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F. O. MOBURG.

APPARATUS FOR BOILING LIME AND SULFUR.

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FIG. 1.

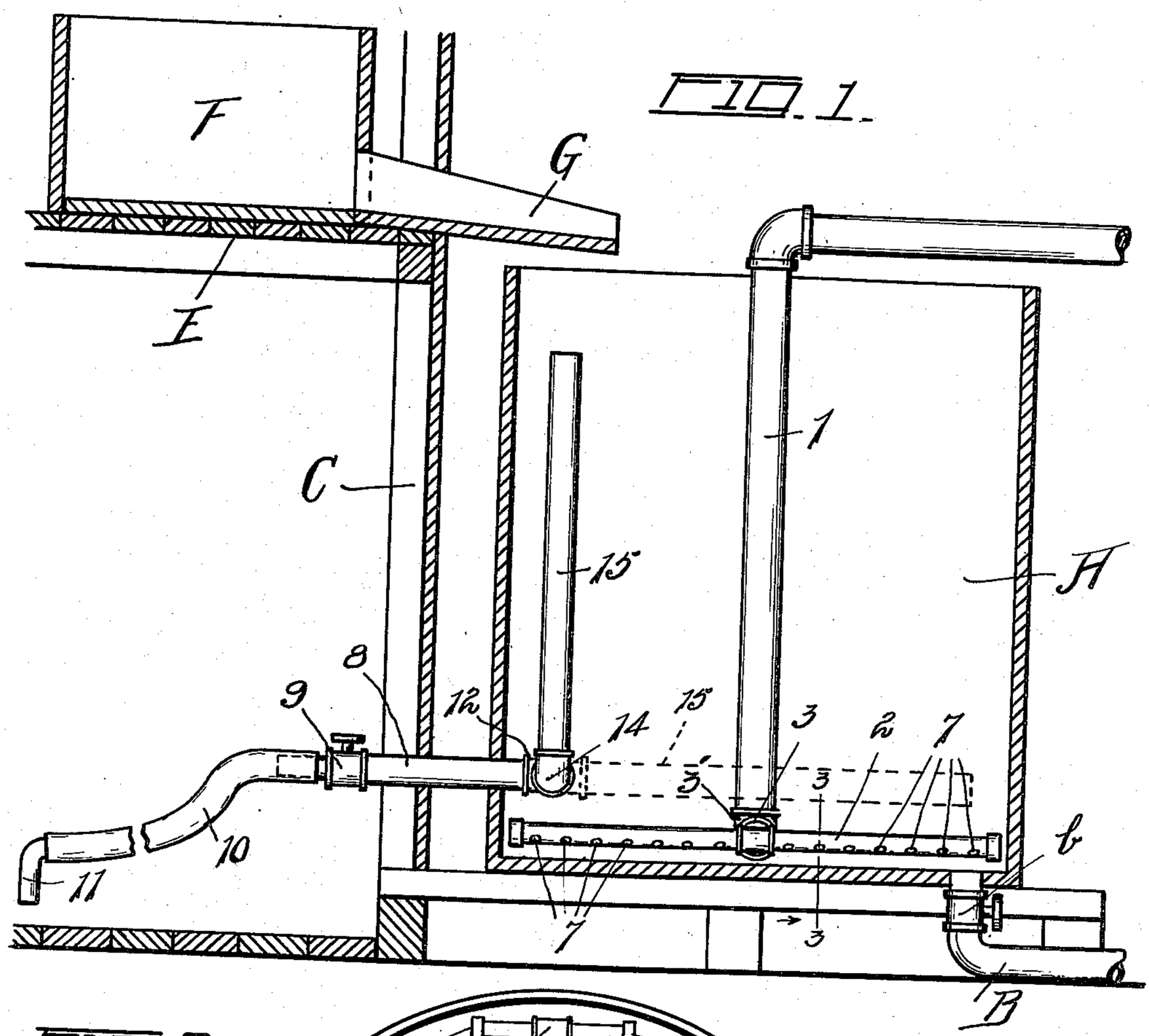

FIG. 2.

