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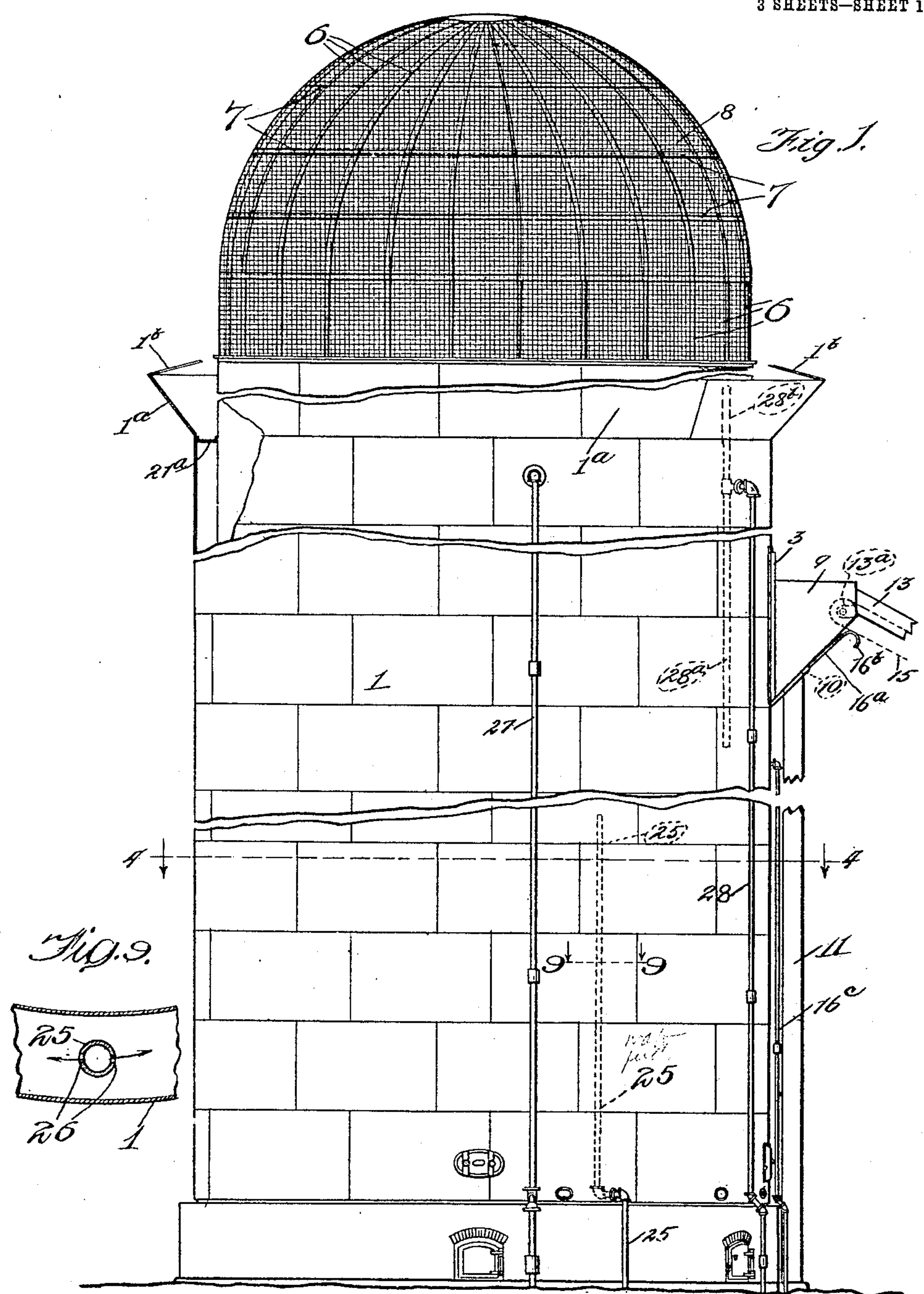
No. 843,971.

PATENTED FEB. 12, 1907.

C. D. STEVENS.  
REFUSE BURNER.

APPLICATION FILED NOV. 24, 1905.

