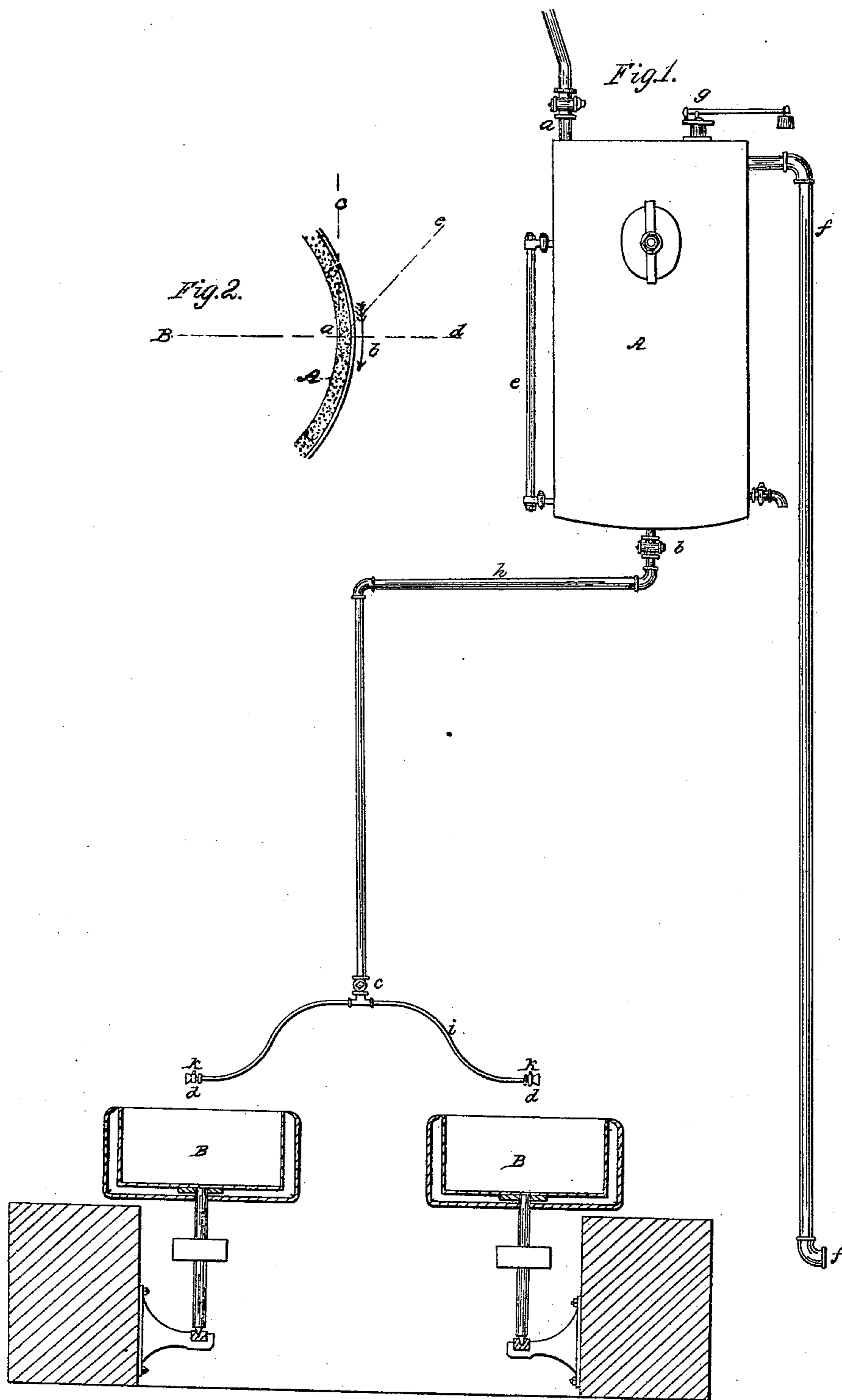


G. A. JASPER.
Sugar Purifier.

No. 37,548.

Patented Jan. 27, 1863.



Witnesses:
R. H. Eddy
Philo S. Shelton

Inventor:
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UNITED STATES PATENT OFFICE.

GUSTAVUS A. JASPER, OF CHARLESTOWN, MASSACHUSETTS, ASSIGNOR TO
THE UNION SUGAR REFINERY, OF SAME PLACE.

IMPROVEMENT IN PURIFYING AND CLEANSING SUGAR.

Specification forming part of Letters Patent No. 37,548, dated January 27, 1863.

To all whom it may concern:

Be it known that I, GUSTAVUS A. JASPER, an alien, but now residing in Charlestown, in the county of Middlesex and State of Massachusetts, have made a new and useful invention, having reference to the cleansing or bleaching of sugar, which invention may also be applicable to other useful purposes of like nature; and I do hereby declare the same to be fully described in the following specification, the accompanying drawings (Figure 1) serving to illustrate the mechanism or apparatus used by me in carrying out or into action my said invention.

I am aware that for the purpose of cleansing sugar, water or other cleansing-liquid has been gradually poured or discharged upon or near the center or other suitable parts of a mass of sugar contained in a centrifugal machine while the foraminous vessel of such machine was in rapid revolution; consequently I lay no claim to the invention of such a mode of procedure.

My invention consists in combining with the said process of cleansing by water or other liquid and by centrifugal action, as specified, a process or means of forcing such cleansing-liquid in numerous fine jets or streams under a high degree of pressure against the mass of sugar while under centrifugal action, my invention enabling thick sirups to be used to great advantage as cleansing-liquids, such preventing the melting of the sugar-crystals.