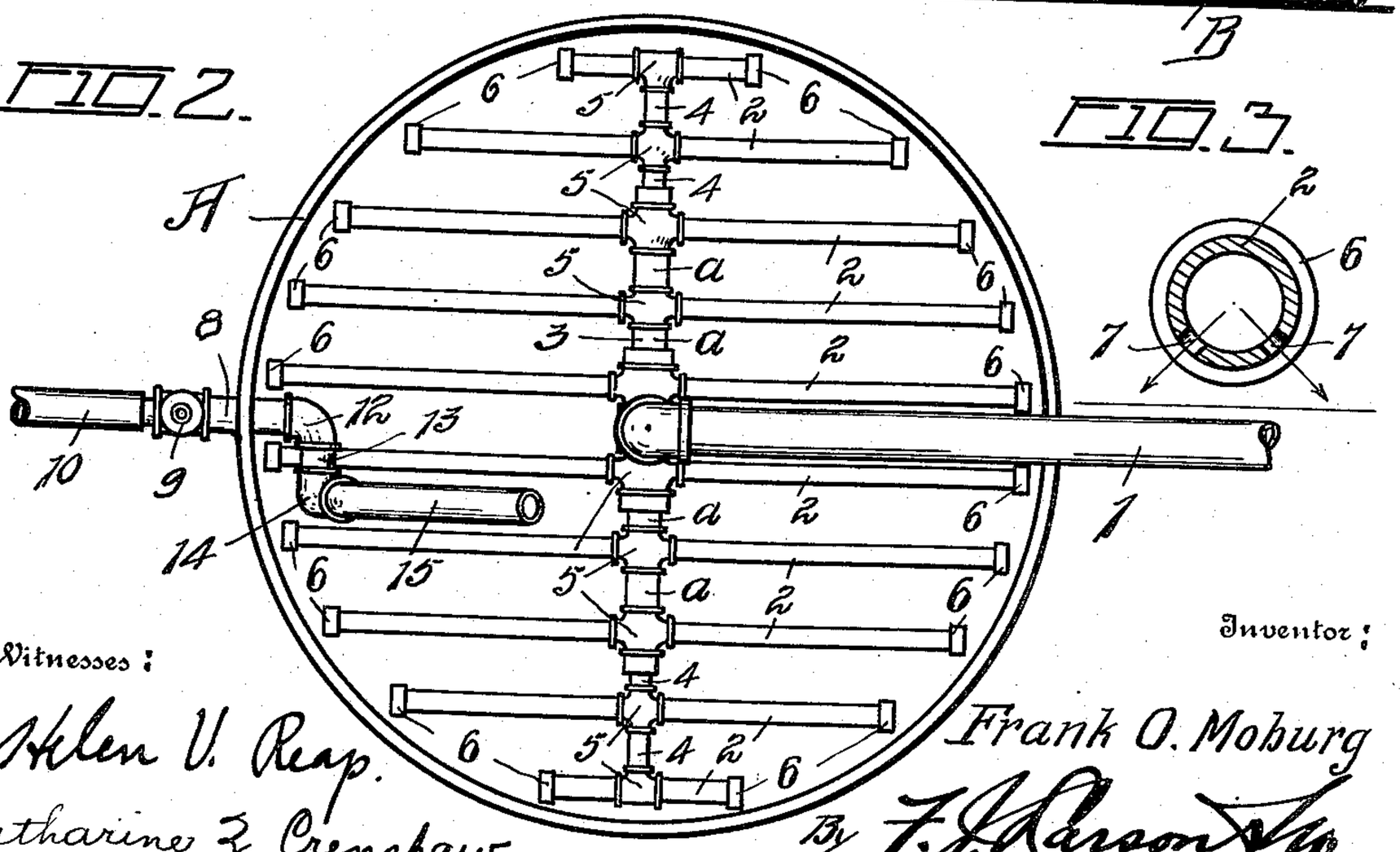

FIG. 3.

