

May 27, 1952

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2,598,293

THAWING PIT FOR RAILWAY CARS

Filed June 6, 1951

2 SHEETS—SHEET 1

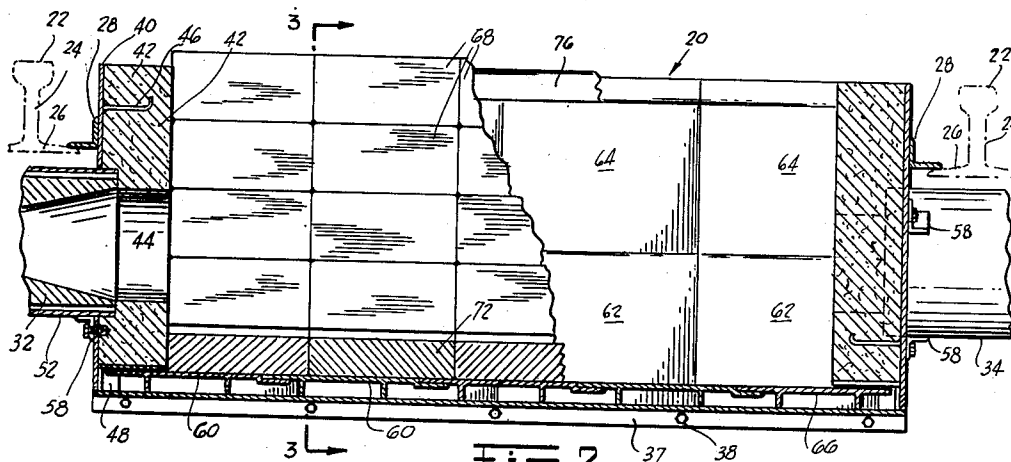


Fig. 2.

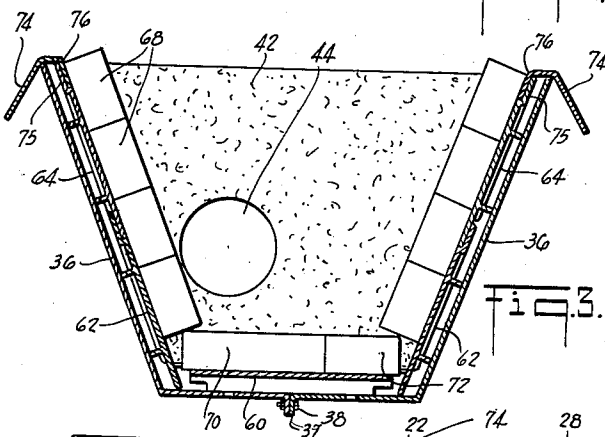


Fig. 3.

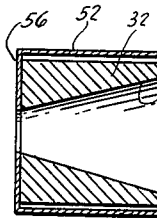


Fig. 6.

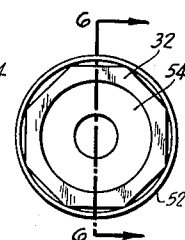


Fig. 5.

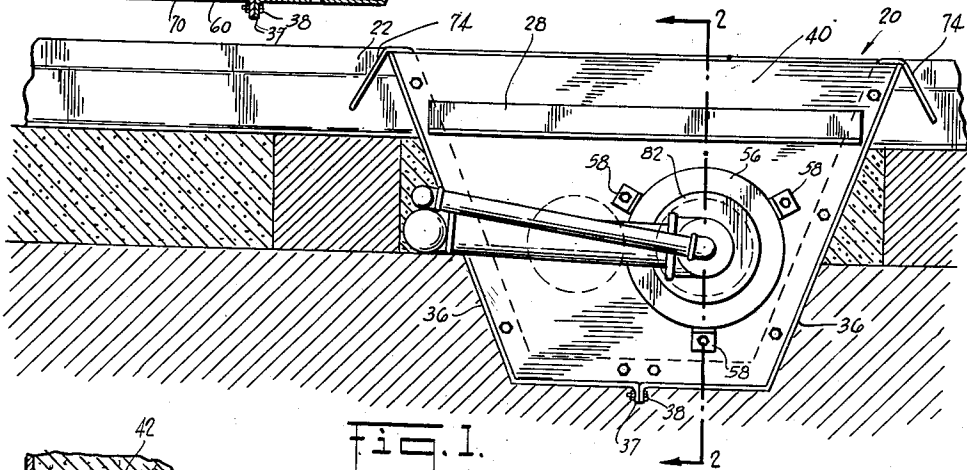


Fig. 1.

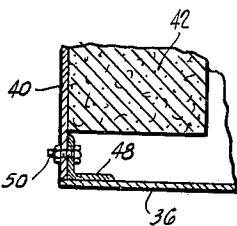


Fig. 4.

