No. 610,180. Patented Sept. 6, 1898.

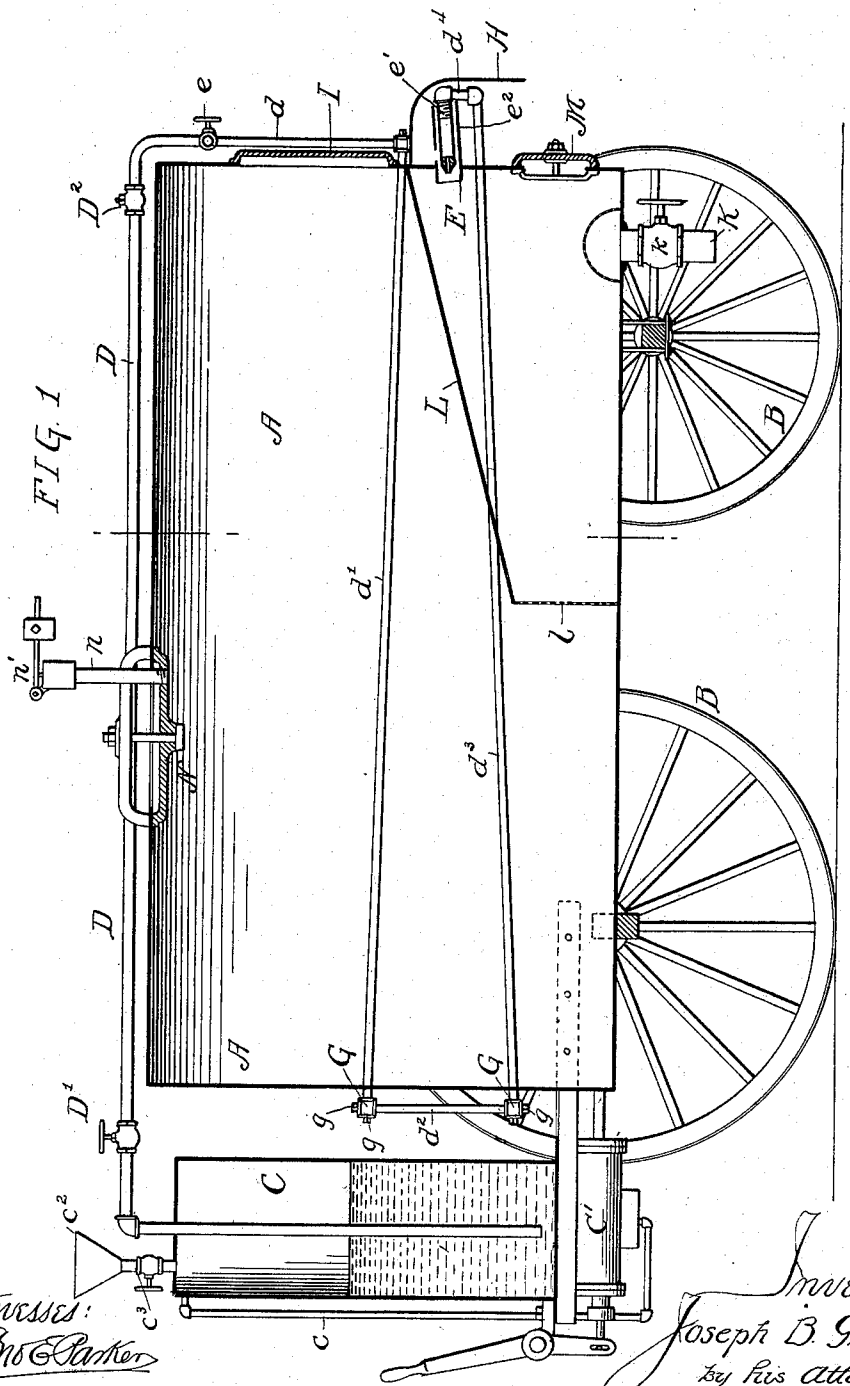
J. B. GREENIG.

APPARATUS FOR MELTING SNOW.

(No Model.) (Application filed Aug. 14, 1897.)

2 Sheets—Sheet 1.

FIG. 1



Witnesses:
Jno. E. Parker
J. Henderson.

Inventor:
Joseph B. Greenig,
by his Attorney,
Howard Pelton.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 610,180. Patented Sept. 6, 1898.

J. B. GREENIG.

APPARATUS FOR MELTING SNOW.

(No Model.) (Application filed Aug. 14, 1897.) 2 Sheets—Sheet 2.

