United States Patent

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[54] METHOD AND APPARATUS FOR POLLUTION FREE BURNING OF AUTOMOBILE BODIES

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[52] **U.S. Cl.** ..... **110/8 A**, 110/18 R, 110/119

[51] **Int. Cl.** **F23g 7/00**

[58] **Field of Search** ..... 110/8, 8 A, 8 C, 18, 18 C, 110/119; 263/2

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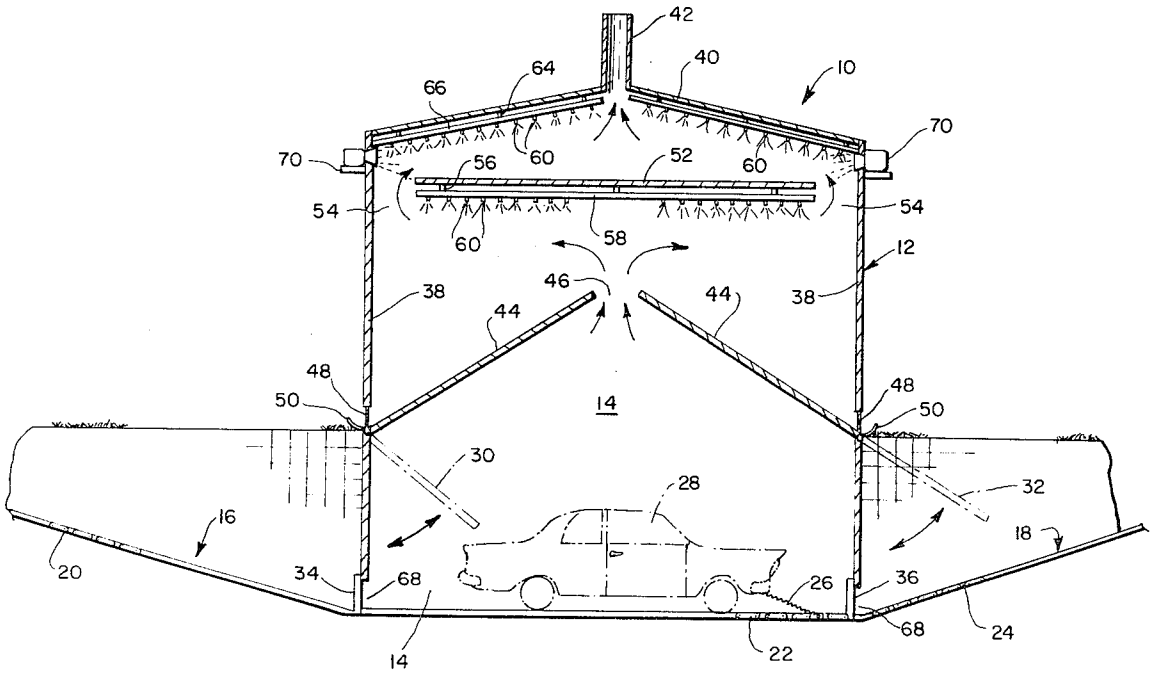
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[57] **ABSTRACT**

A method and apparatus for burning disposed automobile bodies by burning them in a modular-type device and successively contacting the gases with water to remove the contaminates.

