Jan. 23, 1923. 1,443,329

P. A. WEIGERT.
STEAM THAWING APPARATUS.
FILED JAN. 24, 1922.

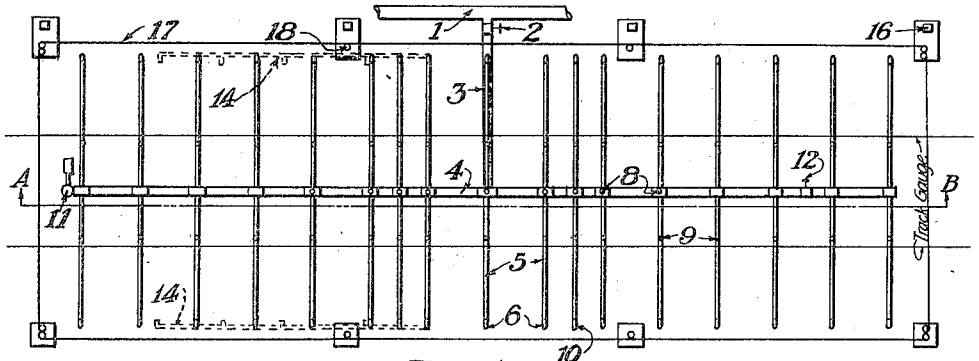


Fig. 1

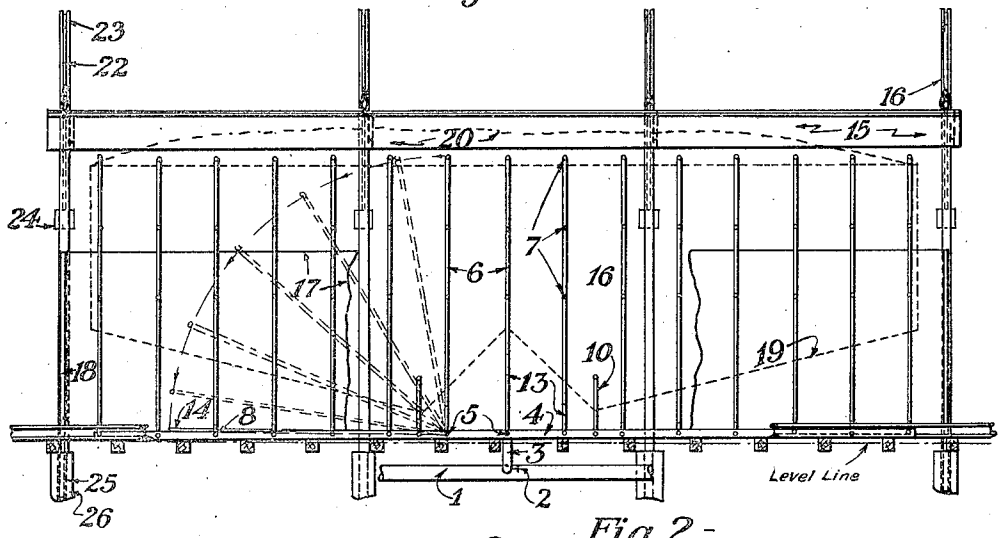


Fig. 2

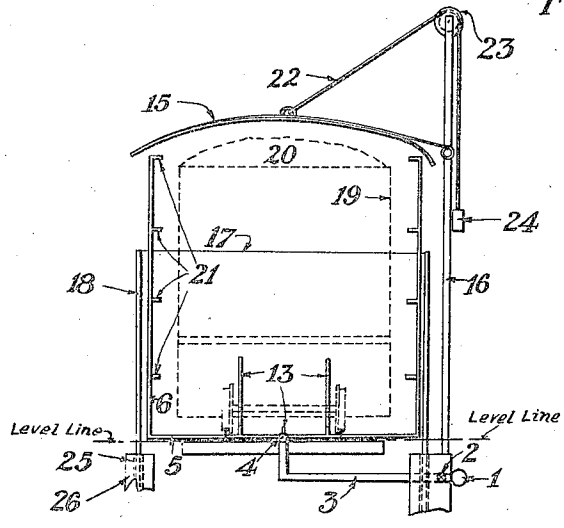


Fig. 3

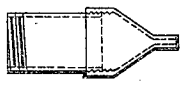


Fig. 4

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UNITED STATES PATENT OFFICE.

