

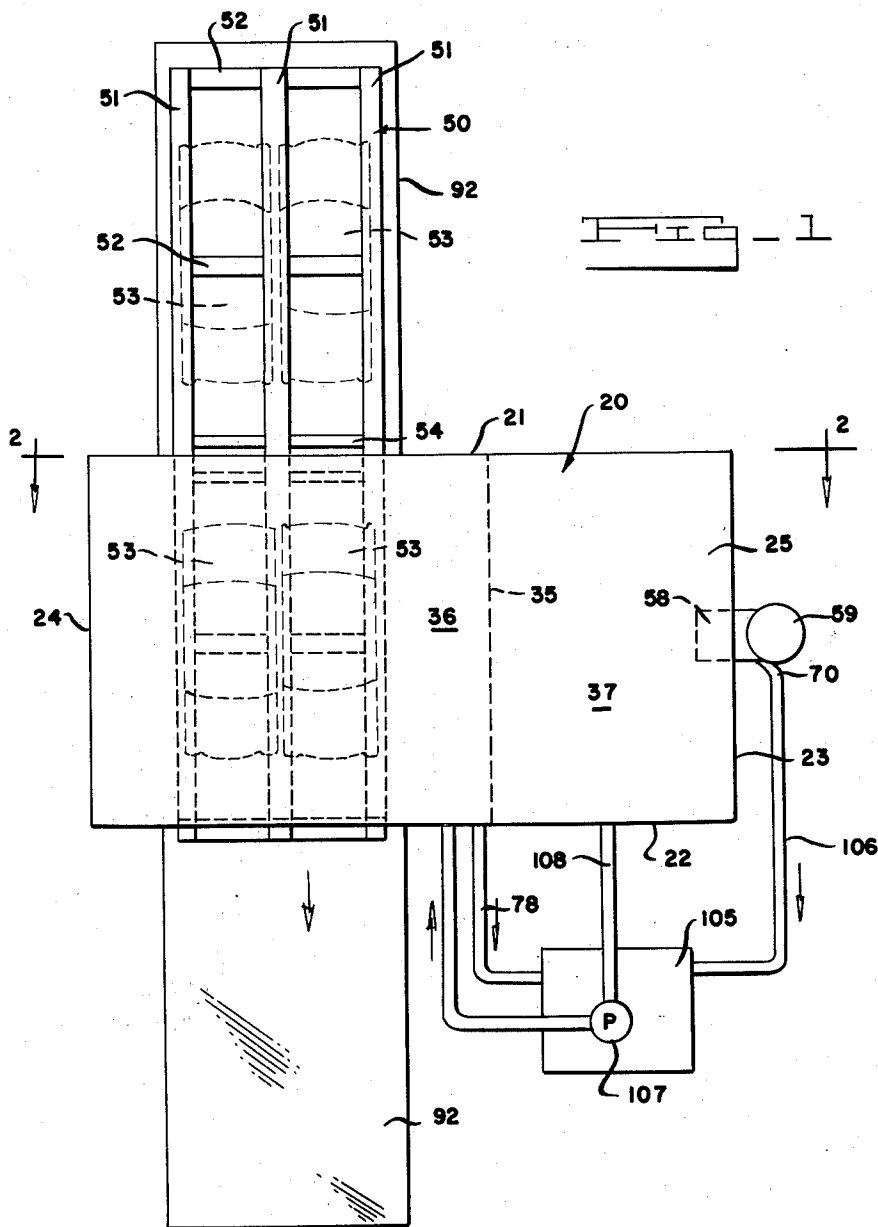
Feb. 10, 1959

S. BABCOCK
INCINERATORS

2,873,101

Filed April 8, 1957

7 Sheets-Sheet 1



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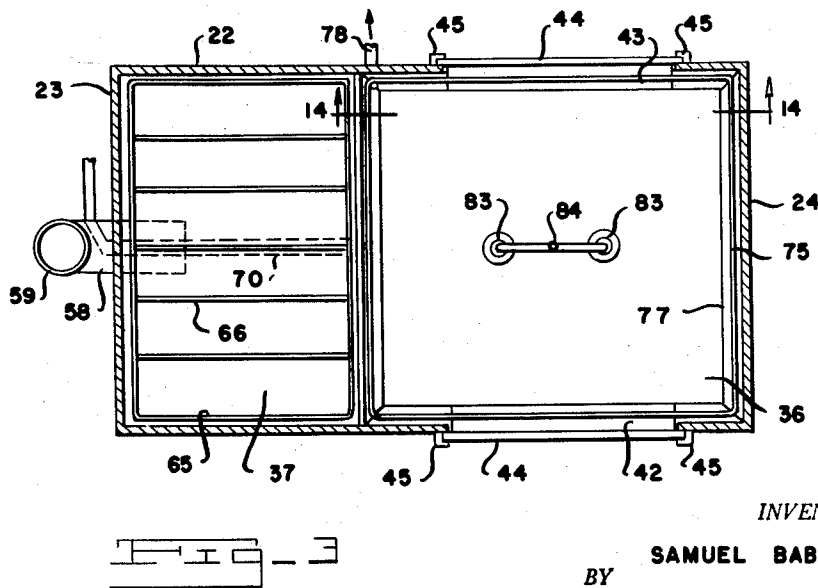
