

(No Model.)

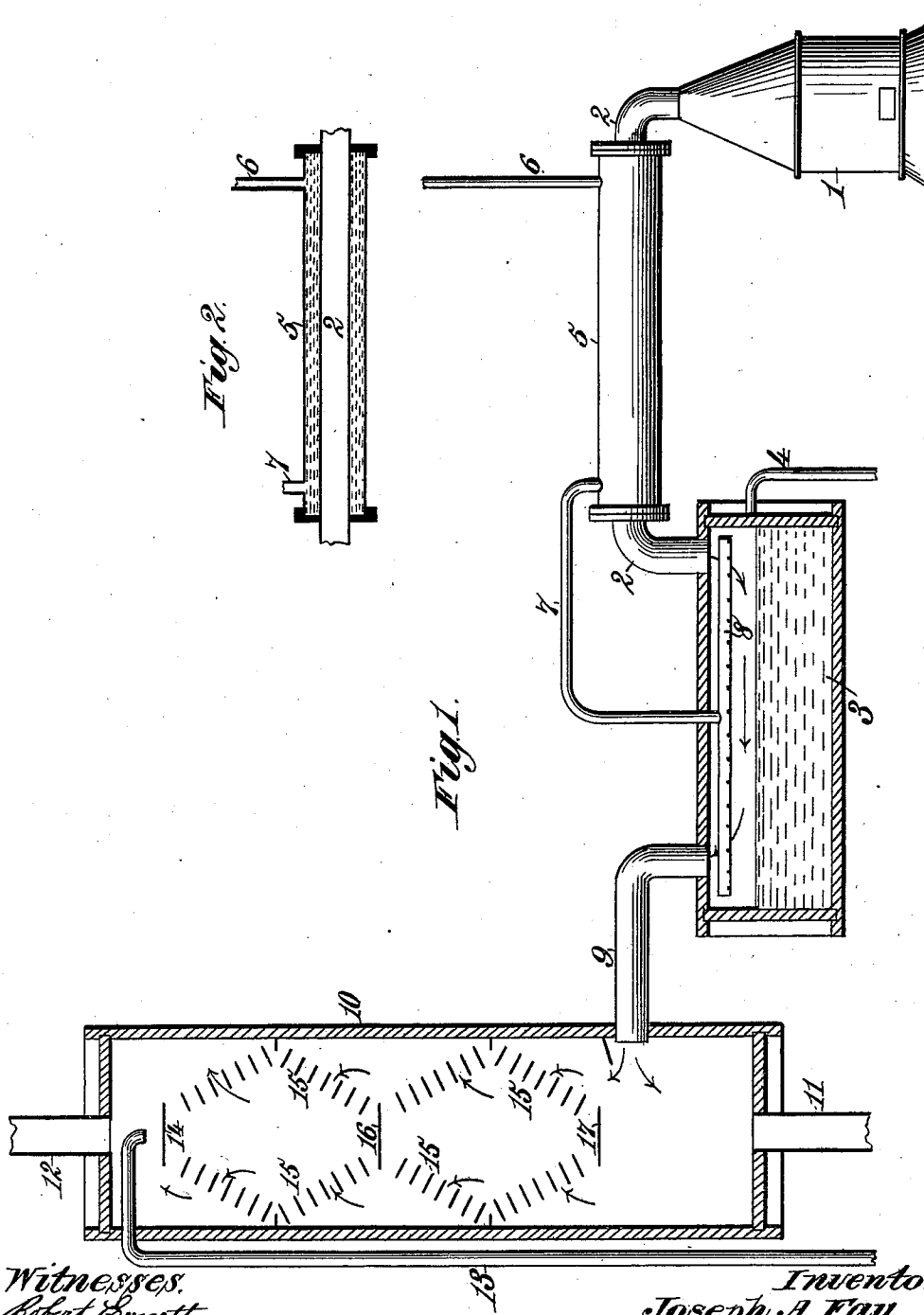
2 Sheets—Sheet 1.

J. A. FAY.

APPARATUS FOR FUMIGATING CANE JUICE.

No. 564,063.

Patented July 14, 1896.



Witnesses.
Robert Everett,
Dennie Sumby.