18 Claims, 6 Drawing Figures



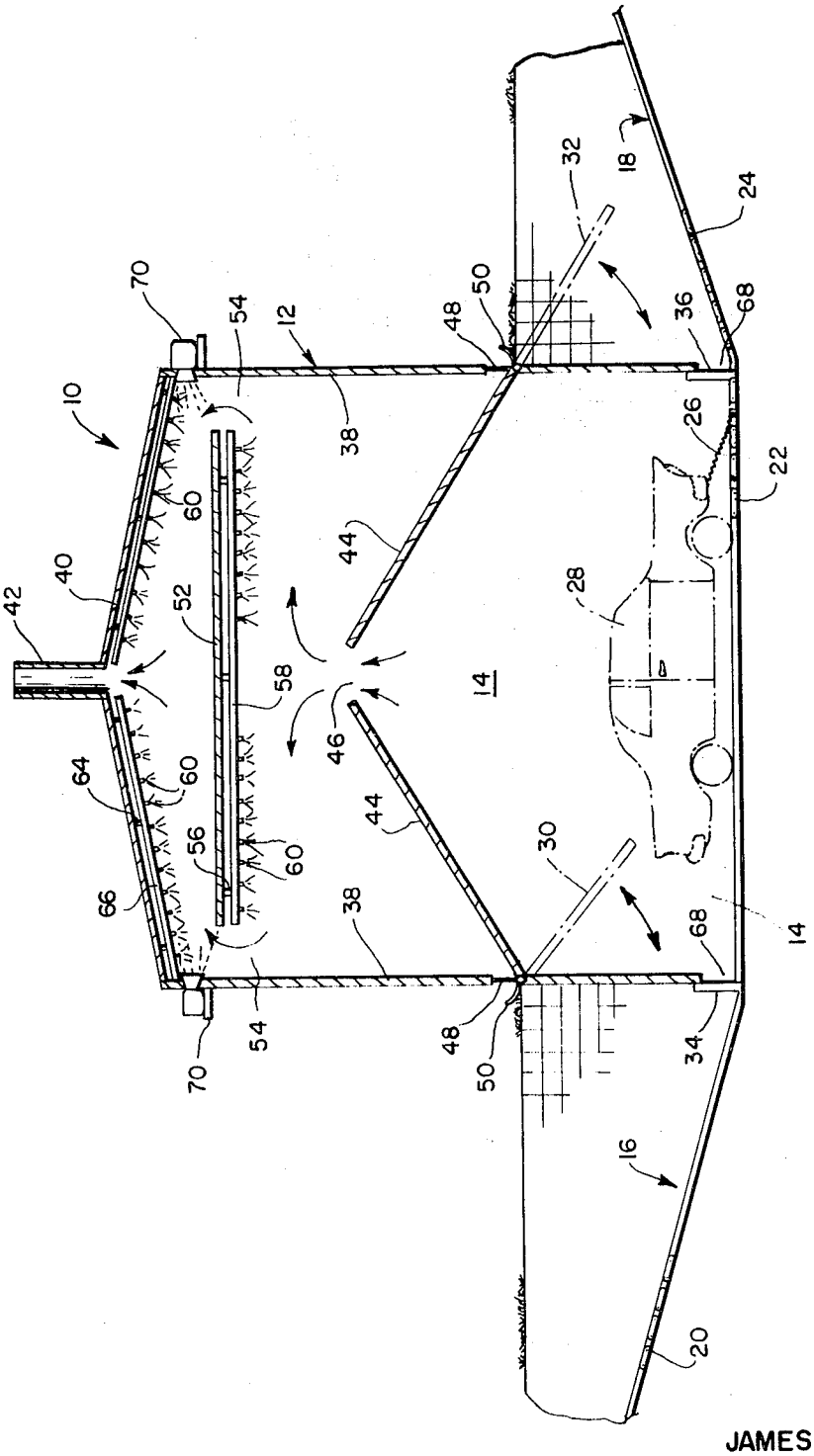


FIG. 1

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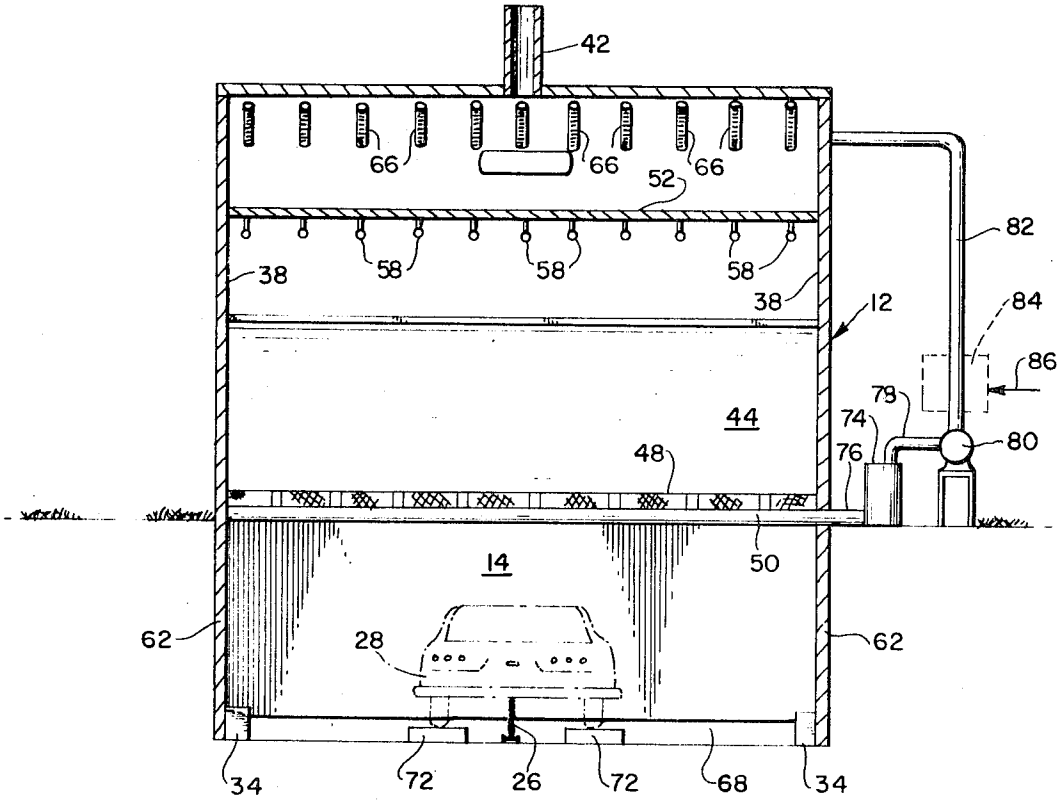


FIG. 2

FIG. 4

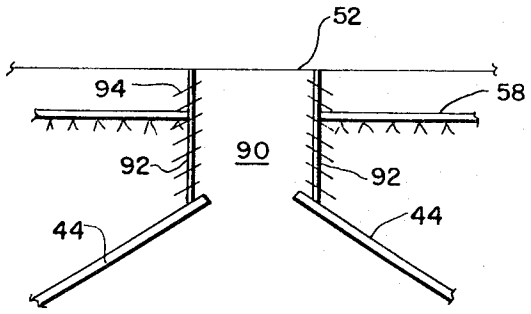


FIG. 5

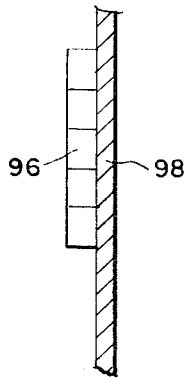


FIG. 6

