

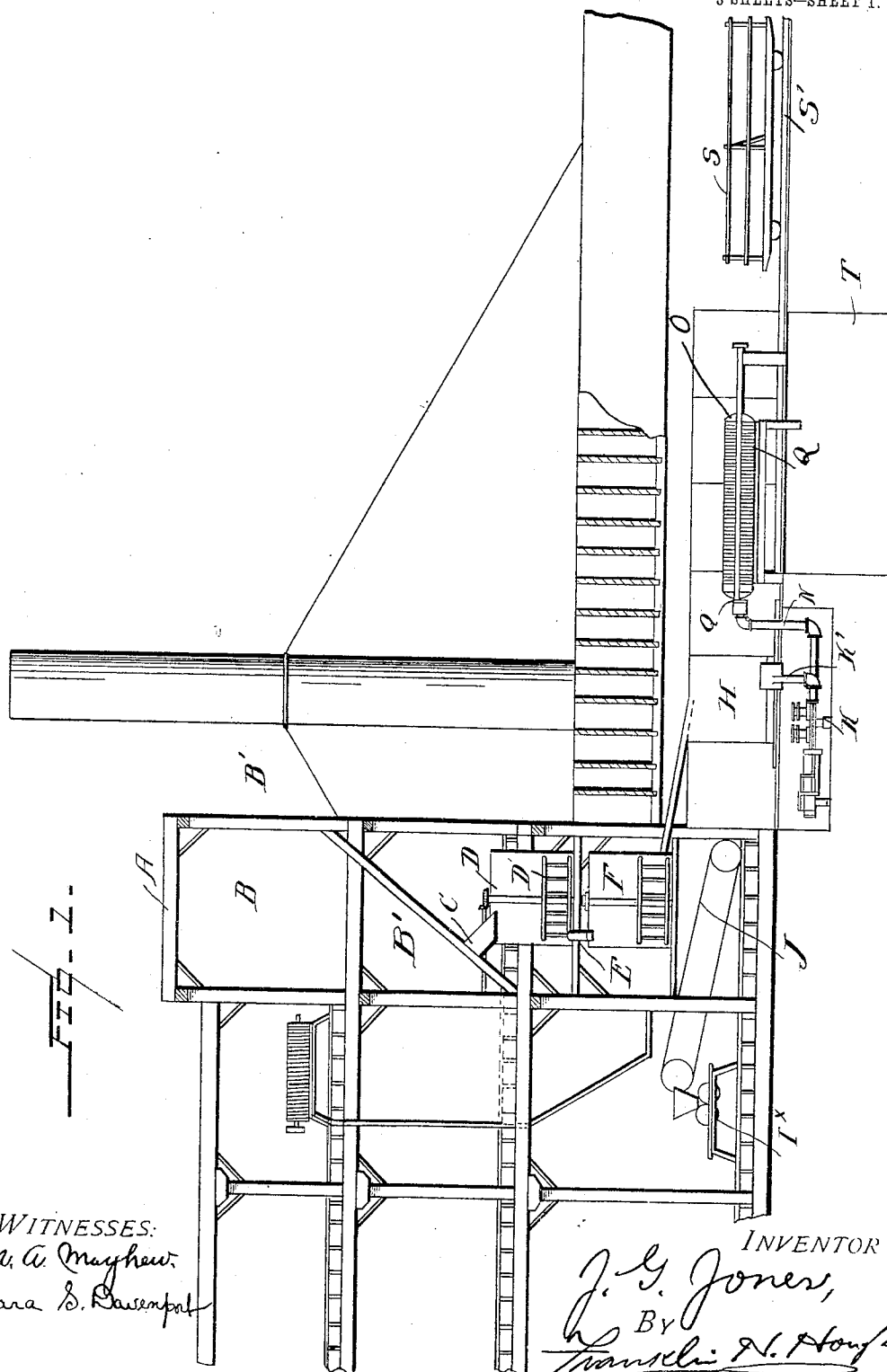
No. 803,904.

