

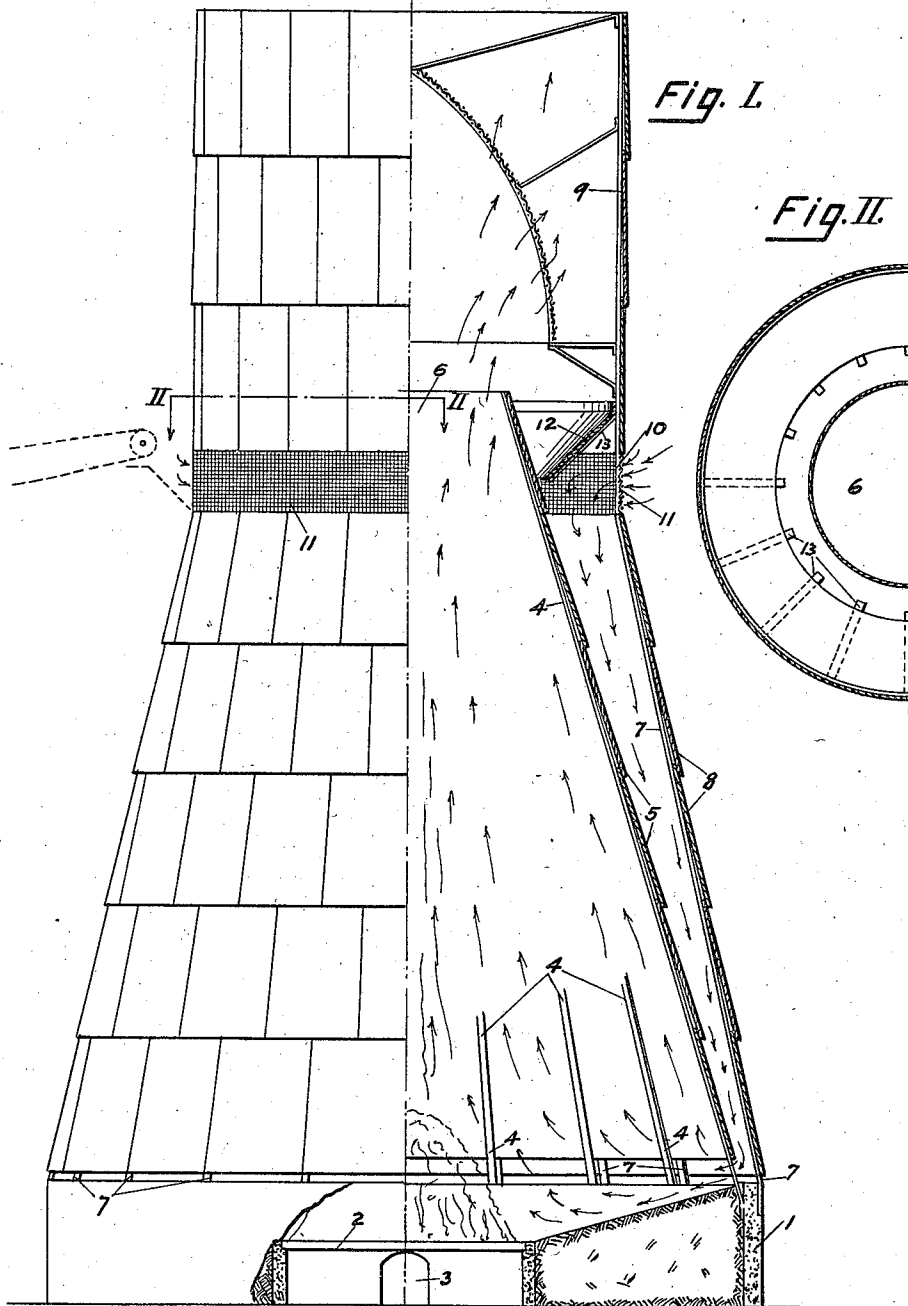
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WOOD REFUSE INCINERATOR

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UNITED STATES PATENT OFFICE.

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WOOD-REFUSE INCINERATOR.

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To all whom it may concern:

Be it known that I, WALTER F. MITCHELL, a citizen of the United States, residing at Rainier, in the county of Columbia, 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 this class adapted to burn wood refuse, saw-dust, etc., usually found about concerns making wood products. In these devices it is found to be necessary and preferable to employ thin material which can be cooled quickly, and at the same time is protected from destruction by the intense heat during combustion, also to save the great expense of heavy material, which in a comparatively limited time would also burn out and require great additional expense to replace it. In my device I provide an improved arrangement of parts to cause a direct downward and upward draft about a double wall and between the inner wall and the flames, to cool the walls, and at the same time not disturbing but aiding the air-draft required in the combustion of material. 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.

Fig. I is an elevation of an incinerator, partly in section and some of the lower part broken away, containing therein my improvement.

Fig. II is a cross-sectional view on the line II—II in Fig. I.

Like characters refer to like parts in the views.