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APPARATUS FOR BOILING LIME AND SULFUR.

No. 881,434. Specification of Letters Patent. Patented March 10, 1908.

Application filed July 29, 1907. Serial No. 386,106.

To all whom it may concern:

Be it known that I, FRANK O. MOBURG, a citizen of the United States, residing at Omaha, county of Douglas, and State of Nebraska, have invented certain new and useful Improvements in Apparatus for Boiling Lime and Sulfur, of which the following is a specification.

My invention pertains to an apparatus for boiling lime and sulfur, and has for its object an apparatus of this type which will permit of the maximum amount of sulfur being put into solution with lime in water.

Other objects of the invention will appear in the course of the following specification.

Referring to the accompanying drawings, wherein like characters of reference denote similar parts throughout the several views:—Figure 1, is a central vertical section of the apparatus, Fig. 2, is a top plan view of the boiling vat, and Fig. 3, is an enlarged detail being a cross section on line 3—3 of Fig. 1.

The apparatus comprises a boiling vat, A, shown arbitrarily in the drawings as of cylindrical form, which on its interior at points slightly above its bottom is provided with a plurality of steam cross pipes 2, each connected to a transverse feed pipe 3. Feed pipe 3, is secured by a union 3′, to the lower end of a vertical depending steam supply pipe 1, which latter enters vat A, from the central top portion thereof.

By reference to Fig. 2, it will be observed that feed pipe 3, is composed of a plurality of short sections *a*, *a*, *a*, *a*, each of the same diameter connected together by the couplings 5, which latter have also the cross pipes 2, secured thereto, and further a plurality of short sections 4, 4, 4, 4, of less diameter than that of sections *a*. Thus it will be observed that the feed pipe 3, decreases in diameter towards its ends, which are farthest from the point of connection of the supply pipe 1, the purpose of which is to equalize the steam pressure throughout the length of feed pipe 3, to obtain as far as possible a uniform and equal distribution of the steam pressure throughout the area of the boiler vat, which latter is secured by reason of cross pipes 2, being connected to feed pipe 3. The equal and uniform distribution of the steam pressure is of vital importance since on the same depends the thorough and uniform agitation and boiling of the lime and sulfur solution at points in like manner. The cross pipes 2, are all of the same diameter, each being closed by a cap 6, at its outer end, and each being formed with two rows of perforations 7, which extend along their length and are arranged in the pipes 2, in the relation shown in Fig. 3, wherein the rows are disposed in an arc of approximately of 90°, the perforations being disposed to discharge and direct the steam onto the bottom of vat A, in paths at right angles to one another, as illustrated by Fig. 3.

B designates the drainage pipe provided with valve *b*, which leads from vat A.

In Fig. 1, of the drawings I have depicted a convenient mixing device which consists of a platform E, which is secured to the wall C, of a building or structure, platform or floor E, being arranged above the top of vat A, and having a large vat F, thereon. Vat F, is provided with discharge trough or spout G, which communicates therewith and extends through wall C, to overlie the top of boiling vat A, and discharge thereinto.

In connection with the vat A, I employ means for filling the barrels with the concentrated lime and sulfur solution, which means embodies a horizontal pipe 8, extending through wall C, and on the interior of vat A. This pipe at its end on the inside of vat A, is equipped with elbow 12, into which is fitted a short section of pipe 13, having a horizontal disposition connected to an annular elbow 14, having its outer end connected to outlet pipe 15, the latter being capable of movement in a vertical semi-rotary plane to the positions shown in full and dotted lines in Fig. 1, and positions intermediate the same. It will be readily understood that as the level of the solution in vat A, is lowered due to the discharge of the same, pipe 15, is lowered to constantly maintain its open upper or outer end directly beneath the level of the solution, so that the solution may at all times have access to such pipe.