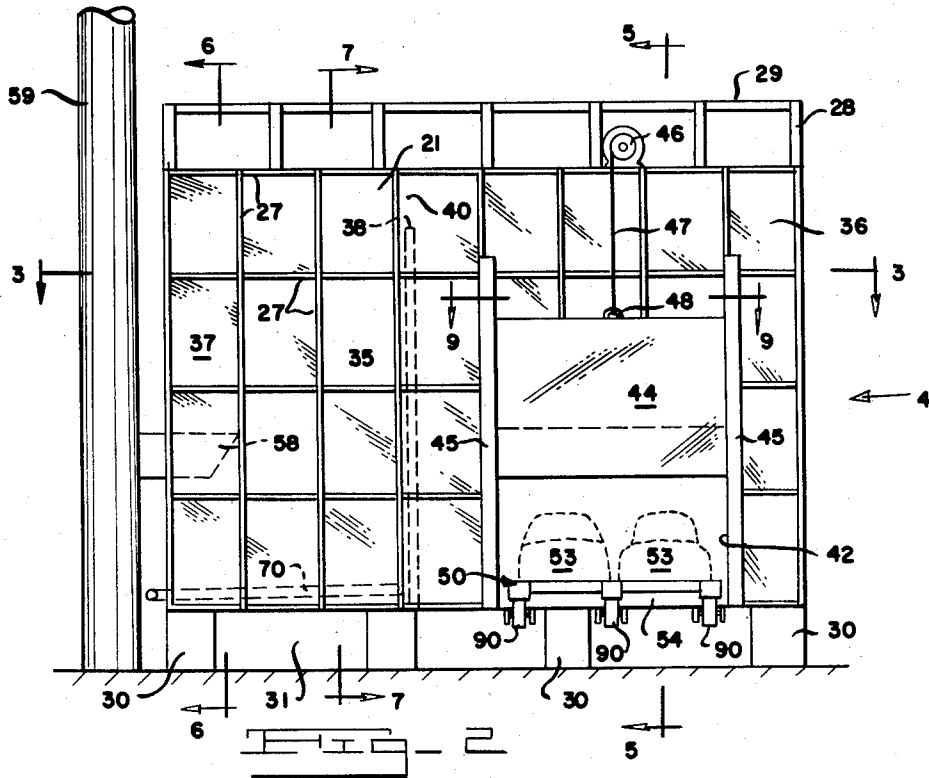
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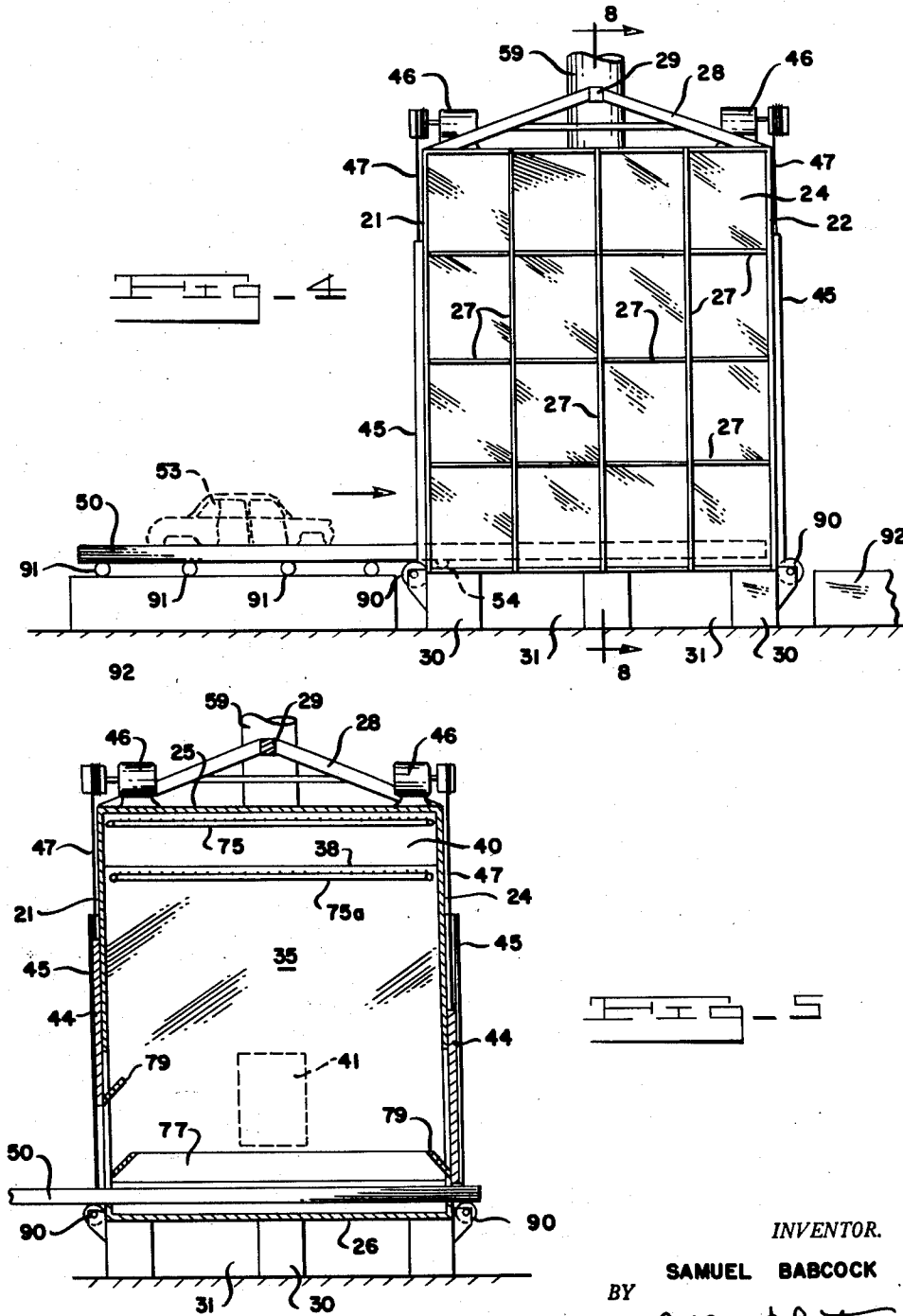
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7 Sheets-Sheet 3



