No. 642,314. Patented Jan. 30, 1900.

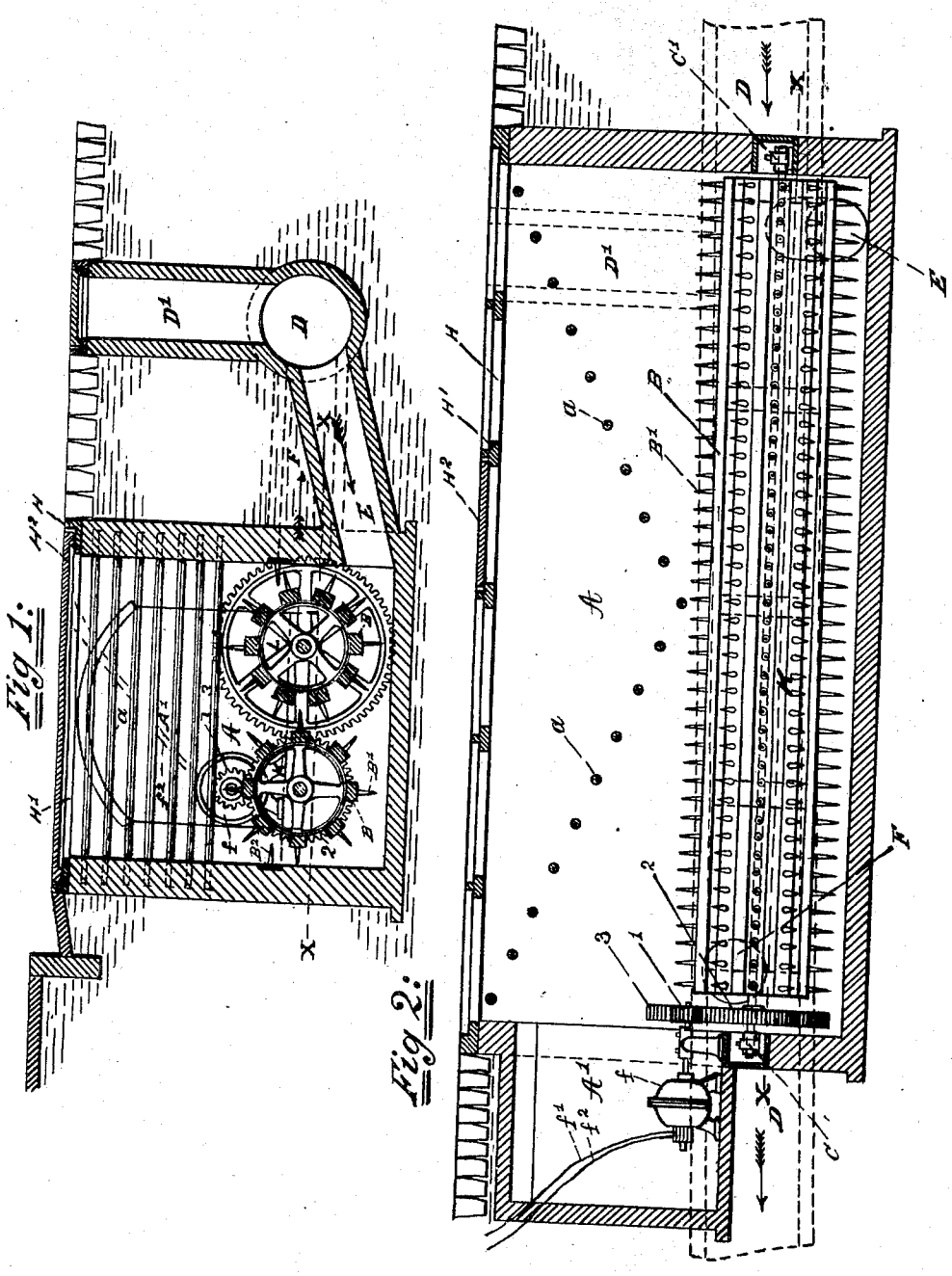
T. FINIGAN.

SYSTEM FOR LIQUEFYING SNOW AND DISPOSING OF SAME.