PATENTED NOV. 7, 1905.

J. G. JONES.
METHOD OF HYDRATING LIME.

APPLICATION FILED MAR. 13, 1905.

3 SHEETS—SHEET 1.



WITNESSES:
N. A. Mayhew,
Clara S. Dawson

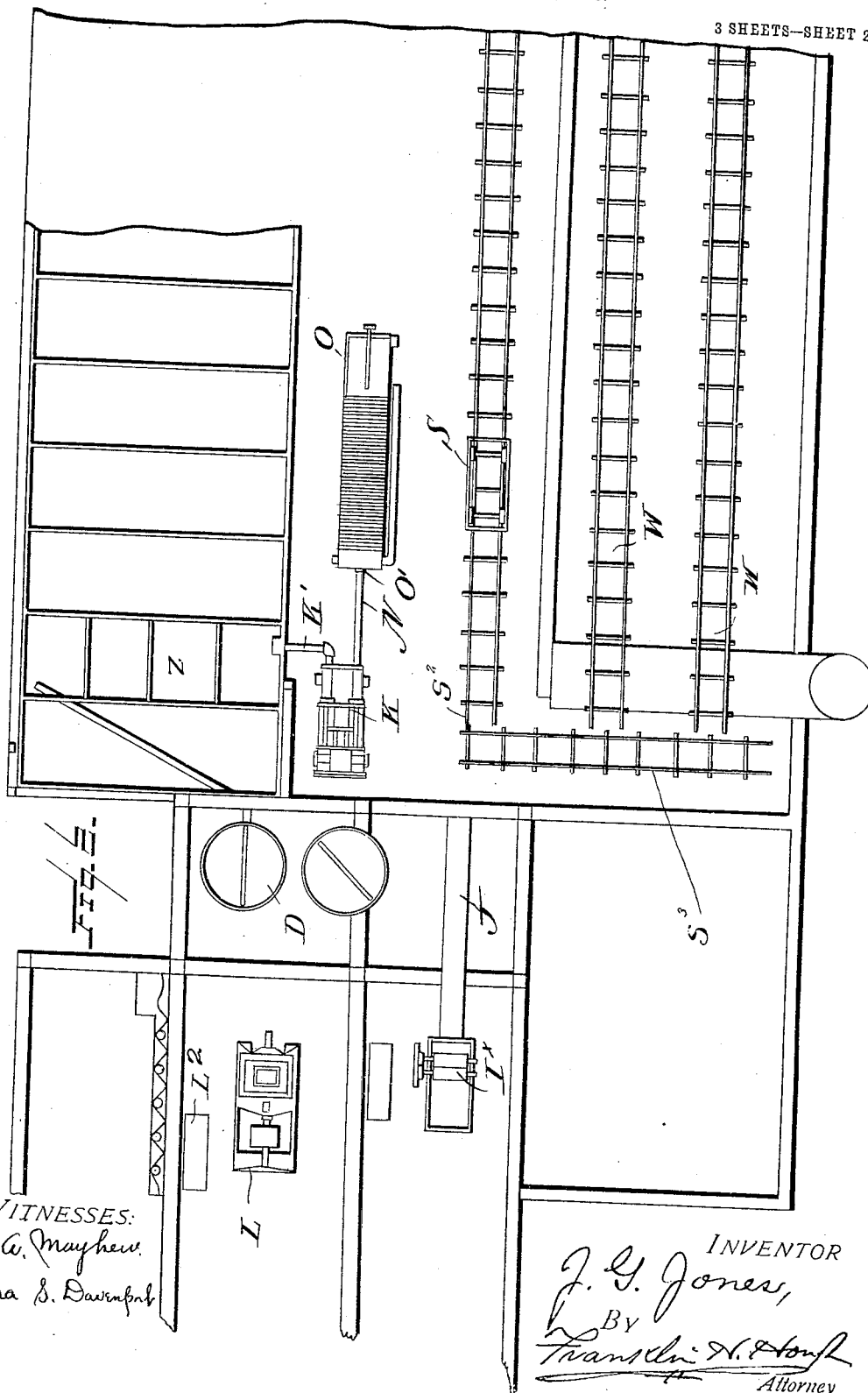
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3 SHEETS--SHEET 2.



