

(No Model.)

J. V. V. BOORAEM.  
Sugar Washing Process and Apparatus.

No. 235,202.

Patented Dec. 7, 1880.

Fig. 1.

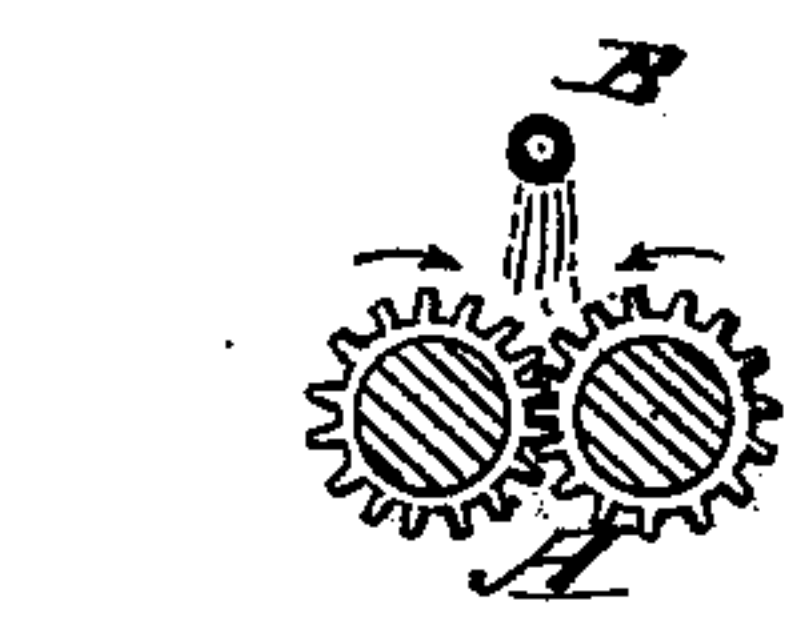


Fig. 2.