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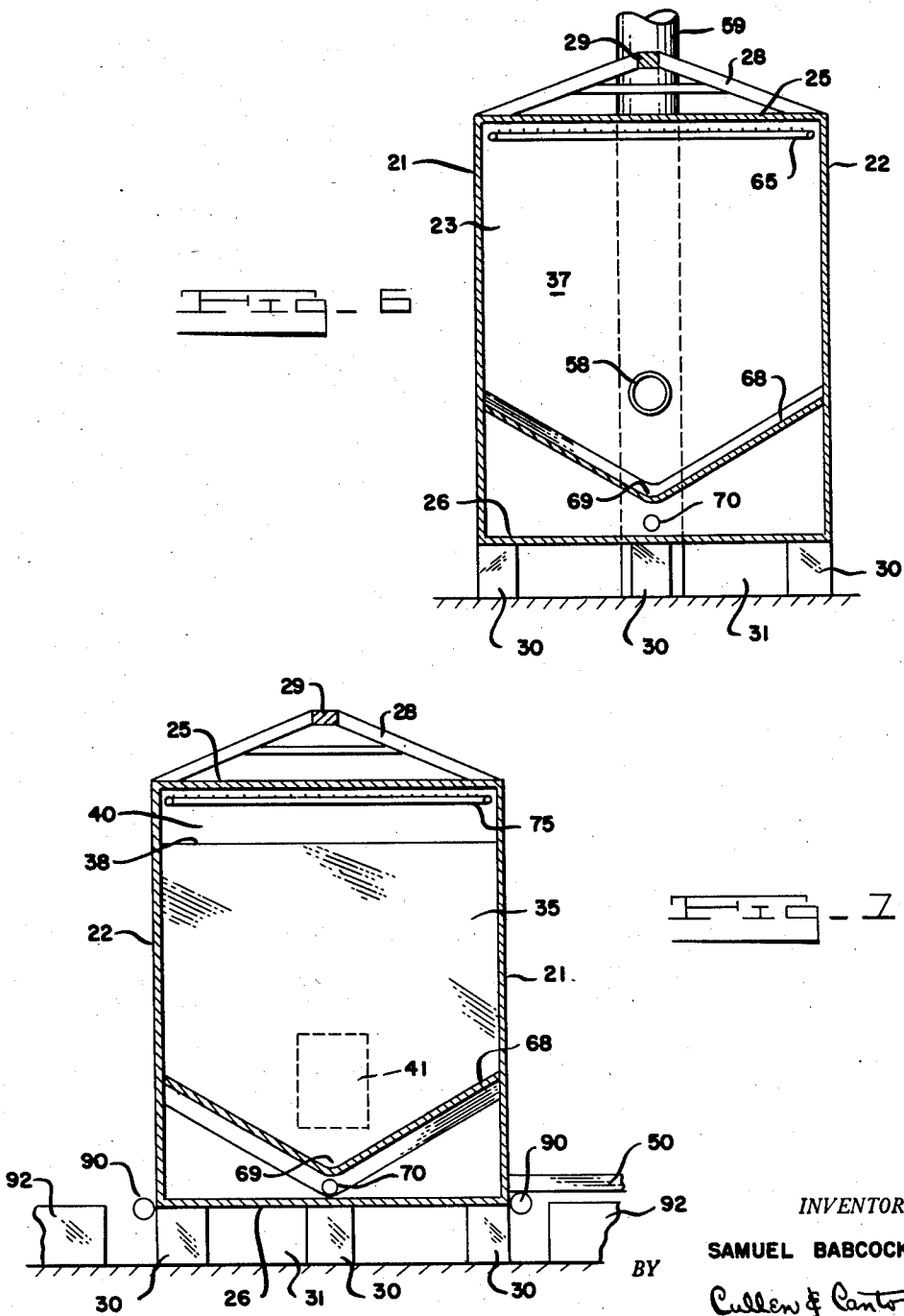
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7 Sheets-Sheet 4