3 SHEETS—SHEET 1.



Witnesses:  
C. H. Seem  
E. C. Sample

Inventor:  
C. D. Stevens  
by Brown & Darby  
attys

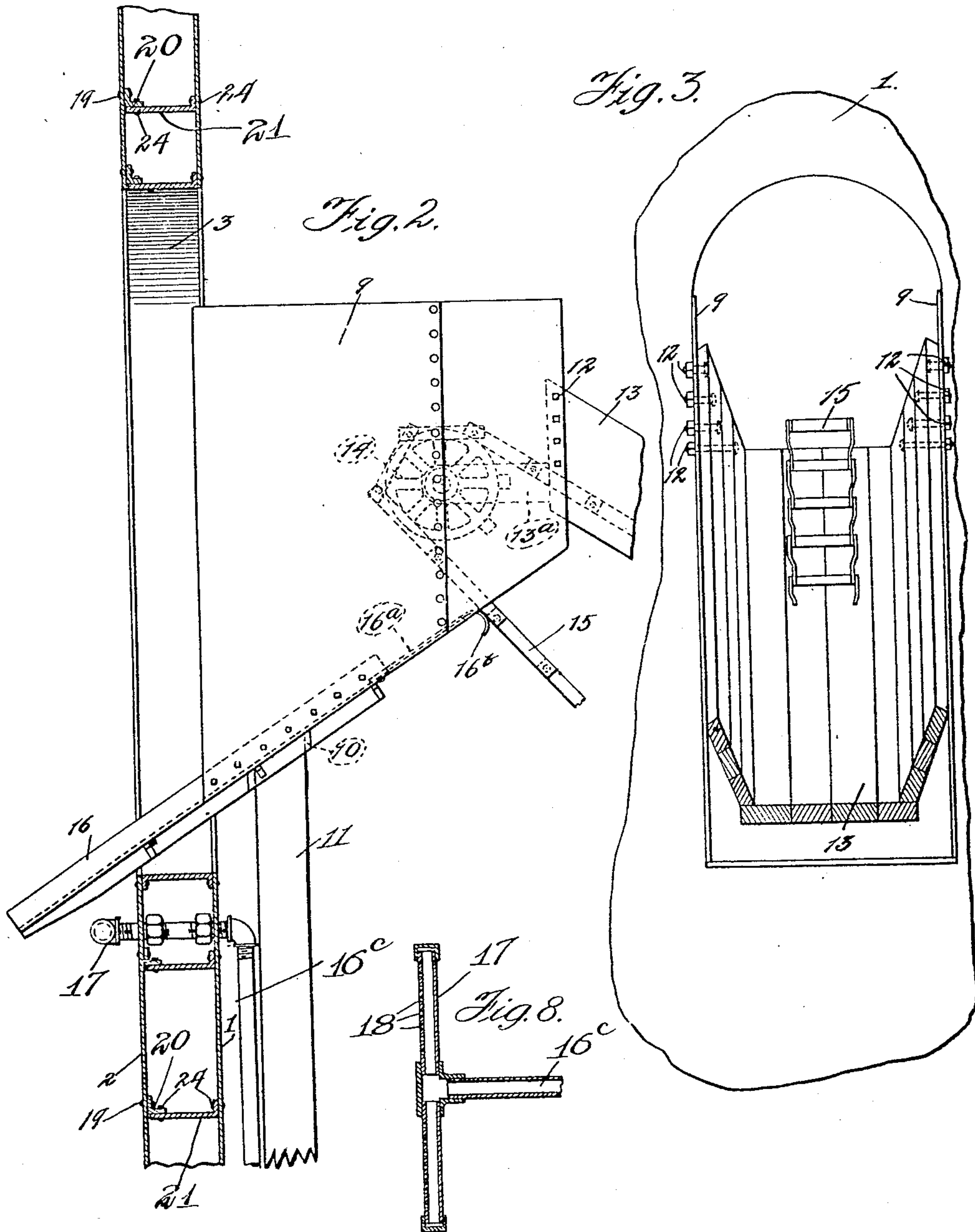
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3 SHEETS—SHEET 2.



Witnesses:

