(No Model.)

E. FOX.

MACHINE FOR GRANULATING SUGAR.

No. 259,753. Patented June 20, 1882.

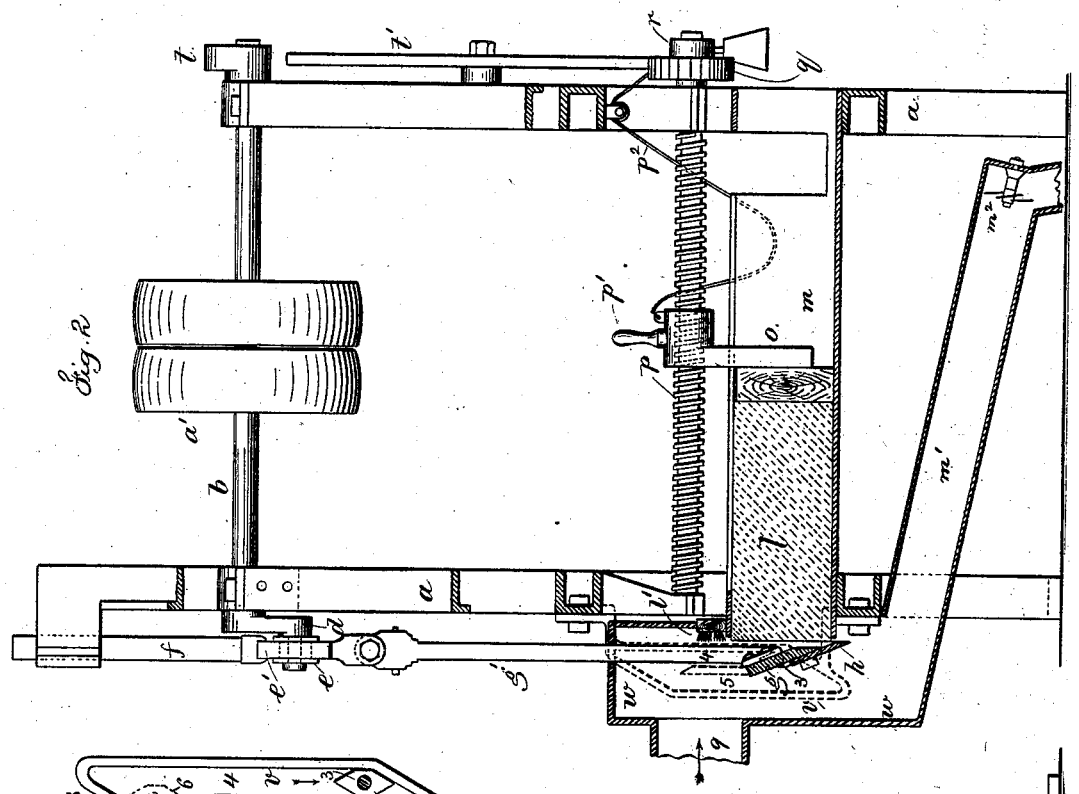

Fig. 2

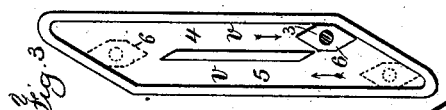

Fig. 3

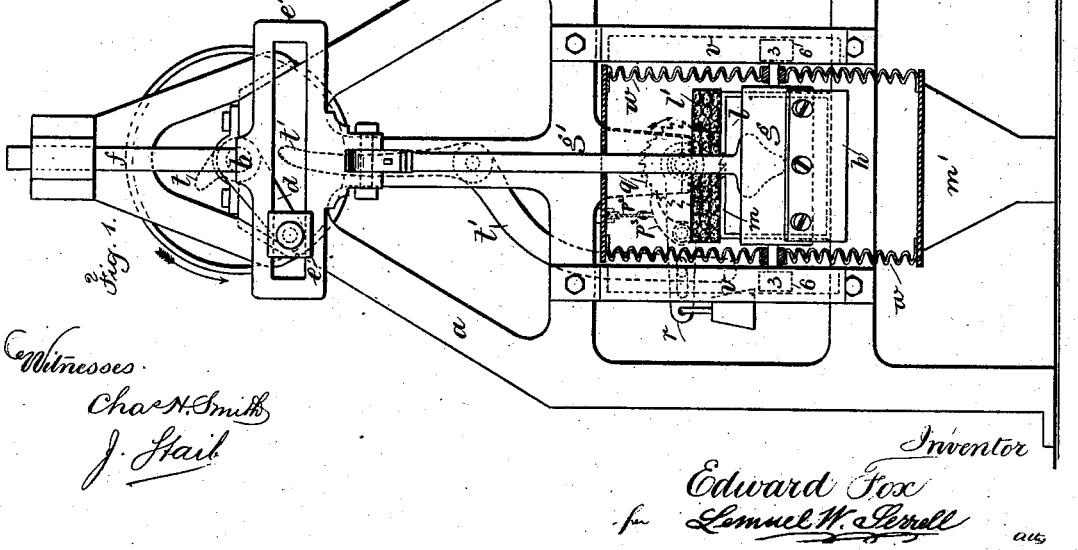

Fig. 1

Witnesses.
Chas. H. Smith
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atty

UNITED STATES PATENT OFFICE.

EDWARD FOX, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND ANDREW ALBRIGHT, OF NEWARK, NEW JERSEY.

MACHINE FOR GRANULATING SUGAR.

SPECIFICATION forming part of Letters Patent No. 259,753, dated June 20, 1882.

Application filed April 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FOX, of the city and State of New York, have invented an Improvement in Machines for Granulating Sugar, of which the following is a specification.

Cakes and blocks of sugar, especially grape-sugar, have been reduced to a pulverized or granulated condition by knives that cut off shavings, and these are acted upon by a current of air for drying, cooling, and breaking them.

My present invention is for preventing the knife or cutter becoming clogged by the action of the sugar or from scratching the same upon the return movement, and for more thoroughly pulverizing the sugar as it is carried away by the air-blast.

In the drawings, Figure 1 is an elevation of the machine with the air-inlet hood removed. Fig. 2 is a side view, partially in section; and Fig. 3 shows the slide and switch-block.

The frame-work *a* supports the parts of the machine. The driving-shaft *b* is in bearings on the upper part of the frame, and it is provided with a pulley, *a'*, for a driving-belt.