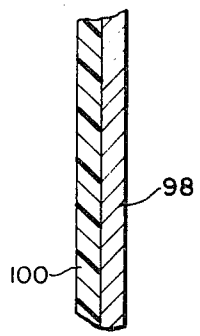
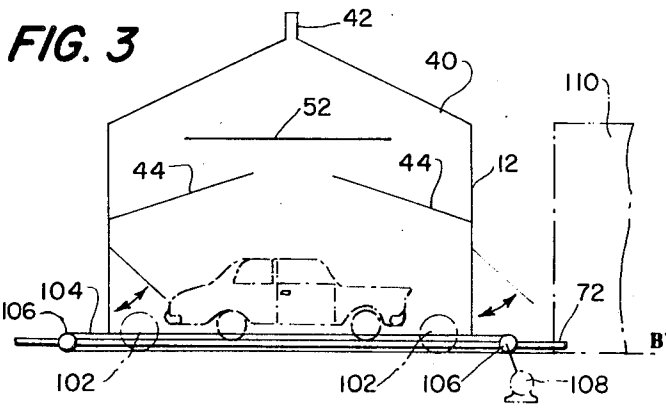


FIG. 3



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METHOD AND APPARATUS FOR POLLUTION FREE BURNING OF AUTOMOBILE BODIES

BACKGROUND AND OBJECTS

This invention relates to a method and apparatus of burning automobile vehicles.

