

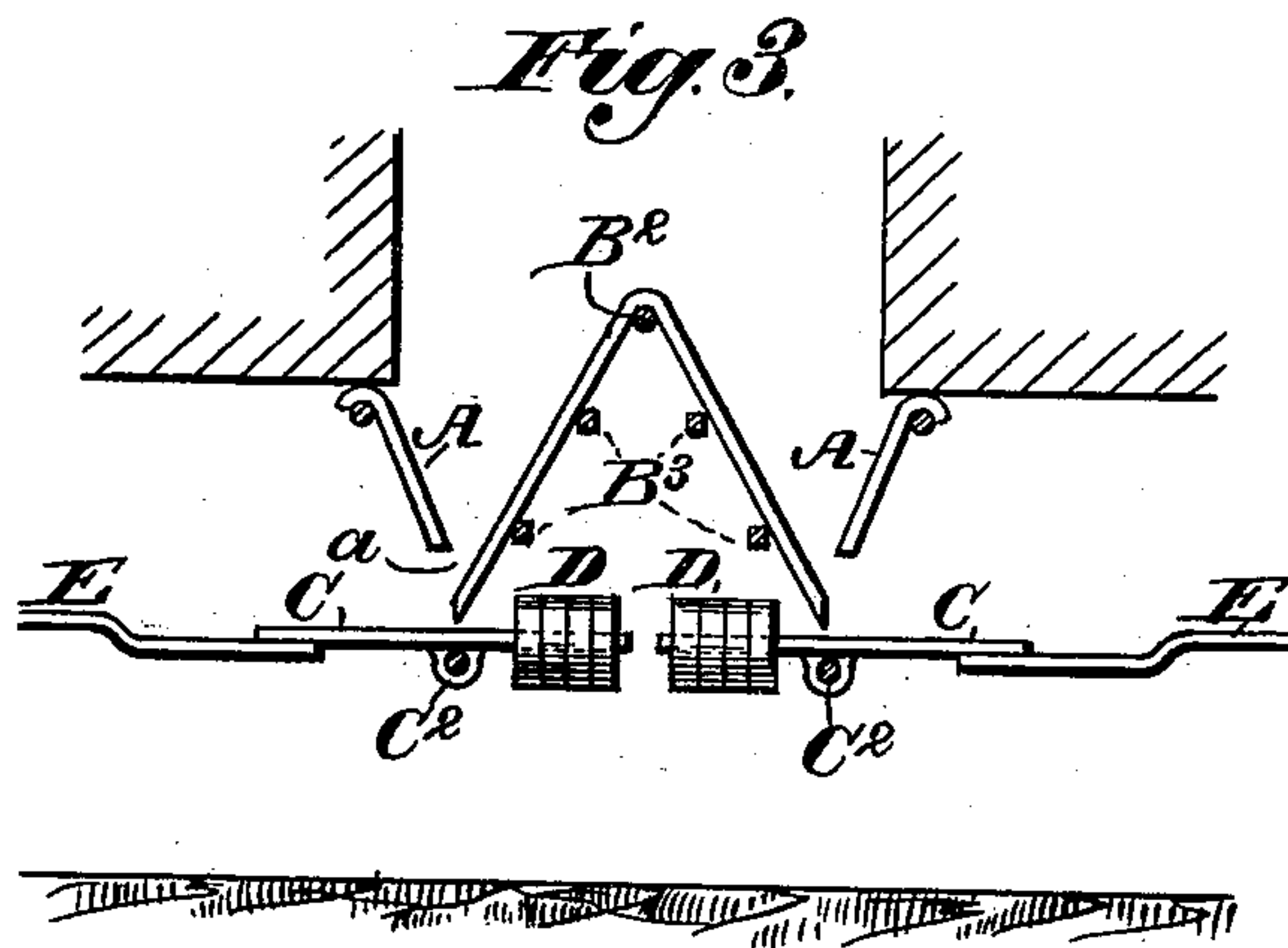
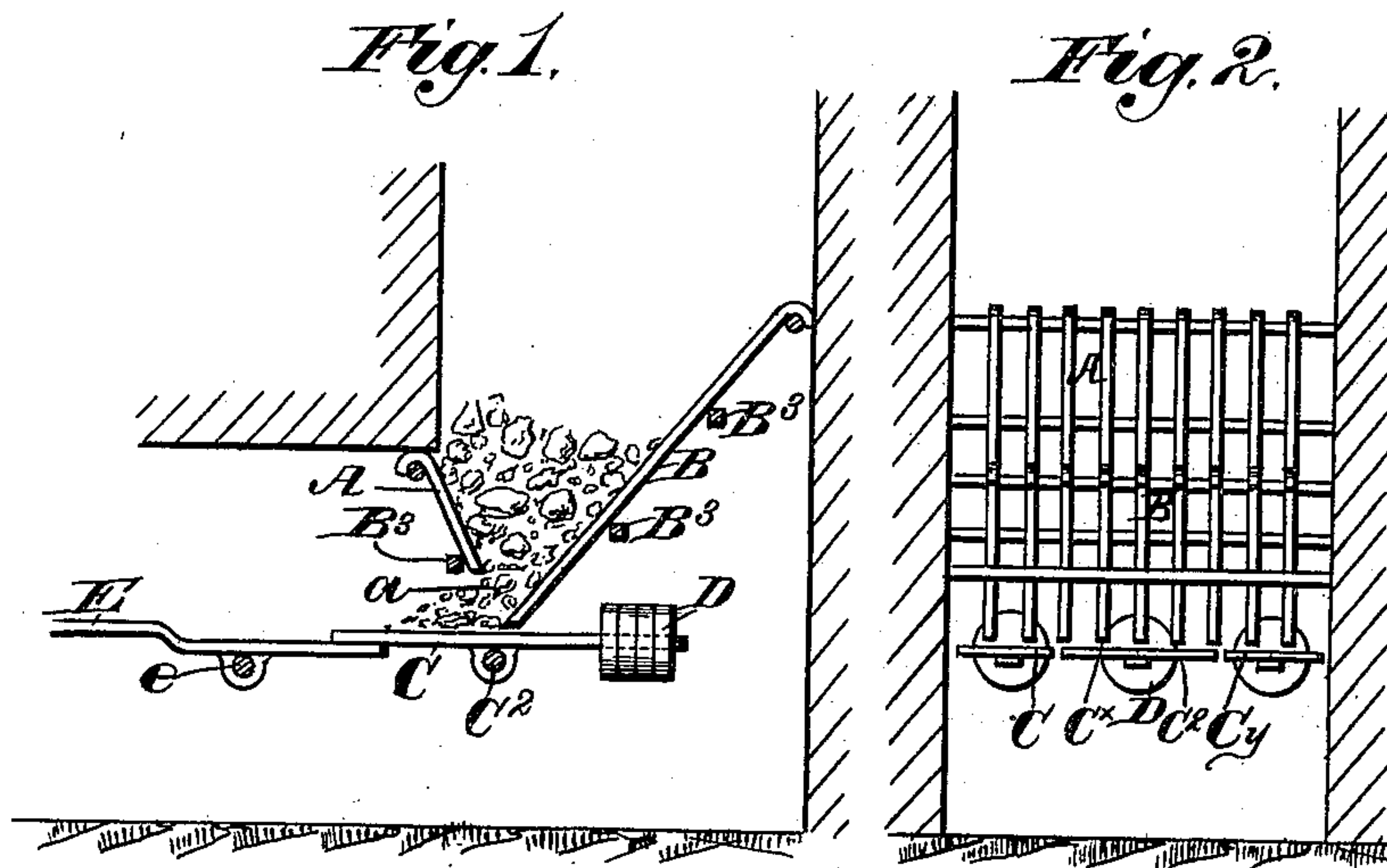
No. 614,730.

