

(No Model.)

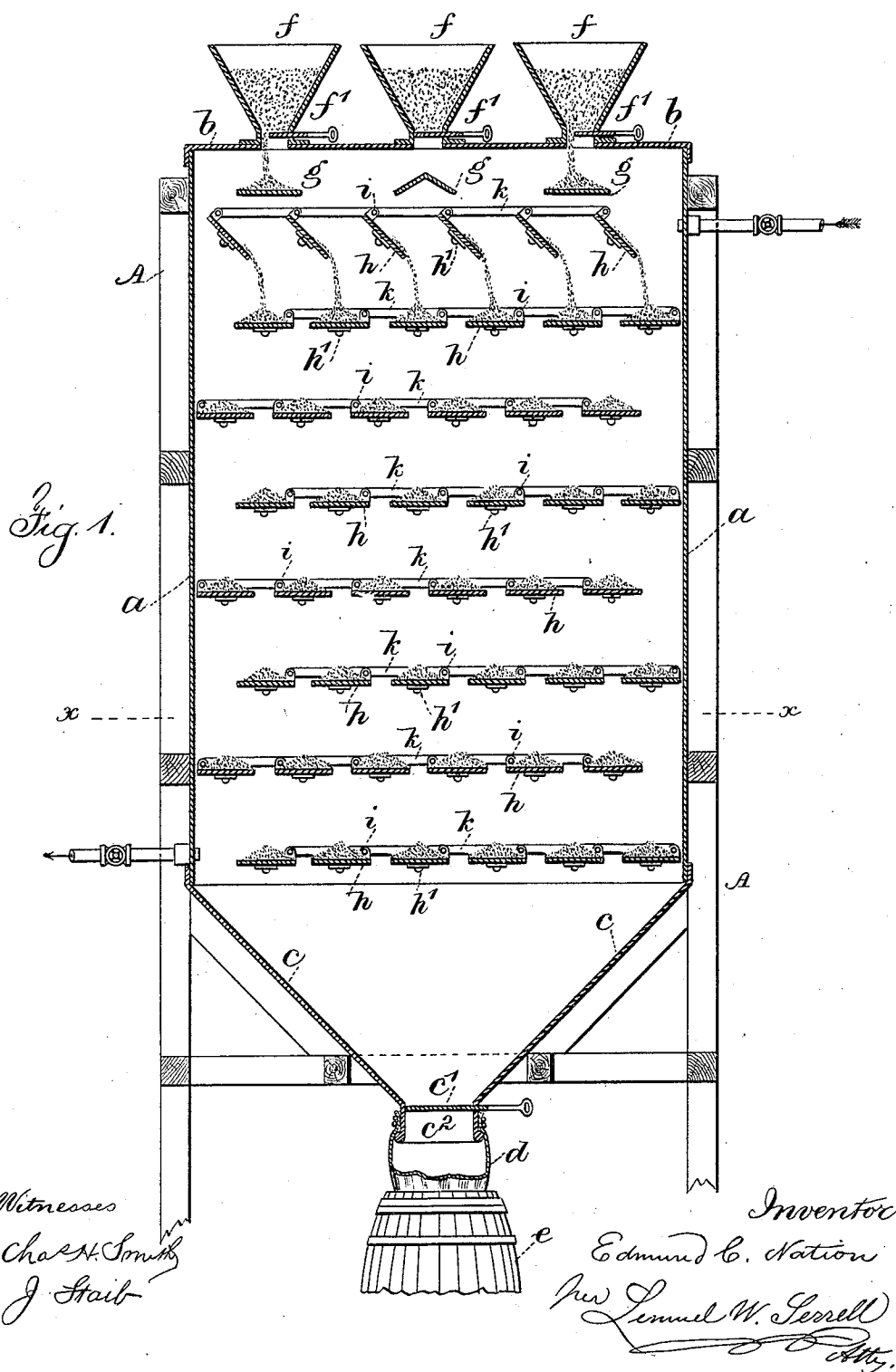
2 Sheets—Sheet 1.

E. C. NATION.

APPARATUS FOR MAKING BLEACHING POWDER.

No. 480,028.

Patented Aug. 2, 1892.



