

May 29, 1945.

C. A. POTTER

2,376,938

DESTRUCTOR

Filed Jan. 13, 1943

2 Sheets-Sheet 1

Fig. 1.

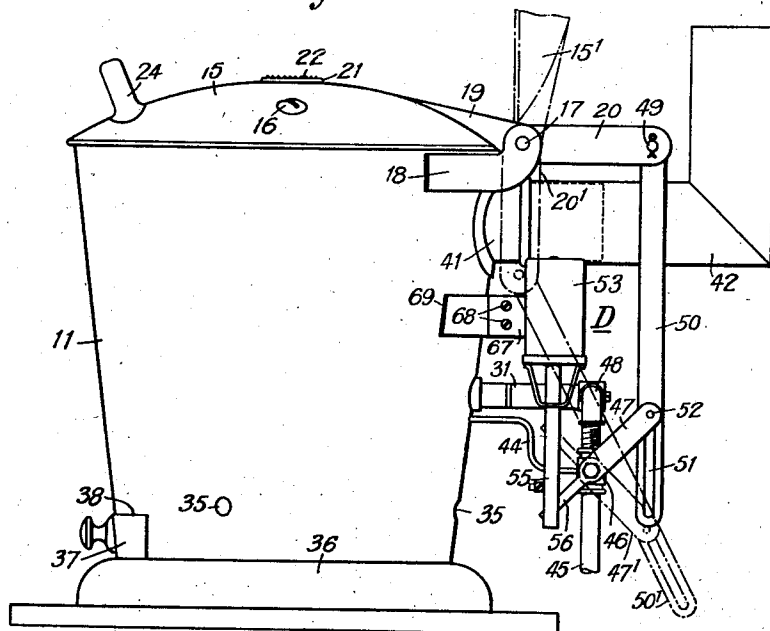


Fig. 2.

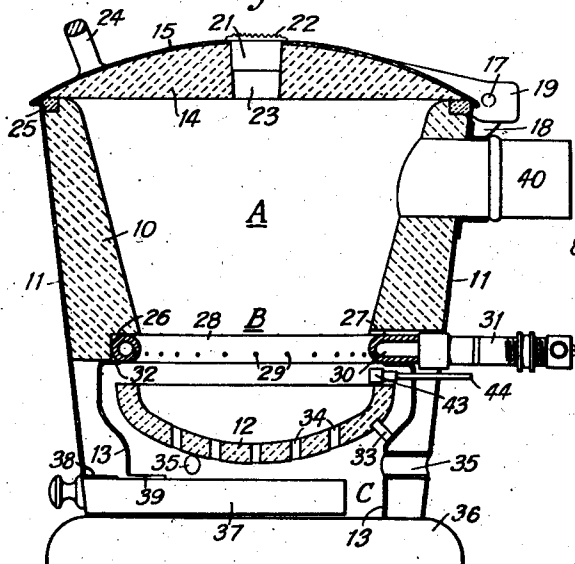
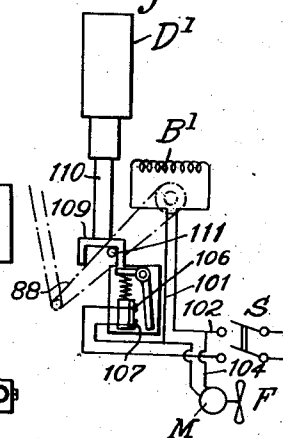