Before a body of a vehicle can be salvaged and the scrap metal properly utilized, it is necessary that the upholstery, seat cushions, plastic and other nonmetallic portions of a disposed automobile be removed. The more of these nonmetallic materials of the vehicle that are removed, the more valuable is the remaining scrap. This is because if the metal or body of the vehicle is shredded, otherwise broken up or pressed for scrap it is important that the above hydrocarbon materials be removed. In this manner the metal can go almost directly to a smelting process. If the nonmetallic materials are left, the scrap and shredded metal is not as readily usable.

There have been numerous attempts at providing means for disposing of the junked vehicles with and without burning so as to eliminate pollution from the air. Unfortunately, these approaches have not entirely been successful, and they are very expensive. It has been estimated that the number of abandoned vehicles each year is equal in number to two thirds of the new cars sold. Therefore, a significant problem is thus created.

In the past it has been common practice to burn the vehicles in the open. This procedure has the obvious disadvantage of contaminating the polluting the air to an extremely high degree in the areas surrounding such burning operations. It is not only objectionable from the standpoint of the appearance of smoke-filled sky, but is also a definite health hazard. Obviously, the more grease and oil in the auto, the worse the smoke and pollution. The same is true of tires.

An object of the instant invention is to provide a low-cost means for the reduction of contaminates released in the atmosphere by burning disposed automobile bodies.

It is another object of the invention to provide a relatively small, compact device which is in a price and size range wherein the large number of small, independent scrap metal yards and the like can utilize and afford it.

The invention also contemplates the possibility of the device being portable or which can be completely assembled and sold in at least a substantially assembled manner. Also, it can be transported with only a minimal amount of subsequent assembling.

SUMMARY OF THE INVENTION

The invention contemplates a method and apparatus for moving a vehicle into the module for burning; igniting it prior to entry or subsequent to entry. The smoke and gas passes upwardly through an opening in a pair of metal sheets. The gas then is washed as it passes around a baffle, subsequently washed again and if there is any remaining gas, it is withdrawn through a chimney. The water is then reclaimed and the sediment removed and the water reused.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects of the invention will readily become apparent from he detailed descriptions set out below in the accompanying drawings wherein:

FIG. 1 is a sectional elevation view of the module as positioned in a below ground arrangement;

FIG. 2 is a section view taken substantially along the center of FIG. 1;

FIG. 3 is a schematic showing of a side elevation view similar to FIG. 1 wherein the module is shown in an aboveground position wherein the device is mobile;

FIG. 4 illustrates a detail of a louvered stack which may be used in one modification of the invention;

FIG. 5 is a detail of the sidewall of the device in, for example, FIGS. 1 and 2 utilizing firebrick; while

FIG. 6 is a detail of a modification of a sidewall in, for example, the mobile device of FIG. 3 utilizing a polytetrafloraethylene lining.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIG. 1, the module 10 includes an aboveground structure 12 and a below ground-burning area 14. There is an entrance slope or ramp indicated at 16 and an exit ramp 18. Since the length of the building is contemplated to be approximately 22 feet and the width, 12 feet, for compactness and ease of transportation, it is felt that the entrance and exit slopes would best be approximately 15 feet long and 9 to 10 feet wide. The dimensions are given merely as examples and of course are not controlling. There may be either a winch to pull the car into the pit area 14 or a chain conveyor seen schematically having an entrance portion 20, an interior portion as seen at 22, and an exit portion 24. This may be a type of chain similar to that used in automatic car washes and may be of the endless type wherein a return portion would be more or less underground or in a groove in the floor. There would also be in this type of device another chain 26 which would attach to the axle or other convenient portion of a vehicle 28.

The entrance and exits have a pair of doors 30 and 32 respectively. Door 30 would swing inwardly as the car enters, and return to a vertical position controlled by a stop 34. The exit door 32 works in a similar manner swinging outwardly and is stopped by a pair of stops 36.