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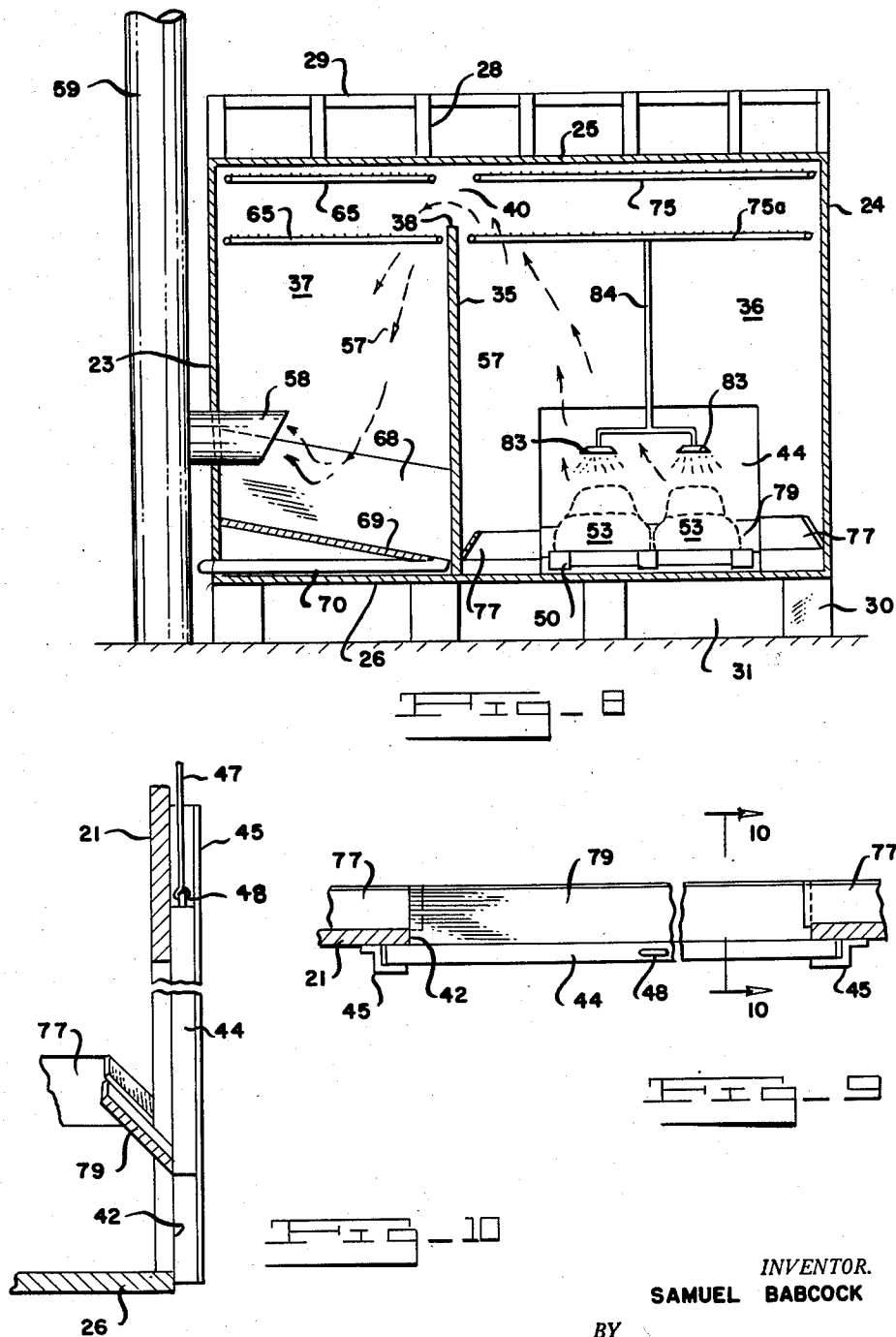
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7 Sheets-Sheet 5