Inventor.
Joseph A. Fay.
By James L. Norris,
Atty.

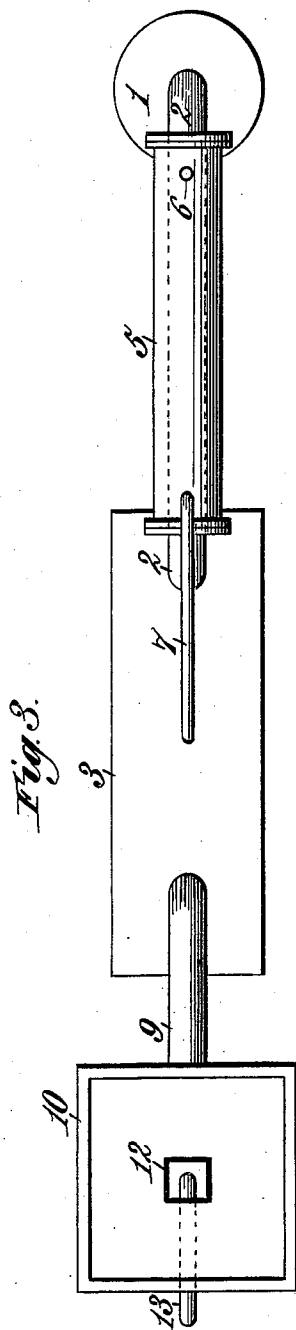
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UNITED STATES PATENT OFFICE.

JOSEPH A. FAY, OF JEANERETTE, LOUISIANA.

APPARATUS FOR FUMIGATING CANE-JUICE.

SPECIFICATION forming part of Letters Patent No. 564,063, dated July 14, 1896.

Application filed May 1, 1896. Serial No. 589,892. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. FAY, a citizen of the United States, residing at Jeanerette, in the parish of Iberia, and State of Louisiana, have invented new and useful Improvements in Apparatus for Fumigating Cane-Juice, of which the following is a specification.

This invention relates to apparatus for fumigating cane-juice, to clarify or decolorize the same, by subjecting a descending spray of the juice to the action of ascending sulfur fumes; and the invention consists in the features of construction and novel combination of parts in a cane-juice fumigating apparatus as hereinafter described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a partly-sectional elevation of my improved fumigating apparatus for treating cane-juice and saccharine liquids. Fig. 2 is a longitudinal section of the water-jacketed device for cooling the sulfur fumes. Fig. 3 is a plan of the apparatus.

Referring to the drawings, the numeral 1 designates any suitable furnace for the burning or baking of sulfur to drive off gaseous fumes for use in clarifying or bleaching cane-juices. The sulfur fumes from the furnace 1 pass off through a pipe 2 into a water-chamber 3, that is constantly supplied with water to a level determined by the location of an overflow-pipe 4, through which the waste water escapes.

For the larger part of its length the furnace-pipe 2 is surrounded by a cylindrical water-jacket 5, to which a water-inlet pipe 6 is connected. By this means the sulfur fumes passing from the furnace, through the pipe 2, are cooled down before reaching the water-chamber 3, above the level of water therein.

The overflow of water from the water-jacket 5 passes, through a pipe 7, into and through a spray-pipe 8, located horizontally in the upper part of the water-chamber 3, so that by means of the water spray issuing from the perforations in said pipe 8 the fumes of sulfur will be further cooled and the impurities thrown down with the water into said chamber.

The sulfur fumes will circulate through the upper part of the chamber 3, above the body of water therein, which will absorb the

said impurities, and finally the fumes of sulfur will pass off through a pipe 9 into the lower part of an upright bleaching-chamber 10, in which the ascending fumes mingle intimately with descending sprays of the cane-juice or saccharine liquid under treatment.

At the bottom of the bleaching-chamber 10 is an outlet-pipe 11 for exit of the clarified juice or liquid; and the top of said chamber is provided with a chimney or gas-outlet pipe 12 for providing the necessary draft to draw the sulfur fumes upward through the bleaching-chamber and permit their escape at the top.