The aboveground portion 12 of the structure has a pair of walls made of suitable gauge metals plates 38. A sloping roof is seen at 40 with a chimney of flue 42. The interior has a pair of slanted 154-inch plates 44 which are at an angle with the horizontal of about 30°. These plates have an opening between them at their apex of about 14 inches seen at 46. The walls 38 have screens 48 running the length thereof at various intervals. On the exterior of the screens 48 are gutters 50. As will be apparent, the screening could be elsewhere in a recirculation system discussed below.

Above the plates 44, at a point approximately 4½ to 5 feet above the ground, is positioned a substantially horizontal baffle plate 52. The plate 52 extends substantially the length and width of the structure 12 and has a small area 54 surrounding it for passage of gases as will be seen below. There are a plurality of retaining or hanging means 56 which support a plurality of pipes 58 having nozzles 60 thereon. It will be noted that there are no nozzles above the area 46 so that water will not fall into the burning area or chamber 14 having walls 62. The roof 40 also has a plurality of retaining or hanging means 64 which support another plurality of pipes 66 also having nozzles 60.

Since the vehicle 28 will be burned in the area 14, it is necessary that a draft be created. A natural draft will result from the fact that doors 30 and 32 are positioned about ½ to 2 feet above the ground as seen at 68. In other words, air will be able to enter the chamber 14 under the doors 30 and 32 and go up through the opening 46, around the baffle 52 in the area of 54 and be drawn continually by means of the flue or chimney 42.

Additional blower means 70 may be provided in the upper end of the chamber 12.

As seen in FIG. 2, the vehicle may be positioned on a pair of rails or skids 72 to facilitate its movement through the chamber. This is because the tires may very likely be removed as well as the wheels if they are salvageable. Also, the tires create more smoke and contaminates; therefore, it may not be desirable to burn them. At the same time, the instant invention is capable of consuming the tires and removing virtually all of the contaminates caused thereby. Therefore, even if the car was brought in with tires on it they would be burned off during the course of the burning operation.

Since it is desired to reclaim the water through the screens 48 and gutters 50, a plurality of receptacles, for example 50-gallon drums 74 are positioned so that they cooperate with gutters 50 by means of pipes 76. The water with the contaminates therein will enter the bottom of the drum 74 where the heavy particles or sediment will remain at the bottom and the relatively clean water will be drawn out by means of pipes 78 through a pump 80 and back into the conduits through a

pipe 82. A cooling means (for example, spraying cool water on pipe 82) may be positioned at 84 with a makeup water source 86 supplying additional liquid. The operation and function of this portion of the invention will be discussed in the operation section below. It should also be apparent that in reusing the cleaning water, not only a savings in water is achieved, but also pollution of rivers, streams, etc., is prevented.

Another means of regulating the draft through the apparatus may be seen in FIG. 4 wherein there is positioned between the plates 44 and the baffle 52 a louvered means 90. This louvered means or chamber would have a plurality of supports 92 with adjustable louvers 94. The adjustable louvers may be controlled manually or automatically depending on whether it is desired to change the openings because of temperature, wind, etc., either by a thermostat, draft velocity means or manually.

It is contemplated that, as seen in FIG. 5, the walls of the burning area 14 could have firebrick 96 attached thereto. The burning area 14 is illustrated in this FIGURE merely by means of a portion of its wall 62. For a mobile-type device or one that is portable and manufactured in a modular component and transported, a very high-heat-resistant synthetic material such as polytetrafloraethylene may be used to coat the wall as seen at 100 in FIG. 6.

Referring now to FIG. 3, an aboveground type device will be seen with corresponding reference numerals. This is a schematic view showing of the same type device as seen in the previously discussed figures except it is all above ground and is designed to be portable. It is contemplated that this device could have wheels 102 removably positioned thereon. An endless conveyor similar to that discussed in relation to FIG. 1 is seen schematically at 104 being mounted on sprocket wheels 106 driven by a conventional motor 108. Again, this is the same type of device that could be used in FIGS. 1 and 2 discussed above. It is also possible that the rails 72 could then lead the burned-out vehicle into a conventional shredder or mechanical compressor unit 110. In this manner a complete operation of bringing the car into the unit 12, burning the carbon containing materials out and then conveying the vehicle to the shredder or compressor 110. The scrap material will then be reduced to the smallest possible dimension when removed from the system.

