

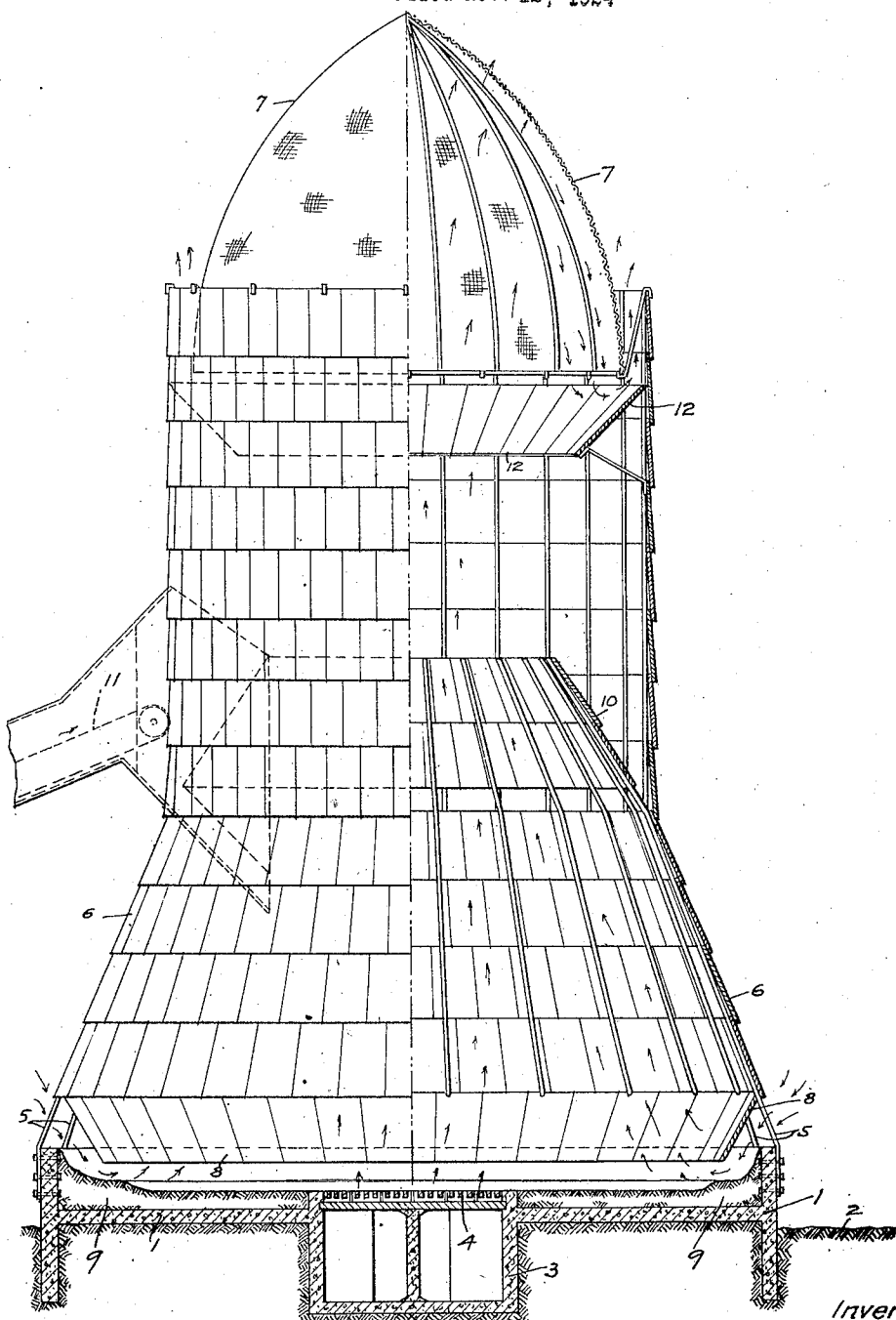
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J. T. STODDARD

WOOD REFUSE INCINERATOR

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Inventor.