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2 SHEETS—SHEET 2

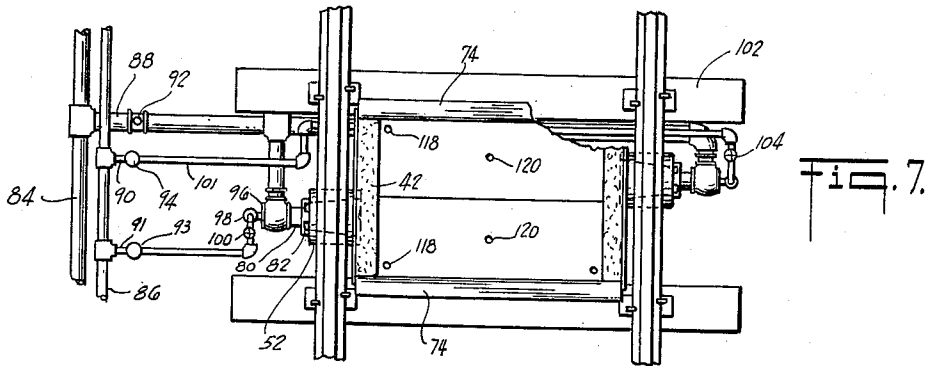


Fig. 7.

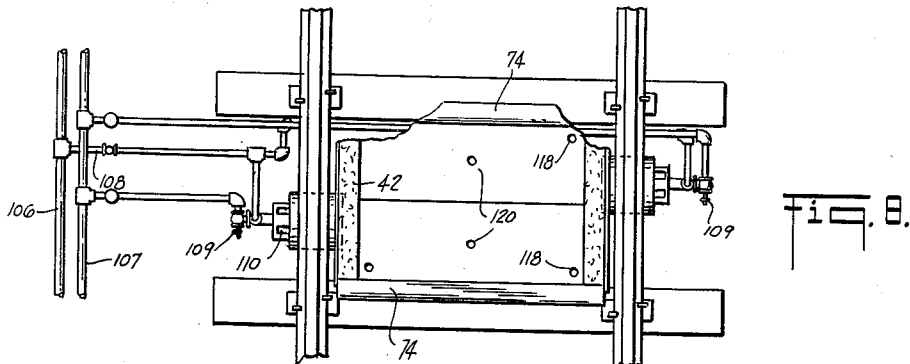


Fig. 8.

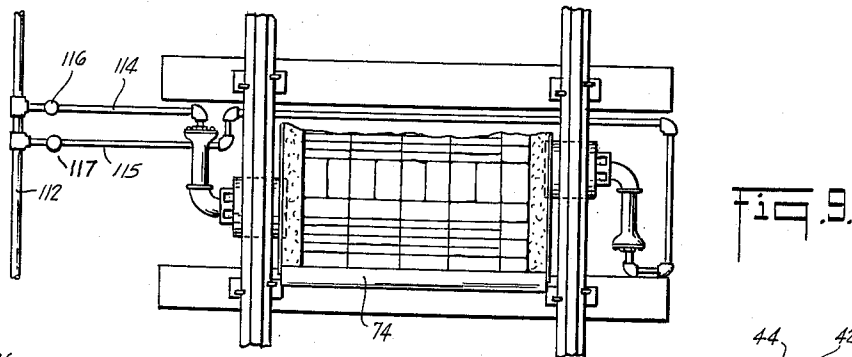


Fig. 9.

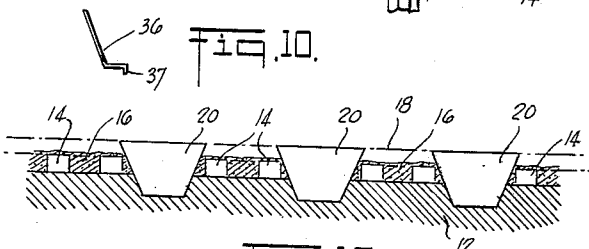


Fig. 10.

Fig. 11.

Fig. 12.

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2,598,293

THAWING PIT FOR RAILWAY CARS

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Application June 6, 1951, Serial No. 230,235

18 Claims. (Cl. 104—1)

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This invention relates to the thawing of railway cars, and more particularly to a radiant heat thawing pit for thawing hopper cars carrying coal, gravel, coke, or other such material.

The primary object of the invention is to generally improve thawing pits. Such a pit is described in U. S. Patent 2,489,874 issued November 29, 1949 to Walter C. Elze and Alexander J. Turpin. A series of such pits is needed along the track because the object is to thaw out not merely the hopper doors but rather the entire load, for otherwise when the doors are opened only a small part of the load will drop, and the rest will remain frozen in a bridge over the doors. Thus the pits preferably should provide heat directed upwardly against an entire car, or in large installations against a series of cars to thaw out an entire load.