It should be pointed out that it is anticipated that all carbon containing material will be completely burned out of the vehicle. This would include not only the seats, upholstery, padding as discussed above but also the insulation on the electrical wiring, the paint and all other nonmetallic materials.

METHOD AND OPERATION OF THE DEVICE

As will be apparent from the above, the car 28 is brought into the burning chamber 14 by means of chain system 20–26. This will be done through the door 30. The car may be ignited prior to entry or subsequent to entry. While an additional combustion source such as gas may be used, it is not necessary. The draft will be created through opening 68 and through the burning chamber 14. The smoke will be drawn out the opening 46 between plates 44. The chamber will be at its hottest at the middle of chamber 14 which will be somewhere in the neighborhood of 1,230° to 1,325°. Since it takes about 17 to 20 minutes to burn a car in the open, it will take approximately the same amount of time depending on the draft, etc., in the burning chamber. As the gases which are laden with sulphur and carbon pass up through the opening 46, they will then be drawn around through the areas 54. As the gas is moving from area 46 to 54 it will be washed by nozzles 60 coming from pipes 58. The gas will then be drawn out through the chimney or flue 42 either by itself or with the aid of additional blowers 70 on the side or by further suction means on the roof which may be associated with the stack 42. As the gases move toward the stack 42 those contaminates that have not been removed and that gas which is left will again be washed by means of nozzles 60 emanating from pipes 66. It will be appreciated that if the baffle and pipes are not sufficient depending upon the other characteristics of the chamber, additional baffle means and pipes and nozzles etc., can still be added.

As the water with the absorbed contaminates sprays down it will not be able to get into the burning chamber since there are no nozzles over the opening 46. Therefore, all waste water will eventually go down the pair of plates 44. The material which floats will be taken out by a series of screens 48 which may be in the wall portion as seen in FIGS. 1 and 2, or a separate filter may be used in conjunction with the gutter 50, pipe 76 and barrel 74. This is so only the heavy sediment remains in the barrel 74 and relatively clean water is removed through pipe 78 by means of the pump 80. Any makeup water can be added through a line schematically shown at 86 and a conventional spray cooler or the like may be used at 84 so that the water entering back into the system at 82 will be as cool as possible.

While pipe 82 is merely shown entering the building wall 12 in FIG. 2, it is realized that this will be done through a system of manifolds which will connect to pipes 58 and 56 in a known manner.

It will also be appreciated that this invention, while designed for burning one car at a time, can be also used for multicar installations. However, the design discussed herein is primarily for use with a single car unit and is contemplated to be used by the small dealer who would not be burning a large number of cars per day. It has been shown in FIG. 3 that the device can have wheels on it so it can be more or less mobile.

It is further contemplated as discussed above that the device can be manufactured relatively easily in a central plant and delivered, because of its compact size, to the user. This obviously saves in construction costs and assembly fees.

While it is not probably necessary (but may be desirable in case certain chemicals or contaminates are left), a filter for the particular constituent can be placed in the stack 42 to remove the appropriate contaminates.

The louvered design seen in FIG. 4 with the adjustable louvers 94 could also of course be replaced by a perforated or rotating-type stack.

It is further presently contemplated that the building be designed with ⅛ inch or 12 gauge steel. The baffles and plates have been shown relatively unsupported. However, they can and may very likely be supported using conventional construction trusses to support the items and provide a sound structure.

It will be understood that the invention has been described in detail in regard to a preferred embodiment. Other modifications will be obvious to one skilled in the art and the invention is intended to cover all suitable modifications and equivalents falling within the scope of the invention as claimed.

