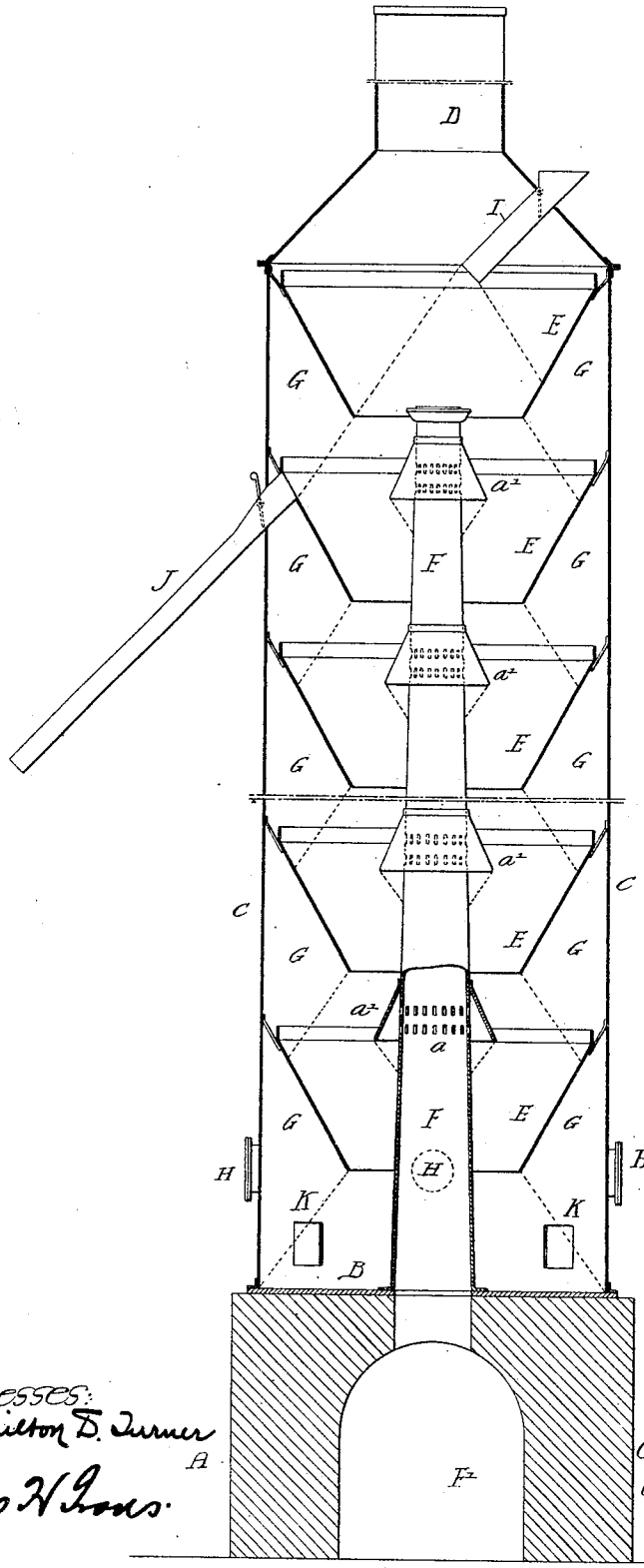
No. 803,424. PATENTED OCT. 31, 1905.

C. A. MATCHAM.

APPARATUS FOR COOLING GRANULAR MATERIAL.

APPLICATION FILED MAY 3, 1905.



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APPARATUS FOR COOLING GRANULAR MATERIAL.

No. 803,424. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed May 3, 1905. Serial No. 258,684.

To all whom it may concern:

Be it known that I, CHARLES A. MATCHAM, a citizen of the United States, residing in Allentown, Pennsylvania, have invented certain Improvements in Apparatus for Cooling Granular Material, of which the following is a specification.

The object of my invention is to so construct a cooler for cement or other powdered or granular material that the air may be caused to flow through the same without the necessity of employing such powerful means as those ordinarily required for inducing such draft of air. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, which represents a vertical sectional view of a cooling apparatus constructed in accordance with my invention.

A represents a suitable foundation structure carrying a base-plate B, to which is secured a vertical casing C, preferably of sheet metal and of circular cross-section, this casing having at the top a stack D, which may be of any height needed to insure the desired draft, the use of rotary fans or other equivalent power-driven means for inducing draft through the casing being unnecessary for reasons explained hereinafter.

Within the casing C are disposed a series of inverted frusto-conical deflectors E, disposed one above another, these deflectors, however, being less in diameter than the casing C, so that a space is provided around each deflector for the upward flow of air.

Centrally within the casing C is a vertical tube F, open at the bottom and communicating with an air-supplying tunnel or passage F′ in the foundation A, and in this central tube are a series of groups of openings *a*, shielded by frusto-conical hoods *a*′, one of such groups of openings being provided for each deflector E.

The pipe F is closed at the top, so that air entering said pipe at the bottom is caused to escape therefrom through the openings *a* therein.

The cement or other powdered or granular material to be cooled is introduced through a spout I, provided with a suitable automatically-closing valve, and said material disposes itself in the casing C, as indicated by dotted lines, any surplus material escaping through the valved overflow-chute J.

The deflectors E are so disposed in respect to each other that an air-chamber G will be formed above the surface of the material as the latter flows from the base of each deflector into the deflector below. Hence the draft of the stack D will cause air to flow from each group of openings *a* in the central pipe F, through the respective masses of material contained in the deflectors E, and into the air-chambers G above said masses of material, from which air-chambers a free escape to the stack is provided through the passages intervening between the top portions of the deflectors and the casing C. By reason of this construction natural draft can be relied upon for the operation of the cooler instead of the powerful and expensive artificial draft-inducers now required in this type of apparatus. When, however, it is desired to use the hot air from the cooler—as, for instance, in supplying boiler-furnaces, calcining-kilns, or the like—the air may be deflected from the stack to such point of use, and in such cases a low-powered fan or other draft apparatus may be employed for conveying the hot air from the cooler to the point of use.

At the lower portion of the stack valved inlets H are provided, through which supplies of air independent of those provided by the central pipe F may be admitted to the casing C, and said lower portion of the casing is also provided with openings K for the withdrawal of the cooled material therefrom.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a cooler for powdered or granular material, of a casing and a series of deflectors disposed one above another therein, all of said deflectors being of less diameter than the casing, whereby spaces for the upward flow of air are provided between the deflectors and the casing, substantially as specified.

2. The combination, in a cooler for powdered or granular material, of a casing, a series of deflectors disposed one above another therein, all of less diameter than the casing so as to provide passages for the upward flow of air between the casing and deflectors, and a central air-pipe having openings for supplying air to the masses of material contained in the deflectors, substantially as specified.

3. The combination, in a cooler for powdered or granular material, of a casing, a series of deflectors disposed one above another in said casing, all of less diameter than the same, whereby air-passages are provided between the deflectors and the casing, a central pipe for supplying air to the masses of mate-

rial contained in the deflectors, and air-supplying means at the lower portion of the casing independent of that provided by the central pipe, substantially as specified.

4. The combination in a cooler for powdered or granular material, of a vertical casing having a draft-stack at the top, a series of deflectors disposed one above another in said casing, all of less diameter than the same, so as to provide passages for the upward flow of air between the deflectors and the casing, and means for supplying to the casing air for passage through the successive bodies of material contained in the deflectors, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES A. MATCHAM.

Witnesses:

GEO. READER,

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