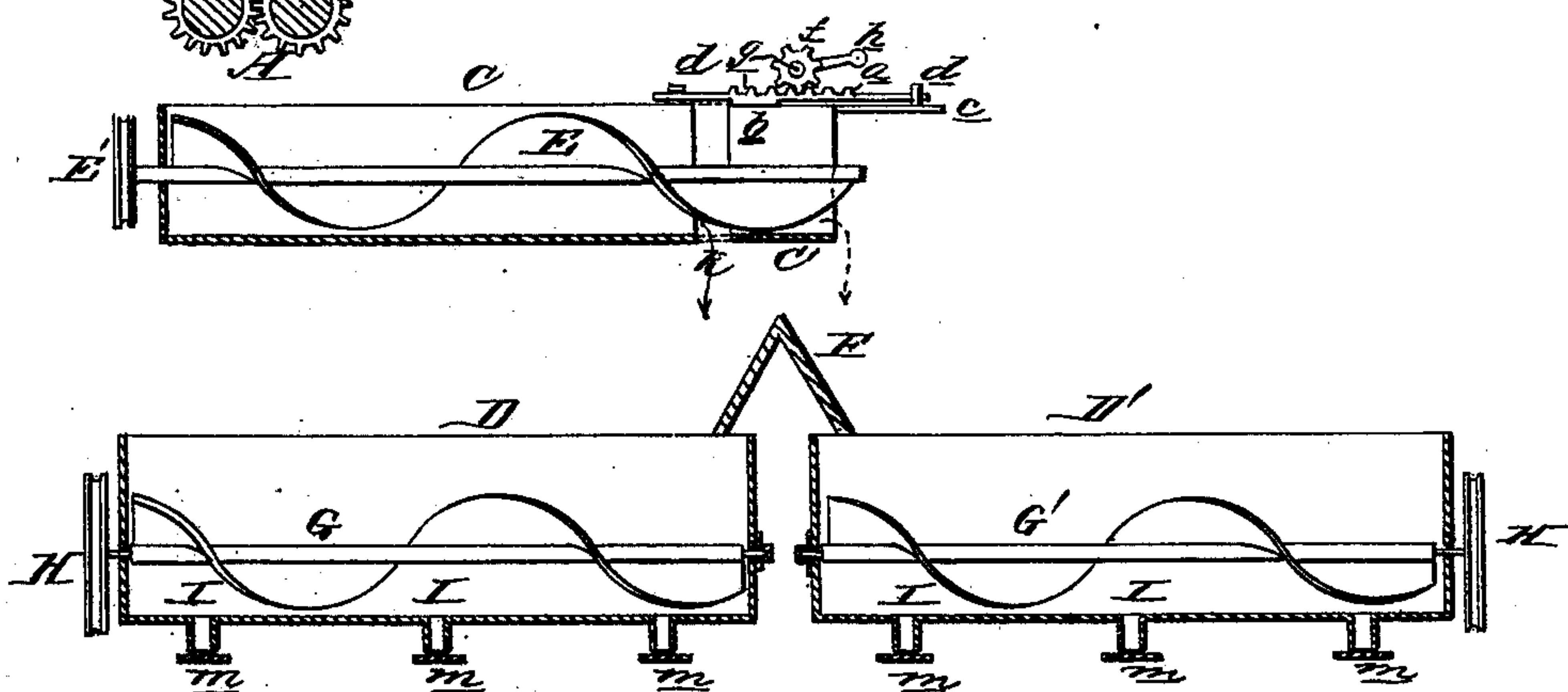
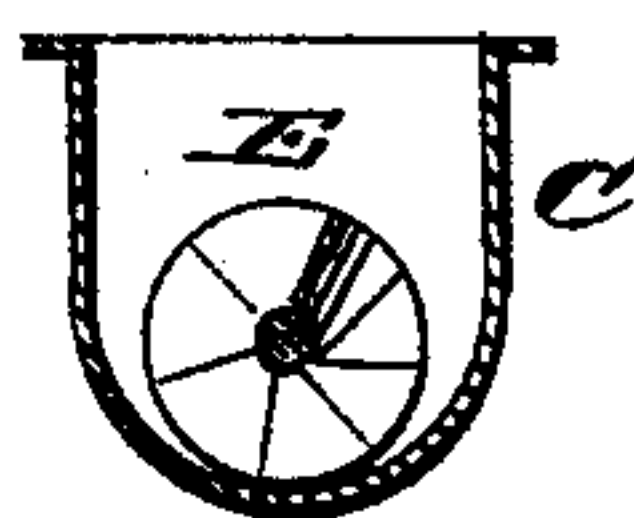


Fig. 3.



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## SUGAR-WASHING PROCESS AND APPARATUS.

SPECIFICATION forming part of Letters Patent No. 235,202, dated December 7, 1880.

Application filed July 13, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN V. V. BOORAEM, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Sugar-Washing Process and Apparatus, of which the following is a specification.

In the ordinary sugar-refining processes the large crystals of sugar are put into the centrifugal machine and there drained by the rapid rotation of the machine, and water or sirup is sprinkled upon the crystals while in the machine for the purpose of washing out the molasses and cleansing and whitening the sugar; but as the crystals are large the process of washing and whitening is less rapid and thorough than is desired.

The object of this invention is to thoroughly wet and wash the surface of the sugar-crystals and to deliver the mass in a perfectly homogeneous state to the centrifugal machines.

The invention consists in the process of thoroughly wetting the sugar with water or sirup and incorporating the sugar and liquid by means of rollers and revolving screws, and in delivering it to the centrifugal machine; and it consists, further, in the combination of mechanism for carrying out the process, as hereinafter described.

Figure 1 represents a transverse sectional elevation of the water or sirup pipe and rollers in position. Fig. 2 represents a sectional side elevation of the incorporating, stirring, and delivery troughs and screws in position. Fig. 3 is a cross-sectional elevation of a trough and screw.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents a pair of geared rollers, that are designed to be set in a suitable frame to be geared into each other, as shown, and to revolve in the directions of arrows, Fig. 1.