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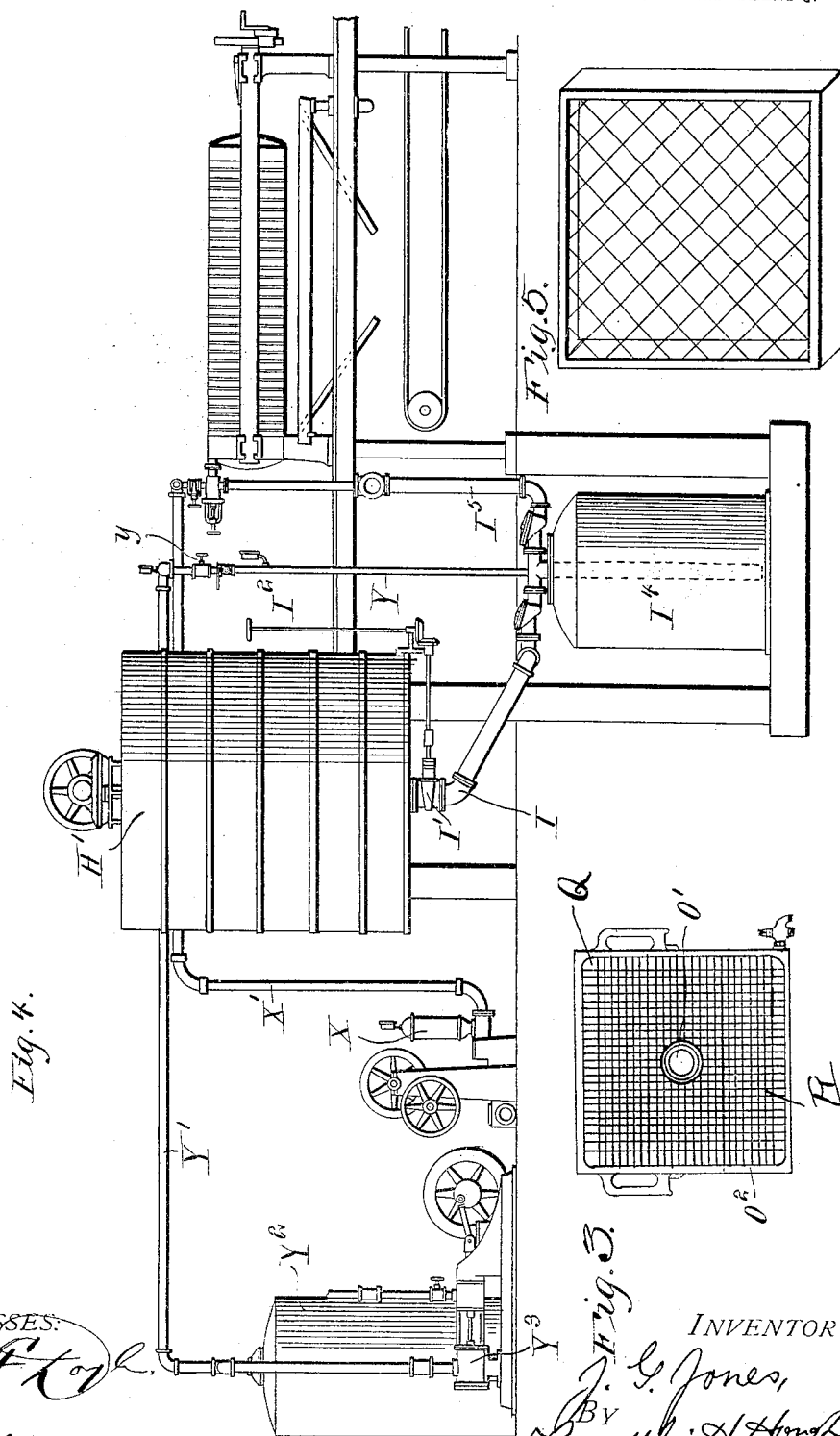
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WITNESSES:

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Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN G. JONES, OF CARTHAGE, NEW YORK.