Fig. 5a



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2 Sheets-Sheet 2

*Fig. 3.*

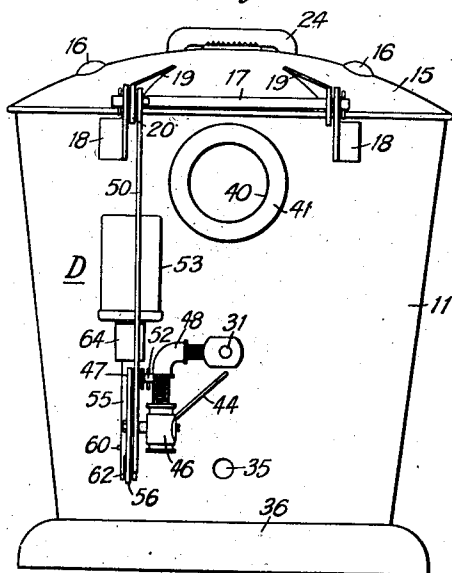


*Fig. 4.*

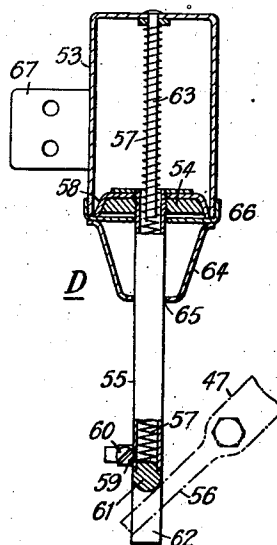


*Fig. 5.*

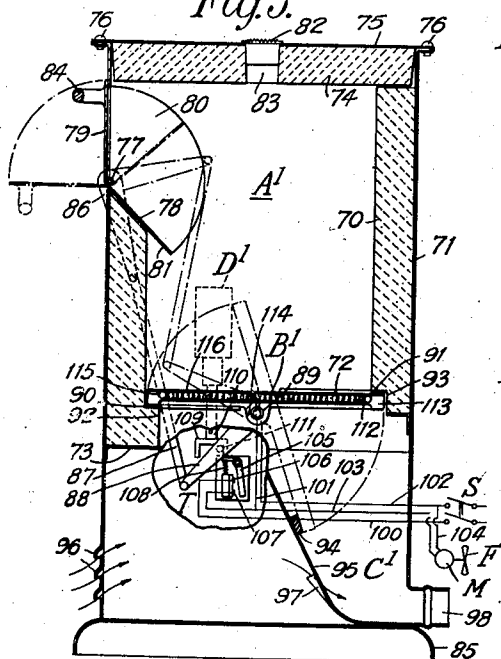


*Fig. 6.*

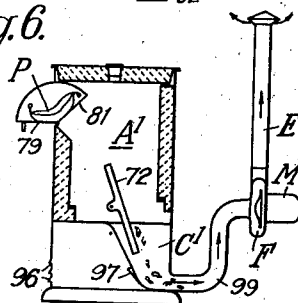
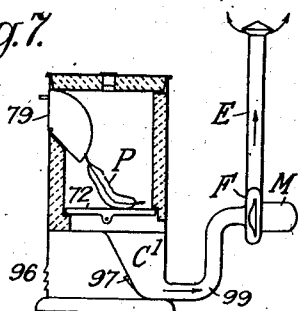


*Fig. 7.*



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## UNITED STATES PATENT OFFICE

2,376,938

## DESTRUCTOR

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Application January 13, 1943, Serial No. 472,267  
In Great Britain January 28, 1942

5 Claims. (Cl. 110—9)

This invention relates to destructors and has for its main object to provide a hygienic destructor for absorbent material such as soiled sanitary towels or catamenial pads, which are usually made chiefly of cellulose wadding or the like.

At the present time, women's branches of the national services and munition plants where large numbers of women are present, have to contend with difficulties in the disposal of soiled sanitary towels; usually the individual follows her own inclination in so doing, for example by leaving the towel anywhere out of sight, which may be very inconvenient to other persons, or by dropping it in the toilet bowl, which may lead to serious obstruction of the drainage system.

Another object of the invention is to provide a destructor of the above character which is adapted for rapidly repeated operation so that large numbers of sanitary towels can be destroyed singly at the convenience of the individuals.

A further object is to provide a destructor of this character which is brought into operation by the simple act of inserting the absorbent material in a container provided with a closure device, the movement of which for the introduction of the material actuates an electrical switch, gas-cock or the like to produce the necessary heat for destroying the material.

