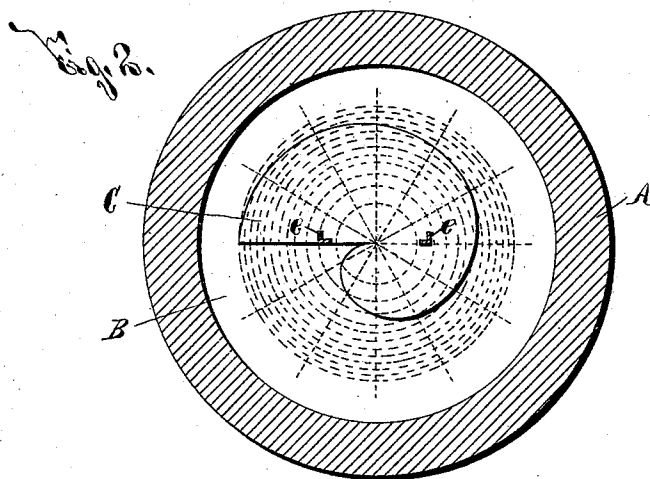
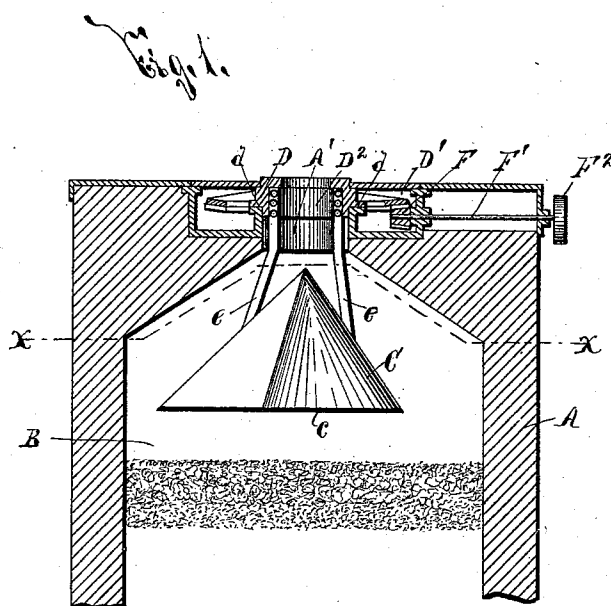


(No Model.)

E. SOLVAY.
CHARGING APPARATUS.

No. 531,282.

Patented Dec. 18, 1894.



WITNESSES:

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ERNEST SOLVAY, OF BRUSSELS, BELGIUM.

CHARGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 531,282, dated December 18, 1894.

Application filed November 10, 1890. Renewed November 14, 1894. Serial No. 528,755. (No model.) Patented in Belgium July 2, 1890, No. 91,114; in England July 3, 1890, No. 10,721; in France July 19, 1890, No. 207,081, and in Germany July 31, 1890, No. 55,811.

To all whom it may concern:

Be it known that I, ERNEST SOLVAY, a citizen of Belgium, residing at Brussels, Belgium, have invented a new and useful Charging Apparatus, (for which I have obtained patents in the following foreign countries, to wit: Belgium, No. 91,114, dated July 2, 1890; France, No. 207,081, dated July 19, 1890; Germany, No. 55,811, dated July 31, 1890, and Great Britain, No. 10,721, dated July 3, 1890,) of which the following is a specification.

My invention relates to improvements in charging apparatus suitable for use in towers, and has for its object the production of a simple and effective device, whereby the distribution of the material charged may be governed at will; either for the purpose of spreading it evenly within the tower, or for conducting the finer material toward the outside and the coarser toward the interior or vice versa, or for producing any other classification of the material at a determined point.

To this end the invention consists, essentially, in a spirally shaped distributor or charger having one extremity bent inwardly toward its center and the other bent spirally outward beyond the plane of said inner extremity.

The invention furthermore consists in a distributor formed of a spiral conical shape, in a wheel for rotating the same having a hollow hub to permit entrance of the material, and in the detail construction and arrangement of the parts, all as hereinafter more particularly described and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawings, forming a part of the specification, in which like letters indicate corresponding parts in both the views.

Figure 1 represents a vertical section of the upper part of a partially filled cupola having my improved charging apparatus shown in operative position. Fig. 2 is a horizontal sectional view, taken on line $x-x$, Fig. 1.

In certain kinds of furnaces kilns and like apparatus, it is very desirable to charge the material uniformly and evenly within the tower in order to present a plane surface, and to permit the production when desired of uni-

form layers of different materials. By the use of the charging cones, as heretofore produced, there is more or less classification of the materials charged, the smaller pieces remaining in place and the large ones rolling to the bottom. This localization of the parts constituting the charge is opposed to the desired end and is detrimental to regularity of operation and uniformity of the product produced. My improved invention obviates these serious difficulties by uniformly distributing the charge irrespective of the size of the composing particles, and by attaining this result with but a single inlet opening for the charge.