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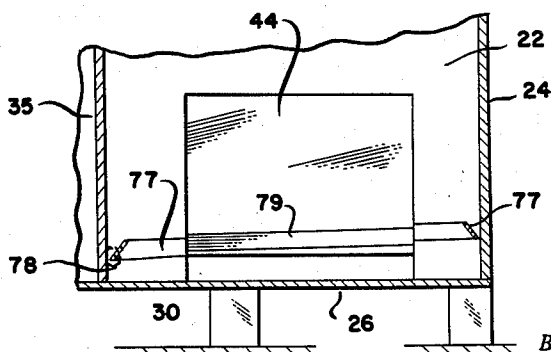
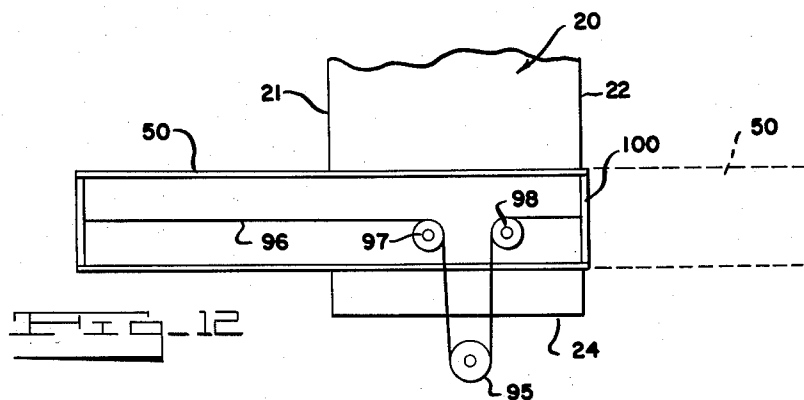
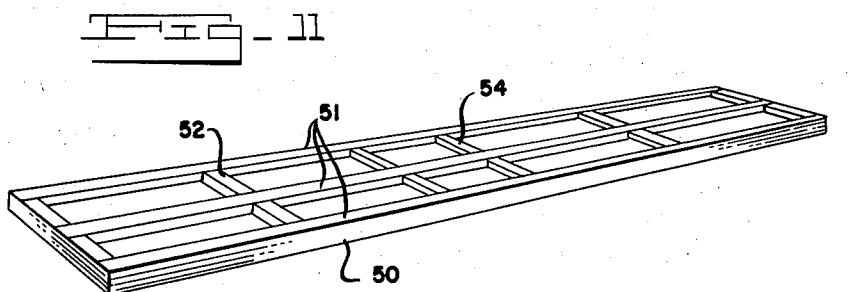
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7 Sheets-Sheet 6



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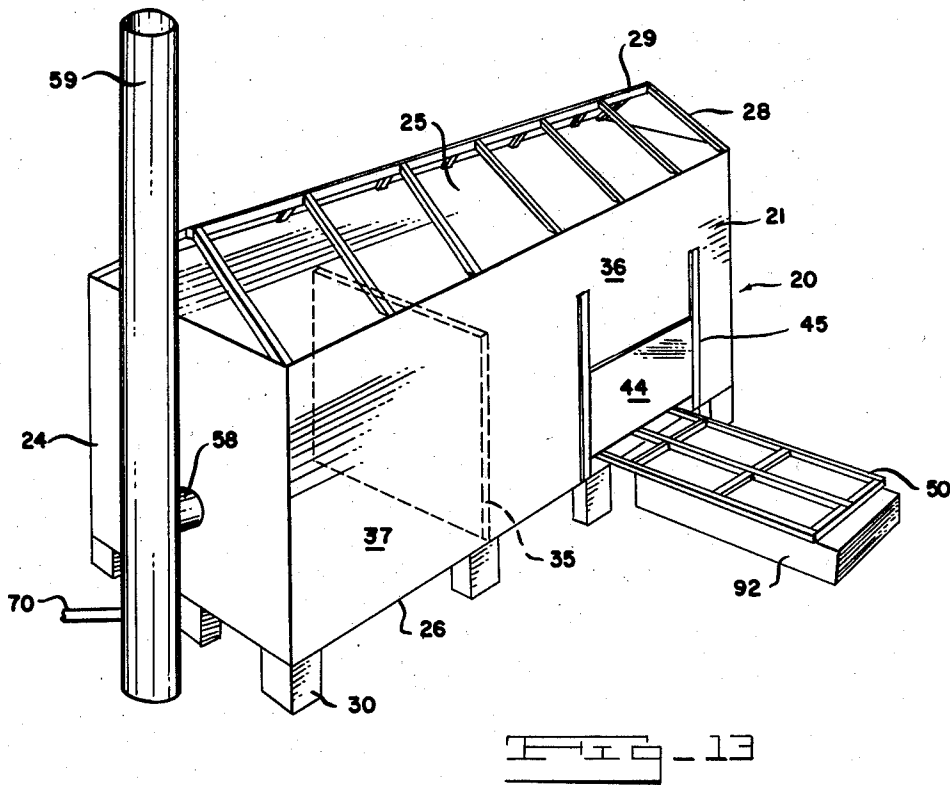
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7 Sheets-Sheet 7



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2,873,101

INCINERATORS

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Application April 8, 1957, Serial No. 651,311

6 Claims. (Cl. 263—2)

This invention relates to incinerators, and more particularly to an incinerator useful for burning automobiles and other large size similar objects and particularly adapted for removing the dirt and soot from the smoke resulting from combustion.

