(No Model.)

A. B. SMITH.

COLD AIR BLAST CENTRIFUGAL SIRUP COOLER.

No. 294,922. Patented Mar. 11, 1884.

Fig. 1

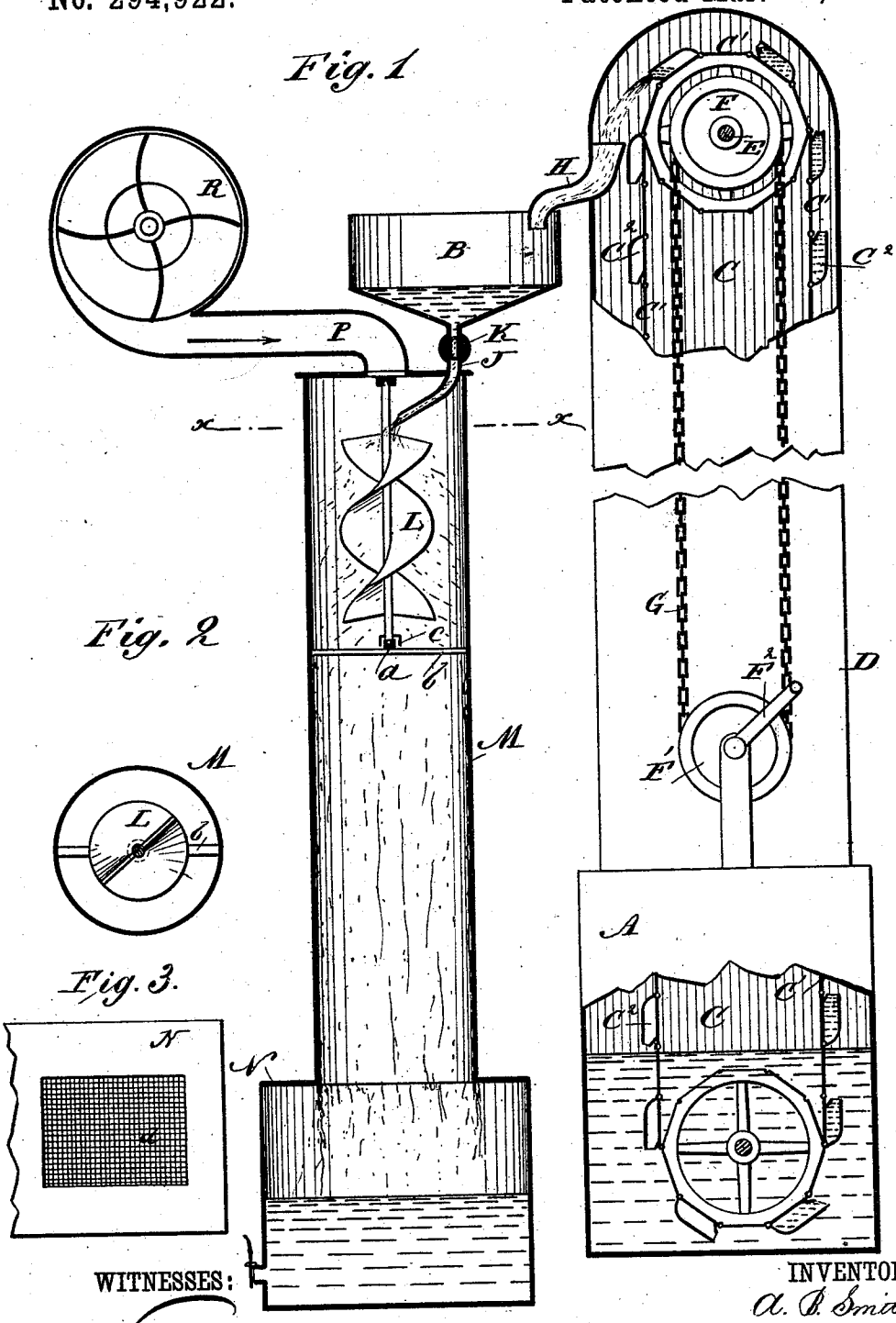


Fig. 2

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALBERT B. SMITH, OF FAIRFIELD, NEBRASKA.

COLD-AIR-BLAST CENTRIFUGAL SIRUP-COOLER.

SPECIFICATION forming part of Letters Patent No. 294,922, dated March 11, 1884.