At one end of the shaft *a* there is a crank, *d*, the crank-pin of which acts upon a block, *e*, sliding in a transverse slot in the yoke, *e'*. This yoke is at the lower end of the slide-rod, *f*, and the knife-head *g* is connected to the yoke *e'* by the rod *g'*. This knife-head *g* is provided with a cutter, *h*, similar to a plane-iron, the same being bolted to the head *g*. Upon reference to Fig. 2 it will be seen that only the cutting-edge is in position to act upon the block of sugar *l* that is to be cut. Hence there will be but little opportunity for the side of the knife next to the sugar to become coated and clogged up with the particles of sugar; and I provide a stationary brush or scraper at *l'*, behind the head *g*, at its downward movement to brush off any particles of sugar that may adhere to the back of the head *g* or the knife *h*. These particles of sugar should be conveyed into a separate receptacle from that which receives the cut sugar.

The grape-sugar is manufactured in blocks or cakes of a uniform size, or nearly so, and the feeding-trunk *m* is of a size to allow these to be passed in endwise and fed up to the knife. The blocks should fit this trunk reasonably close, so that the air employed to carry away the sugar as it is shaved up may not pass between the trunk and the block to any considerable extent.

In order to feed up the block of sugar to the reciprocating cutter, I make use of a follower, *o*, that passes through a longitudinal slot into the trunk, and it is provided at one end with a nut for the screw *p*. This screw is placed longitudinally of the trunk and either above or below the same. It is represented as above the trunk so as not to become gummed up with particles of sugar.