When automobiles and similar types of objects are being wrecked for salvage, it is a common practice to burn these objects in order to remove all grease, paint, fabric and other combustible materials so as to leave the metal bare of all combustible material. This metal is then salvaged for use as scrap to be returned to the steel and iron manufacturers for remelting.

Where automobiles and the like are burned, one of the major problems involved is that of preventing the dirt, soot, and other small particles from being blown away with the smoke of combustion to pollute the atmosphere.

Thus, it is an object of this invention to provide an incinerator suitable for use in burning automobiles and the like but wherein the smoke of combustion is cleaned before release to the atmosphere to avoid pollution of the air.

A further object of this invention is to form an incinerator of large size for the combustion of automobiles and similar types of structures, but at the same time, to form the structure out of inexpensive metal plate material rather than fire brick, which is expensive to install and expensive to maintain in operating condition.

Still another object of this invention is to form an incinerator which can be continuously operated by means of providing a carriage for carrying the automobiles or the like on one end thereof into the incinerator with the opposite end of the carriage remaining outside of the incinerator for loading, and thereafter the carriage can be moved through the incinerator to position the loaded objects therein and to remove those objects which have already been burned.

Still a further object of this invention is to form an inexpensive, extremely large size incinerator out of inexpensive structural material and inexpensive thin, metal plate walls and at the same time to constantly cool these walls to prevent them from buckling or bending due to the heat involved.

These and other objects of this invention will become apparent upon reading the following specification of which the attached drawings form a part.

With reference to the drawings,

Fig. 1 shows a top plan schematic view of the complete incinerator.

Fig. 2 is an elevation of one side of the incinerator taken in the direction of arrows 2—2 of Fig. 1.

Fig. 3 is a cross-sectional plan view taken in the direction of arrows 3—3 of Fig. 2.

Fig. 4 is an end view taken in the direction of arrow 4 of Fig. 2.

Fig. 5 is a cross-sectional view of the combustion chamber as if in the direction of arrows 5—5 of Fig. 2.

Figs. 6 and 7 are cross-sectional views of the washing

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chamber taken in the direction of arrows 6—6 and 7—7 respectively of Fig. 2.

Fig. 8 is an elevational cross-sectional view showing both the combustion chamber and the washing chamber and taken in the direction of arrows 8—8 of Fig. 4.

Fig. 9 is an enlarged fragmentary view of the door structure taken in the direction of 9—9 of Fig. 2, and

Fig. 10 is a fragmentary view showing the door in a vertical end position taken in the direction of arrows 10—10 of Fig. 9.

Fig. 11 is a perspective view of the carriage, per se.

Fig. 12 shows the carriage schematically with the means for moving the carriage likewise shown schematically.

Fig. 13 is a small scale perspective view of the incinerator.

Fig. 14 is a view of the door and water troughs taken in the direction of arrows 14—14 of Fig. 3.

The incinerator of this invention is generally of the appearance of a large box-like structure 20 as illustrated, for example, in Fig. 13. By way of example, one model of this device is dimensionally somewhere in the order of 30 feet high, 50 feet wide, and 30 feet deep. Obviously, the dimensions are by no means critical and may vary considerably, but it can be seen, that this box-like structure is quite large for reasons to be described later.

The structure 20 is formed with side walls 21 and 22, end walls 23 and 24, a flat ceiling or roof 25 and a floor 26. The walls, ceiling and floor, are formed of flat metal plates welded or bolted together and rigidified by structural members 27, which as can be seen in Fig. 2, are secured to the plates on the outside of the box. The structural members may be in the form of T beams or I beams or any similar structural form suitable for an object of this size.

To brace the roof, trusses 28 (Fig. 4) are provided at spaced intervals along the roof and are interconnected by a beam 29 (Fig. 2). The trusses are above the roof and are exposed for free air circulation so that they are constantly cooled.

The box itself is preferably raised off the ground by blocks or beams 30 (Fig. 4) to form an air space between the floor and the ground. This space permits the continuous circulation of air to thereby constantly cool the floor.

As illustrated in Figs. 1, 2, and 8, the incinerator is divided by a partition wall 35 into two chambers: a combustion chamber 36 and a washing chamber 37. The partition wall 35 extends from the floor towards the ceiling, but its top end 38 is arranged a few feet beneath the ceiling 25 to provide a space 40 between the top of the partition and the ceiling 25. A door 41 (see Fig. 5) is formed in the partition to provide access into the washing chamber from the combustion chamber 36.

