

(No Model.)

2 Sheets—Sheet 1.

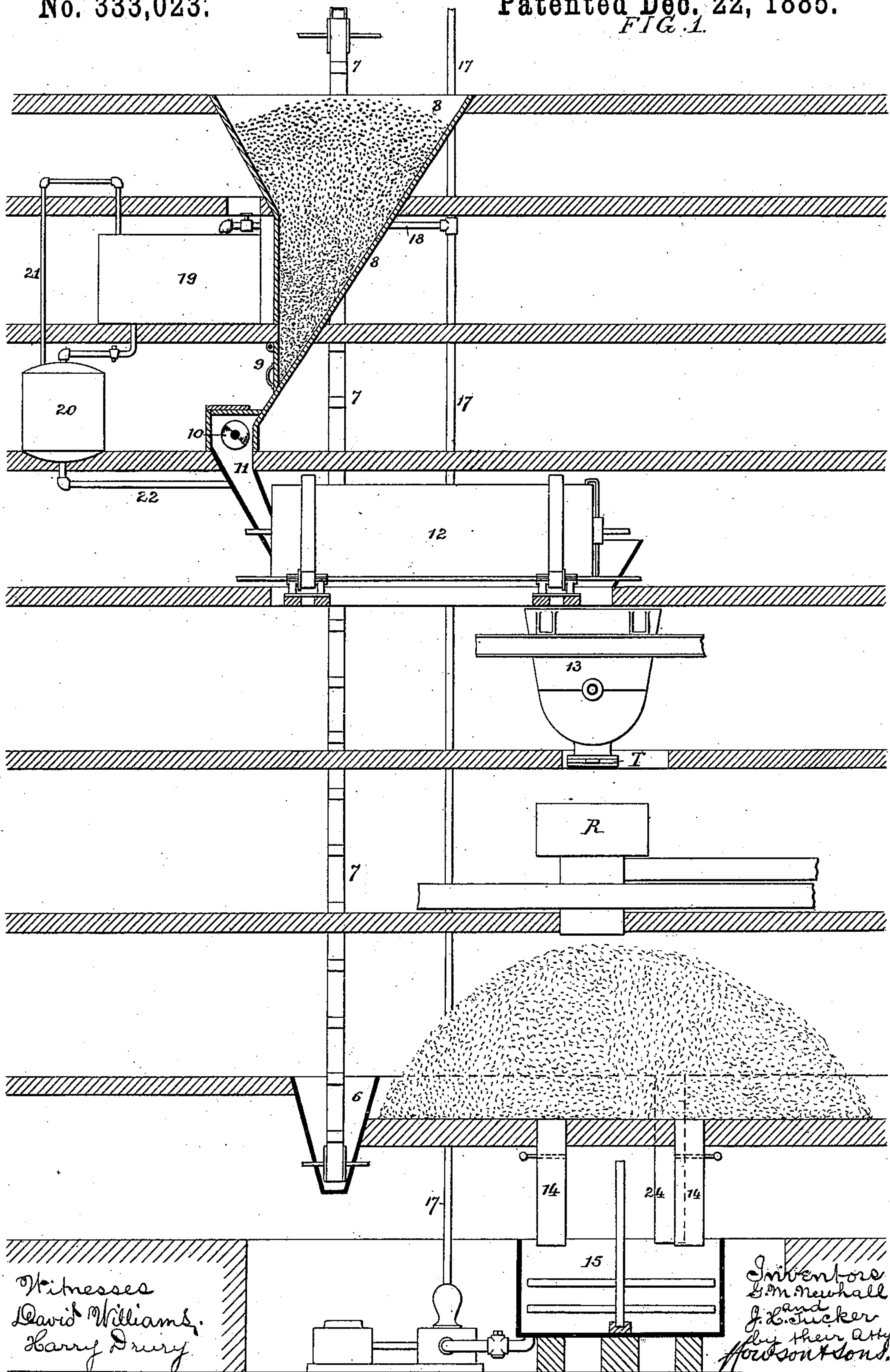
G. M. NEWHALL & J. H. TUCKER.

MACHINING RAW SUGAR.

No. 333,023.

Patented Dec. 22, 1885.

FIG. 1.



Witnesses
David Williams,
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Inventors
G. M. Newhall
and
J. H. Tucker
by their Attys.
Howson & Sons.

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2 Sheets—Sheet 2.