9, designates a valve on the end of pipe 8, which controls the discharge of the solution through such pipe, there being a flexible hose 10, and turn pipe nozzle 11, on the free end of hose 10, which is inserted in the bung hole of the barrel in filling the latter.

In operation the lime in proper proportion is slaked in water in F and the sulfur in proper proportion is added during the time the lime is slaking, the mixture thus formed with the required amount of water is then allowed to discharge through spout into vat A. Inasmuch as vat A, as depicted is of

annular form the cross pipes 2, are so arranged and made of such lengths as to thoroughly cover the bottom of the vat in a uniform manner as illustrated. The apertures 7, of the cross pipes are of such size and distances apart that an even, equal and uniform distribution of the steam is obtained.

The arrangement of the pipes 2, and their perforations to obtain a uniform and equal distribution of the steam is most vital, since I have found that the mass of material can only produce the high and superior grade of concentrated solution by the use of steam which uniformly agitates and boils the material from the bottom up.

What I claim is:—

1. An apparatus of the type set forth, comprising a vat, a steam supply pipe, a transverse feed pipe connected to the lower end of said supply pipe, said feed pipe decreasing in diameter towards its ends, being of greatest diameter at its point of connection with the supply pipe and of least diameter at its ends, and a series of cross pipes perforated on their under sides and having their ends terminating at points adjacent the inner circumference of the vat.

2. In an apparatus of the type set forth, a vat, a steam supply pipe leading into said vat, a transverse feed pipe decreasing in diameter as its ends are approached, secured to the said supply pipe at a point adjacent the bottom of the vat, and a multiplicity of cross pipes having closed ends and perforations on their under sides secured to said feed pipe on opposite sides thereof, and at regular intervals throughout the length of the feed pipe.

3. An apparatus of the type set forth, comprising a vat, a steam supply pipe leading thereinto, a transverse feed pipe connected to the steam pipe and composed of a series of sections which decrease in diameter towards the ends of the said feed pipe, couplings for connecting said sections, a multiplicity of cross pipes arranged on opposite sides of the feed pipe throughout the length of the feed pipe connected to said couplings and each formed with pairs of apertures throughout their length, the apertures of each pair being disposed so as to discharge the steam therefrom in paths at right angles to one another, a horizontal pipe leading into the vat adjacent its bottom, and a pipe connected to the inner end of said horizontal pipe and having movement in a vertical rotary plane.

4. An apparatus of the type set forth, comprising a vat, a mixing tank located at a point above said vat and having a discharge spout which extends over said tank and discharges thereinto, means for feeding steam against the bottom of the tank at spaced points throughout the area thereof, and means to enable the vat contents to be removed by taking the same from the level thereof, said last named means being movable to enable the same to continually be lowered as the level of the vat contents are lowered.

5. An apparatus for boiling lime and sulfur composed of a vat, a main steam supply pipe for said vat, a series of perforated pipes extending throughout the area, of the bottom of the vat, and a pipe having tapering portions connecting said series of pipes with said main steam supply pipe whereby the steam egressing from said perforated pipes will be discharged at the same pressure throughout the length of each.

6. An apparatus for boiling lime and sulfur composed of a vat, a main steam supply pipe, a transverse feed pipe connected to the inner end of said main steam supply pipe, a series of perforated cross pipes connected to said transverse feed pipe, said transverse feed pipe being formed to discharge steam at an equal pressure to each of said cross pipes.

7. An apparatus for boiling lime and sulfur composed of a vat, a main steam supply pipe, a series of perforated pipes arranged at spaced intervals throughout the area of the vat, and means connected to said perforated pipes and to said main supply pipe whereby the steam will be fed to the perforated pipes at an equal pressure.

In testimony whereof I have signed my name to the specification in the presence of two subscribing witnesses.

FRANK O. MOBURG.

Witnesses:
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