A still further object of the invention is to provide a sanitary destructor with automatic means for controlling the heating means so as to put it out of operation after a predetermined period sufficient for the destruction of the material, leaving the destructor ready for operation at the next movement of the closure device.

Other objects and advantages of the invention will hereinafter appear from the following description of preferred embodiments, given with reference to the accompanying drawings, in which:

Fig. 1 is an elevation of a gas-fired destructor with hinged lid, the lifting of which brings the gas-burner into operation under control of a timing device.

Fig. 2 is a sectional elevation of the destructor.

Fig. 3 is a rear elevation.

Fig. 4 is a part-sectional view of the timing device seen in Fig. 1.

Fig. 5 is a sectional elevation of an electrically heated destructor with a trap-door, the opening movement of which brings the heating means into operation under control of a timing device.

Fig. 5a is a detailed showing on an enlarged scale of the control apparatus shown in connection with the device illustrated in Fig. 5.

Figs. 6 and 7 are diagrams on a smaller scale, showing subsequent phases of the cycle of operations of this destructor.

As illustrated in Figs. 1 to 3, the destructor comprises an incinerating chamber A formed by a refractory fire-clay lining 10 inside a frusto-conical metal shell 11, with a fire-clay hearth 12 supported upon a false bottom 13 inside the shell 11, and a fire-clay cover 14 secured to a domed lid 15 by means of screws 16. The lid 15 is mounted upon a hinge pin 17 engaging pairs of lugs 18 and 19 attached as by riveting or welding to the shell 11 and to the lid 15 respectively, one of the lugs 19 attached to the lid having a rearward extension arm 20; a transparent plug 21 with prismatic outer surface 22 is fitted in a hole 23 in the middle of the refractory cover 14, so enabling the conditions inside the incinerating chamber A to be observed from the exterior. A grip 24 is secured as by welding to the front part of the lid 15 so that the latter can be conveniently lifted by hand towards the position indicated by chain lines at 15' in Fig. 1, thereby depressing the arm 20 for a purpose hereinafter explained. An asbestos packing ring 25 is fitted around the rabbeted upper edge of the lining 10 so as to make an air-tight joint with the cover 14 when the lid is returned to the closed position.

The lower end of the lining 10 has an annular recess 26 with a radial connecting channel 27, within which there is fitted a gas-burner B, comprising a hollow ring 28 with perforations 29 and a radial branch 30; the latter extends along the channel 27 and is connected to a pipe 31 through which gas is supplied to the burner, either from a fixed point or from a detachable plug connection. The false bottom 13 has its upper edge inturned at 32 in order to support the burner in position, and the refractory hearth 12, which is perforated as at 34 for passage of air, is provided with a number of inclined pegs 33 to support it on the lower part of the false bottom. Air is admitted to the ash-pit C through radial intake pipes 35 welded in place between the shell 11 and false bottom 13, which are themselves secured as by welding to a base 36, and the ashes falling from the hearth 12 are collected in a removable pan 37 inserted through openings 38 and 39 in the parts 11 and 13 respectively. A flue pipe 40 is connected to the incinerator chamber A, towards the top of the latter, being secured for example by means of a flanged socket 41 to the exterior of the shell 11; as shown in Fig. 1 the flue pipe is fitted with a bend or angle 42 which can be continued to a convenient chimney or other point

of discharge for the flue gases and lighter ashes or residue from the destructor.

