F. ROCHOW.

Sugar-Cutting Machine.

No. 164,485. Patented June 15, 1875.

Fig: 1

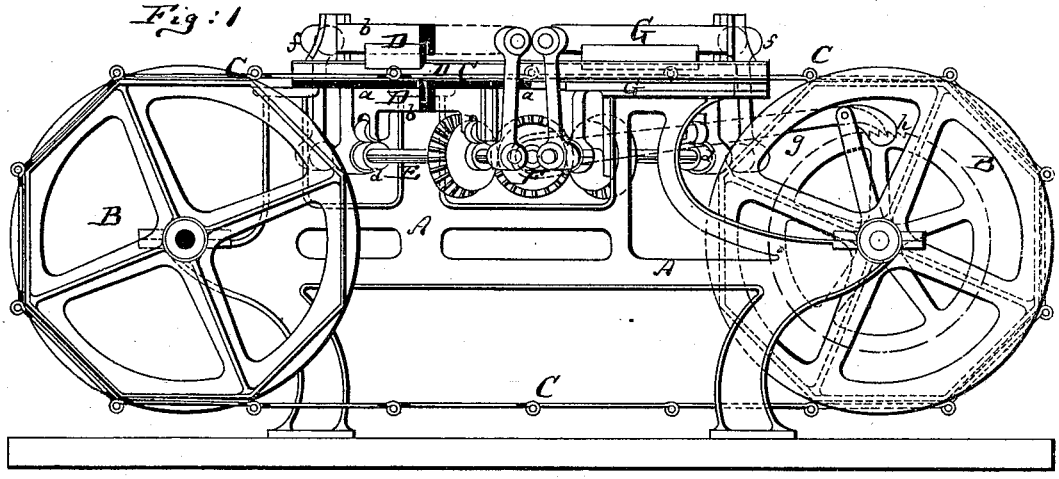


Fig: 3

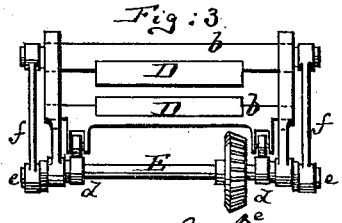


Fig: 4

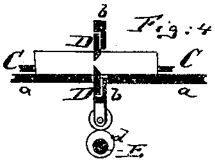


Fig: 2

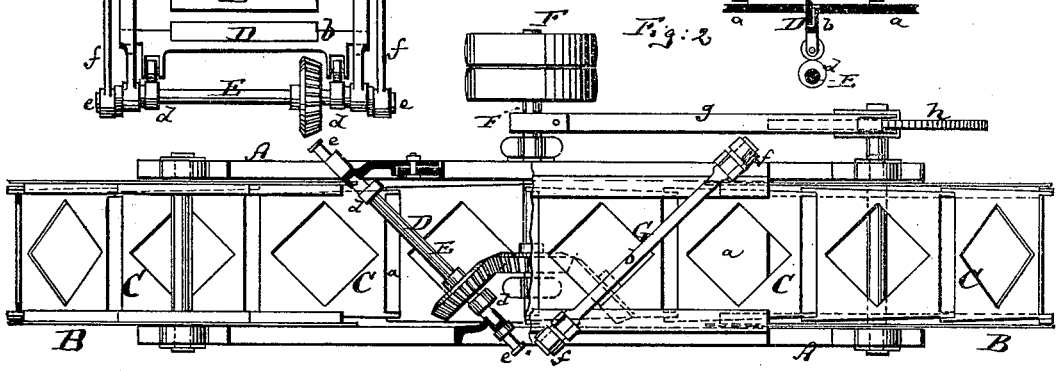
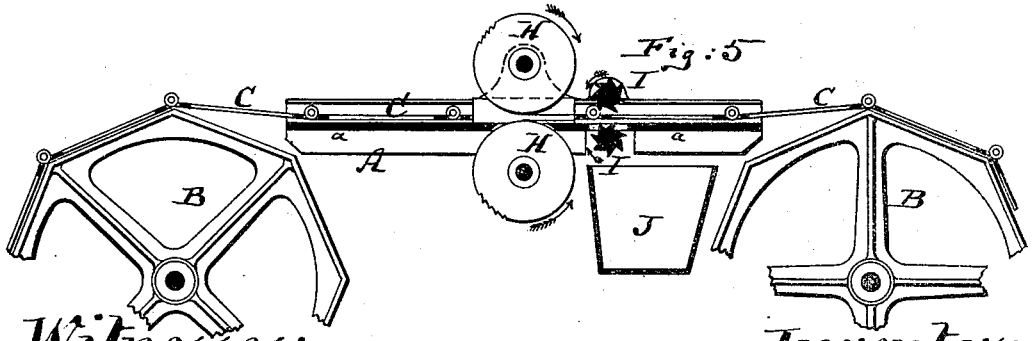