However, pits heretofore known were masonry pits, and each pit unit was expensive to construct, it being necessary to have a construction crew to lift the rails, remove the ties, excavate, build forms, pour the masonry pits, install the fire brick, the burners and the piping, and finally to restore the rails, etc. Various categories of workmen would be required for these different jobs, and the construction of thawing pits has heretofore been a very costly undertaking.

One prime object of the present invention is to greatly reduce the cost. A more specific object is to provide a pit so shaped as to better deflect and radiate heat upwardly. Another object is to devise a pit so compactly dimensioned that it may be manufactured under factory conditions and shipped to the site, where it may be lowered between the rails with a minimum of excavation and disturbance of the roadbed. The economy and convenience may be further improved by making the pit for shipment in "knocked-down" form, and with a construction such that it may be readily and rapidly assembled at the site.

Still another object is to adapt the pit for use with a variety of burners, and to so space the burners in relation to the pit as to obtain efficient combustion and heat radiation while limiting the pit to small dimension as aforesaid, this being done by adding ignition tiles to the outside of the pit beneath the rails after the pit has been lowered between the rails.

For convenience, strength, and compactness, the shell of the pit is made of steel plate. This is protected by a heat insulating medium, which in turn is lined with fire brick, and the fire brick is preferably standard fire brick laid loosely in

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position, so that it may be purchased locally, if desired, instead of being shipped by the manufacturer of the pit. Still another object is to provide a heat insulating medium which will shed water, this being desirable not only because of rain or snow conditions, but also because a substantial amount of water may be released when a hopper car is thawed out. With this object in view we employ relatively light-weight heat deflecting cast iron plates as an insulating medium, these being ribbed to provide an air space. Inverted trough-like metal caps are preferably provided along the top edges of the pit to close the resulting air space, and in accordance with a further feature of the invention these caps are sloped outwardly in such a way as to minimize the chance of broken linkage or the like, dragging from a moving car, becoming caught on the edge of the pit. The bottom of the pit is also provided with holes to drain any water collected.

To accomplish the foregoing objects, and other objects which will hereinafter appear, our invention resides in the thawing pit elements and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings, in which:

Fig. 1 is a partially sectioned end elevation of a thawing pit embodying features of our invention;

Fig. 2 is a longitudinal section, taken approximately in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a transverse section taken in the plane of the line 3—3 of Fig. 2;

Fig. 4 is a section explanatory of a detail;

Fig. 5 is an end elevation of a jacketed ignition tile;

Fig. 6 is a longitudinal section taken approximately in the plane of the line 6—6 of Fig. 5;

Fig. 7 is a plan view of a single pit unit, installed but unlined, with low-pressure-air oil burners;

Fig. 8 is a similar view with high-pressure-air oil burners;

Fig. 9 is a similar view, with the pit lined, and with gas burners;

Fig. 10 is an end view of a steel side plate forming one-half the shell of the trough-like pit, drawn to reduced scale;

Fig. 11 is an inside elevation of an end piece used to close the ends of the trough-like shell, drawn to reduced scale; and

Fig. 12 is a schematic elevation explanatory of the disposition of a series of pits along a track.

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Referring first to Fig. 12 of the drawing, there is an ordinary earth roadbed 12, supporting conventional wooden ties 14, with gravel or like ballast 16 between the ties. The rails are carried by ties 14, and their height is indicated at 13. The radiant heating pits of our invention are shown at 20, it being understood that each pit is a complete unit, and that the installation may comprise many more than three pits, if needed. It will be observed that with normal tie spacing the width of the pit 20 is such that room to receive a pit is afforded between alternate ties by the removal of a single intermediate tie. Thus in Fig. 12 only three ties have had to be removed to make room for the three pits. The spacing between successive pits may be increased by leaving more than two ties between the successive pits, and conversely, might be decreased by leaving only a single tie between successive pits, but such closer spacing would ordinarily be unnecessary and undesirable.

Figs. 7, 8 and 9 are plan views showing a single unit with its burners and associated piping, and it will be understood that in practice there may be a long line of such pits, as suggested by the three pits in Fig. 12, and that the fragmentary pipes 84, 86, 106, and 112 shown running parallel to the rails act as common headers or supply pipes for the entire lines of pits.