Patented Nov. 22, 1898.

A. LAVOCAT & E. CANDLOT.
CEMENT KILN.

(Application filed Dec. 31, 1897.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ALBERT LAVOCAT AND EDOUARD CANDLOT, OF PARIS, FRANCE.

CEMENT-KILN.

SPECIFICATION forming part of Letters Patent No. 614,730, dated November 22, 1898.

Application filed December 31, 1897. Serial No. 664,908. (No model.)

To all whom it may concern:

Be it known that we, ALBERT LAVOCAT and EDOUARD CANDLOT, citizens of France, residing at Paris, France, have invented a new and useful Improvement in Cement Kilns or Furnaces, (for which we have obtained patents in France, No. 254,264, dated February 25, 1896; in Belgium, No. 120,812, dated April 10, 1896, and in Germany, No. 89,606, dated March 1, 1896,) of which the following is a specification.

Our invention relates to kilns for burning lime, cement, and other substances.

In kilns of this type it is desirable that the substance burned should be discharged from the grate at all points of the latter and be caused to descend at an equal rate as nearly as possible at every point. It is also desirable that the operation of discharging said material be carried on rapidly to prevent any part of the material from fusing and sticking to the grate.

In many kilns now in use the withdrawal of the burned substances is effected by displacing the bars of the grate without any regard being paid to the particular spot where the discharged substances may fall. This method is objectionable in several respects. The grates are necessarily of considerable size, and in these large grates it is next to an impossibility to displace the bars simultaneously at all points in the grate. The work is slow and tedious, and any portion of the outflowing substance that happens to be a little larger than the rest may block the whole and stop the discharge at any moment. Moreover, the discharge cannot be arrested by the operator at any point he may wish to stop it, since the grate-bars cannot be restored to place as long as the weight of the load or charge is resting upon them. Finally, in order to slip the grate the workmen are compelled to stand beneath it, where they not only are in a thick dust, but are exposed to contact with the escaping substances, which are either red-hot or at a very high temperature.