METHOD OF HYDRATING LIME.

No. 803,904.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed March 13, 1905. Serial No. 249,909.

To all whom it may concern:

Be it known that I, JOHN G. JONES, a citizen of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Methods of Hydrating Lime; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful methods of preparing and hydrating lime: and the object of the invention is the thorough slaking of burnt lime in agitator slaking-tanks or other suitable form of slaker, the continued agitation of the slaked lime in agitator or revolving tanks or cylinders until all particles of lime are perfectly hydrated, the separation of all impurities from the slaked lime by means of settling-vats and riffle-boxes and forcing the semifluid lime by means of a suitable pump, air, or other power mechanism into a filter-press from which the excess of water is filtered by the pressure under which it is introduced into the filter-press, the formation of the lime into cakes in the recesses between the filter-plates, and the treatment of the lime-cakes in a moist-air steam-drier by which the lime may not only be thoroughly dried, but the particles thereof tempered and rendered more plastic, and afterward reducing the cakes to powdered form of uniform fineness, in which form it may be kept indefinitely without deterioration.

An apparatus by which the steps of my process may be carried out is illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings similar letters of reference indicate like parts in the views, in which—

Figure 1 is a sectional view through a building, showing in elevation the various forms of apparatus which are employed in carrying out the steps of my method or process of making hydrated lime. Fig. 2 is a top plan view of the apparatus, showing a view transversely through the building. Fig. 3 is a detail view of one of the cake-holding frames of the filter-press. Fig. 4 is a slightly-modified form of apparatus for forcing the lime into the filter-press and extracting a large percentage of the

moisture therefrom. Fig. 5 is a detail view showing a cake-carrying frame.

Reference now being had to the details of the drawings by letter, A designates the frame of a building having various floors upon which different parts of the apparatus which I employ in carrying out my process of making hydrated lime rest.

B designates a lime-storage bin having an inclined bottom B' therein and from which leads an exit passage-way C, adapted to convey lime into a slaking-vat D, said slaking-vat being provided with rotatable stirrers D'. Leading from the slaking-vat is an exit-pipe E, whereby the slaked lime is allowed to pass into the lime-mixer F, positioned beneath said slaking-vat. Positioned at any suitable location, preferably below the level of the lime-mixer, is a settling-vat H containing riffles Z, wherein the lime which is fed thereto in a semifluid state may be separated from impurities.

K designates a pump having a pipe K' leading to the lower portion of one of the compartments of said settling-tank and through which pipe K' the slaked lime which has been settled is drawn and forced through the pipe N into the filter-press O. Said filter-press, which may be of any well-known construction, preferably having recessed plates Q, a detail view of one being shown in Fig. 5 of the drawings, has an opening O' at one end, into which the lime in semifluid state is forced under pressure into the series of chambers formed by recessed plates. Each recessed plate has filtering sides R, covered by any suitable fabric or filtering medium provided to retain the lime to allow the excess of water to be filtered through said filtering medium, and said water of filtration is allowed to make exit from the filter-press by means of faucets into the return-water vat T, positioned underneath the filter-press, and from which vat it may be returned to the slaking-vat for the purpose of saving any lime which might escape through the filter-press. After the lime has been forced into the filter-press under the heavy pressure of the pump and the excess of water is filtered off the cakes of lime are placed in wire-covered cake-holding frames L' and transferred to cars S, one of which is shown in Fig. 1 of the drawings as being double-decked and mounted upon a track S'. Said track turns at an angle, as at S², and branching tracks W lead from the outside track S³ into a moist-steam drier which comprises a

housing in which the lime-cakes are not only thoroughly dried, but the particles thereof tempered and rendered more plastic. The cakes as they come from the moist-steam drier
5 are carried by the conveyer J into the crusher I^x, where the cakes are broken up and afterward, by means of an elevator, raised to a grinder L, through which the material is passed, and thence transferred by a suitable
10 elevator L' to the packing-conveyer L².