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WOOD-REFUSE INCINERATOR.

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To all whom it may concern:

Be it known that I, JAMES T. STODDARD, a citizen of the United States, residing at Portland, in the county of Multnomah, State of Oregon, have invented a new and useful Improvement in Wood-Refuse Incinerators, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to incinerators as a class.

The object of my invention is to provide a device of the class adapted to burn wood-refuse, saw-dust, etc., near mills and plants making wood products. Such incinerators usually have a thin wall material to allow it to be quickly cooled and protect the walls from destruction by intense heat during combustion within. Heavy wall material usually burns out in a limited time and its use requires considerable initial expense and large expense for replacement. To effect a proper cooling of the walls of thin material in particular I have provided in my device an arrangement of parts to cause certain drafts of cool air to pass within and over the inner surface of the walls. These objects, as well as other advantages, I attain by the construction, combination and arrangement of parts illustrated in the accompanying drawings which form a part hereof.

The drawing consists of one figure only, being an elevation with parts thereof in section.

In this figure is shown a circular fire-pit 1, constructed in the soil 2, with an ash-pit 3 in the center and a grate 4 upon the same. The pits 1 and 3 are preferably of cement as shown. The superstructure consists of a circular frame 5 supported on the pit 1. This frame is of conical form in its lower part and of cylindrical form in its upper or stack part, and is covered with a thin metal sheathing 6. A screen 7 is hung within the upper end of the stack, with a space between its lower part and the stack wall. The sheathing 6 terminates at its lower end on the frame at a convenient distance above the vertical wall of the pit 1 on which the frame rests, leaving a space for the intake of air from without into the interior of the shell. A baffle plate 8 is provided, being in form the segment of a cone. The upper rim of the plate 8 is rigidly secured to the frame in alignment with the lower end of

the sheathing 6, the plate tapering inwardly at a pre-determined angle to its free lower rim, which is at a convenient distance above the fire-pit and below the plane of the top of the pit wall. Earth 9 is placed in the fire-pit 1 and banked against the pit wall to form a space between this earth and the lower rim of the plate 8, which will allow the passage of a varying quantity of air as may be required for proper combustion of material within and to cool the shell walls. At a convenient height within the frame a flue 10, in form the segment of a cone, is secured in rigid position to the frame. This flue 10 has its larger rim at its lower end and is so positioned that there is a convenient space between the lower rim and the outer wall 6. The diameter of the upper and smaller opening of the flue is related to the diameter of the outer shell for the purpose of checking the blast of light material upward, caused by the heavy draft of air from below over the center of combustion. A conveyor 11 extends from a source of material supply through the outer shell and the flue 10, opening within its interior, to allow material to be dropped to the fire-pit below. Within the upper part of the shell and below the screen 7 a second baffle plate 12, also in form the segment of a cone, is rigidly secured to the frame 5. The upper opening of the plate 12 is of a diameter to form a joint with the shell 6. The lower opening of the plate 12 is of a diameter related to that of the shell wall and the flue 10 for the purpose of causing a proper air draft from the flue 10 upwardly and to allow cinders to drop upon the outer surface of the flue 10 and thence downwardly through the opening near its lower periphery into the fire-pit. It also functions as a baffle to light material blown against the shell wall and causes it to drop along the wall between it and the flue to the fire-pit.