Referring now to Fig. 2 of the drawing, two standard rails are shown in section in broken outline, these being spaced at the standard rail gauge of $56\frac{1}{2}$ ". Each rail consists of a head 22, a web 24, and a base flange 26, and it will be seen that the length of the pit 20 is such that it may be lowered between the base flanges 26 of the rails. However, the ends of the pit have means or projections—in this case angle irons 28—dimensioned to rest on the base flanges 26, and to thereby support the pit on the rails. In the specific case here shown the overall dimension from the outer edge of one angle iron 28 to that of the other is 55", so that it can pass between the heads 22 of the rails which are spaced at $56\frac{1}{2}$ ", but the space between the inner edges of the base flanges 26 is less than 55". The body or shell itself of the pit, however, is short enough to be lowered between the base flanges 26, and in the present case has an outside length of $50\frac{1}{2}$ ". The location of the angle irons 28 with relation to the end plates 40 of the pit is clearly shown in Fig. 1. The angle irons are preferably welded to the end plates, but could be secured in other ways.

For more efficient combustion, and better utilization of the resulting burner flame, the burners are preferably spaced from the ends of the pit, thereby adding substantially to the effective overall length of the pit. This is done by the addition of ignition tiles, indicated at 32 and 34 in Fig. 2. These ignition tiles are located low enough to pass beneath the rails, and it may therefore be said that the relative heights of the pit, the support means or angle irons 28, and the ignition tiles 32 and 34, are such that the top of the pit does not project appreciably above the top of the rails, and the ignition tiles pass outwardly beneath the rails. By so designing the structure as to facilitate the addition of the ignition tiles after the pit has been lowered between the rails, the main or radiant heating part of the pit may be made as long as the space between the rails, and the ignition tiles may be used to provide additional overall length between the burners at the ends.

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Considering the structure in greater detail, and referring first to Figs. 1, 3 and 10, the outer shell of the pit is preferably made of prefabricated pieces of steel plate. In the particular case here shown, the steel is #10 gauge, and the shell is built up of two side pieces 36, joined at their lower edges by bolts 38, each side piece having a cross-sectional configuration shown in Fig. 10 so that when the bottom flanges 37 are bolted together there is formed a trough-like member having a bottom wall and outwardly sloping side walls. The bolt holes are preferably symmetrically located, so that the plates may be alike.

The shell is completed by the addition of two ends. These are trapezoidally shaped, as shown in Fig. 11. Each consists of a steel plate 40 and refractory material 42 cast thereon to desired shape. The trapezoid of refractory material is smaller than the end plate, leaving a margin having bolt holes to facilitate assembly of the pit, and providing a space to receive ribbed iron plates. The end plate 40 and the refractory material 42 also have a large hole 44 therethrough for alignment with the ignition tile and burner. Each pit might have only a single burner, in which case the hole 44 would be centrally located, but we prefer to provide two burners, one at each end. In such case the hole 44 is preferably offset from the center line of the pit. The ends are made alike, and the reversed position of one relative to the other results in the opposed burners being offset from one another relative to the axis of the pit, which we consider to be desirable. Referring to Fig. 2, the end plate 40 may be provided with anchor hooks 46 before the refractory material 42 is cast in place, thus anchoring the latter securely on the plate.

To facilitate attaching the ends to the side plates the latter are preferably provided with flanges carrying short outwardly projecting bolts or studs. Referring to Fig. 4, which is a fragmentary horizontal section at one corner of the pit, we provide angle irons 48 near the ends of side plates 36 so that the trapezoidal ends 40 may be bolted to the angle irons and thus to the side plates, as indicated at 50. In practice the angle irons 48 may be welded to the side plates 36, and the heads of the bolts are preferably welded to the angle irons, so that during the assembly operation it is merely necessary to slide the end plate 40 over the bolts, and to then add the nuts.

The ignition tile and jacket are best shown in Figs. 5 and 6 of the drawing. The refractory part or tile 32 might be cylindrical in section or square in section, but it is convenient to use the octagonal section shown in Fig. 5. This is preferably protected by a steel jacket 52, which might be square in section, but is here shown as cylindrical. The tile may be permanently assembled with the steel jacket by sliding the same into the jacket and then filling some of the space around the flats with cement. The inside of the tile has a frusto-conical or divergent passage 54. One end of the jacket is flanged inward or has an end face, as shown at 56.

Referring now to Fig. 2, the jacketed tile 32 is secured to the end of the pit in alignment with the hole 44 previously referred to. This hole is preferably stepped or shouldered, as shown, to mate with the inner end of the ignition tile, and the latter is secured in position, as by means of three angles shown at 58 in Fig. 1. These are preferably welded to the outside of the steel jacket 52, and are held by bolts, the inner ends

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of which may be threadedly received by the end plates 40. In the alternative, short bolts or studs may be welded to project through the end plate, to later receive the angles 58, following which nuts are screwed on the studs.

