C. CANDLOT.

FURNACE DRAWING APPARATUS FOR LIME KILNS, CEMENT KILNS, AND THE LIKE.

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Fig. 1

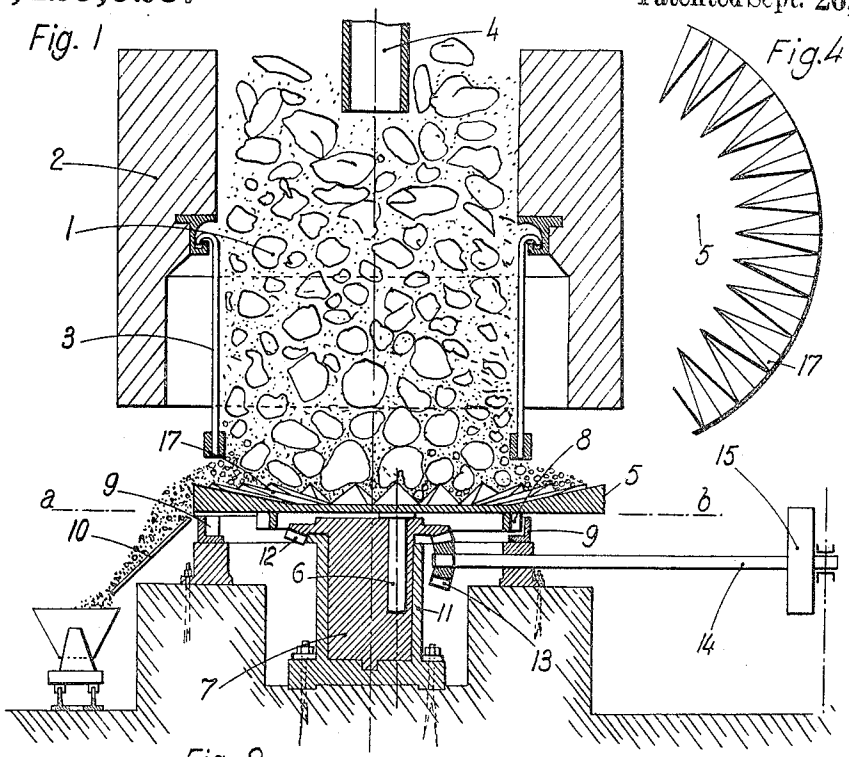


Fig. 4

Fig. 2

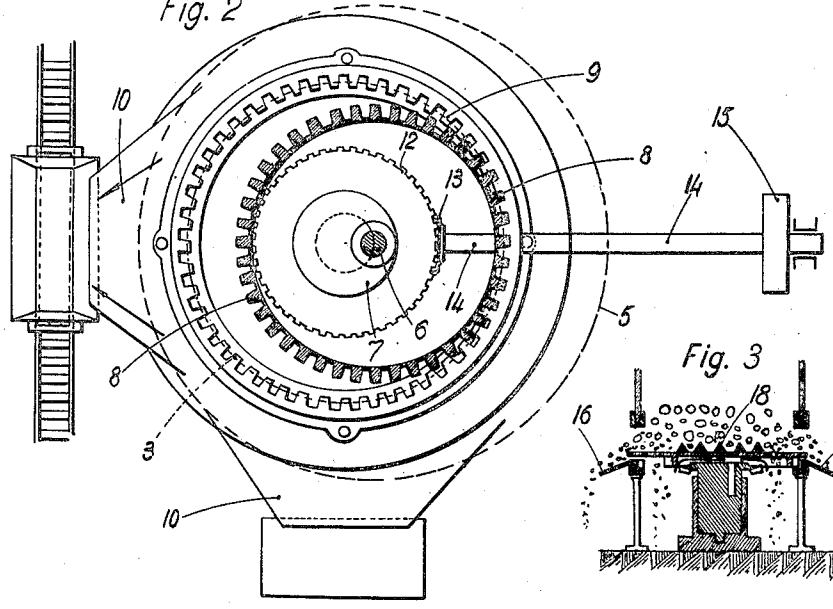


Fig. 3

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CHARLES CANDLOT, OF PARIS, FRANCE.

FURNACE-DRAWING APPARATUS FOR LIME KILNS, CEMENT KILNS, AND THE LIKE.

Application filed August 9, 1921. Serial No. 490,985.

To all whom it may concern:

Be it known that I, CHARLES CANDLOT, engineer, citizen of the French Republic, residing at Paris, Department of the Seine, in France, and having P. O. address 37 Rue du Rocher, in the said city, have invented certain new and useful Improvements in Furnace-Drawing Apparatus for Lime Kilns, Cement Kilns, and the like (for which I have obtained patents in Germany, October 11th, 1919, No. 330,921; Belgium, July 15th, 1920, provisional No. 231,739; Spain, July 19, 1920, No. 74,890; Switzerland, July 20th, 1920, provisional No. 7367; Great Britain, July 29th, 1920, No. 150,994; and Italy, July 21, 1920, provisional No. 293/34); and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to furnace drawing apparatus for lime kilns, cement kilns, and the like and in particular to apparatus in which blocks of considerable dimensions form after burning and by agglomeration.

The object of the present invention is to correct the defects which are well known in the apparatus at present in use, either with revolving or oscillating grates, the rotation taking place about the central axis of the furnace. It follows naturally that the speed varies from the periphery, where it is the greatest, to the centre where it is at zero. The descent of the materials at the centre is retarded, but is accelerated at the circumference while at the centre it piles up. In the oscillating systems the pieces are driven first to one side and then to the other, the discharging of the furnace is not symmetrical relatively to the vertical axis of the furnace but only through a diametrical plane.

