

[54] SELF-PROPELLED TIE DESTROYING MACHINE

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[58] Field of Search .... 110/8 R, 8 C, 18 R, 110/18 C, 19, 119; 144/309

[56] References Cited

UNITED STATES PATENTS

|           |         |                        |         |
|-----------|---------|------------------------|---------|
| 526,284   | 9/1894  | Anderson.....          | 110/8   |
| 2,961,977 | 11/1960 | Coleman.....           | 110/8   |
| 3,128,808 | 4/1964  | Blix, Jr.....          | 144/309 |
| 3,392,690 | 7/1968  | Mandelbaum et al. .... | 110/119 |
| 3,465,696 | 9/1969  | Amundsen.....          | 110/8   |
| 3,610,180 | 10/1971 | Scott et al.....       | 110/8   |

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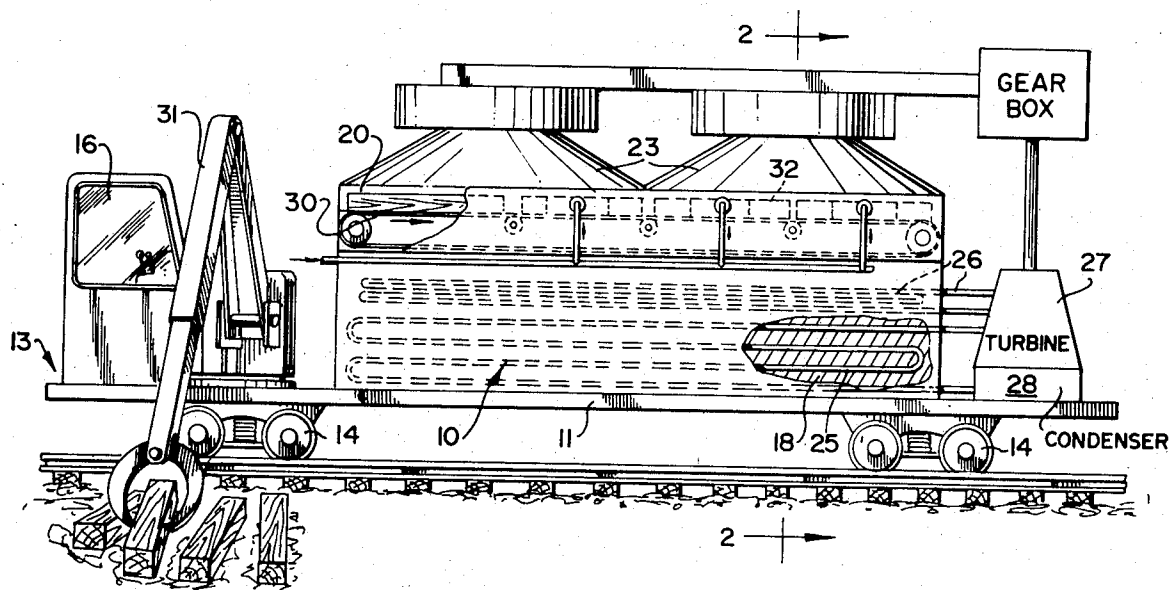
Attorney—Christopher Robinson et al.