The pit may be assembled and mounted in position as described, all before adding the lining. The latter is preferably a loose lining which may be added at any time. It includes ribbed loose plates preferably made of lightweight cast iron, to act as an insulator between the steel shell and the fire brick. These plates are best shown in Figs. 2 and 3 of the drawing, there being a single row of such iron plates 60 along the bottom, and a pair of rows along each side, the lower ones being shown at 62, and the upper ones at 64. It will be seen in Fig. 2 that the plates may be cast with one stepped or lowered edge, so that they can be overlapped as shown. The overlapping edges extend crosswise of the pit along the bottom, and lengthwise of the pit along the sides, as shown in Fig. 3. The plates also have ribs or spacing webs cast integrally therewith, and it is these which rest on the steel outer shell and which provide the desired air space therebetween. From examination of Fig. 3 it will be seen that there is no need to fasten the cast iron plates in position, because the slope of the sides of the pit is such that all of the plates rest in position gravitationally. This slope is anyway desirable for best heat radiation.

In the particular case here shown the cast iron plates are all dimensioned alike, and require no modification with the single exception that one cast iron plate is cut to smaller dimension along one edge, this being the righthand end plate 66 shown in Fig. 2, which has part including its flanged edge cut off, and is thereby reduced to proper dimension to complete the bottom run of plates. The plates are rectangular, rather than square, and the side plates fit properly, the end-most portions coming alongside the cast refractory ends 42. When assembling the plates within the shell they may all be used interchangeably, except that the one special plate previously mentioned is needed to complete the bottom run, and such a special plate is shipped along with the proper number of regular plates.

The fire brick lining is also laid loosely in position, except at the trapezoidal ends where the pre-cast refractory material is permanently bonded to the metal ends. The fire brick may be standard fire brick, which is $2\frac{1}{2}'' \times 4\frac{1}{2}'' \times 9''$. The bricks are laid lengthwise along the sides after setting the bottom brick in position. The bottom consists of one line set crosswise, as shown at 70 in Fig. 3, and one set lengthwise, as shown at 72. The side bricks are almost all laid lengthwise, as shown at 68 in Fig. 2. The overall thickness of the ends, including the refractory material 42, is $4\frac{1}{2}''$, leaving a free space between the ends of $4\frac{1}{2}''$, which receives four of the horizontal bricks 68, plus a vertically disposed brick at one end. In other words, while most of the side brick may be laid horizontally in four tiers, at one point, ordinarily at the end, there will be two bricks stood vertically one above the other. This will be seen from study of Fig. 9 of the drawing. Moreover, more of the side brick may be set crosswise instead of lengthwise, because each brick is twice as long as wide, hence either arrangement may be employed. Full brick may be employed throughout, except for one-half brick at one end of the lengthwise bottom bricks

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The top edges of the pit are preferably closed by inverted trough-like caps, best shown at 74 in Figs. 1 and 3 of the drawing. In Fig. 3 it will be seen how one side 76 of the cap is received in a space formed by the depressed or offset part 75 of the cast iron plates. The outer surface of the cap slopes outwardly and acts as a ramp or safety device to prevent broken linkage, chain, or other mechanism which may be hanging from or dragged along by a moving car, from catching against the pit.

The burners are added to the outer ends of the ignition tiles. For this purpose each tile jacket has secured thereto, as by welding, a burner support ring which also provides air ports. Thus in Fig. 7 burner 80 is supported by a ported ring 82 which is itself welded against the end of ignition tile 52. The ported ring 82 may be conventional, it consisting of a burner support ring supported by integral inwardly directed arms, the space between which acts as the air ports. The inner ends of the arms are secured to the ignition tile jacket, most simply by welding.

It should be understood that the tile as shipped is not bare as shown in Figs. 5 and 6. The angles 58 (Fig. 1) are welded to the side of the jacket at the factory, and the ported ring 82 (Fig. 7) is welded to the end of the jacket at the factory. No welding need be done in the field.

The particular burner shown in Fig. 7 burns fuel oil and is supplied with low pressure air, that is, air from a blower or the like, a single motor-driven blower serving for the entire line of pits. For this purpose there is an air pipe 84 and an oil pipe 86 extending longitudinally of the rails. At each pit branches 88 and 91 are taken, these being provided with valves 92 and 93. The air pipe 88 is connected to the burner at 96, and the oil pipe 91 is connected to the burner at 98. The latter connection is preferably provided with a local valve 100 which may be shut off when the burner is put out of operation in order to stop drippage from the burner. However, the main control valves 92 and 93 are preferably located outwardly as far as possible, so that a workman may adjust the same, or shut them off, without being exposed too closely to the heat of the radiant heating pit.

The burner at the opposite end of the pit is similar, and is supplied by pipes running outside the pit, and preferably between the pit and the adjacent cross-tie 102. In other words, when an intermediate tie and the ballast are removed, the resulting space is adequate not only for the pit, but also for the air and oil pipes extending to the rear burner. The rear burner has a remote valve 94 and a local valve 104 on its oil line 101, the latter to stop drip, but except when shut down, the regulation and control of both burners is by means of the aforesaid remote valves 92, 93, and 94.