(Application filed Jan. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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Fig 3:

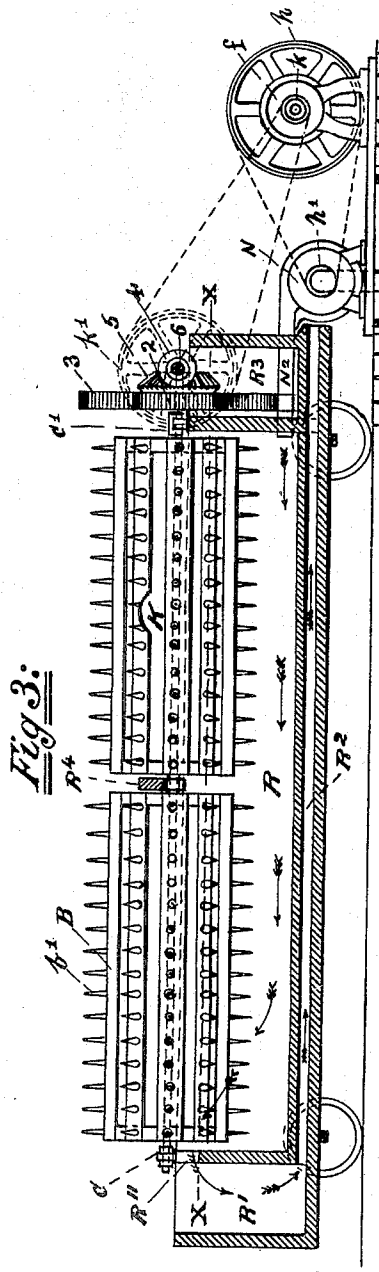
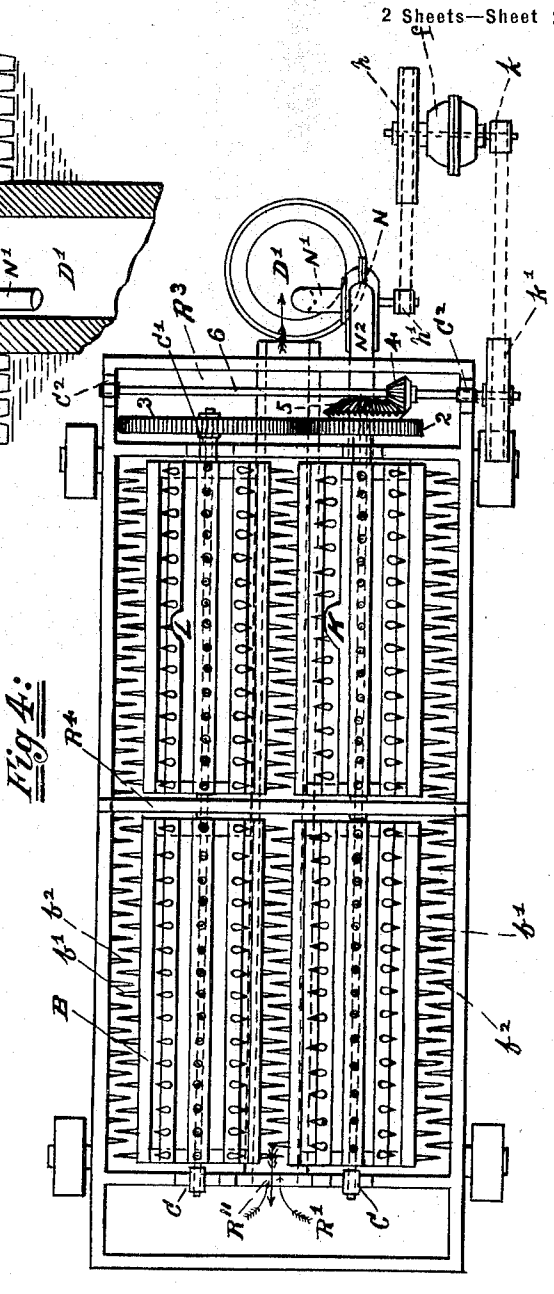


Fig 4:



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

UNITED STATES PATENT OFFICE.

THOMAS FINIGAN, OF PATERSON, NEW JERSEY, ASSIGNOR OF TWO-THIRDS TO JOHN HINCHLIFFE AND EDWARD D. CUNDELL, OF SAME PLACE.