FIG. 2

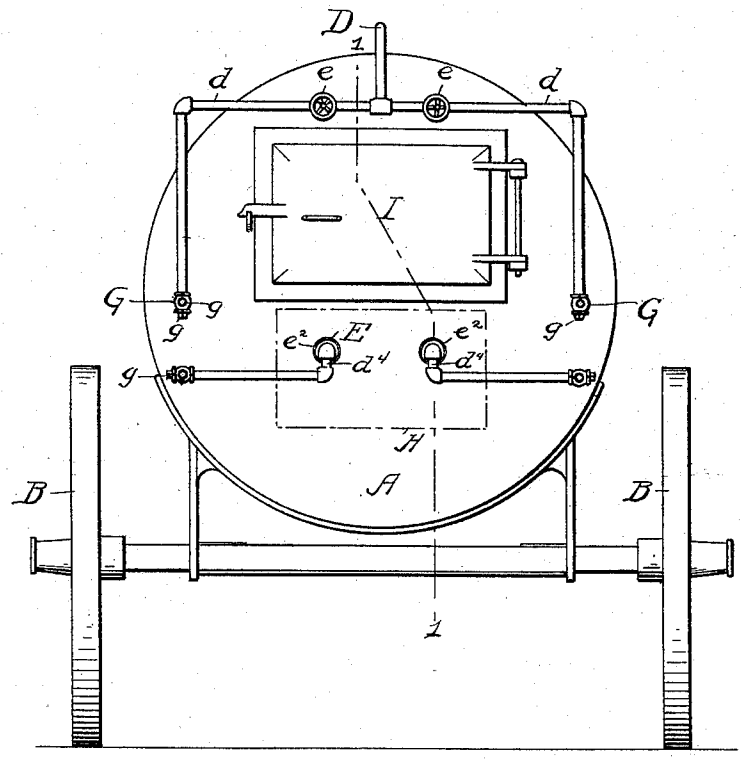
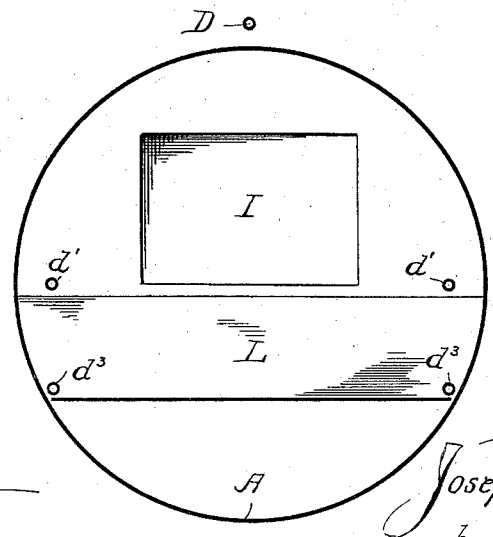


FIG. 3



Witnesses:
Jno. E. Parker
J. Henderson.

Inventor:
Joseph B. Greenig,
by his Attorney.
Howard Pell.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH B. GREENIG, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR MELTING SNOW.

SPECIFICATION forming part of Letters Patent No. 610,180, dated September 6, 1898.

Application filed August 14, 1897. Serial No. 648,229. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH B. GREENIG, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Melting Snow, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in apparatus for furnaces of that class designed to be traveled through city streets and into which snow is thrown for the purpose of melting same. The object of my invention is to provide an improved form of apparatus of this class in which a gas or oil flame is forced directly into contact with the snow and to provide for the ready volatilization of the oil employed and the burning of the gaseous vapor, as more fully set forth hereinafter.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation, on the line 1 1, Fig. 2, of a snow-melting apparatus constructed in accordance with my invention. Fig. 2 is an end elevation of the same; and Fig. 3 is a transverse sectional elevation of the apparatus on the line 3 3, Fig. 1.

Referring to the drawings, A represents a cylindrical furnace mounted on suitable supporting-wheels B, by which it may be traveled from place to place. At a point preferably in the rear of the furnace is arranged a tank C, into which may be placed a quantity of petroleum or other hydrocarbon and on which may be placed gages of any suitable character for determining the level of the liquid and the pressure of the air therein. The upper end of the tank is connected by a pipe c to an air-pump C', so that a constant pressure of air may be brought to bear upon the oil within the tank to assist in forcing the same to the point of consumption and maintaining a blast-flame for contact with the snow. At the top of the tank is a filling-funnel c^2, connected by a valve-pipe c^3 to said tank for convenience in introducing the hydrocarbon. From a point near the lower end of the tank C extends a pipe D, having two branches d, each provided with a controlling-valve e, as shown more clearly in Fig. 2, and arranged in said pipe D are a controlling-valve D' and a check-valve D^2 to prevent any backflow into the tank.