*E. C. Sample.*

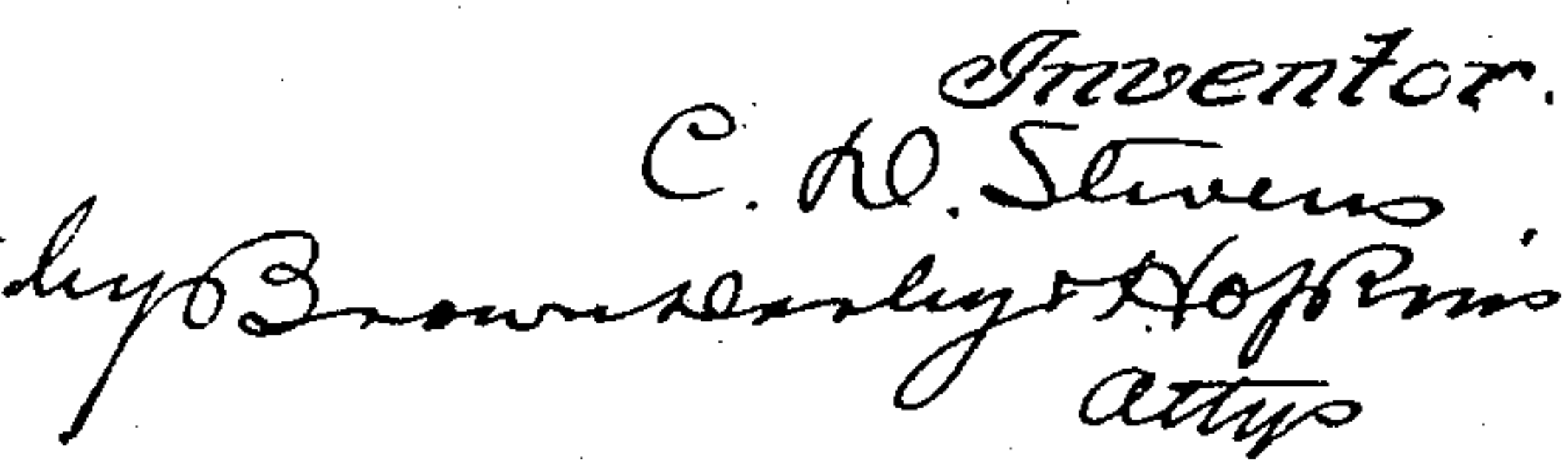
*E. C. Sample.*

Inventor:  
C. D. Stevens

*By Brown & Co. Attys*

PATENTED FEB. 12, 1907.

**3 SHEETS--SHEET 3.**



# UNITED STATES PATENT OFFICE.

CLIFTON D. STEVENS, OF MUSKEGON, MICHIGAN.

## REFUSE-BURNER.

No. 843,971.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed November 24, 1905. Serial No. 288,945.

*To all whom it may concern:*

Be it known that I, CLIFTON D. STEVENS, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Refuse-Burners, of which the following is a full, clear, and exact specification.

This invention relates to improvements in refuse-burners; and the primary object of the same is to construct an improved furnace comprising a water-jacket into which the water is fed in such a manner as not to be sprayed directly against the walls thereof.

A further object is to provide an improved manner of spacing and firmly bracing the walls of the water-jacket; and a still further object is to construct an improved apparatus of this character which will be simple and strong in construction, cheap to manufacture, and efficient in operation.

With a view to the attainment of these ends and the accomplishment of other new and useful objects as will appear the invention consists in certain features of novelty in the construction, combination, and arrangement of parts, as hereinafter more fully described and claimed, and shown in the accompanying drawings, illustrating an example of the invention, in which—

Figure 1 is an elevation of a refuse-burner constructed in accordance with the principles of this invention, partly in section. Fig. 2 is an enlarged detail view of the feeding-hopper, chute, and the upper end of the carrier, with a portion of the furnace adjacent the feed-opening in section and showing the support for the hopper and chute. Fig. 3 is a front view of the carrier or elevator and feed-opening. Fig. 4 is a transverse sectional view on line 4-4 of Fig. 1 looking in the direction of the arrows. Fig. 5 is an enlarged detail plan view of one of the spacing and bracing bars, showing the manner of securing the same. Fig. 6 is a sectional view on line 6-6 of Fig. 5. Fig. 7 is an enlarged detail perspective view of one of the spacing and bracing bars. Fig. 8 is a sectional top plan view of the spray-pipe for disintegrating the material, and Fig. 9 is a transverse section on line 9-9, Fig. 1.

Referring more particularly to the drawings, in which similar reference characters designate the same parts throughout the several views, the numerals 1 and 2 designate, respectively, the outer and inner plates or

walls of the water-jacket constituting the furnace proper, having a feed-opening 3 and an ordinary grate 4, provided with a plurality of perforated grate-bars 5, surrounding the same.

The top of the furnace is preferably open and bowed across the top, and surrounding the same, so as to form a cap or hood, are a plurality of longitudinal and transverse spaced bars or ribs 6 and 7, and 8 designates a cover for said ribs, which is preferably wire-cloth. This cap or hood forms a spark-arrester and may be of any desired design and height; but it is preferable to construct the same elliptical in form.