Fig. 8 is generally similar to Fig. 7, but shows the use of oil burners supplied with oil and high pressure air. The main difference is that the air lines 106, 108 may be small diameter pipe instead of large diameter pipe, and the burner itself is different. Here again there are local shut off valves 109 to prevent drip. The regulation is preferably by means of separate remote oil valves, although a single air valve may be used.

Fig. 9 shows the use of gas burners. These may be used where there is a plentiful supply of natural gas. If the gas supply is short in winter it is better to burn oil, which may be stored, rather than gas, which may be lacking in severe

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weather when most needed. With high pressure gas burners the piping is simplified because only gas pipes 112, 114 and 115 are needed, the air being obtained through inspirators. Control valves 116 and 117 may be employed for both control and shut off. If the gas burner is supplied with low pressure gas, the air may be supplied at low pressure or high pressure through additional pipes for the purpose, much as in Figs. 7 and 8.

In all cases it will be understood that the burners themselves may be of standard manufacture, and therefore no further or more detailed description is believed necessary.

Reverting to Figs. 7 and 8, there are corner drain holes 118 and central drain holes 120. These rid the pit of rain or snow water which might collect when the pit is not in use, or which might run down from a car.

It is believed that the construction, method of assembly and use of our improved thawing pit, as well as the advantages thereof, will be apparent from the foregoing detailed description. The cost of a pit is a matter of only one-tenth the previous cost of making a masonry pit. The overall saving is somewhat less because in both cases the burners and piping are needed, but even so the cost of the improved installation is only a small fraction of what it was. The pit is efficient because of its shape, and in the event that there is a change in location plan, the same pits may be dismantled and used elsewhere. Because the length and construction of hopper cars is not standardized, it is convenient to provide a long line of pits, and to then ignite only those needed beneath the cars to be thawed. Such an arrangement makes it even more important to provide an economical pit structure. Moreover, with the present pit many relatively small companies which previously could not afford to install thawing pits, can now afford to do so.

It is not necessary to interrupt use of the track-age by actually lifting the rails. It is necessary only to excavate well around a single tie, and to remove that tie, after which the pit may be lowered into position; the ignition tiles added; the burners and appropriate piping added; and the lining laid in place.

The loose cast iron plates have the advantage of heat insulation and non-absorption of water, and can warp or bend without affecting the casing. Any water collecting in the pit readily drains through appropriate drain holes. The pit may be shipped "knocked-down," but it is small enough and light enough to be shipped as a unit, if desired, in which case the sides and ends may be permanently welded together, instead of being detachably bolted together in the field as above described.

It is not essential for the pit always to extend across the rails or parallel to the ties. In the case of a trestle, for example, there is the difficulty that the main beams are usually located directly beneath the rails, and might interfere with the addition of the ignition tiles and burners. In such case the pits may be placed lengthwise by removing an adequate number of ties.

The radiant heat method avoids direct flame contact and car damage. The radiant heat is distributed along the length of the car, and thaws it rapidly because of the large area subjected at one time to radiant heat. Usually only a small fraction of an hour is needed to thaw a car.

It will be apparent that while we have shown

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and described our invention in several preferred forms, many changes may be made without departing from the scope of the invention, as sought to be defined in the following claims.

We claim:

1. A thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, means on said pit dimensioned to support the pit on the rails, and a fuel burner mounted outside the pit to project its flame into the pit.
2. A thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, means on said pit dimensioned to support the pit on the rails, and a fuel burner mounted outside the pit to project its flame into the pit, the shell of said pit being a prefabricated steel shell, and said shell having its bottom and sides lined with a loose layer of light weight ribbed cast iron plates and a layer of standard fire brick laid loosely over said cast iron plates.
3. A radiant heat thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, means at the ends of said pit dimensioned to support the pit on the rails, and a fuel burner mounted outside the pit to project its flame into the pit, said pit having its length extending crosswise of the rails, the width of said pit being such that room to receive the pit is afforded between alternate ties by the removal of a single intermediate tie.
4. A radiant heat thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, means at the ends of said pit dimensioned to support the pit on the rails, and a fuel burner mounted outside the pit to project its flame into the pit, said pit having its length extending crosswise of the rails, the width of said pit being such that room to receive the pit is afforded between alternate ties by the removal of a single intermediate tie, the shell of said pit being a prefabricated steel shell, and said shell having its bottom and sides lined with a loose layer of light weight ribbed cast iron plates and a layer of standard fire brick laid loosely over said cast iron plates.
5. A thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, projections on said pit dimensioned to rest on the inner base flanges of the rails in order to support the pit between the rails at desired elevation and location, a heat resistant lining in said pit, an ignition tile and jacket secured to one end of the pit beneath a rail, and a fuel burner secured to the outer end of said ignition tile to operate through the tile and into the pit.
6. A thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, projections on said pit dimensioned to rest on the inner base flanges of the rails in order to support the pit between the rails at desired elevation and location, an ignition tile and jacket secured to one end of the pit beneath a rail, and a fuel burner secured to the outer end of said ignition tile to operate through the tile and into the pit, the shell of said pit being a prefabricated steel shell, and said shell having its bottom and sides lined with a

loose layer of light weight ribbed cast iron plates and a layer of standard fire brick laid loosely over said cast iron plates.