SYSTEM FOR LIQUEFYING SNOW AND DISPOSING OF SAME.

SPECIFICATION forming part of Letters Patent No. 642,314, dated January 30, 1900.

Application filed January 27, 1899. Serial No. 703,633. (No model.)

To all whom it may concern:

Be it known that I, THOMAS FINIGAN, a citizen of the United States of America, and a resident of Paterson, Passaic county, New Jersey, have invented a new and useful Improvement in Systems for Liquefying Snow and Disposing of Same, of which the following is a specification.

The object of my invention is to provide a system of disposing of the snow that falls in the streets of cities and which so often interferes with and interrupts business and travel, especially in our larger cities.

A further object of my invention is to so dispose of the snow as to utilize the great quantities of heat contained in the waters passing through the sewers. According to the report of a chief engineer the water consumed in the boroughs of Manhattan and the Bronx, in greater New York, during the month of June, 1898, averaged daily two hundred and thirty-eight million gallons, or one hundred and nineteen gallons per head per day for an estimated population of two million. Much of this water which passes through the sewers has been heated in consumption in private dwellings, hotels, and mills and factories of various industries, and from actual observation and tests made under my supervision it has been ascertained that the water passing through the sewers in the borough of Manhattan in the winter when snow was on on the ground was of a temperature varying from 50° to 180°.

My system of liquefying snow consists in the disintegration of the same, reducing it into the smallest possible particles, and simultaneously immersing and agitating it in a body of running water.

My system is illustrated in the accompanying drawings, which form a part of this specification.

Similar letters and numerals of reference in the various figures indicate like parts.

In the drawings, Figure 1 is a view showing a cross-section of a vault or melting-chamber in which may be placed a disintegrating and agitating apparatus and which is connected with the sewer D by an inlet-pipe E and an outlet-pipe F, D′ being the sewer-manhole. Fig. 2 is a longitudinal sectional view of the same, showing a chamber A′, in which is an electric motor *f* to drive the disintegrating-drums K and L, which are mounted to revolve in bearings C and C′. Breaker-bars are shown and indicated by the letter *a*. Fig. 3 is a longitudinal sectional view of a portable trough or catch-basin in which revolving spiked drums are mounted and operated, the arrows indicating the course of the water in entering and leaving the trough or catch-basin; and Fig. 4 is a plan view of same.

I propose to use the receiving-basins in the streets at present by enlarging the same and making an inlet from the sewer, there being an outlet, and to divert the water from the sewer to the basin, utilize it in liquefying the snow, and return it and the melted snow to the sewer again, or, if this is not convenient or advisable, to sink a vault or melting-chamber in the street of sufficient length and width between the sewer and the curb, providing an inlet from the sewer and an outlet to the same. In said receiving-basin or melting-chamber may be placed the spiked drums K and L, which are secured to shafts mounted to revolve in suitable journals or bearings C and C′ or any suitable disintegrating and agitating device.

The iron spikes or pins may be made to project four inches or more from the surface of the drums. The drums may be made to revolve toward each other, and as they so revolve the spikes on one drum intermesh with or pass between the spikes on the other drum from the top downwardly. One drum may be caused to revolve four times faster than the other or in such proportion as the circumstances of the case require.

The broken line *x x* represents the surface of the water, and the arrows show the course of the water from the sewer to the receiving-basin or melting-chamber and back to the sewer.

The pinion 1 on the motor meshes with and

turns the gear 2 on the shaft of the drum K and in turn the gear 2 turns the gear 3 on the shaft of the drum L.

As shown in Figs. 1 and 2, the bottom of the melting-chamber is lower than the bottom of the sewer, and the spikes on the revolving shafts turn, so as to thoroughly agitate and keep in motion the water and melting snow.

An electric motor is shown as the power-supplying means; but other power might be used by connections from shops or other buildings in front of which the vaults are sunk in the street. Many ways and means have been devised in late years to solve the problem of doing away with the snow nuisance, and it has resolved itself into this that the first important essential step is to bring about as thorough a disintegration of the snow as possible and while it is so reduced to the smallest possible particles to bring to bear the necessary heat to cause liquefaction. A particle of snow, as a snowflake, instantly melts when it strikes an object or an atmosphere of a higher temperature than itself, and it is the object of my new system to bring about this disintegration of the snow and simultaneously apply the heat and agitation to liquefy it.