The combustion chamber 36 is provided with aligned large doorways 42 and 43 (shown in Fig. 3). These doorway openings are covered by vertically sliding doors 44 which slide in tracks 45 (Figs. 2 and 9). These doors may be independently raised or lowered, to completely or partially cover the doorway openings, by means of an outside winch arrangement 46 (Fig. 2), including a pulley and motor having a connecting cable 47 connected to the top of each door at 48. Any conventional controls may be used to operate the winches, so as to raise and lower the doors when desired.

In order to move the objects to be burned into and out of the combustion chamber, a carriage 50 (Fig. 1) is provided. This carriage (Fig. 11) may be formed of spaced elongated metal beams 51 joined together at spaced points by cross-bars 52. Upwardly extending

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bars 52a may be provided to act as cradles for the objects to be burned.

The carriage is at least twice as long as the depth of the combustion chamber so that when approximately one half of the carriage is within the combustion chamber, the other one half is out in the open (Fig. 1). Thus, in operation of this carriage, objects 53, to be burned, in dotted lines representing automobiles in Fig. 1, are placed on the carriage at one end and then slid through the open doors into the combustion chamber. The opposite end of the carriage remains outside and additional automobiles 53 may then be mounted on this end. When the automobiles inside the combustion chambers have been fully burned, the carriage is moved through the aligned doorways so that the burned cars come out one end and the cars to be burned enter the chamber. At this point, the burned cars are unloaded and additional cars to be burned are then loaded in their place. Thus, a slide action is obtained where loading and unloading takes place at both opposite doors of the combustion chamber to give a quick loading and unloading and a continuous operation.

The cross beam construction of the carriage permits the burned debris about 800 lbs. per automobile, to fall through the carriage to the floor 26. It is scraped off the floor and out of the incinerator into pits of the loading docks outside the doors by the reciprocation of the carriage, which carries a scraper blade 54 on its lower surface for this purpose.

In order to burn the automobiles or other objects to be consumed within the combustion chamber, these objects may be soaked with gasoline or other inflammable material and set on fire within the combustion chamber.

While the object is burning, particularly where the object is covered with paint and grease and the like, dense, black, sooty, dirty smoke is emitted. Such smoke quickly pollutes the atmosphere, and in fact, there are ordinances in many areas which prohibit the discharge of such smoke into the atmosphere.

In this incinerator, the smoke rises and passes over the top 38 of the baffle plate or partition 35 through the space 40 and then into the washing chamber 37. This is illustrated by the arrows 57 in Fig. 8. The smoke in the washing chamber then is carried through an exhaust pipe 58 and out through the exhaust smoke stack 59.

The washing chamber is provided with water pipes 65 extending around the perimeter thereof near the ceiling and also cross pipes 66, where necessary. These pipes are provided with a large number of nozzles spaced as close to each other as necessary. Water is discharged through these nozzles in the form of a spray to float down through the washing chamber to the floor thereof. The floor in this case is provided with a trough shaped basin 68 with the V shaped part of the trough 69 being angled relative to the horizontal towards a discharge tube 70 (Fig. 8). Thus, the washing chamber is completely saturated with water which pours down from the ceiling in a spray which washes the smoke to remove all the various dirt and soot particles. The smoke which then exits through the pipe 58 and then through the smoke stack 59 is quite clean and is free of all the particles which would otherwise pollute the air.

Where necessary to provide a better draft for the smoke stack, a small heater, such as an oil heater 59a (Fig. 2) may be positioned in the base of the smoke stack 59.

In view of the fact that the walls of the combustion chamber are of thin metal plate, it can be seen that this plate is highly susceptible to damage because of heat. For example, the plate walls and ceilings and floors would easily buckle under the heat of combustion unless protective steps were taken. Obviously, the chamber could be lined with fire brick or the like, but this is quite expensive and it is an object of this invention to avoid the use of fire brick. Thus, the combustion chamber

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is provided with pipes 75 (Figs. 3, 8) arranged around the perimeter thereof near the ceiling and formed with nozzles for pouring water directly on the walls and to cause the water to constantly bathe the walls from the ceiling to the floor. Where necessary, additional perimeter pipes 75a may also be provided against the walls. The water as it reaches the floor is caught in troughs 77 which are arranged around the entire perimeter of the combustion chamber and which are angled relative to the horizontal so as to collect the water at one discharge drain port 78. In this case, the sliding doors are likewise provided with trough portions 79 so as to form a continuation of the troughs which extend around the wall perimeters when the door is aligned or substantially aligned with the troughs. Since the doors are used as dampers for adjusting the amount of air entering into the combustion chamber, the door and wall troughs would not normally align perfectly, but would be vertically offset somewhat (Fig. 14). However, the troughs may be made to overlap so that thus, water pours a short distance from one wall trough into the door trough and then back into the wall trough to thereby provide a continuous flow of water and prevent the water from flowing to the ground outside of the combustion chamber.