A pilot or bye-pass burner 43, supplied through a small pipe 44, is arranged beneath the branch 30 of the gas-ring 28 and just above the top edge of the hearth 12, this pilot burner being constantly kept alight in order to ignite gas issuing from the main burner B when the destructor is brought into operation. Both burners are fed from the same main or supply pipe 45, but the main burner B is controlled by a gas-cock 46 operated by a lever 47, the burner pipe 31 being connected to the outlet of the cock 46 through a bend 48; the lever 47 is operated to open the cock 46 by the depression of the arm 20 when the lid 15 is lifted, a pin 49 at the rear end of the arm 20 being engaged by a dependent link 50 having its lower end slotted at 51 to engage a pin 52 upon the lever 47, the parts then assuming the positions indicated by chain lines at 20<sup>1</sup>, 50<sup>1</sup> and 47<sup>1</sup> in Fig. 1. While the lid is open and after the burner B has been ignited by the pilot burner 43, the absorbent material to be destroyed can be cast into the incinerator chamber A, the lid being then reclosed; during the closing movement, the arm 20 and link 50 return to their normal position, but the gas-cock lever 47 remains approximately in the full-on position, which it retains for a sufficient period (for example, 1 or 2 minutes) to complete the destruction by fire of the absorbent material. At the expiration of this period, the gas-cock is automatically closed by the operation of a timing device D; in the embodiment illustrated in Fig. 4, this device comprises a dash-pot cylinder 53 containing a piston 54 with a tubular piston rod 55 which engages a tail or extension 56 of the lever 47, a compression spring 57 acting to force down the rod 55 and thereby return the gas-cock to closed position as the piston 54 completes its downward stroke. The piston is fitted with a leather washer or bucket 58 which yields to allow air from the closed upper end of the cylinder to pass freely to below the piston during upward movement of the latter as the gas-cock is opened by the lifting of the destructor lid 15; on the return stroke, however, the bucket 58 seals the air in the lower end of the cylinder 53 beneath the piston 54, subject to a regulated escape through the tubular piston rod 55 to an outlet 59, which is adjustable by means of a needle valve or screw 60, whereby the time of descent may be regulated to give any required period of operation of the burner B at each charging of the incinerator. The bottom end of the tubular piston rod is plugged by a forked member 61, soldered in place, the tail or extension 56 of the gas-cock lever engaging between the prongs 62 of the forked member; the latter also provides an abutment for the lower end of the spring 57, which is centered at its upper end by a guide pin 63 fixed to the top of the cylinder. A bridge piece 64, apertured at 65 to guide the movement of the piston rod 55, is soldered to a cap 66, which is screwed in place upon the lower end of the cylinder; a web 67 upon one side of the cylinder is secured by screws 68 to a supporting bracket 69 welded to the shell 11 of the destructor.

Figs. 5, 6 and 7 illustrate another construction of destructor comprising an incinerating chamber A<sup>1</sup> formed by a refractory brick lining 70 inside a cylindrical metal shell 71, with a tilting hearth 72 fitted with one or more electrical heating elements B<sup>1</sup>, a false bottom 73 and a refractory cover 74 secured to a flat metal lid 75. The

lid 75 is attached to the top of the shell 71 by means of screws 76, and a transparent plug 82 with prismatic outer surface is fitted in a hole 83 in the middle of the cover 74; the shell 71 rests upon a base 85 to which it is secured, as by welding. At the front of the incinerator chamber, there is mounted upon a hinge pin 77 and within an opening 78 in the refractory lining 70, a trap door 79 having obtuse sector-shaped side flaps 80 and an inner flap 81; the door is provided with a grip 84 whereby it may be pulled forward from the normal closed position shown in Fig. 5 to the open position shown in chain lines, in order that the absorbent material to be destroyed may be placed upon the inner side of the door while the trap is open.

A crank arm 86 secured to an extremity of the pin 77 to one side of the destructor is connected by a link 87 to a second crank arm 88 secured to a hollow spindle 89 upon which the tilting hearth 72 is mounted; the proportions of the parts are preferably such that in the normal closed position of the trap door, the crank arm 86 and connecting link 87 lie in a straight line so as to lock the hearth in a horizontal position, but in the open position of the trap door the hearth is tilted to a steep angle of about 70 degrees in order to discharge any matter resting thereon into a pit C<sup>1</sup> at the back of the false bottom 73. Normally the front and back of the hearth rest against asbestos pads 90 and 91 located respectively upon an inward flange 92 and within a rabbet 93, both formed at the base of the lining 70; in its tilted position, the hearth rests with its back edge seated upon an asbestos pad 94 secured to the sloping wall 95 of the pit C<sup>1</sup>.