Fig: 5



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UNITED STATES PATENT OFFICE.

FERDINAND ROCHOW, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SUGAR-CUTTING MACHINES.

Specification forming part of Letters Patent No. **164,485**, dated June 15, 1875; application filed May 26, 1875.

CASE A.

To all whom it may concern:

Be it known that I, FERDINAND ROCHOW, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machinery for Cutting Sugar Slabs into Blocks, of which the following is a specification:

Figure 1 is a side elevation, partly in section, of my improved machine for cutting sugar into blocks. Fig. 2 is a plan or top view of the same; Fig. 3, a detail side view of the cutting apparatus; Fig. 4, a detail transverse section of the cutting apparatus; Fig. 5, a vertical section of a modification of my invention.

Similar letters of reference indicate corresponding parts in all the figures.

The object of this invention is to devise a practicable mechanism for cutting sugar slabs (especially the kind produced in centrifugal sugar-machines) into blocks or cubes of the size most usually required in households.

I am aware that many machines have already been constructed for cutting sugar into blocks; but the same were mostly arranged with reference to the reduction of sugar loaves, the slabs produced in a centrifugal machine being of comparatively late introduction, and the former machines were, therefore, not necessarily adapted to work on slabs of equal size.

My invention principally consists in combining a perforated carrier with double cutters, the sugar slab being held in and moved by the carrier, and brought between the two cutters, to be affected by the same simultaneously from opposite sides, all as hereinafter more fully described. My invention also consists in the peculiar arrangement of cutting apparatus, and other features of improvement hereinafter more specially pointed out.

In the drawing, the letter A represents the frame of the machine, carrying at its ends two drums, B B, over which an endless chain, C, is placed. The chain C constitutes the carrier of the sugar slabs to be cut, being made with apertures, each of a size sufficient to receive and be filled by a slab of sugar as it comes from the centrifugal machine. The slabs of sugar are, by hand or otherwise, placed into the openings of the chain C as the same arrive above a fixed table, *a*, of the frame A, and are then carried along on said table by means of the chain or carrier C, each slab being virtually dragged along the surface of the table by the chain, which grasps or incloses the slab at about the middle of its height, as more clearly indicated in Fig. 4. D D are two knives, secured, respectively, to cross-heads *b b*, of which one is arranged above and the other below the table *a*, both cross-heads being parallel, and vertically in line with each other. These cross-heads *b b* receive vertical reciprocating motion by means of a shaft, E, which is hung in the frame A beneath them, and which, by cams *d d*, raises the lower cross-head at the same time that it, by cranks *e* and connecting-rods *f*, lowers the upper cross-head. Thus it is that during the rotation of the shaft E, which is imparted to it by gearing connection with the main driving-shaft F, or otherwise, the knives D D are alternately moved toward and away from each other. Between these two knives D D the sugar is carried by the chain C over the table *a*, the table being slotted directly above the lower knife D, as indicated in Fig. 4, so that said knife can reach the sugar. By a rod, *g*, and pawl, the main driving-shaft F, or its equivalent, engages with a ratchet-wheel, *h*, on the shaft of one of the drums B, so that the said drums and their carrier-chain will receive intermittent rotary motion.