The operation will now be described. When material is deposited in the first fire-pit 1, and combustion is going on, a sufficient quantity of air is admitted from without through the space below the lower end of the baffle plate 8, by arranging the earth 9 to allow the desired draft, as in the nature of a damper or control. The cool air, deflected by the plate 8, then flows within, and supplies air for combustion and at the same time the coolest portion of the air tends naturally to

flow along and in contact with the interior surface of the wall 6 and to keep it constantly cool in conjunction with the outer cool air passing over its exterior surface. Air also flows from the ash-pit 3 through the grate 4 to further supply the need thereof for combustion in the center of the material mass. When the screen becomes filled with cinders or oily carbon so as to check the flow of air through it, the air and smoke will pass downward and are deflected by the plate 12 upwardly and outwardly through the space between the screen and outer wall until the matter collected on the screen is consumed or falls. Cinders which drop along the plate 12 fall upon the outer surface of the flue 10 and through the space between its lower end and the wall 6 into the fire-pit. The flue 10 tends to preserve the major part of the combustion below it, and material spreading above it will fall upon its outer surface and through the adjacent opening into the fire-pit. The intensest heat of combustion must, as will be apparent, occur about midway in height of the shell and the flue 10 tends to confine this heat in the central part of the shell, away from its walls and deflect the heated air to a space in cylindrical alignment to and within the area of the plate 12 above until it passes out through the screen or through the space adjacent to its lower part, along which course it is deflected in a spreading manner by the plate 12. The by-pass between the screen and shell wall permits the use of a fine screen to prevent the discharge of small sparks, and at the same time obviates the difficulties heretofore experienced of a clogged screen which has no such outlet and must be freed of the obstruction before it will function. This arrangement is a decided advantage. The baffle plate 8 not only tends to insure the proposed currents of air most efficiently, as mentioned, but covers the opening between the lower end of the shell wall and the fire-pit in its horizontal alignment and tends to prevent gusts of wind driving burning material across the fire-pit and outside of the same, which difficulty has heretofore seriously interfered with the operation of such incinerators and creates a dangerous fire risk. In operation, material blown out of the stack shown tends to drop alongside and upon the sloping exterior of the lower shell to the lower draft opening and is sucked through the same into the fire-pit. The form shown of the frame and cover wall is believed to be practical for the assembling therein of the baffle plates and flue described, but this form might be varied without departing from the principle of my improvement which is adapted to any of such incinerators of common type.

I claim:

1. In an incinerator of common type as shown, having below it a fire-pit with a wall and a single circular covering shell wall terminating at a convenient distance above the said pit wall, an interior baffle plate, in form the segment of a cone, having its larger rim rigidly secured to the frame and joined to the lower end of its said wall, the smaller plate rim being positioned below the plane of the top of the pit wall, a convenient distance therefrom, to allow the passage of air from without, below and upwardly through the plate, to cool the shell wall and for combustion, also to prevent the discharge of material outwardly.

2. In an incinerator of common type as shown, having below it a fire-pit with a wall and a single circular covering shell wall terminating at a convenient distance above the said pit wall, the combination of; an interior baffle plate, in form the segment of a cone, having its larger rim rigidly secured to the frame and joined to the lower end of its said wall, the smaller plate rim being positioned below the plane of the top of the pit wall, a convenient distance therefrom, and an earth filler in the pit, the plate and earth being arranged in relation to each other and to the pit wall in a manner to allow a control of the draft of air from without, below and upwardly through the plate, to cool the inner shell wall, to aid combustion, to draw within, material falling along the outer shell wall, and to prevent the outward discharge of material below the shell wall.

3. In an incinerator of the kind illustrated, having a single shell the lower part the frustrum of a cone and the upper part a cylinder; an interior flue, in form the segment of a cone, rigidly secured centrally in the shell, its lower rim positioned a convenient distance above the plane of the joint between the conical and cylindrical parts of the shell, its upper rim positioned a convenient distance below the upper shell outlet, the lower flue rim being positioned apart from the shell wall, the pitch and position of the flue being adapted to cause the heated air to be directed through it centrally to a discharge above from the shell and apart from the shell walls, also to allow falling material to pass downwardly between the flue and cylindrical shell wall.