Each feed-pipe d is connected to a pipe d', extending directly through both of the end plates of the furnace and inclining upwardly from front to rear. The rear end of each pipe d' is connected by a vertical pipe d^2 to a pipe d^3, also extending through both of the end plates of the furnace and inclining upwardly from the rear to the front, at which latter point it is connected by a branch pipe d^4 to a burner E, the upward incline given to each of the pipes acting to slightly retard the passage of the oil and prevent any excessive flow at the burners.

The connections between the various pipes at the points outside of the furnace are in the form of four-way couplings G, two of the openings of which are arranged to receive the pipes and the remaining openings being closed by screw-plugs g, which may be removed in order to permit the insertion of a suitable cleaning-tool to remove any accumulation of carbon or tar within the pipes.

The burners E, which may be of any desired number, each have nippled jet-pipes e', surrounded by a pipe e^2 of somewhat larger diameter, to guide the jet and to permit of the admixture of a suitable quantity of air with the flame issuing from the jet-pipes. The burners are covered by a suitable guard or shield H, extending out from the front of the furnace, in order to prevent the falling of snow upon them.

The front of the furnace is provided with a suitable door I, covering an opening through which the snow may be thrown into the furnace, and at the bottom of the furnace is an escape-pipe A, provided with a valve k, through which the melted snow or slush may escape directly to the pavement or be guided by a hose or pipe to a sewer-inlet. The door I being normally open for the insertion of the snow permits the escape of such products of combustion as may arise from the consumption of the gaseous vapor. When a hose or conducting-pipe is employed, there is some danger of the freezing of the escaping water in the pipe, and when this occurs the valve k may be closed until a sufficient quantity of hot water has accumulated in the furnace to thaw the ice in the hose or pipe.

In order to prevent the escape of the flame from the doorway during the time the door I is open, I arrange within the furnace at a point immediately above the oil-burner a deflector-plate L, which serves in a measure to deflect the flame and keep it near the lower portion of the furnace. At the end of the deflector-plate and extending from thence to the bottom of the furnace I arrange a suitable screen *l* to prevent the passage of incombustible material to the escape-pipe, the screen, however, having a mesh of such size as not to interfere with the passage of the flame from the burners E.

At the front of the furnace or at any other suitable point is arranged a manhole M for convenience in cleaning the interior of the furnace, and in the upper portion of the furnace is a manhole N, preferably provided with a pipe *n*, having a steam-escape valve *n'*.

In some cases where an intense heat is employed I may line the furnace with cement or any suitable refractory material to avoid any danger of destroying the shell of the furnace.

In operation the tank C is partially filled with a liquid hydrocarbon, and the pump C' is then actuated until sufficient pressure is brought to bear upon the hydrocarbon to force the latter through the feed-pipes to the burners, the supply from the tank to one or other of the burners being cut off by closing one of the valves *e* when necessary, this depending entirely on the condition and temperature of the snow to be melted. After igniting the oil at the burners the temperature will in a short time be raised to an extent sufficient to vaporize the oil passing through the pipes *d' d³*, and the product of the burners will then be an oil-vapor, which may be mixed at the burners with a suitable quantity of air to insure complete combustion. The flames under the pressure of the air in the tank C will be sufficiently long to reach to the rear of the furnace and will impinge directly upon the snow thrown through the entrance-door.

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

1. A snow-melting apparatus comprising a closed tank having a doorway for the passage of the snow to be melted, an injector-burner adapted to direct a jet of flame into direct contact with the snow to be melted, and a deflecting-plate located within the tank between the burner and the doorway to direct the flame toward the lower rear end of the tank, substantially as specified.

2. A snow-melting apparatus comprising a closed tank having at one end a doorway for the passage of the snow to be melted, a door for closing said doorway, an outlet at the lower end of the tank, an injector-burner adapted to direct a jet of flame against the snow to melt the same by direct contact, and a deflector-plate between the burner and the doorway, substantially as specified.

3. The combination of the closed tank, A, having a doorway for the passage of the snow to be melted, a door, I, for closing the same, a deflector-plate extending inwardly from below the doorway, a screen, *l*, between the deflector-plate and the bottom of the tank, an outlet-pipe, K, and an injector-burner, E, located at or near the end of the furnace below the deflector-plate to direct an impinging flame against the snow, substantially as specified.

In witness whereof I have hereunto set my hand this 11th day of August, A. D. 1897.

JOSEPH B. GREENIG.

Witnesses:
J. HENDERSON,
W. S. FURST.