PETER ALBERT WEIGERT, OF BALTIMORE, MARYLAND, ASSIGNOR TO WESTERN MARYLAND RAILWAY COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

STEAM THAWING APPARATUS.

Application filed January 24, 1922. Serial No. 531,487.

To all whom it may concern:

Be it known that I, P. A. WEIGERT, a citizen of the United States, residing at No. 1701 Patterson Park Avenue, in the city of Baltimore, State of Maryland, have invented a new and useful Improvement in Steam Thawing Apparatus, of which the following is a specification.

The object of this invention is to provide an efficient apparatus for thawing frozen material such as is often found in freight cars,—coal, ore, earth, gravel, etc.—by the direct application of steam to the car or other vehicle so that the material may be unloaded through drop doors at the bottom, or from the top by the use of a mechanical car dumper, or otherwise. The object of the invention is, further, to provide at relatively small expense a relatively more efficient apparatus than has heretofore been used for such thawing purposes, and to provide an apparatus which does not require the construction of a special or permanent building or track layout, although it may be used in connection therewith, but can be set up and used at any point on a railroad track or other roadway and can be used without being housed within a building or other permanent structure.

By a direct application of steam simultaneously at a number of points at the bottom, sides and top of the car an intense heat envelope is created which has the effect of changing the condition of the material within the car in a very short time from a frozen mass to a condition in which it can be handled effectively and discharged in the same manner as material which contains little or no frost. In actual practice the application of steam by means of this apparatus has thawed material frozen to a thickness of from six inches to one foot from the outside edges of the car in two to five minutes. Ordinarily such thawing of the surfaces of the material is sufficient to permit it to be freely discharged from the vehicle as it is but necessary to release the surface material to effect a complete discharge of the lading, gravity and the weight of the material itself ordinarily being sufficient to break it up into sufficiently small chunks, masses or particles, if it be frozen to a greater depth from the surface, so that the whole load is released. This effects a saving of from one to five hours in unloading time for each car. Due to its simplicity and low cost of construction and erection it is superior to the thawing house method, where a building say, 400 feet long, 30 feet wide, and 25 feet high must be constructed, ordinarily involving a special track layout, at an excessive cost which includes elaborate piping features, expensive steam plant and other machinery necessary to its operation. The thawing apparatus herein described can be taken down at small expense and stored when not needed, and replaced in a few hours. It may be put into use most effectively at a point or points within reach of any constant source of steam supply, such for instance, as a steam plant which is often constructed in connection with the operation of machinery at a modern coal pier, although it is possible to set it up and use it at any point at which a locomotive, for instance, may be used as a temporary source of steam supply. This gives great elasticity to the use of the apparatus at various temporary or permanent locations. The amount of pressure required for operating it varies with its size. The particular unit which is illustrated in the accompanying drawings may be effectively used with a steam pressure of from 50 to 200 pounds.

I attain the above mentioned objects by a mechanism which comprises a set, sets or series of pipes or conduits through which the steam is conducted and projected against the bottom sides or/and top of a car or cars, simultaneously so as to envelop the entire surface of the vehicle and its lading, or locally so that parts which may be more frozen than others may be thawed without wasting steam by unnecessarily expelling steam coincidentally from the whole apparatus. With these pipes or conduits there may be used a movable top, and a windshield for enclosing the side, sides, end or ends of a car or cars.

This mechanism is illustrated by the accompanying drawing in which Figure I is a ground plan, Figure II is a vertical or longitudinal cross section, A—B; Figure III is an end elevation, Figure IV represents a jet or nozzle which may be used for concentrating and directing the steam against a car when it is projected from a pipe.

A more detailed description of my apparatus is as follows:—

From the steam main 1 to which steam may be supplied from any suitable source, the steam is conducted through a feed pipe 3 through valve 2 to feed pipe 4. There may be one or more of these feed pipes 4, from which branches 5 carry the steam to upright pipes 6 from which it is projected through an opening or openings 7 which may be one or more in number in each pipe, against the sides of the car 19. In feed line 4 there are openings 8 from which the steam may be projected against the bottom of a car or cars. These openings may be at the points indicated on the drawings or at other convenient points in the feed pipe 4. In branch pipes 5 there are openings 9 through which the steam may also be projected against the bottom of a car. These openings 9 may be at other points on branch pipes 5 than those indicated on the drawings. If desirable, these openings 7, 8 and 9 may be fitted with nozzles, nipples or jets 13, 21, such as are illustrated in Figure IV, in order to concentrate the steam and force it more directly against the car and its lading. By means of valves 12 in the feed pipe 4 the steam may be excluded from one or more sections or units of the system if desirable, when, for instance, a car shorter than the average is being thawed, or the steam is being applied to a single car instead of two or more cars. The branch lines 5 may slope toward feed line 4 which may be lower at one end than at the other. At the lower end of the feed pipe 4 there is an automatic drain 11 which when the apparatus is not in operation and the steam pressure is cut off, automatically drains the system of any condensed steam which may accumulate. Freezing and unnecessary rust is thereby avoided.