The front wall of the shell 71 is provided with louvres 96 for the admission of air beneath the false bottom 73, the air then passing into the pit C<sup>1</sup> through a scoop 97 formed in the sloping wall 95 and sweeping across the bottom of the pit so as to carry off any remains of the discharge from the tilted hearth into an outlet 98 from which they are evacuated through a pipe 99 and a chimney E by a fan F, as indicated in Fig. 6.

The heating element or elements B<sup>1</sup> and the motor M driving the fan are preferably fed with current simultaneously with the tilting of the hearth so as to prepare the hearth for the incineration of the material to be introduced through the trap door and at the same time to draw out any remains from a previous operation, such remains being discharged by the tilting of the hearth. As represented diagrammatically in Fig. 5, current is supplied through a main switch S along the line 100 to an auxiliary switch T mounted on the side of the destructor, from which a line 101 extends to one terminal of the heating element or elements B<sup>1</sup>, with a return lead 102 back to the main switch; a branch 103 of the line 101 extends to the motor M, with a return lead 104 back to the main switch. The auxiliary switch comprises a rocking lever 105 adapted to bridge two fixed contacts 106 and 107 connected to the lines 100 and 101 respectively; a spring 108 engaging the rocking lever tends to close the auxiliary switch, but in the normal position shown the lever is rocked back to open the contacts by one arm of a forked member 109 secured to the lower end of a tubular piston rod 110 forming part of a timing device D<sup>1</sup> similar to that already described with reference to Fig. 4. The upward movement of the piston rod 110 is produced by a pin 111 projecting from the crank arm 88, so that when the trap door is opened,

the movement of the linked crank arms lifts the forked member 109 and piston rod 110, thereby closing the auxiliary switch T, lifting the piston rod 110 and setting the timing device D<sup>1</sup> for controlled return of the piston rod; at the end of the downward movement, the forked member 109 re-engages with the rocking lever 105 to break the heating and motor circuits, and also with the pin 111 upon the crank arm 88, which has already returned to normal position as the trap door was closed.

The closing of the trap door, after the absorbent material P has been placed thereon as indicated in Fig. 6, will cause the material to drop upon the hearth as indicated in Fig. 7, all parts being then again in normal position, but with the heating element or elements B<sup>1</sup> raised to a suitable temperature and the fan F drawing air through the louvres 96 and scoop 97 into the pit C<sup>1</sup> so as to carry off any odours from the incineration. At the end of the period determined by the timing device D<sup>1</sup>, the current will be switched off from the heating and motor circuits, the destructor being then ready for another operation when required. In the event of the trap door being opened for introduction of further material before the expiration of the set period, the partly consumed material upon the hearth will be discharged into the pit C<sup>1</sup>, where its combustion will be completed in the current of air induced by the fan F; at the same time, the device D<sup>1</sup> will be reset for a further period sufficient for the destruction of the second batch of material, the remains of which will be discharged into the pit at the start of the next cycle.

The construction of the tilting hearth is preferably such as to minimize retention of the charred remains upon its surface when tilted; it may comprise a circular plate 112 with a thickened rim 113, the underside of which is formed at diametrically opposite points with lugs 114 to engage the hollow spindle 89 and a corresponding spindle or pivot (not shown) at the other side of the hearth. The leads 101 and 102 extend through the hollow spindle 89 to the heating element or elements which are mounted within a recess 115 on the upper face of the plate 112 and are covered by mica or like refractory material as at 116, giving a smooth surface to which the charred remains will not adhere.