—A— represents a tower of any desirable form, size and construction suitable for the particular operation to be effected.

—B— is the central chamber within which the material is charged.

—C— represents the distributor or charger, which consists of a spiral cone of any suitable material. The base —c— of the cone is disposed in a particular spiral curve determined according to the conditions to be fulfilled. If, for instance, absolute uniform charging is desired in order that each point of the chamber B may receive an equal proportion of the material, this base is determined by a spiral of such contour that any two radii thereof making between themselves a constant angle determine on their revolution two circles between the area of which a constant difference exists. Each portion of the spiral corresponding to a constant angle at the center produces therefore a constant annular surface.

In Fig. 2 it will be seen that one end of the sheet from which the spiral cone is formed must stand truly vertical as it is coincident with the vertical axis; and the lower or outer edge of this sheet broadens from said axis, during its single revolution around the same, to a point on the same radius as the point of starting, as seen at the left of this figure.

—D— represents any suitable construction of actuating wheel, which is suitably journaled within the chamber —D'— and upon a bearing —d— in its upper part, and is connected by straps or other suitable means —e— to the distributor or charger for supporting

and revolving the same. These straps may pass through the distributor C and have hubs or nuts at their lower ends. The upper extremity of the tower and the gear—D—are formed with the respective openings—A'— and —D²— to permit the entrance of the material through a single opening directly upon the charger —C—.

—F— represents a suitable wheel for driving the wheel —D—. This wheel —F— is supported on a shaft or spindle —F'—, which may be revolved by any suitable construction of actuating wheel —F²— driven by suitable power. As the charge falls upon this spiral cone it is divided equally according to its periphery, and if the cone makes one complete revolution during the fall the material will be equally and uniformly spread over the entire upper surface of the material within the furnace.

When different materials are successively charged they are arranged in uniform layers in the furnace, and when the materials are intimately mixed in wagons, cars or other means before the charge, they are deposited in the same condition in the furnace, with a constant thickness at all points of the furnace section. It will thus be readily apparent from the foregoing description and upon reference to the drawings that an absolutely equal and uniform charging is accomplished.

Instead of causing the charger to turn during the fall of the first charge, it may remain stationary during this time, and then turn to a constant angle during the succeeding, and if desired every alternate charge. In this manner after one complete revolution of the distributor and a certain number of charges a regular and uniform feeding of the material will have been effected.

It is evident that the cost of my improved apparatus is slight, its operation simple and easy; that by its use the effectiveness of the furnace is greatly augmented; and that the uniformity of the product conforms to the will of the operator.

The operation of my invention will be apparent upon reference to the foregoing description and the drawings, and it will be understood that I do not limit myself to its precise form and construction, since the same may be changed without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein described apparatus for distributing material, the same consisting of a distributor or charger in the shape of a spiral cone having its upright sides inclining downwardly and outwardly from a point at the

axis of the distributor and having its base disposed in a horizontal plane and forming substantially a true spiral, one extremity of which extends substantially to the axis of the distributor the body completely surrounds the axis, and the other extremity of which is considerably separated from the axis of said distributor, substantially as set forth.

2. The herein described apparatus for distributing material, the same consisting of a distributor or charger in the shape of a spiral cone having its upright sides inclining downwardly and outwardly from the axis of the distributor and having its base disposed in a spiral plane, one extremity of which extends substantially to the axis of the distributor where this end of the spiral is vertical and the other extremity of which is considerably separated from the axis of said distributor and has its greatest inclination, and means, substantially as described, for supporting and rotating said distributor, from above, substantially as and for the purpose described.

3. The herein described apparatus for distributing material, the same consisting of a revoluble distributor or charger in the shape of a spiral cone having its upright sides inclining downwardly and outwardly from the axis of the distributor, upwardly extending straps having their lower ends secured to opposite sides of said spiral, and a gear formed with a hollow hub standing above the apex of said cone and to which gear on opposite sides of its hub are secured the upper ends of said straps for supporting the distributor, and means, substantially as described, for rotating said gear, substantially as and for the purpose specified.

4. In an apparatus for distributing material, the combination with a tower having an interior furnace chamber and a chamber above it, an annular bearing supported within said upper chamber, a horizontal gear mounted upon said bearing and having a hollow hub registering with the opening in the bearing and means for rotating said gear; of a revoluble distributor formed in the shape of a spiral cone and located within said furnace chamber below the gear, and upright straps connected at one end with the sides of the distributor and at the other end with opposite sides of said hollow hub, as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at the city of Brussels, Belgium, this 30th day of August, 1890.

ERNEST SOLVAY.

Witnesses:

R. LUCION,
GREGORY PHELAN.