The cane-juice or other saccharine liquid to be treated is pumped or carried to the top of the bleaching-chamber 10 through a pipe 13 and falls, at first, onto a shelf 14, supported horizontally in the top of said chamber. The juice rebounds, over the sides of the horizontal shelf 14, onto series of inclined shelves 15, arranged in zigzag fashion and alternating at suitable intervals with other horizontal shelves 16 and 17, over all of which the descending juice or saccharine liquid successively passes into a finely-broken spray. During the fall of the saccharine juice over the horizontal plates or shelves 14, 16, and 17 and alternately zigzag series of inclined plates or shelves 15 it is brought into intimate contact with the ascending fumes of sulfur, passing around and between said shelves, as indicated by the arrows in Fig. 1, and thus every drop or globule of juice is thoroughly exposed to the bleaching and clarifying action of the fumigating agent.

In the bleaching-chamber 10 there may be arranged any desired number of horizontal plates 14, 16, and 17, alternating with any corresponding series of inclined and zigzag-arranged plates 15 according to the amount of exposure required in subjecting the spray of juice to the action of the sulfur fumes. The zigzag and closely-set arrangement of the series of inclined shelves or plates 15 affords a most thorough exposure of the juice in greatly facilitating its breaking up into a fine spray while splashing downward from one plate to another.

The water-jacket 5, around the furnace-pipe 2, accomplishes the important purpose of greatly cooling the fumes of sulfur before

they are allowed to pass into the water-chamber 3, thus facilitating the ready condensation of acids into the water contained in said chamber, assisted by the water spray therein.

5 By providing a steady flow of fresh water through the water-jacket 5 and chamber 3, the water is kept constantly cool and better fitted to condense and carry off the acid from the fumes in the upper part of said chamber.

10 Thus, by means of the water-jacket 5, spray-pipe 8, and constantly-changing body of water in the tank or chamber 3, is accomplished one of the most important objects of the apparatus, in the thorough cooling and purifying of the sulfur fumes before coming in contact with the saccharine juice.

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Another principal object of the apparatus is effectively accomplished by means of the zigzag series of inclined shelves or plates 15 alternating with the horizontal shelves 14, 16, and 17, whereby the juice is broken into a fine spray or shower in gravitating through the bleaching-chamber 10 in intimate contact with the ascending fumes of sulfur circulating in and out, around and between said plates. Every drop of the sprayed juice being thus thoroughly fumigated in passing down through the bleaching-chamber, the said saccharine liquid will be perfectly clarified before making its exit from the apparatus.

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What I claim as my invention is—

1. In apparatus for the sulfur fumigation of cane-juice and saccharine liquids, the combination of a furnace, a water-chamber having an overflow-pipe, a pipe leading from the furnace to the water-chamber to conduct the fumes of sulfur to the upper part of said water-chamber, a water-jacket located around said pipe and provided with a water-inlet, a spray-pipe extended horizontally in the upper part of the water-chamber and connected with the water-jacket, a bleaching-chamber pro-

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vided with horizontal shelves and alternating series of inclined shelves, a pipe for conducting the cooled and purified fumes of sulfur from the water-chamber into the lower part of said bleaching-chamber, and a pipe for conducting cane-juice or saccharine liquid into the upper part of said bleaching-chamber, substantially as described.

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2. In apparatus for the sulfur fumigation of cane-juice and saccharine liquids, the combination of a furnace, a water-chamber having an overflow-pipe, a water-jacketed pipe connecting the furnace with the upper part of said water-chamber for the passage thereto of the fumes of sulfur, a water-spray pipe located in the upper part of the water-chamber to supply said chamber with water and throw down impurities from the sulfur fumes and cool the same, a bleaching-chamber having its lower part communicating with the upper part of the water-chamber to receive the cooled and purified fumes of sulfur therefrom, a pipe for conducting cane-juice or saccharine liquid into the upper part of the bleaching-chamber, zigzag series of inclined plates or shelves arranged in said bleaching-chamber and horizontal plates or shelves alternating with said zigzag series of inclined plates, whereby the juice is broken into spray in falling from plate to plate and is mingled with the ascending sulfur fumes, the said bleaching-chamber being provided at the top with an exit for the fumes and at the bottom with an exit for clarified juice, substantially as described.

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In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH A. FAY.

Witnesses:

E. P. MORERI,
J. C. GEBHART.