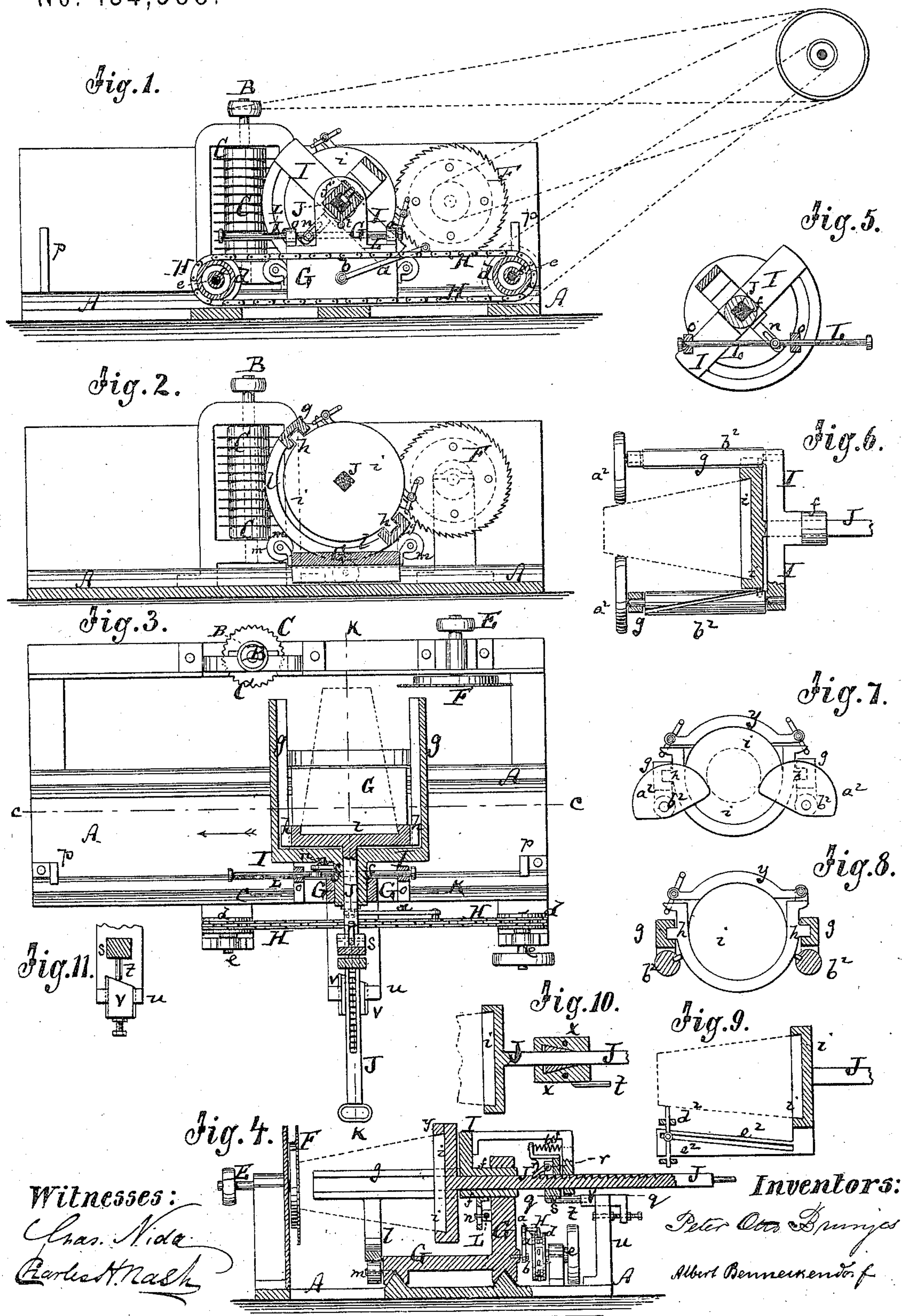


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Machines for Cutting Sugar into Blocks.

