2 Sheets—Sheet 1.

J. MULLALY & J. T. HAWKINS.

MACHINE FOR MELTING SNOW.

No. 181,964. Patented Sept. 5, 1876.

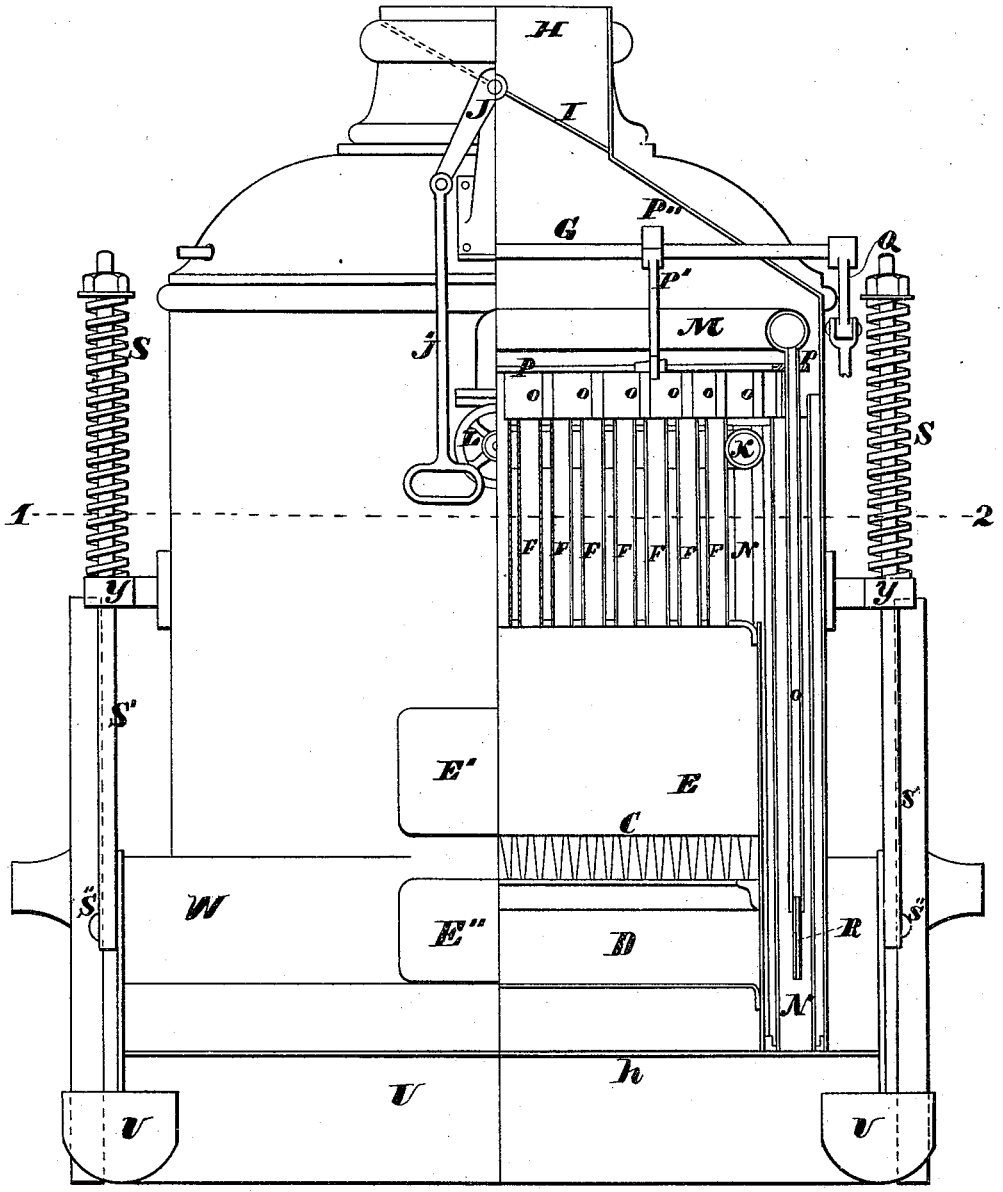

Fig. 1

Witnesses

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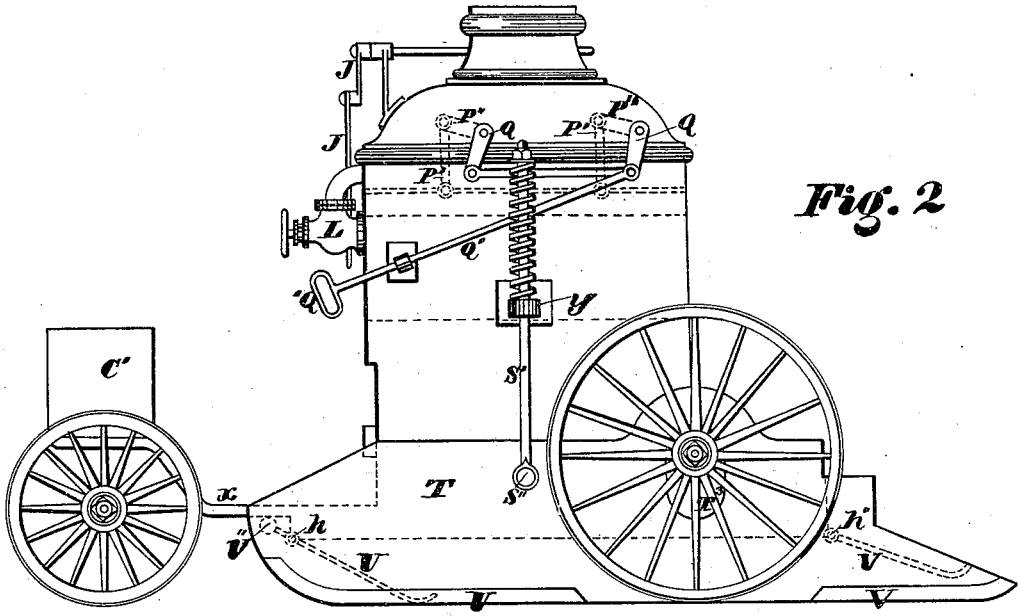

Fig. 2

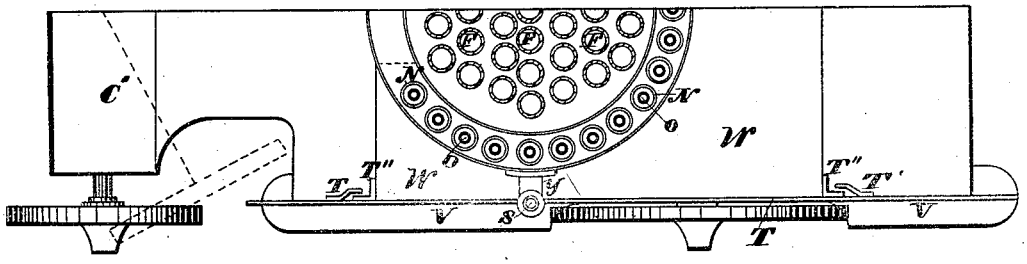

Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN MULLALY, OF NEW YORK, N. Y., AND JOHN T. HAWKINS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR MELTING SNOW.

Specification forming part of Letters Patent No. **181,964**, dated September 5, 1876; application filed May 4, 1876.

To all whom it may concern:

Be it known that we, JOHN MULLALY, of New York city, New York, and JOHN T. HAWKINS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Melting Snow and Ice on Streets, Roads, &c.; and we 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a representation of the snow-melting machine, one-half being in section and the other half being a front elevation. Fig. 2 is a side elevation of the machine. Fig. 3 is a plan view, showing one side half of the machine, with the top of the steam-boiler removed to exhibit the interior arrangements.

This invention has relation to a machine for the removal of snow and ice from streets, roadways, and railway-tracks, through the agency of steam ejected from a boiler portably mounted on wheels.

The object of this invention is, primarily, the utilization of the whole of the heat resulting from the combination of the fuel in the furnace of the apparatus; and said invention accordingly consists, first, in the novel construction, combination, and arrangement of the parts pertaining directly to the boiler and furnace, whereby the operation of the draft and the circulation of the heat-currents and steam are controlled sufficiently for the purposes in view; and, secondly, in the improved construction and arrangement of parts pertaining directly to the carriage upon which the boiler and furnace with water-tank and coal-box are situated.