By way of example, the heating element or elements B<sup>1</sup> may be of 2 kilowatts rating, which has been found adequate to ensure destruction of the material within a period of two minutes; the destructor is thus adapted for rapid and repeated operation, without undue consumption of electrical power. In order to expedite the operation, the heating element or elements may be arranged to concentrate heat towards the middle of the hearth so that the actual burning of the material shall start as quickly as possible.

Instead of the electrical heating element or elements described, there may be employed a gas-burner similar to that shown in Fig. 2, covered by a plain or apertured plate of non-oxidizing metal, the gas supply to the burner being passed through the hollow spindle 89 and controlled by a gas-cock with timing device as hereinbefore described.

What I claim is:

1. A destructor of the kind set forth, comprising an incinerating chamber, a hearth within said chamber, a closure device normally sealing said chamber but displaceable manually for introduction of material upon said hearth, heating

means adjacent to said hearth, a control member for said heating means, mechanical connections between said closure device and control member adapted to bring said heating means into operation by displacement of said closure device, means for admitting air beneath said hearth, an outlet pipe for the discharge of said air together with gases and remains of material burnt upon said hearth, and a timing device associated with said control member, said timing device being connected to said control member for setting said timing device in operation simultaneously with said heating means, and said timing device being adapted by the connection with said control member to cut off said heating means after the lapse of a predetermined period of time.

2. A destructor of the kind set forth, comprising an incinerating chamber, a hearth within said chamber, a closure device normally sealing said chamber but displaceable for introduction of material upon said hearth, heating means adjacent to said hearth, means for admitting air beneath said hearth, pneumatic means connected to said chamber for extracting the remains of material burnt upon said hearth, means for controlling said heating and extracting means, and means connecting said closure device to said controlling means, said connecting means being adapted to bring said extracting means into operation jointly with said heating means.

3. A destructor of the kind set forth, comprising an incinerating chamber, a tiltable hearth within said chamber, heating means adjacent to said hearth, a closure device near the top of said chamber, said closure device including a trap and being displaceable in one direction for introduction of material into said trap, the replacement of said closure device dropping the introduced material from said trap upon said hearth, means for tilting said hearth to an inclined position by the displacement of said closure device in said one direction, and means connected to the bottom of said chamber for extracting the remains of incinerated material discharged by the tilting of said hearth to inclined position.

4. A destructor of the kind set forth, comprising an incinerating chamber, a tiltable hearth within said chamber, heating means adjacent to said hearth, a closure device near the top of said chamber, said closure device including a trap and being displaceable in one direction for introduction of material into said trap, the replacement of said closure device dropping the introduced material from said trap upon said hearth, means for tilting said hearth to an inclined position and bringing said heating means into operation by the displacement of said closure device in said one direction, means connected to the bottom of said chamber for extracting the remains of incinerated material discharged by the tilting of said hearth to inclined position, and a timing device for putting said heating and extracting means out of operation at the expiration of a given period from the displacement of said closure device in said one direction.

5. A destructor of the kind set forth, comprising an incinerating chamber, a tiltable hearth within said chamber, an ashpit beneath said hearth, heating means adjacent to said hearth, a closure device near the top of said chamber, said closure device consisting of a hinged mounted trap door displaceable outwardly from

said chamber for introduction of material into said chamber, a flap within said chamber, said flap being hingedly mounted together with said trap door and adapted to receive the material introduced in the outwardly displaced position of said trap door, a crank secured to said hearth, a second crank secured to said closure device, a link connecting said cranks, said link having a dead-center relation to said second crank and an angular relation to said first-mentioned crank in the closed position of said closure device and the horizontal position of said hearth, the re-

5 placement of said closure device being adapted to drop the introduced material from said flap upon said hearth in its horizontal position, and pneumatic means connected to the bottom of said chamber for causing a flow of air through said ashpit, said air completing the combustion of material ignited by said heating means upon said hearth and extracting the remains of incinerated material discharged into said ashpit by the tilt-  
10 ing of said hearth to inclined position.

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