No. 134,588.

Patented Jan. 7, 1873.



UNITED STATES PATENT OFFICE

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IMPROVEMENT IN MACHINES FOR CUTTING SUGAR INTO BLOCKS.

Specification forming part of Letters Patent No. 134,588, dated January 7, 1873.

To all whom it may concern:

Be it known that we, PETER O. BRUNJES and ALBERT BENNECKENDORF, both of Hoboken, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Machines for Cutting Sugar into Blocks, of which the following is a specification:

This invention relates to a simplification of the machine which is described in the Letters Patent No. 132,626, granted to us on the 29th day of October, 1872. The most marked feature of the present improvement consists in dispensing with one set of saws for grooving the end of the cone, as now we use, but one set of such grooving-saws turning the cone after it has been once grooved and moving it a second time over these saws, so that the latter may make a second set of incisions at right angles to the first. Another peculiar feature of the present invention is a more simple mode of feeding and holding the sugar-cones, which mode permits its application in a horizontal position, where heretofore—that is to say, in our former patent—it was described to be held in a vertical position. We secure the cone to a plate or disk which is gradually and automatically fed forward so as to carry the end of the cone against the saws after each series of blocks has been cut off. The device which holds and feeds the cone is held in a swivel-frame, which is turned at an angle of ninety degrees whenever it is passed or about to pass the circular grooving-saws.

In the accompanying drawing, Figure 1 represents a side elevation; Fig. 2 is a vertical longitudinal section of the same on the line *c c*, Fig. 3; Fig. 3 is a top view, partly in section, of the same; Fig. 4, a vertical transverse section on the line *k k*, Fig. 3; Fig. 5 is a detail longitudinal section on the line *c k*, Fig. 3; Fig. 6 is a side view, partly in section, of the sugar-holding device; Fig. 7, an end view of the same; Fig. 8, a transverse section of a portion of the same; Fig. 9, a longitudinal section of a portion of the same; Fig. 10 is a longitudinal section of a portion of the sugar-feeding apparatus; and Fig. 11, a horizontal section on the line *q q*, Fig. 4.

Similar letters of reference indicate corresponding parts.

The letter A in the drawing represents the bed-plate or frame-work of our new machine. At one side thereof is hung a vertical shaft, B, upon which a series of circular saws, C C, are mounted at suitable distances apart, the said saws serving to groove the ends of the sugar-cone into the checker-board design described in our former Letters Patent. A horizontal shaft, E, is hung on the same side of the frame A, and carries a suitable circular saw, F, by means of which the blocks formed by the grooving of the cone are finally detached therefrom. G is a sliding carriage arranged on the side of the frame A which is opposite to the saws C and F, and connected by a crank, *a*, of a spindle, *b*, that hangs in G, with an endless chain, H, which passes over pulleys *d d* that hang in the frame A, as shown in Fig. 1. The crank *a* is firmly connected with said chain H, so that as the latter is revolved on and by its supporting-pulleys *d d* the carriage G will receive reciprocating motion.

This manner of converting the rotary motion of an endless chain or band into the reciprocating motion of a slide or other body is a well-known mechanical movement, and therefore not claimed by us, neither in itself nor in combination with our apparatus. But in order to explain it to those who may not be acquainted with it, we will state that the crank *a* does not entirely revolve on or with the pin *b*, but turns only sufficiently to follow that portion of the chain with which it is connected in its motion around the pulleys and between the same. The spindles *e* of these pulleys have their bearings on that side of the chain which is opposite to that at which the crank *a* is connected with it so as to allow said crank to pass by the inner faces of said pulleys from which no spindles project, as is fully indicated in Fig. 3. Rotary motion is imparted to one of the pulleys *d* and to the shafts B and E by suitable means not necessary to describe. In the carriage G are the bearings of the tubular shank *f* of a plate, I, from which plate two grooved horizontal arms, *g g*, project toward that side of the frame A on which the saws are arranged. These arms *g g* are parallel to each other, as shown, and serve to receive the projecting tenons *h h* of a disk, *i*, that is placed between them.