7. A radiant heat thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, projections at the ends of said pit dimensioned to rest on the inner base flanges of the rails in order to support the pit between the rails at desired elevation and location, a heat resistant lining in said pit, an ignition tile and jacket secured to one end of the pit beneath a rail, and a fuel burner secured to the outer end of said ignition tile to operate through the tile and into the pit, said pit having its length extending crosswise of the rails, the width of said pit being such that room to receive the pit is afforded between alternate ties by the removal of a single intermediate tie.

8. A radiant heat thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, projections at the ends of said pit dimensioned to rest on the inner base flanges of the rails in order to support the pit between the rails at desired elevation and location, an ignition tile and jacket secured to one end of the pit beneath a rail, and a fuel burner secured to the outer end of said ignition tile to operate through the tile and into the pit, said pit having its length extending crosswise of the rails, the width of said pit being such that room to receive the pit is afforded between alternate ties by the removal of a single intermediate tie, the shell of said pit being a prefabricated steel shell, and said shell having its bottom and sides lined with a loose layer of light weight ribbed cast iron plates and a layer of standard fire brick laid loosely over said cast iron plates.

9. A thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, means at the ends of said pit dimensioned to support the pit on the rails at desired elevation and location, fuel burners secured to the opposite ends of said pit to operate through the ends and into the pit, said burners being off-set from one another, appropriate fuel supply piping and valves connected to the burner at one end, additional piping extending alongside the pit to the opposite burner at the opposite end, said pit having its length extending crosswise of the rails, and the width of said pit being such that room to receive the pit and the piping alongside the same is afforded between alternate ties by the removal of a single intermediate tie.

10. A thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, means at the ends of said pit dimensioned to support the pit on the rails at desired elevation and location, fuel burners secured to the opposite ends of said pit to operate through the ends and into the pit, said burners being offset from one another, appropriate fuel supply piping and valves connected to the burner at one end, additional piping extending alongside the pit to the opposite burner at the opposite end, said pit having its length extending crosswise of the rails, and the width of said pit being such that room to receive the pit and the piping alongside the same is afforded between alternate ties by the removal of a single intermediate tie, the shell of said pit being a prefabricated

steel shell, and said shell having its bottom and sides lined with a loose layer of light weight ribbed cast iron plates and a layer of standard fire brick laid loosely over said cast iron plates.

11. A radiant heat thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, projections at the ends of said pit dimensioned to rest on the inner base flanges of the rails in order to support the pit between the rails at desired elevation and location, a heat resistant lining in said pit, an ignition tile and jacket secured to one end of the pit beneath a rail offset from the axis of the pit, an ignition tile and jacket secured to the other end of the pit beneath a rail offset from the axis in opposite direction, fuel burners secured to the outer ends of said ignition tiles to operate through the tiles and into the pit, appropriate fuel supply piping and valves connected to the burner at one end, additional piping extending alongside the pit to the opposite burner at the opposite end, said pit having its length extending crosswise of the rails, the width of said pit being such that room to receive the pit and the piping alongside the same is afforded between alternate ties by the removal of a single intermediate tie.

12. A radiant heat thawing pit for railway cars, said pit comprising an open topped outer shell dimensioned to be received between the base flanges of the rails of the railway, projections at the ends of said pit dimensioned to rest on the inner base flanges of the rails in order to support the pit between the rails at desired elevation and location, an ignition tile and jacket secured to one end of the pit beneath a rail offset from the axis of the pit, an ignition tile and jacket secured to the other end of the pit beneath a rail offset from the axis in opposite direction, fuel burners secured to the outer ends of said ignition tiles to operate through the tiles and into the pit, appropriate fuel supply piping and valves connected to the burner at one end, additional piping extending alongside the pit to the opposite burner at the opposite end, said pit having its length extending crosswise of the rails, the width of said pit being such that room to receive the pit and the piping alongside the same is afforded between alternate ties by the removal of a single intermediate tie.