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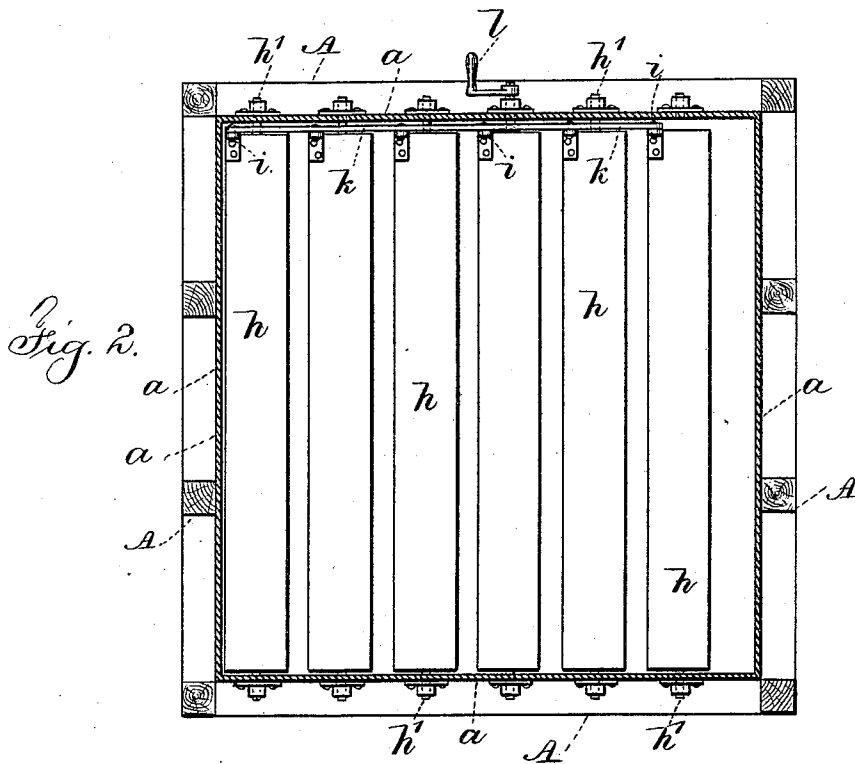
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Witnesses

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UNITED STATES PATENT OFFICE.

EDMUND C. NATION, OF PEEKSKILL, ASSIGNOR TO HIMSELF, AND EUGENE WAUGH, OF BROOKLYN, NEW YORK.

APPARATUS FOR MAKING BLEACHING-POWDER.

SPECIFICATION forming part of Letters Patent No. 480,028, dated August 2, 1892.

Application filed January 11, 1892. Serial No. 417,621. (No model.)

To all whom it may concern:

Be it known that I, EDMUND C. NATION, a citizen of the United States, residing at Peekskill, in the county of Westchester and State of New York, have invented a new and useful Improvement in Apparatus for the Manufacture of Bleaching-Powder, of which the following is a specification.

Heretofore the most commonly practiced method of manufacturing bleaching-powder has been as follows: Kilns or chambers composed of lead, iron, or brick, with entrance-doors and floors specially prepared for the purpose, have been charged with hydrated lime—that is to say, the floors of said chambers have been covered with hydrated lime to a depth of about six inches and chlorine gas has been turned into the chamber for a period and absorbed by the surface lime. This lime has been periodically turned over by workmen entering the chamber until all of the lime has been acted upon by the chlorine gas and has taken up as much of said gas as is possible and necessary to make as perfect a bleaching-powder as possible. During this operation the workmen have to be protected about the head from the action of the deadly chlorine gas, so that the same is not breathed by them or their eyes affected. This operation is attended with much danger to those working in the chambers.

Other devices than these have been employed for the manufacture of bleaching-powder, but with indifferent results; and the object of my invention is to overcome the difficulties that have heretofore existed by the employment of a chamber and such devices therein as will make it unnecessary for workmen to enter the same or for the hydrated lime to be in any manner handled during the process of making the bleaching-powder.

In carrying out my invention I employ towers or chambers in which there are superposed tiers of revolving or tilting slats and at the top of which there are hoppers for feeding into such towers or chambers the hydrated lime onto said revolving slats and a hopper at the bottom portion of said tower receiving the bleaching-powder and discharging it into casks for shipment. The slats of each superposed tier of tilting slats are connected to-

gether at one end by a bar, to which one corner of each of such slats is pivoted, and the axis of one slat of each tier projects outside of the tower or chamber wall and has connected to it a crank arm or handle, by the movement of which all of the slats in that tier are given a partial rotation, or, in other words, tilted, whereby the hydrated lime as it is fed from the upper hoppers is discharged onto said superposed tiers of slats and covers the same with a heaped-up mass of lime of pyramidal form. The slats are employed not only to hold the lime in this form while it is exposed to the action of the chlorine gas, but they are to be tilted to deliver said lime onto the slats beneath, and in so doing turn over the lime and expose fresh surfaces thereof to the action of the chlorine gas.

In the drawings, Figure 1 is a vertical section illustrating my improved device, and Fig. 2 is a sectional plan at the line $x x$.