Application filed November 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBERT B. SMITH, of Fairfield, in the county of Clay and State of Nebraska, have invented a new and Improved Cold-Air-Blast Centrifugal Sirup-Cooler, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved machine for cooling hot sirup rapidly, whereby the color of the sirup will remain several shades lighter than that of the sirup cooled by the slow process, and the specific gravity of the sirup will be increased.

The invention consists in a cooling-tube, against the inner surface of which the sirup is thrown by a revolving distributer, which is operated by compressed air forced into the cooling-tube. The air passing through the tube cools the thin layer of sirup flowing down the inner surface of the tube.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of my improved cold-air-blast centrifugal sirup-cooler. Fig. 2 is a sectional plan view of the same on the line *x x*, Fig. 1; and Fig. 3 is a plan view of a portion of the receiving-tank.

The hot sirup which is to be cooled is contained in a tank, A, and is carried upward to the regulating-tank B by a bucket-elevator, C, formed of an endless chain, C′, provided with buckets C^2, which chain passes over a wheel or drum in the tank A, and a drum or wheel in the upper part of the elevator-casing D, which upper drum or wheel is mounted on a shaft, E, journaled in the upper part of the casing D, on which shaft a sprocket-wheel, F, is mounted outside of the casing, over which wheel F and a wheel, F′, provided with a crank-handle, F^2, a driving-chain, G, passes, whereby the elevator can be operated by turning the wheel F′. The buckets C^2 discharge the sirup into a spout, H, which conducts it to the regulating-tank B, provided with an outlet-pipe, J, having a cock, K, the lower end of which pipe J is held above the centrifugal or screw distributer L, journaled vertically in the upper part of the cooling tube or shaft M, at the bottom of which the tank N, for the cooled sirup, is located. The centrifugal distributer consists of two spiral blades or wings mounted on a vertical shaft, the lower end of which is journaled in a cup, *a*, on a cross-bar, *b*, in the cooling-tube M, which cup is provided with a cover, *c*, to prevent the sirup from flowing into it. A blower, R, fan, or other air-forcing apparatus has the end of its outlet-pipe P connected with the top of the cooling-tube. The centrifugal distributer is revolved by the current of air from the pipe P striking the wings of the said distributer. The top or cover of the tank is provided with an opening closed by wire-cloth *d*, to admit of the free escape of the air.

The cooling-pipe M is made of metal or other suitable material, with a perfectly smooth inner surface.

The elevator can be operated by hand or by machinery.

The operation is as follows: The hot sirup is raised by the elevator from the tank A into the distributing-tank B, and is then admitted into the upper part of the cooling-tube M and runs on the blades of the revolving distributer L, which throws the sirup against the inner surface of the cooling-tube, down which the sirup flows into the tank N. The sirup flows down the tube M in a very thin layer, and is subjected to the action of the current of air forced into the cooling-tube, and thereby the sirup is cooled very rapidly. If sirup is cooled rapidly, the color will remain lighter than if it is cooled slowly, which is of great importance, as light sirup brings a higher price than dark sirup. By rapidly cooling the sirup the specific gravity of the same is also increased.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The method of cooling sirup by subjecting it in a comminuted state to a current of cold air, substantially as specified.

2. A sirup-cooler consisting of a cooling-pipe, combined with means for spreading the sirup on the inner surface of the said pipe, and means for conducting air through the pipe, substantially as herein shown and described.

3. In a sirup-cooler, the combination, with a cooling-pipe, of a revolving distributer for distributing the sirup on the inner surface of the tube, and means for forcing or conducting air through the cooling-tube, substantially as herein shown and described.

4. In a sirup-cooler, the combination, with

a cooling-tube, of an air-forcing apparatus, and a revolving sirup-distributer operated by the current of air entering the cooling-tube, substantially as herein shown and described.

5. In a sirup-cooler, the combination, with a cooling-tube, of a sirup-elevator, a revolving sirup-distributer within the cooling-tube, and of an air-forcing apparatus, substantially as herein shown and described.

6. In a sirup-cooler, the combination, with the cooling-tube M, of a revolving distributer in the same, and air-forcing apparatus, a regulating-tank, B, and means for raising the hot sirup into the regulating-tank, substantially as herein shown and described.

7. In a sirup-cooler, the combination, with the cooling-tube M, of the revolving distributer L, the blower R, the regulating-tank B, the elevator C, and the hot-sirup tank A, substantially as herein shown and described.

8. In a sirup-cooler, the combination, with a cooling-pipe, of a sirup-distributer formed of a shaft on which spiral wings or blades are mounted, and of means for forcing air into the cooling-pipe, substantially as herein shown and described.

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Witnesses:
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