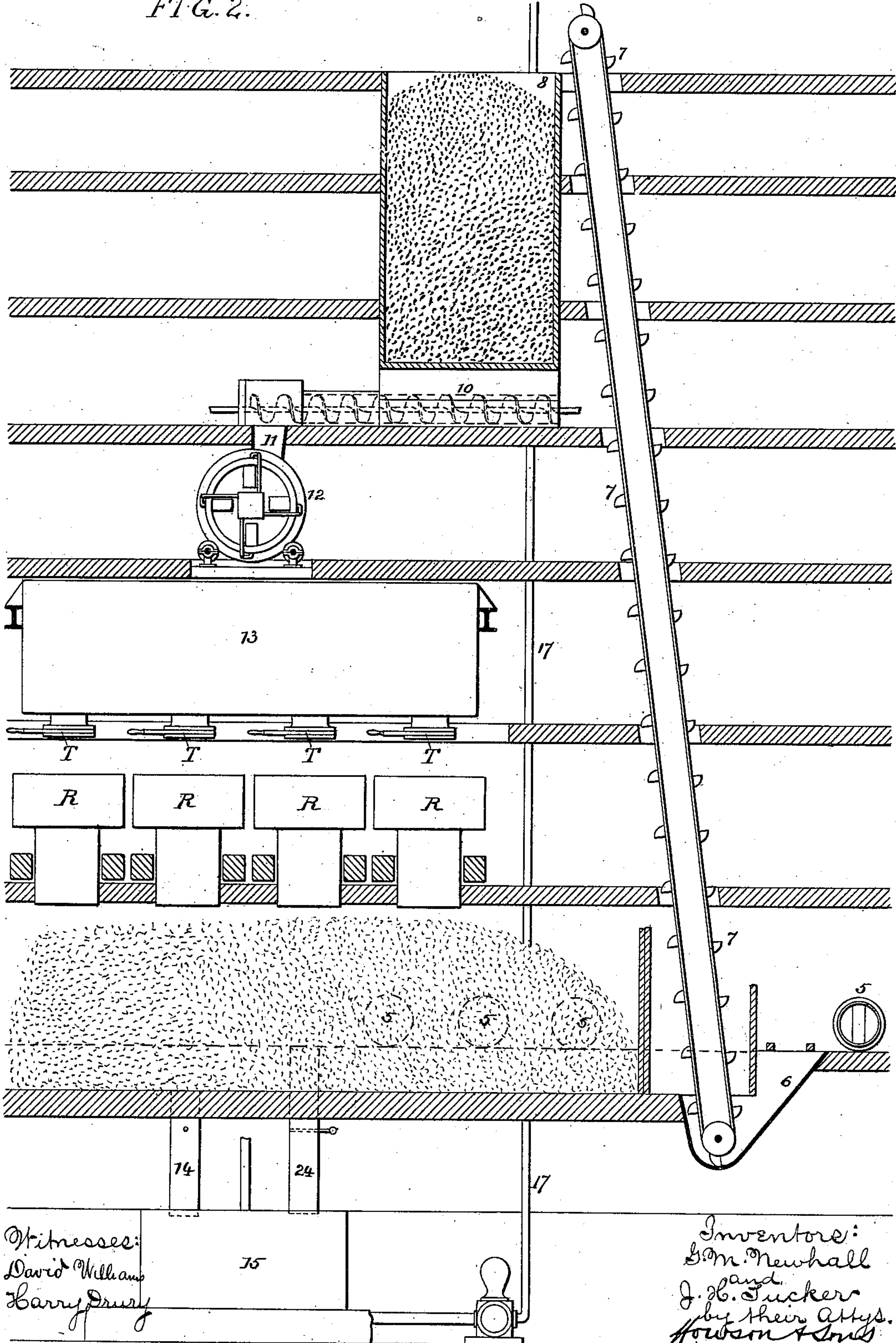
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FIG. 2.



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UNITED STATES PATENT OFFICE.

GEORGE M. NEWHALL AND JOHN HENRY TUCKER, OF PHILADELPHIA, PA.

MACHINING RAW SUGAR.

SPECIFICATION forming part of Letters Patent No. 333,023, dated December 22, 1885.

Application filed July 27, 1885. Serial No. 172,726. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. NEWHALL and JOHN HENRY TUCKER, citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain Improvements in Machining Raw Sugar, of which the following is a specification.

This invention relates to that branch of the process of refining sugar which is commonly termed the "machining of raw sugar."

The ordinary process of machining raw sugar consists in mixing the raw sugar with sufficient cold or moderately warm water or sirup to form a semi-fluid mass or magma, and subsequently submitting this mass to the action of centrifugal machines, whereby the fluid matter in whole or in part is separated from the crystals of cane-sugar, the object being to separate the impure sirup from the crystals of raw sugar, and thus at the outset to materially aid the refining process.