It is evident that instead of grooving the arms g and forming the tenons h on the disk i , other equivalent means for guiding said disk may be provided. A shank or rod, J , preferably of prismatic form, or at least provided with groove and feather in f projects from the back of the disk i , through a corresponding hole in the tubular shank f , and has ratchet-teeth cut or formed upon it, as shown in Figs. 3 and 4. At or near their front ends the two arms g are, by preference, but not necessarily, connected by a semicircular plate, l , which rests on friction-rollers m , that hang in a horizontal projection of the carriage G , as is more fully shown in Fig. 4. The sugar-cone is secured with its base to the face of the disk i , by means hereinafter more fully set forth, and is, as the carriage G is reciprocated, carried by the same, first toward one end of the machine and then toward the other, its small end being held toward the same. L is a horizontal bar connected by a pin, n , with a crank-projection of the plate I , and passing through two lugs, o c , that project from the carriage G . Buttons or heads are formed at both ends of this rod L , that is allowed longitudinal play in the lugs o o , for the purpose of turning the plate I on its center. At the end of each stroke of the carriage the rod L strikes against one of two fixed stops, p , and is, by striking said stops, pushed in a direction opposite to the continued motion of the carriage, so that such movement of the rod L will cause the plate I to be swung at an angle of ninety degrees or at any other desired angle at the end of each stroke or movement of the carriage. This vibration of the plate I produces the required change of position of the cone, for when the cone is, by and on the carriage, moved in the direction of the arrow 1, marked in Fig. 3, over the saws C , it will have its small end grooved by the saws with parallel incisions, and after it has passed these saws it will, by the rod L striking the one stop p , be swung at the required angle, carried back over the saws C , and grooved by them again in parallel incisions that will be at a right or other angle to the incisions first made by said saws C . Then the cone is carried against the circular saw F , by which the prismatic blocks formed by these incisions of the saw C will be detached from the end of the cone. The cone is thereupon, or while the detaching saw F is still at work on it, turned back, by striking the other stop p , to the position which it occupied previous to being first grooved by the saws C , and is then again moved over the said saws, and so on indefinitely. The feeding of the cone toward the saws—that is to say, the motion of the cone in line with its axis—is produced by means of a pawl, r , catching into the ratchet-teeth of the shank J of the disk i . This pawl is hung in a block, S , that fits loose over said shank J , and that is provided with a projecting pin, t . In a projecting post or part, u , of the frame A is secured adjustably an obliqued-faced cam or

abutment, v . When, during the motion of the carriage in the direction of the arrow 1, the pin t is carried against the oblique face of the cam v , as in Fig. 11, the slide S will be moved forward, and will cause its pawl r to push the shank J , and with it the disk i and the sugar-cone forward, and after the pin t has passed the block v it is drawn back by a spring, w , to resume its former position, the pawl then slipping loose on the ratchet, leaving the plate i and the cone to remain in the position into which they were pushed by the pawl. Being attached to the prismatic or grooved rod J , the sleeve s with its pin t will be turned with said rod when the carriage G has finished its stroke in the direction of the arrow 1; and by such turning the pin t will be carried out of the level of the cam v , so as not to come in contact with the same during the return stroke of the carriage in the direction opposite to the arrow 1. Thus it is that the cone will be fed forward one certain space during every back and forward motion of the carriage G . The pin t is again brought in line with the cam v , when the plate I with its cone is turned at the end of the return stroke of the carriage, the return stroke being that in the direction opposite to the arrow 1.