I claim:

1. The method of burning vehicle bodies and the like comprising:
   a. igniting a vehicle,
   b. moving the vehicle to be burned into a module for burning,
   c. allowing the gases of combustion to flow upwardly
   d. passing the gases through a restricted opening formed by inclined plates,
   e. then passing the gases around a baffle,
   f. subjecting said gases to a washing liquid as it flows from said opening around said baffle,
   g. subjecting said gases to a washing liquid after it has passed around said baffle, and
   h. preventing the washing liquid from entering the burning chamber.

2. The method of claim 1 including regulating the draft to control the flow of the gases upwardly.

3. The method of burning vehicle bodies and the like comprising:
   a. igniting a vehicle,
   b. moving the vehicle to be burned into a module for burning,
   c. allowing the gases of combustion to flow upwardly

d. passing the gases through a restricted opening,
e. then passing the gases around a baffle,
f. and subjecting said gases to a washing liquid as it flows from said opening around said baffle, and
g. connecting said vehicle to cable means and pulling said vehicle through said module.

4. A module for burning nonmetalic materials comprising:
a. a substantially enclosed structure,
b. a burning chamber in said structure,
c. restricted means formed by a pair of inclined plates separated at their apex for allowing the gases of combustion to flow from said chamber,
d. baffle means positioned above said restricted means,
e. means for washing said gases with a liquid as they flow from said restricted means around said baffle,
f. said washing means being positioned so the liquid is kept from entering said chamber.

5. A module for burning vehicle bodies and the like comprising:
a. a substantially enclosed structure,
b. a burning chamber for a vehicle in said structure,
c. restricted means having an opening therein for allowing the gases of combustion to flow from said chamber,
d. baffle means positioned above said restricted means,
e. means for washing said gases with a liquid as they flow from said restricted means around said baffle,
f. said washing means being positioned so the liquid is kept from entering said chamber, and
g. an endless conveyor for moving the vehicle through said module.

6. A module for burning nonmetalic materials comprising:
a. a substantially enclosed structure,
b. a burning chamber in said structure,
c. restricted means having an opening therein for allowing the gases of combustion to flow from said chamber,
d. baffle means positioned above said restricted means,
e. first means for washing said gases with a liquid as they flow from said restricted means around said baffle,
f. said washing means being positioned so the liquid is kept from entering said chamber, and
g. second means for washing positioned above said baffle means.

7. A module as defined in claim 6 wherein said burning chamber is substantially underground.

8. A module as defined in claim 7 wherein a pair of ramps leads to and from said chamber.

9. A module as defined in claim 6 wherein said washing means is positioned along said baffle.

10. A module as defined in claim 6 wherein said washing means includes a plurality of nozzles positioned a substantially regular distance apart over said restricted means with an expanded spacing over said opening whereby substantially no liquid flows into said chamber.

11. A module as defined in claim 6 wherein said structure has walls having firebrick thereon.

12. A module as defined in claim 6 wherein said structure has walls having a heat-resistant synthetic material coated thereon.

13. A module as defined in claim 6 including means for varying the draft to control the flow of said gases.

14. A module as defined in claim 6 having wheel means adapted to enable the structure to be moved.

15. A module as defined in claim 6 having means for reusing the liquid.

16. A module as defined in claim 15 having means to filter said liquid prior to reusing same.

17. A module comprising:
a. a substantially enclosed structure,
b. a fume collecting chamber in said structure,
c. restricted means formed by a pair of inclined plates separated at their apex for allowing the gases to flow from said chamber,
d. baffle means positioned above said restricted means,
e. first means for washing said gases with a liquid as they flow from said restricted means around said baffle.
f. said washing means being positioned so the liquid is kept from entering said chamber,
g. second means for washing positioned above said baffle means.

18. A module for burning nonmetalic materials comprising:
a. a substantially enclosed structure,
b. a burning chamber in said structure,
c. restricted means formed by inclined plates having an opening there between for allowing the gases of combustion to flow from said chamber,
d. baffle means positioned above said restricted means,
e. first means for washing said gases with a liquid as they flow from said restricted means around said baffle,
f. said washing means being positioned along said baffle so the liquid is kept from entering said chamber, and
g. second means for washing positioned above said baffle means.

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