In the apparatus which forms the subject matter of this invention, these defects are eliminated by the movement of the grate, which takes place in a symmetrical and uniform manner and about the vertical axis of the furnace without however leaving any dead points, the periphery even is relatively slightly moved.

The invention will now be described with reference to the accompanying drawings, in which Figures 1, 2, 3 and 4 illustrate diagrammatically, by way of example, an apparatus constructed in accordance with the present invention.

In these drawings:

Figure 1 is an axial section of the furnace.

Figure 2 is a sectional plan on the line *a*—*b* of Figure 1.

Figure 3 is a modification of the grate.

Figure 4 is a fragmentary plan of the grate shown in Figure 1, indicating the form of the teeth.

The parts of the furnace indicated by 1 and 2 may be of any kind. At 1 is situated the mass to be withdrawn from the furnace and 2 is the body of the furnace lined with refractory bricks, the grid through which air passes to support combustion is indicated at 3. These details including the chimney 4 which dips into the mass do not form any part of the present invention.

The grate proper, on which rests the mass to be withdrawn from the furnace, is indicated at 5. In the example given it is flat and at its periphery teeth 17 cast integral therewith are distributed radially (see Figure 4). They are of the shape of a spear head the point of which is directed inwardly towards the centre. This particular form has the effect of ensuring a rational disengagement of the materials. The grate may obviously, if necessary, be of slightly convex or concave shape, the apparatus remaining otherwise the same.

Connected rigidly to the grate and resting upon it is a vertical shaft 6, the axis of which coincides with that of the circular grate. This shaft 6, about which the grate can rotate, can rotate freely in the body of a large vertical pivot 7 the axis of which coincides with that of the furnace while the axis of the shaft 6 is eccentric relatively to that of the said pivot 7. A strong vertical bearing 11, the base of which is connected to the foundation by anchoring bolts, acts as a support for the pivot 7.

At the upper part of the pivot 7 and cast integral therewith or not, is a bevel wheel 12 which gears with a pinion 13 keyed on the end of a shaft 14 which receives through a belt and pulley 15 or in any other manner, the power necessary for the rotation of the pivot. When the pivot 7 rotates, the shaft 6 consequently travels in the path of a circle having for its radius the eccentricity given.

The mechanism is completed by a toothed

wheel rigidly attached to the grate and the axis of which passes through the vertical shaft 6. Concentrically with the axis of the furnace and engaging the wheel 8 is an internally toothed sector mounted on a circular seat of cast iron connected to the foundations by anchoring bolts.

It follows from this mechanical arrangement that a planetary movement is imparted to the wheel 8 integral with the grate, when the pivot 7 is set in motion. The wheel 8 rolls over the fixed ring 9. The large diameter given to the wheel 8, which is practically that of the grid, causes a tangential movement to be produced of the material covering the grate thus avoiding any jamming that might occur between the grid and the grate. This planetary movement has the effect of causing the materials to issue naturally from the grate by gravity, they being thrust downward by their own weight and distributed regularly towards the exterior. The diameter of the grate 5 is such as to considerably project beyond the grid 3 so as to permit the pieces to arrange themselves thereon according to their natural downward slope. The eccentricity, the value of which may vary, produces a to and fro movement along the radii, so that the products are driven towards the exterior in the direction of the radii, as they would by means of an oscillating table, but in a much more rational manner.

Around the grate 5 may be reserved a certain number of shoots 10 which permit trucks or transporters of any type to be filled directly.

It is evident to any engineer that variations may be made in the details of the mechanism hereinbefore described without in any way changing the nature of the invention. Thus in particular the plate may be perforated with openings arranged between suitable teeth, so as to permit, in case of need, of a partial evacuation of the products from the interior of the toothed rings. In like manner, in order to diminish the size of the rotating plate, it may be so arranged that the external downwardly sliding material may be collected by a plate of a grid, which may be either flat or conical, on to which the products are driven by the eccentric movement of the table. These modifications are shown in Figure 3, the change to the table or plate being shown at 16, the teeth at 18, its diameter is smaller and the parts 16 complete it. The plate also is shown as being provided with holes which permit of a partial evacuation of the materials, the teeth cast in one may vary in dimensions from the centre to the periphery the larger ones at the centre.

Claims:

1. A furnace drawing apparatus for lime kilns and the like, comprising a grate supporting the mass to be withdrawn, a rotary support for said grate causing a planetary movement thereof relative to the axis of the furnace, whereby the materials are driven towards the exterior in a continuous manner over the whole periphery of the grate.

2. A furnace drawing apparatus for lime kilns and the like, comprising a grate supporting the mass to be withdrawn, a rotary support for said grate causing a planetary movement thereof relative to the axis of the furnace, said grate being gradually thickened at its periphery, and provided with a single series of adjoining radial teeth, said teeth being triangular in cross section and gradually increasing in height and width from a point adjacent the center of the grate to the periphery thereof, said teeth adapted to disintegrate the materials in a gradual and continuous manner, as they are discharged over the whole periphery of said grate.

3. A furnace drawing apparatus for lime kilns and the like comprising a grate supporting the mass to be withdrawn, a rotary support for said grate causing a planetary movement thereof relative to the axis of the furnace, said grate being gradually thickened at its periphery, and provided with a single series of adjoining radial teeth, said teeth being triangular in cross sections and gradually increasing in height and width from a point adjacent the center of the grate to the periphery thereof, whereby disintegration of the material is effected, and the grate is caused to act upon the whole under surface of said material supported thereon.

In testimony whereof I affix my signature.

CHARLES CANDLOT.