The main feature of the improved process forming the subject of this invention consists in mixing with the raw sugar in the heater a hot dense sirup, which is prepared from part of the raw sugar being treated.

The advantages of this process are several. The sugar-mash resulting from the mixture of the hot liquor and commercially dry sugar is considerably heated, so that more can be passed through a given heater, or a smaller machine may be sufficient for a given quantity of sugar treated. We have found by experience in working this process that for one hundred parts of dry raw sugar about thirty parts of the hot liquor at 36° Baumé are required. Taking the temperature of the sugar at 60° Fahrenheit and the liquor at 200° Fahrenheit, we have for the resulting magma 92° Fahrenheit, or, independently of the heater, an increase of 32° Fahrenheit. This increase in temperature obtained from the heat of the liquor greatly facilitates the process. Furthermore, it is often desirable to submit to the washing process raw sugar varying greatly in size of grain, gumminess, or lumpy character. As a rule, fine-grained sugars cannot be washed in the centrifugal machine to any advantage in the cold, while sugars such as Brazilian, Manilas, &c., are absolutely unworkable, on account of their fine soft grain and gummy nature.

By this improved process of mixing the hot liquor with the raw sugar many sugars otherwise unworkable may be dissolved to a heavy hot liquor, and this mixed with the coarser-grained raw sugar in the heater. The liquor supplies enough water to make the magma semi-fluid, while it takes up impurities from the dry sugar, and the whole purges freely in the centrifugal machine.

This improved process may be carried out in any convenient construction or arrangement of apparatus, but in the accompanying drawings is illustrated a construction of apparatus which is preferred.

In these drawings, Figure 1 is a vertical section illustrating the different parts of the apparatus on the several floors of a sugar-house. Fig. 2 is a similar view at right angles thereto.

Referring to Figs. 1 and 2, the sugar to be treated, brought in hogsheads, for instance, is thrown into the hopper 6, whence the sugar is carried by the endless conveyer 7 up into the hopper or bin 8, which at the lower end is provided with an adjustable gate, 9, Fig. 1. This gate regulates the amount of sugar to be supplied to the apparatus, and this raw sugar is fed forward into the chute 11, leading to the heater 12, by means of a screw-conveyer, 10. The raw sugar in passing down this chute is mixed with the hot dense liquor prepared for the purpose, and introduced through the pipe 22 into the chute 11, where it thoroughly mingles and combines with the raw sugar passing down into the heater and mixer 12. This hot liquor is prepared by taking at the commencement of the operation a quantity of the raw sugar and supplying it to the melter 15 through a chute, 24, Fig. 2. The sugar being dissolved in the melter 15, is pumped up through a pipe, 17, and branch 18 into the receiving tank or tanks 19, where sufficient of the liquor is collected for the operation. From the tank or tanks 19 the liquor is drawn off through a valved pipe into a vessel or vessels, 20, into which steam is injected through a suitable pipe, 21. By this means the liquor is heated, preferably, to about 210°, and thence it passes through the pipe 22 into the chute 11, and thence to the heater and mixer 12, as before described. The mixture leaves the heater 12 at the opposite end and

passes into the mixer 13, which is provided at the lower side with a number of sliding gates, T, immediately over a corresponding number of centrifugal machines, R, in which
 5 the sugar is machined. From the centrifugal machines the sugar is discharged, as indicated in Figs. 1 and 2, onto the floor or bin below, whence it is passed through valved conduits 14 to the melter 15, and so on for the subse-
 10 quent refining operations.

The heater 12 and mixer 13 may be of any convenient construction.

We claim as our invention—

1. The process herein described of facilitat-
 15 ing the refining of raw sugar, said process consisting in mixing with the raw sugar under treatment heated liquor or sirup, substan-
 tially as set forth.

2. The process herein described of facilitat-
 20 ing the refining of raw sugar, said process

consisting in preparing a hot dense sirup or liquor from a part of the sugar and mixing this in proper proportion with the raw sugar to be treated, as set forth.

3. The process herein described of facilitat- 25
 ing the refining of raw sugar, said process consisting in preparing a hot dense sirup or liquor from a part of the sugar and mixing this with the raw sugar to be treated, and then heating the magma formed in a heater on its 30
 way to the centrifugal machines.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE M. NEWHALL.
 JOHN HENRY TUCKER.

Witnesses:

WILLIAM F. DAVIS,
 HARRY SMITH.