height and character of the obstruction.

The jet L, together with its adjustable deflecting-lip L<sup>2</sup>, is adapted, as shown, to be lined with proof-tile M<sup>2</sup> to resist the action of the flame. The jet L is also provided with 35 trunnions N on opposite sides, which are mounted to rock in bearings N', carried on jack-screws Q, by which they may be vertically adjusted in the slots O' of the standards O, rising on opposite sides of the vehicle, and 40 on the back of the jet is a shoulder P, which is supported on a vertical jack-screw P', mounted on the floor C, so that the burner can be adjusted bodily on its trunnions to throw the flame angularly upward or downward as the 45 depth of the snow or ice may vary.

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

1. In a snow-melter, the combination of a 50 gas-producer, an air-blower, air and gas mixers, a forwardly-directing flame-jet, and combustion-chamber into which the air and gas mixers lead, pipes connecting the gas-producer and air-blower with the mixers, and a 55 vehicle upon which the several parts are mounted, as and for the purposes described.

2. The combination, in a snow-melter, of a 60 vehicle, a fuel-gas producer, an air-blower, an oil-tank carried by the vehicle, and an air and gas burner connected with the gas-producer and air-blower, and provided with a dirigible flame-jet, substantially as described.

3. The combination, in a snow-melter, of a

supporting-vehicle, a fuel-gas producer, an oil-tank, an air-blower, an air and gas burner 65 adjustable for directing its flame-jet, and flexible air and gas pipes connecting the blower and gas-producer with the burner, as and for the purposes described.

4. In a snow-melter, the combination, with 70 a supporting-vehicle, of a gas-producer, an air-blower, a gas and air burner capable of a vertical angular motion, and of adjustable and flexible piping connecting the gas-producer and air-blower with the burner, as and 75 for the purposes described.

5. The combination, in a snow-melter, of a supporting-vehicle, a fuel-gas producer, an air-blower, gas and air pipes connecting the said producer and blower with a burner, a 80 mixed gas and air burner having a flame-jet provided with an angularly-adjustable deflecting-lip, and means for adjusting the deflecting-lip, substantially as described.

6. The combination, in a snow-melter, of a 85 fuel-gas producer, an air-blower, a mixed gas and air burner having a forwardly-opening jet provided with a mouth, the upper lip of which is angularly adjustable, and gas and air pipes connecting the burner with the gas- 90 producer and air-blower, substantially as described.

7. In a snow-melter, the combination, with a vehicle, of a burner having a jet arranged transversely across the front end of the ve- 95 hicle and opening forward, a number of mixed air and gas supply regulators and mixers connected with the back of the jet, a fuel-gas and air-pressure supply, and one or more upright perforated diaphragms arranged trans- 100 versely within the jet, substantially as described.

8. The combination, in a snow-melter, with a vehicle, of a fuel-gas and air-pressure supply and a gas and air burner connected there- 105 with, the said burner having a jet arranged transversely on the front of the vehicle, opening forward, and provided with flaring side and bottom lips and an angularly-adjustable upper lip, substantially as described. 110

9. A burner for snow-melters, having trunnions upon its sides, an adjustable upper lip, a flaring mouth, and perforated diaphragms within the same, substantially as described.

10. A burner for snow-melters, having trunnions upon its sides, an adjustable upper lip, 115 a flaring mouth, air and gas mixers connected with its base, and a perforated diaphragm within its interior, as and for the purposes described. 120

In testimony whereof I have hereunto set my hand in presence of two witnesses.

JOHN B. ARCHER.

Witnesses:

L. B. MARTIN,

VERNON M. DORSEY.