In addition to the water spray on the walls of the combustion chamber, nozzles 83 which are hung from a pipe 84 and connected to the water supply perimeter lines 75 or 75a are arranged to provide a water fog above the object to be burned (Fig. 8) to thereby prevent the heat from the burning objects from rising to scorch or damage the ceiling of the combustion chamber. The fog is sufficient to prevent overheating of the ceiling but is not sufficient to put out the fire on the objects being burned.

In operation, the automobile or other object 53 to be burned is placed upon one end of the carriage 50. In Fig. 1, two automobiles are placed side by side. Then that end of the carriage is pushed into the combustion chamber. The carriage itself rides upon rollers 90 arranged at the doorways and rollers 91 arranged on top of loading docks 92 aligned with the openings in the combustion chamber. The carriage may be moved by means of a winch 95 (Fig. 12) operating a cable 96 wound around stationary pulleys 97—98 under the floor and connected at its ends to the ends of the carriage at 99—100. Thus, the winch, which may be operated by a reversible electric motor or the like, by winding or unwinding the cable moves the carriage back and forth into the combustion chamber and out the other side again. This is shown schematically in Fig. 12.

Thereafter, the doors are closed and the object is burned within the combustion chamber. During the burning, additional automobiles may be loaded upon the end of the carriage which is outside of the combustion chamber. The water during this time flows within the combustion chamber to completely bathe the walls of the chamber and keep the walls cool and likewise, the water fog above the automobiles being burned prevents the ceiling from being over heated.

The smoke rises through the water fog and over the top of the partition 35 and into the washing chamber where water constantly flowing down in a spray from the ceiling washes the dirt particles and the like out of the smoke into the catch trough 68 and then out through the V part 69 of the trough to the drain 70. The smoke which is cleaned, then passes through the exhaust tube 58 and out the smoke stack 59.

In order to supply water continuously for the combustion chamber walls and for the spray in the cleaning room, a pit 105 (Fig. 1) is provided outside of the incinerator and water from the washing chamber passes into the pit through the drain pipe 106 connected with the drain 70 therein. Likewise, water passes from combustion chamber collection drain pipe 78 into the pit. A pump 107 in the pit then picks up the water from the pit after filtering the water by means of a filter (not shown)

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and pumps the water back through pipes 108 into the water tubing 65 and 66 within the washing chamber for recirculation and also into the water piping 75 and 75a inside the combustion chamber for repassage over the walls of the combustion chamber.

This invention may be further developed within the scope of the following attached claims. Accordingly, it is desired that the foregoing description be read as being merely illustrative of one operative embodiment of this invention and not in a strictly limiting sense.

I now claim:

1. An incinerator for burning old automobile bodies comprising a large box having side walls, end walls and a ceiling, and divided vertically by a substantially imperforate baffle plate or partition parallel to the end walls to provide a combustion chamber adapted to contain automobile bodies to be burned and a smoke washing chamber, with the partition having its upper edge a short distance below the ceiling to provide an upper passage between the upper edge of the baffle plate and the ceiling for smoke to pass from the combustion chamber into the washing chamber only through said upper passage, the box height and length dimensions being at least several times the height and length of the automobile bodies being burned, and the depth dimension being at least larger than the maximum dimension of the bodies being burned, said box being made solely of large area thin metal plates joined edge to edge to form the side walls, the end walls and the ceiling, the walls forming the box being secured to a structural frame which rigidifies and supports the box and which comprises frame members arranged outside of the box so as to be exposed to atmosphere, and including side wall frame members, end wall frame members and ceiling frame members, all outside the box walls, the box having in its side walls alined openings large enough to permit one or more automobile bodies to be entered horizontally through these openings in the side walls, these openings being located in the combustion chamber part of the box a considerable distance from the washing chamber, water spray means in the upper part of the combustion chamber and the wash-

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ing chamber which sprays water on the walls and partition of the box for cooling these walls and partition, and for spraying water downwardly into the washing chamber from above it to wash the smoke in the washing chamber and for spraying water into the combustion chamber from above it for forming a water fog for cooling the ceiling of the combustion chamber, an exhaust opening in the end wall of the washing chamber and an exhaust stack outside the box and supported independently of the box and connected at its lower end to the exhaust opening of the washing chamber which is also near the lower edge of the washing chamber end wall.

2. A construction as defined in claim 1 wherein the ceiling frame is a roof truss arranged above the ceiling and on the outside of the box.

3. A construction as in claim 1 wherein the alined doorways in the side walls are covered by vertically movable sliding doors.

4. A construction as defined in claim 1 wherein the floor of the box is mounted on pedestals above the ground to provide an air space between the ground and the floor for cooling the floor.

5. A construction as in claim 1 having a water collecting trough and a drain therefor.

6. A construction as in claim 1 having a loading and unloading carriage whose length is twice the depth of the box and whose width is nearly that of the side wall openings and which is mounted to reciprocate through these openings whereby one body may be loaded or unloaded while another is being burned.

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