The nut of the follower is sectional, so that when the handle *p'* is grasped to draw the follower back for the insertion of a fresh cake into the trunk such nut-section is moved out of contact with the threads of the screw. This renders it unnecessary to revolve the screw backwardly to move the follower, and the back end of the trunk is removed, as shown in the upper part, so that the follower can be swung aside on the screw as a fresh cake of sugar is passed into the trunk, after which the follower will be turned back behind the cake and feed the same along gradually by the progressive revolving motion given to the screw. The screw-thread should terminate at a suitable place, so that it will cease to act upon the follower when said follower has reached its nearest point to the cutting-knife, so that the feed will stop; or there may be a connection, p^2, to the feed-pawl p^3, to lift the same at this point in the operation.

At the back end of the screw *p* there is a ratchet-wheel, *q*, with a lever, *r*, and pawl p^3. For turning the ratchet and screw progressively, this lever is moved by a cam, *t*, upon the driving-shaft *b*, acting through the lever *t'* upon said pawl-lever *r* just after the cutting-knife descends.

At the ends of the knife-head *g* there are guide-pins 3, that move up and down in the fixed guides *v*, that are bolted to the frame. Each guide has two slots in its face, and as the knife descends the guide-pins 3 are in the slots 4 nearest to the sugar, and as the knife is raised such guide-pins are directed into the

slots 5, so as to move the knife-head and knife back from the sugar bodily, so that it may be out of contact on the return-stroke. The pins 3 may be guided into these slots in any known or desired way. I, however, prefer and use upon said pins 3 switch-blocks or gibs 6, that are pointed at the ends, and are turned into one direction by the inclined end portion of the slot 4, so as to pass into the slot 5 on the up movement, and then turned the other way at the upper end of the slot 5 to pass back into the slot 4 on the downward movement.

There is an air-hood, *w*, applied around the end of the trunk *m*, preferably between the cutter-head and the slides, so as to keep the particles of sugar out of the slides, the hood at this part being of elastic or flexible material, so as to allow of the motion of the cutter-head. Air is supplied by the pipe 9 into this hood by a fan or blower, and it passes with the sugar down into the inclined chute *m'*, and carries the sugar along through such chute to a suitable bin or receptacle, and in this air-chute there is a centrifugal separator, m^2, formed as a wheel with a number of diagonal blades, so that it is revolved by the passing current of air, and by it the shavings of sugar are broken into granules as they pass by with the current of air.

This centrifugal separator may be either in the chute or near the end thereof, within a bin or receptacle. In any case the current of air causes it to revolve and act to separate the particles of sugar, as aforesaid.

I claim as my invention—

1. The combination, with the knife and knife-head, of the slide-rod *f*, yoke *e'*, actuating-shaft and crank-pin in the slot of the yoke, and mechanism moving the knife away from the sugar on the return-stroke, substantially as set forth.

2. In a machine for cutting sugar, the combination of a feeding trunk and screw, a knife and means for reciprocating the same, the knife-head, guide-slides with the grooves 4 and 5, and switch-gibs, substantially as set forth.

3. In a machine for cutting sugar, the combination, with the feeding trunk and screw, of a knife, a crank for reciprocating the same, a knife-head, guide-slides, the ratchet-wheel, pawl, and actuating mechanism, substantially as set forth.

4. In a machine for cutting sugar, the combination of a knife, a knife-head, carrying the said knife at an inclination to the surface of the sugar, and a stationary brush or scraper to clean the back of the knife and knife-head next to the sugar, substantially as set forth.

5. The combination, with the knife and the means for holding the sugar while being cut, of a chute, through which the sugar is conveyed by a current of air, and a revolving separator receiving its motion from said current of air, substantially as specified.

Signed by me this 28th day of March, A. D. 1882.

EDWARD FOX.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.