At openings 9 in branch lines 5, and openings 8 in feed line 4, there may be adjustable nipples, nozzles or jets, by which the steam may be conducted closer to the bottom of the car before being projected against it, in order to give it the maximum effectiveness.

Up-right pipes 6 may be lowered from their erect position when not in use without disconnection, as shown by position 14 in Figure II. The steam may be thus concentrated against some particularly difficult part to thaw more effectively. Track and car clearance may also be assured when necessary by lowering all uprights completely to the ground.

The adjustable top 15 is attached to standards 16 and catches, retains and deflects against the top of the car or material 20 therein, the steam which arises from the bottom and sides of the car—from openings 7, 8 and 9 in feed line 4 and branch pipes 5 and erect pipes 6. This top may be made portable so that it can be removed and stored when not needed. In the particular illustration in the drawings, the top is shown to be constructed so that it can be raised by means of cables 22, pulleys 23 and counterweights 24.

The windshield 17 may be attached to the standards 16 which support the top, or special standards 18. It may be made in units and may be made portable in whole or in part and may be used at either one or both sides or ends of the car as weather conditions demand. It may be made of any suitable material, such as canvas, for instance, to be rolled on poles or uprights; or of sheet metal or boards.

If it is desired to make the top and windshield portable the standards 16 and/or 18 may be made to rest in and be supported preferably by a sleeve 25 embedded in a stationary form 26.

The top 15 and the windshield 17 make the use of the apparatus very much more economical and effective, although it may be used effectively without either.

Figure II gives a view of the features above described from a vertical, longitudinal cross section.

Figure III gives an end view of the same features.

The drawings merely show one unit of the apparatus, but it may consist of several units and each unit may consist of a greater or less number of pipes or conduits than are shown in the drawings.

By thus using steam for thawing frozen material in cars there is eliminated the dust, soot and gases which are coincident to the use of hot air for thawing purposes, as in the old thawing house method. Soot and dust do not accumulate upon the tracks and the car can more readily be released by gravity after the thawing operation is completed. The car is not subjected to gases, soot and dust, and is subject to heat for a much shorter period of time; there is, therefore, much less wear and depreciation on the car. The paint is less damaged, rusting less violent, and danger of frame-buckling less present.

The use of this apparatus, doing away, as it does, with the necessity of a permanent building, likewise dispenses with the expense attached thereto. For instance, the heavy lighting expenses made necessary to meet the legal requirements for the safety of men working in thawing buildings, are eliminated. Moreover, a track which has been used in connection with this apparatus may be restored to normal use with safe clearance when the thawing apparatus is removed or when the upright pipes are lowered to track level. A single car can be subjected to special thawing treatment

either more or less intense, and it is not necessary to retain subject to the same thawing process, a whole line of cars which may be frozen to different degrees and thus thaw the least frozen car as long a time as the one most frozen, as in the case when the old thawing house method was used. Moreover, the erection of this apparatus need not interfere with the location or operation of switches and if located with that end in view may be used incidentally to keep a switch free from an accumulation of ice.

Although I have shown certain of my improvements in considerable detail, I do not limit myself to the exact particulars of the construction, arrangement or sections, shown and described but may use such substitutions, modifications, or equivalents thereof as are embraced within the scope of my invention and as pointed out in the claims.

Having thus described my invention, I, therefore, claim:

1. In a thawing apparatus a combination of a steam supply main or mains and a series of branch pipes arranged at suitable intervals along the bed and sides of a railroad track or other roadway—said pipes having perforations located at points suitable for the projection of steam as desired against the surfaces of a vehicle adapted to pass over the track.