The preferable form of incinerator, to which my improvement is adapted, is as illustrated. A concrete circular fire-pit base 1 is provided, having a grate 2 and a draft door 3 into the ash-pit below it. Upon this pit base foundation, an inner conical frame 4 is vertically erected in rigidly secured position, and to a suitable height. This frame is covered with a thin metal sheathing 5, extending from the top downwardly to a convenient place above the fire-pit to allow the passage of air below it and between the fire-pit and sheathing. This sheathed frame has a circular opening 6, at the top

and is also open at the bottom. About the frame 4 an outer frame 7 is vertically erected and rigidly secured over the fire-pit base 1. The frame 7 extends upwardly to a convenient height below that of the inner frame, and they are arranged with a downwardly tapering space between them, to provide a control for the quantity of air allowed to pass below the inner cone. A sheathing 8, of thin material, covers the outer frame and extends downwardly to a convenient place to allow a space between its bottom rim and the fire-pit base, preferably not so great as that below the bottom of the inner cone sheathing, which allows direct passage of air into the pit. The outer cone is also open at each end. At one side of the incinerator is shown in dotted lines a convenient mechanism and chute of any common type for conveying and discharging refuse material into the incinerator. A vertical chimney 9, having a frame and sheathing of like character, is secured upon the upper end of the frame 7. Above the upper end of the frame 7 and about the lower part of the chimney frame there is a circular opening 10, covered by a screen 11. Within the chimney, a circular baffle or deflector plate 12 is secured to the chimney frame and is supported upon brackets 13. The plate 12 extends from a joint within the chimney frame and sheathing downwardly, within the space surrounded by the opening 10, at a predetermined incline toward and nearly to the surface of the sheathing 5 on the inner frame, to allow cinders and ashes which would otherwise collect on the plate to pass by it and downwardly into the ash-pit.

The operation will now be described. When combustion is taking place in the mass of refuse shown resting upon the grate, the heated air rises through the inner cone and passes out through the chimney, provided with a spark arrester if desired. This combustion naturally heats the cone walls to a high temperature. In the construction shown, a partial vacuum is created by the rising heat in the inner cone, which causes cool air to flow through the opening 10, below the plate 12, which deflects it downwardly until it is drawn below the inner cone and passes upwardly within same, the cooler part of the air following between the flames and inner cone sheathing. The tapering, intermediate space is arranged as to area at top and bottom, in relation to the plate 12,

to allow a large quantity of cool air to be immediately deflected into contact with the superheated upper parts of the cones and at the same time not to interfere with the necessary velocity of the suction in the downward passage of the air and its discharge beneath the inner cone, thus causing a large body of cool air to continuously move in contact with the upper parts of the cones, at the same time permitting an uninterrupted flow of the full amount of air through the opening 10 to the extent that its area is designed and intended. The space below the outer sheathing allows the passage of any other or greater quantity of air into the pit, which may be deemed necessary to insure steady and proper combustion. It will thus be seen that the lateral opening 10 allows the air to pass at once to the desired place and thereafter to be deflected by the plate between the cones and discharged within the inner one. The course of the air currents is indicated by the arrows. The cool air thus flowing constantly cools the sheathing of both cones to an extent which prevents them from becoming heated to a temperature which burns out or disintegrates the thin metal, thus rendering the apparatus inoperable. The improved device has been thoroughly tested in actual practice and accomplishes the results stated. Other devices do not have the high cool air intake and the deflecting plate which I provide over the tapering intermediate air space, and have been found deficient in operation, for the reason that the sheathing in them will overheat and soon become destroyed. In these other devices the cooling air must all pass only through the spaces below the cones, and in practice this has been found insufficient and ineffective for the cooling purposes proposed in them. It is to overcome these difficulties that I have invented the improvement shown and referred to, for effectively cooling the sheathing.

I claim—

1. In an incinerator, outer and inner sheathed cones having a downwardly tapering space between them, each open at top and bottom, sheathing on the inner cone extending to a suitable distance from the lower end of its frame rim, the outer cone having a sheathed chimney on its upper end with a lateral, circular opening about the lower part of the chimney, and a deflector plate, having its outer rim secured to the chimney above the lateral opening, said plate extending at a predetermined downward incline toward and near the surface of the inner cone

below its upper opening, the area of the aforesaid tapering space being arranged in relation to the deflector plate to allow the inward passage of a large quantity of cool air and the same to be deflected immediately upon the upper part of the inner cone without retarding the velocity of downward suction of the entire volume of air so admitted, to a discharge thereof beneath the inner cone.

2. In an incinerator, a circular fire-pit base, outer and inner sheathed cones secured over the fire-pit base, with a downwardly tapering space between them, each open at top and bottom, sheathing on the inner cone extending to a place suitably distant above the fire-pit base, the outer cone having a sheathed chimney on its upper end with a lateral, circular opening about the lower part of the chimney, and a deflector plate, having its outer rim secured to the chimney above the lateral opening, said plate extending at a predetermined downward incline toward and near the surface of the inner cone below its upper opening, the area of aforesaid tapering space being arranged in relation to the deflector plate to allow the inward passage of a large quantity of cool air and the same to be deflected immediately upon the upper part of the inner cone without retarding the velocity of downward suction of the entire volume of air so admitted, to a discharge thereof beneath the inner cone.

3. In an incinerator having outer and inner sheathed cones with a downwardly tapering space between them, each open at top and bottom, sheathing on the inner cone extending to a suitable distance from the lower end of its frame rim, a sheathed chimney on the upper end of the outer cone with a lateral, circular opening about the lower part of the chimney, a deflecting plate in the aforesaid incinerator, having its outer rim secured to the chimney above its lateral opening, said plate extending at a predetermined downward incline toward and near the surface of the inner cone, below its upper opening, the plate being arranged in relation to the tapering space to allow the inward passage of a large quantity of cool air to be deflected immediately upon the upper part of the inner cone without retarding the velocity of suction of the entire volume of air so admitted, to a discharge thereof beneath the inner cone.

WALTER F. MITCHELL.

Witnesses:

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