The fuel is fed to the furnace by an improved feeding mechanism which forms the subject-matter of a separate application and comprises a hopper 9, supported adjacent the feed-opening 3 by suitable standards 11. This hopper is provided with an inclined bottom 16, which projects into the furnace, preferably through the opening 3. A trough or way 13 is connected to the hopper, and traveling over sprockets 14, supported by suitable brackets 13<sup>a</sup>, is an endless feed-chain 15, which moves in the trough or way to discharge the fuel into the hopper 9. A nozzle 17 is arranged below the projecting end of the bottom of the hopper and receives a fluid-supply through a suitable pipe 16<sup>c</sup> for disintegrating the material as it falls into the furnace. A suitable cleaner 16<sup>a</sup>, having a curved end 16<sup>b</sup>, is provided and arranged so that said end will engage the chain 15 for removing any material which may adhere to the chain.

The walls of the furnace are constructed of a series of sections, each comprising the outer wall 1 and an inner wall 2. To the periphery of the inner wall 2 is secured in any desirable manner, preferably by bolts or rivets 19, a radially-projecting circumferential flange 20, which is provided with a plurality of bolt-apertures. This flange serves as a means for bracing the wall and also for a purpose to be set forth.

Spacing or brace bars or ribs 21, provided with an angular portion 22 and having a slot 23 in one end, are secured to the inner face of the outer wall 1 by means of bolts or rivets 24, engaging the angular ends 22, and in such a position that the slot 23 in each bar or brace will register with one of the apertures in the radial flange 20. A bolt or rivet 24 passes through the registering aperture and

slot and serves as a means whereby the walls may be adjusted and braced in relation to each other.

In the upper sections of the water-jacket the pressure caused by the water and steam is considerably less, and the radial flange 20, carried by the periphery of the inner wall 2, may be dispensed with, if desired, also the adjustable brace-bars 21, and in place thereof double-end brace-bars 21<sup>a</sup>, as shown in Fig. 1 of the drawings, may be used. The lower ends of both the outer and inner walls are so arranged as to overlap the top edges of the walls of the next adjacent section and may be secured together in any desired manner to produce a water-tight joint.

Any desired number of supply-pipes 25 may be used to supply water to the water-jacket. The upper ends of these pipes pass through the outer wall of the jacket and stand within the water-space formed by the walls, and said pipes are provided with a plurality of radial openings 26, and said openings are so disposed as to direct the water into the water-space in such a manner that the water will not be sprayed directly against the walls thereof. An overflow-pipe 27 and a feed-water pipe 28 may also be provided, which latter leads from the water-space of the furnace to a boiler or any other desired point of utilization.

The feed-pipe 28 is so constructed that its end 28<sup>a</sup> projects downward into the water-space formed between the walls 1 and 2 of the furnace a sufficient distance to insure the end thereof being at all times in pure water. The constant boiling of the water causes the impurities to rise to the top of the water, and it is the object of so locating the end of this pipe that the impurities will not enter therein with the water. An extension 28<sup>b</sup> may also be provided to prevent the siphoning of the water from the jacket or water-space, as will be understood.

From the above description it is thought that the operation of the apparatus will be fully understood, and it will be clearly seen that the walls of the furnace are entirely free from the continuous jarring of the hopper

and chute caused by the motion of the carrier and the falling of the material, as both the hopper and chute are supported out of contact with the walls of the furnace, yet the chute extends through the opening and into the furnace.

The top of the water-jacket is provided with a flaring trough 1<sup>a</sup>, supported by suitable braces 1<sup>b</sup>, for catching the overflow when the water boils.

In order that the invention might be fully understood, the details of an embodiment thereof have been thus specifically described; but

What is claimed as new, and desired to be secured by Letters Patent, is—

1. An incinerating-furnace comprising inner and outer spaced walls, a radially-projecting circumferential flange secured to the periphery of the inner wall and provided with a plurality of apertures, braces secured to the inner face of the outer wall, said braces being provided with a slot in the free end thereof, each of said slots being adapted to register with an aperture in the flange, and a bolt passing through the registering apertures.

2. An incinerating-furnace comprising inner and outer spaced walls, a radially-projecting circumferential flange secured to the periphery of one wall, and braces secured to the inner face of the other wall, the free ends of said braces being slidably connected with the flange.

3. An incinerating-furnace comprising spaced concentric walls, forming a water-space, a vertical water-supply pipe within the space and provided with a plurality of oppositely-disposed radial openings, arranged to discharge the water radially into the space and substantially parallel with the walls thereof.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 21st day of November, A. D. 1905.

CLIFTON D. STEVENS.

Witnesses:

GEORGE D. VANDERWERP,  
MAE A. ROCKENBACH.