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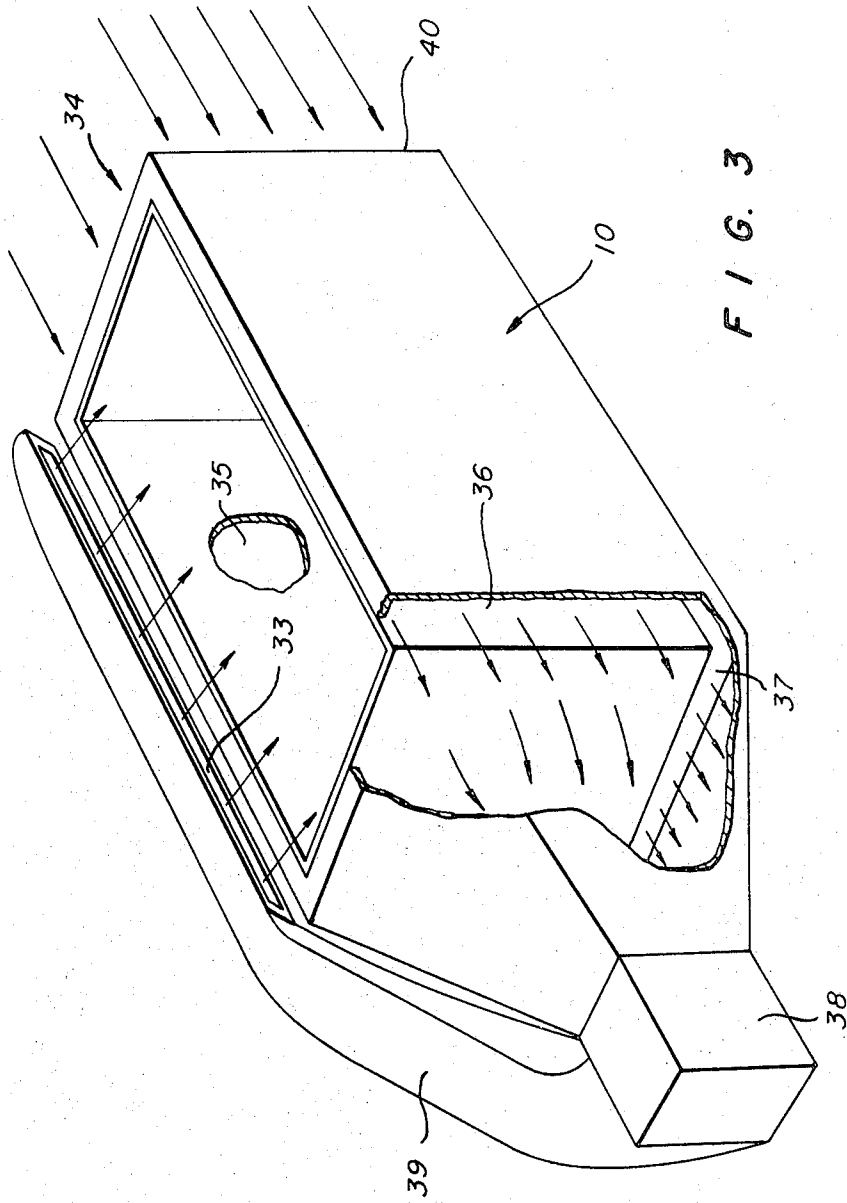
ABSTRACT

A device for destroying railroad ties which comprises fire brick insulated open-topped fire box mounted on a self-propelled track-travelling vehicle. The device is provided with at least one plenum chamber from which extends, along the top of one side of the fire box, a series of nozzles which are downwardly and inwardly directed into the box. These nozzles deliver air for combustion across the top of the box so as to form an air curtain which inhibits the escape of particles of ties being burned in the box. An endless conveyor is located adjacent the open top of the box on the side remote from the nozzles and ties are loaded onto this conveyor by means of a crane. The conveyor has a series of hydraulically operated pusher plates arranged longitudinally thereof which are operated by temperature sensitive elements within the fire box to distribute ties from the conveyor into area in the box where the combustion of ties already therein is substantially complete. The device also envisages the provision of a water wall boiler within the box which generates steam to drive a turbine which in turn drives air compressor motors to pressurize the air for the nozzles. An alternative embodiment includes a blower and a ducting system which will preheat ambient air and utilize the air to form the air curtain.

8 Claims, 3 Drawing Figures







**SELF-PROPELLED TIE DESTROYING MACHINE**

This application is a continuation-in-part of my parent application Ser. No. 204,611 filed Dec. 3, 1971 now abandoned.