13. A thawing pit for thawing railway cars, said pit comprising a steel trough having a bottom with outwardly sloping sides, trapezoidal shaped steel ends for said pit, said ends having pre-cast refractory material, said ends each having a large aperture to mate with an ignition tile, heat insulating means to line the bottom and sides of the pit, standard fire brick disposed loosely on said bottom and along said sides, ignition tiles secured to the ends of the pit, fuel burners secured to the ends of the ignition tiles, and appropriate piping and valves connected to said burners.

14. A thawing pit for thawing railway cars, said pit comprising steel sides having appropriate holes for bolts to secure the same to form a trough having a bottom with outwardly sloping sides, trapezoidal shaped steel ends for said pit, said ends having pre-cast refractory material permanently secured thereto by appropriate anchor hooks, said ends each having a large aperture to mate with an ignition tile, ribbed cast iron plates dimensioned to loosely line the bottom and sides of the pit, standard fire brick disposed loosely on said bottom and along said sides, inverted trough-

like sheet metal caps disposed over the top edges of the sides to close the air space between the cast iron plates and the sides, steel jacketed ignition tiles detachably secured to the ends of the pit, fuel burners secured to the ends of the ignition tiles, and appropriate piping and valves connected to said burners.

15. A radiant heat thawing pit for thawing railway cars, said pit comprising a steel trough having a bottom with outwardly sloping sides, trapezoidal shaped steel ends for said pit, said ends having pre-cast refractory material, said ends each having a large aperture to mate with an ignition tile, heat insulating means to line the bottom and sides of the pit, standard fire brick disposed loosely on said bottom and along said sides, support means on the ends adapted to rest on the inside base flanges of the rails of the railway, ignition tiles detachably secured to the ends of the pit, fuel burners secured to the ends of the ignition tiles, appropriate piping and valves connected to said burners, the length of the pit being such that it may be lowered between standard gauge rails, the width of the pit being such as to be received between alternate ties at normal tie spacing, the relative heights of the pit, the support means and the ignition tiles being such that the top of the pit does not project substantially above the tops of the rails and the ignition tiles pass outwardly beneath the rails.

16. A thawing pit for thawing railway cars, said pit comprising metal sides having appropriate holes for bolts to secure the same to form a trough having a bottom with outwardly sloping sides, trapezoidal shaped steel ends for said pit, said ends having pre-cast refractory material secured thereto, said ends each having a large aperture to mate with an ignition tile, ribbed cast iron plates dimensioned to loosely line the bottom and sides of the pit, standard fire brick disposed loosely on said bottom and along said sides, support means welded to the steel ends and adapted to rest on the inside base flanges of the rails of the railway, steel jacketed ignition tiles detachably secured to the ends of the pit, fuel burners secured to the ends of the ignition tiles, and appropriate piping and valves connected to said burners.

17. A thawing pit for thawing railway cars, said pit comprising metal sides having appropriate holes for bolts to secure the same to form a trough having a bottom with outwardly sloping sides, trapezoidal shaped steel ends for said pit, said ends having pre-cast refractory material se-

cured thereto, said ends each having a large aperture to mate with an ignition tile, ribbed cast iron plates dimensioned to loosely line the bottom and sides of the pit, standard fire brick disposed loosely on said bottom and along said sides, support means welded to the steel ends and adapted to rest on the inside base flanges of the rails of the railway, steel jacketed ignition tiles detachably secured to the ends of the pit, fuel burners secured to the ends of the ignition tiles, appropriate piping and valves connected to said burners, the length of the pit being such that it may be lowered between standard gauge rails, the width of the pit being such as to be received between alternate ties at normal tie spacing, the relative heights of the pit, the support means and the ignition tiles being such that the top of the pit does not project substantially above the tops of the rails and the ignition tiles pass outwardly beneath the rails.

18. A radiant heat thawing pit for thawing railway cars, said pit comprising steel sides having appropriate holes for bolts to secure the same to form a trough having a bottom with outwardly sloping sides, trapezoidal shaped steel ends for said pit, said ends having pre-cast refractory material permanently secured thereto by appropriate anchor hooks, said ends each having a large aperture to mate with an ignition tile, ribbed cast iron plates dimensioned to loosely line the bottom and sides of the pit, standard fire brick disposed loosely on said bottom and along said sides, inverted trough-like sheet metal caps disposed over the top edges of the sides to close the air space between the cast iron plates and the sides, support angle irons welded to the steel ends and adapted to rest on the inside base flanges of the rails of the railway, steel jacketed ignition tiles detachably secured to the ends of the pit, fuel burners secured to the ends of the ignition tiles, appropriate piping and valves connected to said burners, the length of the pit being such that it may be lowered between standard gauge rails, the width of the pit being such as to be received between alternate ties at normal tie spacing, the relative heights of the pit, the support angle irons and the ignition tiles being such that the top of the pit does not project substantially above the tops of the rails, and the ignition tiles pass outwardly beneath the rails.

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No references cited.