B represents a perforated pipe for supplying the water or sirup for wetting the sugar.

C is a trough of U-shaped cross-section, set below the rolls A to receive the material that passes through said rolls A. Said trough C is open at one end, and the open-end section C' is movable in a horizontal line for the purpose of regulating the flow of the wetted sugar

to the one or the other of the mixing-troughs D D', as may be desired.

In Fig. 2 is shown a device for adjusting said open end section, C', of the trough C, which consists of a rack, *a*, which is secured longitudinally with the trough C on a bar, *b*, that is fixed transversely across the top of section C'; and *c* represents a fixed support, on which are secured the guides *d d*, in which the ends of the rack *a* slide. A pinion, *f*, is designed to mesh with the rack *a* and to be keyed on a suitable shaft, *g*, and to be turned by a crank, *h*, so that said end section, C', may be moved off from the stationary part of the trough C, as shown in Fig. 2, in order to permit the flow of the wetted sugar into the mixing-trough D through an opening, *k*, or may be closed up so that the wetted sugar shall fall from the open end of said trough C into the trough D'.

A horizontal screw, E, designed to be supported in proper bearings and to be revolved by belt or other connection with its pulley E', is set longitudinally in the trough C for the purpose of mixing and incorporating the wetted sugar and delivering it into the lower troughs, D D'. These lower troughs, D D', are closed at both ends and set end to end, and over their contiguous ends a triangular guide, F, is designed to be fixed with its apex in a line with the movable end section, C', of the trough C, so that material falling from trough C through opening *k* will fall on one face of the guide F, and thence into the trough D, and so that material falling on the opposite face of guide F shall be directed into the trough D'. Both of these troughs D D' are provided with screws G G', respectively, that are designed to be suitably supported and to be revolved by means of their pulleys H H or other suitable device; and said troughs D D' are provided with suitable outlets I I, that are controlled by slides or other suitable device, as indicated at *m m*, Fig. 2, it being designed that the thoroughly mingled and incorporated sugar and liquid shall be discharged through the outlets I I into the centrifugal machines. (Not shown.)

The operation consists in introducing the sugar-crystals between the rolls A A and showing water or other liquid from the pipe B



upon the sugar as it passes through and is broken up by the said rolls in their revolutions. From the rolls A A the broken or crushed sugar and liquid falls into the trough C, wherein they are further mingled by the revolution of the screw E, and thereby ejected at the opening *k*, or the open end of said trough C, upon the triangular guide F, and thence into a trough, D or D', to be further mingled and incorporated by the revolutions of the screw G G', as the case may be, and thereby be discharged in a homogeneous mass through the outlets I I into the centrifugal machine, (not shown,) and it is found that the sugar is so thoroughly wetted, cleansed, and whitened by this process that the subsequent refining operation is greatly facilitated.

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

1. An improved sugar-washing apparatus constructed and arranged substantially as herein shown and described, consisting of rolls A and troughs C D D', provided with revolving screws E G G', respectively, as set forth.

2. In a sugar-washing apparatus, the combination, with the rolls A A, of the sectional trough C, provided with screw E, guide F, and troughs D D', having outlets I I, and provided

with screws G G', substantially as herein shown and described.

3. In a sugar-washing apparatus, the trough C, provided with an adjustable end section, C', substantially as herein shown, and for the purpose described.

4. In a sugar-washing apparatus, the combination, with the mixing-troughs D D', of the triangular guide F, substantially as herein shown and described.

5. The process, substantially as herein described, of washing sugars, which consists in passing the sugar with water or other suitable liquid through rolls, thence into series of stirring, incorporating, and delivering troughs, as set forth.

6. The process, substantially as herein described, of washing sugars, which consists in passing the sugar with water or other suitable liquid through rolls, thence into series of stirring, incorporating, and delivering machines, and finally discharging the thoroughly mingled and incorporated mass into centrifugal machines, as set forth.

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