In our invention we aim to avoid these objections, and to enable others to fully understand and practice the same we will explain said invention in detail and then particularly

point out and define the novel features thereof in the claims.

For the purposes of the following description reference will be had to the accompanying drawings, in which—

Figure 1 is a sectional elevation, the sectional portion being on a line from front to rear, showing a grate for a kiln constructed in accordance with our invention. Fig. 2 is a view of the same parts in front elevation, the line of sight being at a right angle to that in Fig. 1. Fig. 3 is a sectional elevation similar to Fig. 1, showing a slightly-modified construction.

The reference-letter A in said drawings indicates a part of the bars of the grate, and B denotes the remainder of said bars. These two series of bars are arranged at front and rear and are inclined relatively to each other at a suitable angle, that shown in the present instance being rather less than a right angle and greater than forty-five degrees. The bars B also are longer than the bars A and extend above the top and below the lower ends of the latter, as shown in Fig. 1, a space α being provided between the lower ends of the bars A and the corresponding ends of the bars B, which preferably lie below and substantially in the same plane with the bars A. This space α is of sufficient width to permit the free passage of the substance burned in pieces of any usual size.

Nearly upon the same level as the lower ends of the bars B are arranged plates C, lying in or nearly in a horizontal plane and supported upon a fulcrum or pivot C², which lies directly under the opening α . These plates are provided with counterbalancing-weights D, mounted upon those portions of said plates which lie beneath the bars B, by which they are sustained, so far as their own weight is regarded, in position relatively to the bars A and B, as shown in Fig. 1. In order to maintain this position in the event of any further weight being placed upon the parts of said plates that lie beneath the bars A, we provide a lever E, one end of which lies beneath the free ends of the plates and coöperates with the weights D in holding them in a normal position in case a part of the substance that is being burned should pass through the

opening *a* and fall upon said plates, as is commonly the case.

The cement, lime, or other material that is being burned is arrested and retained by the grate-bars A B as long as the plates C remain in a horizontal or substantially horizontal position, as may be seen in Fig. 1. When the kiln is to be emptied, the workman merely turns the lever E upon its fulcrum *e*, so as to remove the supporting end of said lever from beneath the plates C. The weight of the load or of that portion which has passed through the opening *a* and is resting upon the plates overcomes the counterbalance and the plates tilt downward, whereupon the substance in the kiln shoots down through the opening *a* and over the plates C until the kiln is completely discharged.

Should it be necessary to arrest the discharge from the kiln before the latter is empty, the lever E is released, and its tendency to restore itself, together with the operation of the weights D, immediately raise the plates C and stop the discharge.

When the kiln has two or more orifices, the grate-bars may be duplicated, the two sets of bars B being formed in the shape of an inverted letter V and hung upon a central supporting-bar B², which lies in the angle between the two sets of bars, as in Fig. 3. The plates C and levers E will also be duplicated. It is preferable in every form to provide auxiliary supports B³ for the grate-bars; but the precise details of construction form no part of our invention, as we do not restrict ourselves to any specific features of such character.

To enable the operator to discharge the grate at any one of several different points, as well as to discharge the whole simultaneously, the discharging device is divided into three parts, as indicated by the reference-letters C C^x C^y in Fig. 2, each capable without any material change of being operated independently of both the others. The middle plate C^x is preferably of greater width than the side plates, as shown in Fig. 2.

Having thus described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. In a kiln for burning lime, cement, and other substances, the combination with grate-bars, arranged to converge downward and having an opening between their lower ends, of a plurality of plates mounted on a pivotal support beneath said opening, a lever having one end lying underneath the ends of said plates, to normally maintain them in a horizontal position and counterbalancing-weights cooperating with said lever and adapted to restore said plates to their normal position, substantially as described.

2. In a kiln for burning lime, cement, and other substances, the combination with grate-bars which converge to an opening at their lower ends, of a plurality of plates pivoted to lie beneath said opening, counterbalancing-weights hung upon arms which project from said plates, and a lever having one end lying beneath the counterbalanced ends of said plates, substantially as described.

3. In a kiln for burning lime, cement, and other substances, the combination with two series of inclined grate-bars, one series being longer than, and extending below, the other series to form an opening between the lower ends of the two series for the discharge of material, of plates pivoted beneath said opening and having arms which project on one side of the pivot and under the longer grate-bars, counterbalancing-weights mounted upon said arms, and a lever fulcrumed upon the other side of the pivot for said plates and having one end lying beneath the counterbalanced ends of said plates, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ALBERT LAVOCAT.
EDOUARD CANDLOT.

Witnesses:

EDWARD P. MACLEAN,
HIPPOLYTE ZOTTE.