**BACKGROUND OF THE INVENTION**

A problem existing in railroads today is that the destroying old railroad ties after they have been removed from the roadbed. This problem has been accentuated by the need to decrease atmosphere pollution. The invention seeks to provide a device which will effectively destroy ties leaving little residue or pollution.

**SUMMARY OF THE INVENTION**

The present invention provides a device for destroying railroad ties and the like comprising an insulated open-topped fire box mounted on a self propelled vehicle for movement along the railroad track; means for providing a curtain of combustion supporting gas under pressure from one edge of the box across the open top thereof to inhibit the escape of particles of ties being burned therein; and means for delivering ties to be burned in the box and to distribute them selectively therein. The invention also relates to the means for providing the curtain of combustion supporting gas.

In a preferred construction the combustion supporting gas is air and the means for supplying it is a series of closely longitudinally spaced nozzles downwardly and inwardly directed into the fire box.

According to a feature of the invention, a heat exchanger such as a water wall boiler and superheater is provided in the fire box and may, in the preferred construction in accordance with the invention, generate steam to drive a steam turbine which in turn drives a pump for pressurizing the air curtain.

According to a feature of the invention, the means for distributing the ties in the fire box is controlled in response to a signal from a temperature-responsive means in the fire box.

Again, according to a preferred embodiment, the means for delivering the ties include an endless conveyor which is longitudinally located along the upper edge of the fire box opposite the nozzles and the means for distributing the ties comprising a series of longitudinally spaced ram driven pusher plates.

According to a further preferred embodiment, the combustion supporting gas is ambient air which has been preheated by passing along the outside fire box surfaces and the means for supplying the ambient air is a ducting system consisting of an inlet portion, an outlet portion and a powered blower located there between.

**DESCRIPTION OF SPECIFIC EMBODIMENT**

The following is a description by way of example of one embodiment in accordance with the invention, reference being had to the accompanying drawings in which:

FIG. 1 is a diagrammatic view of a railroad tie destroying device on a track;

FIG. 2 is a section on line 2—2 of FIG. 1; and

FIG. 3 is a view of an alternative embodiment of the invention.

Referring now to the drawings: A fire box 10 is mounted on the flat bed 11 of a self-propelled rail-travelling vehicle 13 which is mounted on wheel bogies 14 and controlled from a cab 16. The fire box is lined

with refractory bricks 18 or the like and is open-topped at 20.

Extending longitudinally along one edge of the fire box are a plurality of downwardly and inwardly directed nozzles 21 arranged in an angle of about 30° to the horizontal.

The nozzles direct a current of combustible gas across the opened topped surface 20 of the fire box so as to inhibit the escape from the fire box of particles of ties or other materials being burned therein. The combustion supporting gas may be air and the nozzles 21 are provided with large quantities of air from the fans 22 in the plenum chambers 23. Thus large quantities of air with excess oxygen for combustion are provided to create a turbulent condition within the fire box 10 and to ensure virtually complete combustion leaving little or no residue. The incinerator works in the fashion of the APC Model 24D Trench Incinerator manufactured by Air Pollution Control Products Company of Richmond, Va. That is to say air is blown through the nozzles 21 downwardly across the fire box where the air is deflected by the curved back wall to the bottom of the fire box then across it in close contact with the ties being burned therein and directed finally upwardly at the front wall until it reaches the underside of the air curtain.

The fire in the fire box may be started by or maintained by jets of combustible gas such as propane from suitable nozzles 24 in the wall of the fire box.

Located in the wall of the fire box is a water wall tube boiler 25, and a superheater 26 is located in the fire box so as to generate steam to drive a turbine 27 which in turn, through gear ring 28, drives the fans 22. If desired, a certain quantity of steam may be bled over from the turbine and mixed with the air to be passed through the nozzles 21. The turbine may be provided with condenser 28 in known fashion.