Referring to the accompanying drawings, A designates the boiler, having the general form of a vertical tubular boiler, C being the grate, D the ash-pit, E the fire-box or combustion-chamber, E′ the furnace-door, and E″ the ash-pit door. F F are the vertical tubes through which the gases from the fire first pass into the uptake G. H is the ordinary chimney, in which is the damper I, operated by the lever J and handle J′. K is a dry-pipe, perforated on its upper side with a sufficient number of small holes for the passage of the steam to its interior. This pipe is in the form of a ring, and is situated in the space between the outer tubes F and the descending chimney-tubes N. The dry-pipe K communicates with the stop-valve L, which, in turn, communicates with the pipe M, also in the form of a ring, and situated in the uptake G. N N, &c., are a series of descending chimneys, passing down through the legs of the boiler, and surrounded with the water in the same. O O are small tubes, the upper ends of which are inserted in the tube M, and, passing down in the centers of the chimney-tubes N, terminate in nozzles R. These nozzles are arranged to screw into the lower ends of the tubes O O, so they may be readily adjusted as to the size of openings for the escape of steam through them. P is a damper, in the form of a flat ring, perforated so as to pass over the tubes O O, and of sufficient width to cover the tops of the chimney-tubes N N. This damper is suspended from the four links P′ P′, and is raised or lowered at will by means of the levers P″ P″, Q Q, and the handle Q′.

The operation of the parts already described is as follows: First, in getting up steam, the damper P is lowered on the tops of the descending chimneys N N, and the damper I is opened. When steam has been raised to the desired pressure, the damper I is closed and P opened. Then steam is admitted through the stop-valve L into the pipe M, and thence through the tubes O O, &c., making its escape from the nozzles R R, these nozzles forming the descending draft in the small chimneys N N, as with the ordinary exhaust-blast of a locomotive or steam fire-engine, the draft being in this case downward. While the steam and hot gases are thus forcibly projected upon the snow or ice, the machine is drawn over it at a rate depending upon the depth of snow or ice to be melted, and the quantity of steam and heated gases flowing from it. It is purposely designed to have this boiler impart a high degree of superheat to the steam, as, it will be seen, must be the case with the very considerable superheating-surface contained in the ring M and descending tubes O.

W is the water-tank, surrounding the bottom of the boiler, and designed to carry one-

half hour's supply of water for the boiler. C′ is the coal-box, forming a seat for the driver, in which coal for the same period is to carried. T T are pieces of plate-iron, carrying a semicircular shoe, U, suspended by the pins S″ S″, rods S′ S′, and springs S S in such a manner that the springs S S shall just balance their weight when upon the bare ground, thus assisting them to rise and fall with the inequalities of the snow, or on meeting with an obstruction, automatically. These plates are held from motion endwise by the slots T^3, which pass over the axle or over suitable projections on the water-tank for that purpose.

The plates T T are prevented from side motion by the lugs T′ T′ and T″ T″, the former being attached to the plates T T, and the latter to the water-tank W. V is a plate or door, hinged at *h*, having the bottom end curved, as shown, so that the apparatus may be backed without obstruction from it, and, extending across between the plates T T, the bottom end dropping into an opening cut in the side of the shoe U for its reception. This plate or door is counterbalanced by a weight, V″, so as to slightly preponderate on its curved end. V′ is a similar door, hinged at *h′*, but not counterbalanced, and resting upon a stop on the plates T T, so that it can never entirely close. The plates T T and the doors V V′ form a comparatively tight box, into which the heated gases and steam are projected, preventing annoyance to other vehicles, and providing for a discharge of the cooled products of combustion from the rear end of the machine only. The operator stands at *x*, where all handles, valves, &c., are at his command.

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

1. The combination of the dry-pipe K, superheating-pipe M, superheating-tubes O, descending chimneys N, and damper P, substantially as and for the purpose set forth.

2. The inclosed box, formed by the self-adjusting plates T, shoes U, and doors V V′, in combination with the springs S S, substantially as described.

3. The combination, with the boiler, having the descending chimneys and steam-jets, of the inclosed box, formed by the plates T T, doors V V, &c., substantially as described.

4. In a snow-melting machine, the combination, with the steam-boiler, of the descending chimneys N, and descending steam tubes O, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands this 29th day of January, 1876.

JOHN MULLALY.
JOHN T. HAWKINS.

Witnesses:
JOHN R. MUMFORD,
JAMES J. CONNER,
SAML. J. VAN STAVOREN,
ANTHONY A. CONNOLLY.