It has been discovered by me that if, when a mass of sugar is in revolution in a centrifugal machine, we cause to impinge against it with great force a minute stream of sirup or other saccharine matter, the impinging force of the stream will cause it to so act against the inner or exposed surface of the mass as to penetrate the same without melting it, and also that the combined forces of impingement and centrifugal action greatly facilitate the cleansing of the sugar. This will be apparent from the diagram marked Fig. 2 of the drawings. Suppose A, Fig. 2, to represent a portion of a hollow cylinder or annular mass of sugar in a centrifugal machine; B, the center thereof. Suppose a particle of water to impinge against *a* with no material force, the

mass of sugar being in rapid revolution in the direction of the arrow *b*, it will be evident that the watery particle would be caused to penetrate the inner surface of the mass not at right angles thereto, but nearly parallel to it or in a direction of the tangent *a c*; but if the particle of water be thrown in a direction, *a d*, with great force, its penetration into the mass would be more in the direction of the resultant of the forces of impingement and centrifugal action, or would be in the direction *a e*. Thus, an impinging force combined with the centrifugal force causes the watery particle not only to penetrate much quicker into the surface of the sugar, but to go through the mass quicker and in a direction more favorable to the removal of the coloring-matter to be separated from it. The quicker the watery particle is caused to penetrate the sugar, the less will be its liability to melt the sugar, and the better will be its chance of washing it.

In carrying out my invention, an apparatus such as hereinafter described, or its mechanical equivalent, is to be employed in connection with one or more of the centrifugal machines.

The drawing herewith presented and marked Fig. 1 represents the said apparatus and two of the centrifugal machines, the construction of these latter being well understood, they being exhibited in vertical section and marked B B. At a suitable altitude above them there is placed a tight vessel, A, made of strong material, and capable of bearing a great internal pressure, or one, say, of about one hundred and twenty-five pounds to the square inch. This vessel is to be provided with a filling-pipe, *a*, having a stop-cock in it, and it may also have a safety-valve, *g*, and a glass tube, *e*, the latter being arranged as shown in the drawing, and made to communicate at its two ends with the interior of the vessel A, in order that the height of any liquid when in the said vessel may be indicated by the liquid which may be within the tube. A pipe, *f*, to lead from an air-forcing pump, may enter the upper part of the vessel A. Another pipe, *h*, having a stop-cock, *b*, near its upper end, leads out of the bottom of the vessel A, and communicates with a flexible pipe, *i*, arranged

over each of the centrifugal machines B B. Each pipe *i* is to terminate in a foraminous nozzle, *d*, which may be provided with a stop-cock, *k*. There may also be a stop-cock, *c*, at the lower extremity of the pipe *h*. With an apparatus so constructed, if the reservoir A be charged with a strong or thick cleansing-liquor or sirup until the said reservoir be about two-thirds filled therewith, and if afterward air be forced into such reservoir and be condensed therein under a high pressure of fifty pounds (more or less) to the square inch, as may be required for the kind of sugar to be treated, the apparatus will be ready for use. If we next suffer either or both of the centrifugal machines B B to be charged with a mass of sugar, and to be put in rapid revolution, we have only to open the stop-cocks *b* and *c*, as well as the stop-cock *k* of that flexible tube which may be directly over the charged centrifugal machine, and direct the foraminous nozzle so as to discharge with great velocity and force the minute streams of the cleansing-liquid against the inner surface of the mass of sugar which may have accumulated against the vertical inner surface of the rotary vessel of the centrifugal machine, taking care to move the nozzle so as to cause the streams to be laid on the sugar evenly from the bottom to the top of the mass thereof. Generally speaking, about thirty seconds will suffice to effect the cleansing. The great velocity of the minute or small jets of cleansing-liquor causes them to instantaneously penetrate the surface of the sugar without melting it. The combined operation of the centrifugal force and the force of impingement on the cleansing-liquid causes it to enter the mass in lines perpendicular, rather than tangential, to its inner surface, and to pass through it much sooner than when going through it tangentially or thereabouts.

I do not confine my invention to the precise pressure - liquoring apparatus as above described, as others under different constructions and forms and productive of like effects may be employed in lieu of it, my object being to combine with the force induced by the centrifugal machine—a force which shall so operate on the cleansing liquor or sirup as to drive it with such velocity into the sugar while in revolution as to prevent such sugar from being melted at the surface of impingement—a difficulty which results in liquor when gradually poured or suffered to run with little force into the machine and to be carried into and through the sugar by centrifugal force only. By throwing the cleansing-liquor in minute streams against the surface of the sugar its tendency to melt the crystals is greatly diminished, the smaller the streams the less being their liability to melt the crystals. Furthermore, my invention enables me to employ very thick sirups as cleansing-liquids, and thus to diminish the chance of melting the crystals or particles of the sugar to be cleansed.

The rapidity and the thorough manner in which sugar may be cleansed and bleached by my invention are remarkable in comparison to what results from simple centrifugal action, as heretofore practiced.

What, therefore, I claim as my invention is—

The combining with the process of cleansing sugar by centrifugal action in the centrifugal machine a means or process of forcing the cleansing liquid or sirup in one or more fine jets or streams under high pressure or velocity, against the mass of sugar in revolution, the whole being substantially as above described,

GUSTAVUS A. JASPER.

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