I find that my system with an agitating and disintegrating apparatus mounted in a portable melting-chamber and water at a temperature of 40° will liquefy snow quickly. Hydrant-water may be used.

In the sides of the walls side pins or spikes B^2 are secured, as shown in the drawings, to intermesh with the spikes B′ on the drums as they revolve.

The vault or melting-chamber is laid even with the street at the top, as shown in Figs. 1 and 2, and is covered with a plate H^2, which is laid on cross bearing-bars H′ in the cover-frame H. The break-bars *a* extend across the melting-chamber, forming a V-shaped cradle to receive the snow when it is dumped into the melting-chamber and to perform the first work in the way of disintegrating the snow. The operation of liquefying the snow is to throw it into the melting-chamber or receiving-basin, when it is separated and passes through the cradle-bars *a* onto the revolving drums K and L and is drawn down between the drums by means of the intermeshing pins or spikes B′ on said drums, aided by the difference in speed thereof, and is in this disintegrated condition immersed in the current of water as it moves through the melting-chamber, being kept in continual agitation by the revolving spiked drums until again discharged into the sewer to be followed by a new supply of warm water and disintegrated snow, and so on, *ad libitum*.

As I wish to claim, broadly, my system, I do not wish to limit myself to any particular structure for disintegrating and agitating the snow.

Instead of sinking new vaults or extending the sewer catch-basins now in use portable troughs or melting-chambers, such as shown in Figs. 3 and 4, may be used to carry out my ideas and system. In this latter case the method is the same, but the means used slightly different. Fig. 3 is a longitudinal section of a portable trough in which revolving spiked drums are mounted and operated, as in the first instance. Fig. 4 is a plan view of the portable trough with apparatus mounted therein. In Figs. 3 and 4 a centrifugal pump N is shown, which is operated by a motor *f* by belt on the pulleys *h h′* and takes the water from the sewer through the suction-pipe N′ and delivers it to the trough through the delivery-pipe N^2, whence it flows to the revolving drums and over into the overflow-chamber R′, and thence to the return outlet-pipe R^2 and to the manhole of the sewer. At the end of the trough is a chamber R^3 for gearing driving drums. A cross-shaft 6, having secured thereto a bevel-pinion 4, which meshes with the bevel-gear 5 on shaft of drum K, drives the apparatus by means of belt on pulleys *k* and *k′*.

The construction of the drum with the lags B separated and the spikes secured in the lags is such as to freely admit water to pass to the interior of the drums.

When it is advisable to divert the water of a sewer to the receiving-basin or melting-chamber, it may be done by dropping one or more sand-bags into the sewer between the inlet and the outlet connecting the sewer and basin.

With this description of my invention, what I claim is—

1. In a system for liquifying snow, the combination of a receptacle, through which passes a body of water, and an agitator arranged and adapted to disintegrate the snow before it is delivered to said body of water.

2. In a system for liquefying snow and disposing of the same, the combination of a catch-basin, a sewer and connections between said sewer and catch-basin, with a snow disintegrating, immersing and agitating machine, arranged and adapted to disintegrate, immerse and agitate the snow in said catch-basin, substantially as set forth.

3. In a system for liquefying snow, the combination of a catch-basin, provided with spikes projecting from the inner walls thereof, with transverse angle-bars forming a V-shaped cradle, adapted to be placed in said catch-basin through which passes a body of water, and a snow disintegrating and agitating machine, arranged and adapted to disintegrate and agitate the snow in said body of water, substantially as set forth.

4. In a system for liquefying snow a portable catch-basin or snow-receptacle, a sewer, and pipes connecting the said basin or receptacle with the sewer, in combination with a

snow disintegrating and agitating machine mounted in said basin or receptacle, and adapted to disintegrate, immerse and agitate the snow, substantially as set forth.

5. In a system for liquefying snow and disposing of the same, the combination of a receptacle, through which passes a body of water, and a machine arranged and adapted to disintegrate, and then immerse and agitate the snow, in said receptacle, substantially as set forth.

THOMAS FINIGAN.

Witnesses:
JOHN F. KERR,
I. F. BOICE.