In Fig. 4 of the drawings I have shown a slightly-modified form of apparatus, in which H' shows a tank into which the lime thoroughly mixed is introduced and from which it makes
15 exit through the pipe I, regulated by a valve I', having an operated wheel I², with suitable gear connections with said valve, into the receiving-reservoir I⁴, which is adapted to hold a sufficient quantity of the lime to fill the filter-
20 press. A pipe Y leads from the top of the tank I⁴ and is provided with a valve y, and a pipe Y' communicates with the pipe Y and also with an air-supply reservoir Y², which is supplied with air from the pump Y³. A pipe
25 I⁵ leads from the tank I⁴ to the filter-press and through which lime is forced by pressure supplied from the reservoir Y² through the pipes Y' and Y. A second pump X is provided, whereby dry air under heavy pressure may
30 be driven through the pipe X' to the filter-press after the plates of the filter-press have been filled with the lime, it being understood that after the filter-press has been filled with lime the valve in the supply-pipe leading to
35 the filter-press from the tank I⁴ is closed and the valve in the air-pipe X' opened, thereby allowing a heavy blast of air to be forced through the cakes to appreciably reduce the percentage of water contained therein.

40 By the method of hydrating lime in the manner described the excess of water required to thoroughly slake the lime is quickly separated from the lime, all impurities are removed, and the lime cakes after being removed
45 from the filter-press are thoroughly tempered and dried and reduced to powdered form of a uniform fineness, thereby making a superior product by a simple process, which may be carried out by various forms of appa-
50 ratus.

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

1. A method of hydrating lime, consisting
55 in slaking burnt lime with an excess of water, separating a large percentage of the water from the lime, and afterward passing the latter through a moist-air drier, as set forth.

2. A method of hydrating lime consisting

in slaking burnt lime with an excess of water, separating a large percentage of the water from the lime by pressure, and afterward passing the latter through a moist-air drier, as set forth.

3. A method of hydrating lime, consisting
65 in slaking burnt lime with an excess of water, then forcing the lime in a semifluid state through a filter-press to relieve same of a large percentage of water, and afterward passing the lime through a moist-air drier, as set forth.
70

4. A method of hydrating lime, consisting
in slaking burnt lime with an excess of water, then forcing the lime, in a semifluid state into a filter-press and applying pressure there-
75 to forming the lime into cakes and afterward passing the cakes through a moist-air drier, as set forth.

5. A method of hydrating lime, consisting
in slaking burnt lime with an excess of water, forcing the lime in a semifluid state into
80 a filter-press, applying pressure to the latter to relieve the lime of a large percentage of its water, forcing air through the cakes of lime formed in the press, and afterward passing the cakes through a moist-air drier, as set
85 forth.

6. A method of hydrating lime, consisting
of slaking burnt lime with an excess of water, forcing the lime, in a semifluid state into
90 a filter-press, applying pressure to the latter to relieve the lime of a large percentage of water, afterward passing the cakes of lime formed in the press, through a moist-air drier to dry and bleach the lime, as set forth.

7. A method of hydrating lime, consisting
95 in slaking burnt lime with an excess of water, forcing the lime in a semifluid state into a filter-press, applying pressure to the latter to relieve the lime of a large percentage of its water forming a saturated solution of lime
100 utilized for slaking the burnt lime, and afterward passing the lime as it issues from the press, through a moist-air drier, as set forth.

8. A method of hydrating lime, consisting
105 in slaking burnt lime with an excess of water, forcing the lime into a filter-press and applying pressure to the latter to relieve the lime of a large percentage of its water, passing the lime formed into cakes in the filter-press, through a moist-air drier to dry and
110 bleach the lime, and afterward reducing the latter to powdered form, as set forth.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

JOHN G. JONES.

Witnesses:

ANDREW TROMBLEE,
W. W. SWEET.