4. In an incinerator of common type as shown, provided with a screen rigidly secured in the upper part of the shell, the lower part of the screen extending a convenient distance within the shell and a distance apart from the shell wall thereby forming a by-pass between screen and wall; a baffle plate, in form the segment of a cone, its larger rim rigidly secured to the shell wall a convenient distance below the plane of the lower rim of said screen, the plate having a pre-determined pitch inwardly toward the

vertical center of the screen, said plate being positioned and arranged to adapt it for the purposes indicated.

5. In an incinerator of common type as shown, having below it a fire-pit and a circular covering shell wall terminating at a convenient distance above said pit wall, the combination of; an interior baffle plate, in form the segment of a cone, having its upper and larger rim rigidly secured to the frame and joined with the shell wall near its upper end, and a screen of common type suspended within the upper part of the incinerator stack, the lower part of the screen wall being at a convenient distance from the shell wall, the lower screen rim being also positioned above the plane of the upper rim of said baffle plate, the screen and plate being arranged in relation to each other and to the shell stack wall in a manner to allow a backward current of air within the screen to be deflected by the plate upwardly and outwardly around the screen to a discharge, to allow falling cinders to be deflected downwardly into the fire-pit, and to prevent material blasted upwardly along the shell wall from escaping with the air below the screen.

6. In an incinerator of common type as shown, having below it a fire-pit and a circular covering shell wall terminating at a convenient distance above said pit wall, the combination of; an interior baffle plate, in form the segment of a cone, having its upper and larger rim rigidly secured to the frame and joined with the shell wall near its upper end, a screen of common type suspended within the upper part of the incinerator stack, the lower part of the screen wall being at a convenient distance from the shell wall, the lower screen rim being also positioned above the plane of the upper rim of said baffle plate, the screen and plate being arranged in relation to each other and to the shell stack wall in a manner to allow a backward current of air within the screen to be deflected by the plate upwardly and outwardly around the screen to a discharge, to allow falling cinders to be deflected downwardly into the fire-pit, and to prevent material blasted upwardly along the shell wall from escaping with the air below the screen, and a centrally disposed interior flue, in form the segment of a cone, rigidly secured to the frame with the smaller rim upward and the larger rim at a convenient distance from the shell wall, the flue being arranged in a manner to tend to deflect the major

heated air current upwardly in a column away from the shell wall aligned with the upper rim of the flue and the lower rim area of the baffle plate above, also to allow cinders and material falling near the shell wall to drop alongside it to the fire-pit and to allow free passage of cool air from below along the shell wall.

7. In an incinerator of common type as shown, having below it a fire-pit with a wall and a circular covering shell wall terminating at a convenient distance above the said pit wall, the combination of; an interior baffle plate, in form the segment of a cone, having its larger rim rigidly secured to the frame and joined to the lower end of its shell wall, the smaller plate rim being positioned below the plane of the top of the pit wall, an earth filler in the pit, the plate and earth being arranged in relation to each other and to the pit wall in a manner to allow a control of the draft of air from without, below and upwardly through the plate, to cool the inner shell wall, to aid combustion, to draw within, material falling along the outer shell wall, and to prevent the outward discharge of material below the shell wall, a centrally disposed interior flue, in form the segment of a cone, rigidly secured to the incinerator frame with the smaller rim upward and the larger rim at a convenient distance from the shell wall, a second interior baffle plate, in form the segment of a cone, having its upper and larger rim rigidly secured to the frame and joined with the shell wall near its upper end, and a screen of common type suspended within the upper part of the incinerator stack, the lower part of the screen wall being at a convenient distance from the shell wall, the lower screen rim being also positioned above the plane of the upper rim of said second baffle plate, the screen and plate being arranged in relation to each other and to the shell stack wall and the central flue in a manner to allow the central major heated column of air to pass through the plate into the screen for discharge, to allow a backward current of air within the screen to be deflected by the plate upwardly and outwardly around the screen to a discharge, to allow falling cinders to be deflected downwardly into the fire-pit, and to prevent material blasted upwardly along the shell wall from escaping with the air below the screen.

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