2. In an apparatus for thawing material in cars or other vehicles, a combination consisting of pipes or conduits and a combination of sets or series of such pipes or conduits through which live steam superheated or otherwise may be conducted, projected or released from openings therein simultaneously against the whole surface, including the sides, bottom or top of a car or cars, and the material therein, or locally against some part or portion thereof.

3. In a thawing apparatus a combination of a steam supply main or mains and a series of branch pipes arranged at suitable intervals along the bed and sides of a railroad track or other roadway—said pipes having perforations located at points suitable for the projection of steam as desired against the surfaces of a vehicle adapted to pass over the track; the said series of pipes being so arranged that any condensed steam which may accumulate in the apparatus will be freed through an automatic drain or drains at the lower end, or other low point, of the said steam supply main or mains, which would allow such condensed steam to pass off.

4. In a thawing apparatus a combination of a steam supply main or mains and a series of branch pipes arranged at suitable intervals along the bed and sides of a railroad track or other roadway—said pipes having perforations located at points suitable for the projection of steam as desired against the surfaces of a vehicle adapted to pass over the track, the said series of pipes being so arranged that any condensed steam which may accumulate in the apparatus will be freed through an automatic drain or drains at the lower end, or other low point, of the said steam supply main or mains, which would allow such condensed steam to pass off, which automatic drain by means of a steam valve would allow such condensed steam to pass off when the steam pressure is removed and the apparatus is not in operation.

5. In a steam thawing apparatus for the thawing of bulk material in cars a combination of a set, sets or series of pipes or conduits with openings therein through which steam may be projected against the surfaces and jets or nozzles attached to some or to all of the openings to project the steam more forcefully and directly against such surfaces, or to concentrate or direct it more effectively against certain local parts of the vehicle or its lading.

6. In a steam thawing apparatus for the thawing of bulk material in cars or by the direct application of live steam against the bottom, sides and top of a car or cars and the lading therein, a combination of pipes or a set or series of pipes or conduits with openings therein through which the steam may be projected, and a movable or adjustable top which may be placed above the car to catch and deflect the steam against the top of the car and its lading, as it rises from the sides and bottom thereof.

7. In a steam thawing apparatus for the thawing of bulk material in cars by the direct application of steam simultaneously against all the surfaces of a car and its lading or against part only thereof, a combination of a set, sets or series of pipes or conduits with openings therein through which the steam may be projected; and jets, nozzles or nipples attached to such pipes or some or all of such openings therein to concentrate the steam or project it more forcefully or directly against the said surfaces, some of which jets may be adjustable or movable to enable the steam to be more effectively directed against the car; and a movable or adjustable top to catch and deflect the steam against the top of the car or material therein as it rises from the sides and bottom of the car or vehicle; and a windshield or windshields which may be made in units and may be either portable or stationary to deflect the wind away from the sides, side, end or ends of the vehicle in order to prevent any appreciable dissipation of the steam and to allow it more effectively to envelop the car.

8. In a steam thawing apparatus for the thawing of bulk material in cars by the direct application of live steam against the

surfaces of a car, a combination of a set or sets of pipes or conduits including a feed pipe or pipes and branches therefrom, with an automatic drain at the lower end of the feed pipe, and with openings therein through which the steam may be projected from the feed pipe and branches directly against the bottom of a car, to which feed pipe and branches may be attached at such openings adjustable height or stationary nipples or nozzles to direct the steam against the bottom of a car; such apparatus also including erect or upright pipes or conduits with openings to direct the steam against the sides and top of a car, so that they may be lowered from their erect position when not in use without disconnecting them from the rest of the apparatus.

9. In a thawing apparatus a combination of a steam supply main or mains, and a series of branch pipes arranged at suitable intervals along the bed and sides of a railroad track or other roadway—said pipes having perforations located at points suitable for the projection of steam as desired against the surfaces of a vehicle adapted to pass over the track; with a wind shield or windshields which may be made either portable or stationary, to deflect the wind from the side, sides, end or ends of the vehicle.

10. In a thawing apparatus a combination of a steam supply main or mains and a series of branch pipes arranged at suitable intervals along the bed and sides of a railroad track or other roadway—said pipes having perforations located at points suitable for the projection of steam as desired against the surfaces of a vehicle adapted to pass over the track. Said apparatus may be either permanently located or temporarily erected at a particular point.

In testimony whereof I hereunto affix my signature.

PETER ALBERT WEIGERT.