The tower or chamber for treating the hydrated lime with the chlorine gas I prefer to make of sheet metal, which metal is preferably iron-painted on the inside with a suitable paint or substance not acted upon by the chlorine gas. This tower or chamber has side walls a , a flat top b , and a hopper-shaped bottom portion c , with a slide-gate c' and neck c'' , around which is secured a sleeve of bagging d , depending into the cask or barrel e . This tower is within and supported by a suitable timber framework, (represented at A .) Hoppers f are connected upon the top b of the tower and are provided with gates f' . Within the tower and below the hoppers f are shelves g , which are preferably stationary, and below the shelves g and comprising the height of the tower from the hopper-bottom c up to the shelves g are the superposed tiers of tilting or partially-revolving slats, each of the said tiers being composed of slats h , pivoted at h' in the respective walls a of the tower. These shelves g I make either flat to hold some lime or double-inclined to deflect said lime onto the slats beneath. I have shown both forms. Each slat h in each tier has a boss i upon one corner, and bars k connect together pivotally all of the bosses i of each tier of slats. One pivot or shaft of one of the slats in each tier projects through the wall a of the tower and

has connected to it a crank and handle *l*, and by this handle and the bar *k* all of the slats in one tier are tilted or given a partial rotation, as illustrated in Fig. 1, at the upper tier of slats. The slats in the respective tiers are not placed directly over each other, but are set alternately, or, in other words, one is intermediate of the other, the central points or pivots of one tier being over the space between the slats of the tier beneath, so that when one tier of slats is tilted its contents are delivered onto the center of the slats beneath.

It will be noticed from Fig. 1 that the bosses *i* are upon one corner of one tier of slats and upon the opposite corner of the tiers of slats above and beneath and that one tier of slats tilts in one direction and the next tier above in the opposite direction. This is done to economize space and to insure the thorough turning over or mixing of the hydrated lime and the absorption of the chlorine gas by the lime in its descent through the tower or chamber from one set of slats to another.

The operation of the parts is substantially as follows: The hoppers *f* are charged with hydrated lime and the slats of all the tiers occupy a horizontal position, the gates *f'* are opened, and the lime descends onto the shelves *g*, and the surplus lime over and above the pyramidal capacity of the shelves falls upon the tilting slats *h* beneath. These slats *h* fill up to their pyramidal capacity and the surplus falls onto the slats beneath, and so on down all of the tiers of slats until they are all charged to their capacity. Where the double inclined shelves *g* are employed, no lime remains thereon; but all is delivered onto the slats *h*. The gates are now closed and chlorine gas is admitted to said tower or chamber at any desired point and in any suitable or desired manner. I have shown an inlet-pipe at the top of the tower and an exit-pipe at the bottom thereof. After sufficient time has elapsed the lower tier of revolving slats is tilted and their contents delivered into the hopper *c*, and then they are returned to a normal position. The second tier of slats is now tilted and their contents delivered on the tier beneath, in which delivery the lime is turned over and mixed up to a certain extent, so that a new and unacted-upon surface is presented. The third tier is now tilted and its contents delivered upon the second, and so on all the way up the tower, and this operation is repeated as many times as may be essential to convert the hydrated lime into bleaching-powder, after which the entire contents of the slats *h* are delivered into the hop-

per *c*, the gas turned off, and the contents of the hopper barreled for shipment. After this the slats of the tower are again charged with hydrated lime as at first and the gas is again turned on, so that the fresh hydrated lime is acted upon by the chlorine gas, which it absorbs, and these operations are continuously repeated, and the bleaching-powder made thereby is drawn from the hopper *c* by the opening of the gates *c'* and delivered into the barrel or barrels *e* for shipment.

It will thus be seen that in my improved apparatus and during the manufacture therein of bleaching-powder all the operations of supplying and turning over the lime are conducted from outside the tower or chamber and that it is not necessary for workmen to go inside the same under any circumstances.

Sight-holes with glass in them may be provided in the walls *a* of the tower at different places, so that the operations can be observed.

I claim as my invention.

1. A closed tower for the manufacture of bleaching-powder, having feed-hoppers and slides at the upper end and a hopper at the lower end and a pipe for supplying the gas at the upper part of the tower, in combination with tiers of pivoted horizontal slats at suitable distances and with the slats in one tier above the spaces between the slats in the next tier, the slats in each tier being connected at one end, and means for tilting the slats from outside the tower, substantially as specified.

2. A closed tower for the manufacture of bleaching-powder, having hoppers and slides at the upper end for supplying the hydrated lime into such tower and a hopper at the lower end for receiving the bleaching-powder and a pipe for supplying the gas at the upper part of the tower, in combination with tiers of pivoted horizontal slats set at suitable distances one above the other, the slats of one tier being intermediate to those of each other tier, bosses upon the corners of the slats, rods pivoted to said bosses for connecting the slats of the respective tiers, the shaft of one slat in each tier passing outside the tower, and a crank-arm or equivalent device connected therewith for tilting the slats of the tiers, substantially as specified.

Signed by me this 8th day of January, 1892.

EDMUND C. NATION.

Witnesses:

GEO. T. PINCKNEY.
HAROLD SERRELL.