In order to vary the length of the blocks of sugar detached by the circular saw F , it is only necessary to set the cam v more or less forward or back, provided the teeth of the shank J are at such distances apart as to permit such adjustment. In place of the pawl and rack I may use on the shank J a sliding-block, x , shown in Fig. 10, which block contains two wedges, whose thicker ends are forward, as shown, so that when the pin t attached to such slide x is pushed by contact with the cam v the wedges will clamp the rod J and move it forward with them, while when the block x is subsequently drawn back by spring-connection or otherwise the wedges will become loose on said rod J , and not affect the position of the same. The wedges, it is evident, must be allowed slight longitudinal play within the block x , in order to operate in the manner described.

The plate i is recessed on its face to receive the base of the sugar-cone, and has a bail or strap, y , applied to its upper or lower part, or at one side, for the admission of the cone and removal of the uncut remnant of the same. This bail may be hinged to the plate, as in Fig. 8, at one end, and clamped to it by a suitable catch at the other end; or it may be made entirely detachable, as in Fig. 7, and clamped at both ends when applied. When this bail is removed or swung open the base of the cone can be entered into the dovetailed or countersunk recess of the plate i , and when it is closed over the base of the cone the same is securely confined. The front or smaller end of the sugar-cone is supported between two cams, a^2 , whose spindles hang in the arms g of the plate I . Upon the spindles are mounted rollers b^2 , having spiral grooves or tracks cut into or formed on them, as shown in Fig. 6, and small pins pro-

ject from the periphery of the plate *i* into the grooves of these rollers *b*². When the plate *i* is quite drawn back, so that the smallest part of the sugar-cone is still between the cams *a*², as in Figs. 6 and 7, the said cams will support the cone with their most projecting parts; and as, after the end of the cone becomes gradually detached, the plate *i* is being fed forward it serves to turn the rollers *b*² by the pins on *i*, which enter the spiral grooves on *b*², and thereby also to turn the cams *a*², so that their less projecting parts will gradually admit the larger portion of the cone between them as the same is being fed toward the same.

In place of these rollers *b*² and cams *a*² I may use a support, *d*², which is shown in Fig. 9, and which rests in an inclined slot of an arm or arms, *e*², projecting from the plate *i*, so that as the said plate is being fed forward the deeper part of the slot of its arm *e*² will also be moved gradually forward, and will cause the support *d*² to be lowered to admit and support the larger parts of the cone.

The saw F is secured upon its mandrel E in such manner that there is no projection on its face, and that its supporting-disk, screw-bolts, or other devices will leave a clear rim fully as large as the thickness of the blocks to be detached from the cone, so that as the grooved cone is moved against the saw F the blocks that would strike the supporting-disk or screws, or other devices, will drop off before they can reach the same.

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

1. The reciprocating carriage G carrying the swivel-plate I, and in the same the laterally-

movable sugar-holder *i*, substantially as described.

2. The rod L, connected with the plate I and hung in the carriage G, for the purpose of turning the plate I, as described.

3. The sugar-holder *i* provided with the shank J and combined with the pawl *r*, slide *s*, pin *t*, and cam *v*, to operate substantially as herein shown and described.

4. The plate I provided with the projecting arms *g g*, that serve as a guide and support for the cone-holder *i*, as specified.

5. The combination of the laterally-movable sugar-cone holder with one set of grooving-saws, C, and with one detaching-saw, F, substantially as described.

6. The process, herein described, of cutting sugar into blocks by one set of grooving-saws, C, and one detaching-saw, F, and by turning the said cone previous to each movement of the same toward the grooving-saws, as specified.

7. The cams *a*² connected with the spirally-grooved rollers *b*² and combined with the sugar-cone holder *i*, to be operated by the same, substantially as described.

8. The slide *x* carrying double wedges and a pin, *t*, and applied to the shank J of the sugar-cone holder, as described.

9. The cone-support *d*² arranged on the arm *e*² of the sugar-cone holder, when said arm is provided with an inclined slot, as specified.

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ALBERT BENNECKENDORF.

Witnesses:

CHAS. NIDA,

CHARLES H. NAST.