Referring to the alternative embodiment of the invention, as shown in FIG. 3, the fire box 10 is provided with spaces 35, 36 and 37 between the inner and outer walls. Ambient air is drawn into these spaces 35, 36 and 37 by a blower 38 via air intake openings located at the inlet portion end 34 of the fire box 10. The air passes over the walls and bottom of the fire box 10, causing a cooling effect on the walls and being itself heated. The heated air is drawn into the blower 38 from where it passes under pressure through a plenum chamber 39 to the duct 33. From the duct, the air is distributed as an overfire curtain. Because this embodiment utilizes a self contained power source for the blower, such as a diesel engine, the superheated 26 and turbine 27 may be disposed with. Further, as large amounts of air provide the necessary cooling effect on the fire box walls, the entire wall tube boiler 25 may be eliminated.

Located adjacent the other upper edge of the fire box is an endless conveyor 30 onto which ties are placed by means of a crane 31 which is operated by the operator in the cab to pick up ties from the side of the roadbed and lay them on the conveyor 30. The conveyor 30 then moves the ties longitudinally of the fire box and a plurality of hydraulic ram driven plates 32 are located at spaced intervals along the conveyor 30. Operation of the rams 33 forces the plates to move across the conveyor and displace a tie therefrom to load it into the fire box 10. Control of the rams 33 may be either by the operator in the cab or may be under the automatic control of temperature-sensitive devices (not shown) lo-

cated throughout the fire box. Thus where a previously loaded tie is almost completely incinerated the temperature-sensitive devices will locate a drop in temperature in that area of the fire box and will, in conventional fashion provide a signal to operate a servo valve to actuate the appropriate ram 33 to move its plate 32 across the conveyor 30 and load a further tie to be burned into that area. The device has the advantage that it can be moved into an area where ties are being removed and the ties can be destroyed quickly and efficiently with minimum of pollution to the surrounding atmosphere.

It is of course to be understood that variations could be provided within the scope of the invention. For example, the conveyor 30 could be replaced by some other loading means and the crane 31 could be replaced by a pick-up conveyor.

What I claim as my invention is:

1. A device for destroying railroad ties and the like comprising an open-topped fire box mounted on a self-propelled vehicle for movement along a railroad track; nozzle means extending longitudinally of and adjacent one edge to the box and downwardly and inwardly directed thereinto for providing a curtain of combustion supporting air under pressure across the top of the box to inhibit the escape of particles of ties being burned therein; means for delivering ties to be burned in the box including an endless conveyor longitudinally located along the upper edge of the fire box opposite said nozzles; and means to distribute the ties selectively in the box comprising a series of longitudinally spaced ram driven pusher plates.

2. Apparatus as claimed in claim 1 in which heat exchange means is provided in the fire box and comprises

a water wall boiler and superheater.

3. Apparatus as claimed in claim 2 in which a steam turbine driven fan means is provided for pressurizing the air curtain and in which steam from the heat exchanger is used to drive the turbine.

4. Apparatus as claimed in claim 1 in which the means to distribute the ties are controlled in response to a signal obtained from temperature-sensitive means in the fire box whereby to supply new ties to areas of the fire box where combustion of prior fed ties is substantially completed.

5. A self-contained device for destroying railroad ties and the like comprising an open-topped fire box mounted on a self-propelled vehicle for movement along a railroad track; means on the vehicle for providing a curtain of combustion supporting gas under pressure from one edge of the box across the top thereof to inhibit the escape of particles of ties being burned therein; and means mounted on the vehicle for delivering ties to be burned in the box and to distribute them selectively therein.

6. Apparatus as claimed in claim 5 in which the combustion supporting gas is air and the means for providing it, is a blower, inlet means to supply air to the blower, and outlet means to distribute air from the blower as the curtain.

7. Apparatus as claimed in claim 6 wherein the inlet means to supply air to the blower is such that the air passes along the fire box walls preheating the air and providing cooling for the walls.

8. Apparatus as claimed in claim 6 wherein the outlet means is a longitudinal duct downwardly and inwardly directed into the fire box.

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