The action of the apparatus is as follows: The carrier, being moved by the intermittent rotation of the drum, brings the inner end of the slab of sugar between the two knives D D. Thereupon the carrier stops, and the knives are brought from above and below against the slab and cut or clip, separating thereby a strip or bar of sugar from the slab. The knives are then drawn apart, and the chain moved sufficiently to bring another portion of the slab between the knives, and the action above described is then repeated until the whole slab of sugar has been cut into a suitable number of parallel bars, all of equal width, their width depending upon the degree of motion imparted at each interval to the chain or carrier C. After one slab has thus passed under the knives, the chain continues

its movement, and the knives also continue to move without affecting or injuring either part of the machinery, and in fact without any effect whatever until the next slab of sugar arrives between the knives, when the former action will be repeated, and the slab cut into bars, as before. Thus it is that with intermittently-moving carrier, and with reciprocating knives, a slab of sugar laid in the carrier will be reduced to bars.

By reference to Fig. 2 it will be seen that I have formed the openings in the chain diagonally, and placed the knives D D diagonally in the frame A, so that the bars may be cut from the slab parallel to its sides, or nearly so. By this arrangement, which is the preferable plan, I am also enabled to place another duplicate set of knives, G G, which are in every respect similar to the knives D, and act in the same way as the knives D, at right angles to the latter, as shown in Fig. 2, so that the bars of sugar which have been formed by the action of the knives D will, as they arrive in the carrier-chain between the knives G G, be reduced to blocks or cubes.

Various modifications of this arrangement may be invented, and two important modifications have been described in the two applications for patents marked B and C, which I have filed at the same time with the present application; but in all these modifications the same principle of invention—to wit, the use of the perforated carrier-chain, passing between two cutting-tools that are strictly in line with each other—must be retained. Of course, when clipping-tools are used, like the knives D D and G G, which cut into but not through the sugar, as the latter will be separated in the desired manner by the partial entry of the knives, the motion of the chain must be intermittent; but when rotary saws and rotary clipping-tools such as are represented in Fig. 5 are used, the motion of the chain may be continuous—that is to say, in Fig. 5 the slabs of sugar are first exposed to the action of two sets of circular saws, H H, which cut them into bars, and afterward these bars are exposed to the action of two rotary clippers, I I, and thereby cut into cubes. The shafts of the saws H and of the rotary clippers I are parallel with each other, as clearly indicated in Fig. 5, and they can move continuously, as well as the chain C, which feeds the sugar to and between them.

It must be observed that the cutting-tools, whatever they are, working in opposite directions against the lower and upper side of the sugar, are not allowed, and cannot be allowed, to meet, but must be, when nearest together, still far enough apart to allow the carrier-chain C to be between them, as otherwise such carrier-chain would be cut by the cutting or clipping tools. Therefore the chain must be considerably less in thickness than the slab of sugar it carries, as shown in Fig. 4.

It will also be observed that the slab, being confined in the opening of the chain, will not lose any of its parts that may be cut from it by the tools hereinbefore mentioned, but that all the pieces will be retained in the chain until after the whole slab has been cut into cubes or blocks and arrives over a discharge-spout or suitable receptacle; but when the rotary clippers I I, which are shown in Fig. 5, are employed, the bars formed from the slab will be retained in their original position while fed from the saws H H to the clippers I; but the cubes detached by the clippers I I may, as soon as they are cut off, fall down through a slot of the table *a* into a receiving-vessel, J.

It is evident that, instead of making the carrier C in the form of a continuous chain, any other form or kind of carrier may answer the same purpose. Thus it may be made a plane flat rack or plate, perforated as described, to effect the same purpose as the chain C.

I claim as my invention—

1. In a sugar-cutting machine, the combination of a perforated sugar-carrier, C, with two cutting or clipping tools, between which said carrier passes, substantially as herein shown and described.

2. The perforated sugar-carrier C, combined with a stationary slotted table, *a*, and with the cutting or clipping tools D D, placed, respectively, above and below the table and carrier, substantially as herein shown and described.

3. The combination of the perforated sugar-carrier C with two several series of cutting or clipping tools, by which the sugar slabs held in and fed by the carrier are first reduced into bars by one set of cutters, and the bars into cubes by the second set of cutters, all without removing the sugar from or changing the motion of the carrier, substantially as specified.

The above description of my invention signed by me this 25th day of May, 1875.

F. ROCHOW.

Witnesses:

E. C. WEBB,

F. V. BRIESEN.