2 Sheets--Sheet 1.

G. DINKEL & W. R. ELMENHORST.

Machine for Splitting Hard Sugar.

No. 168,728.

Patented Oct. 11, 1875.

Fig. 1.

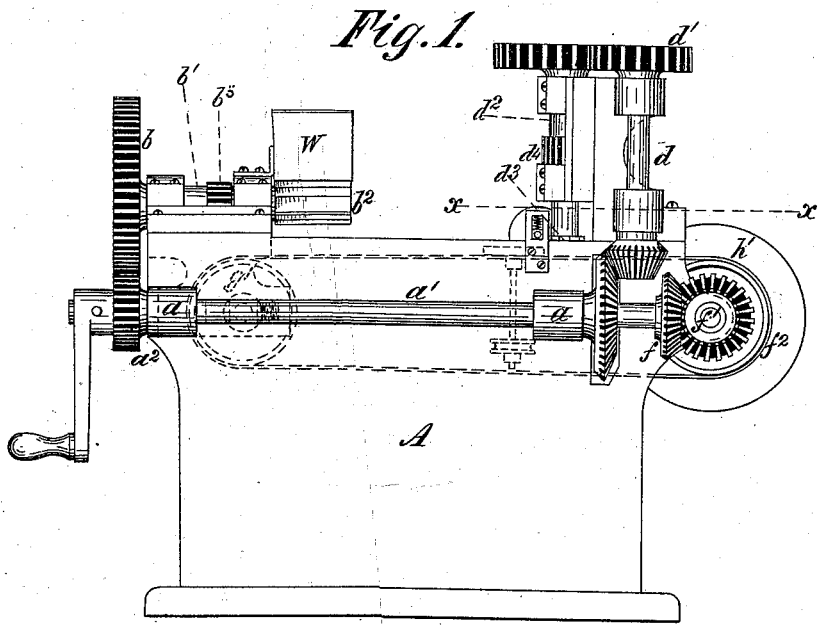
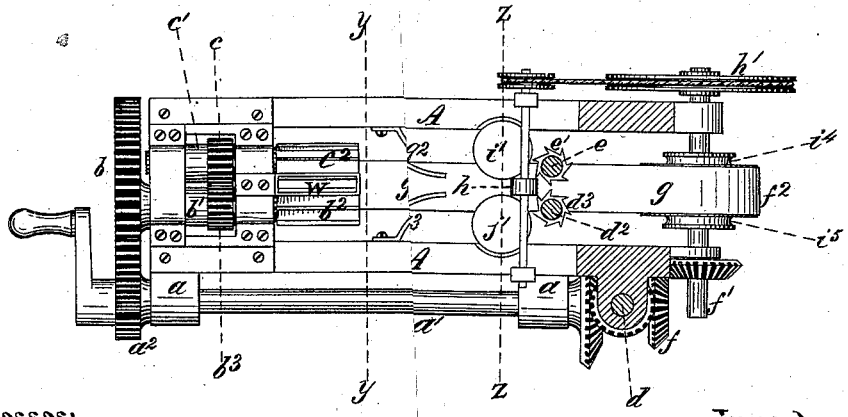


Fig. 2.



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2 Sheets--Sheet 2.

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Fig. 3.

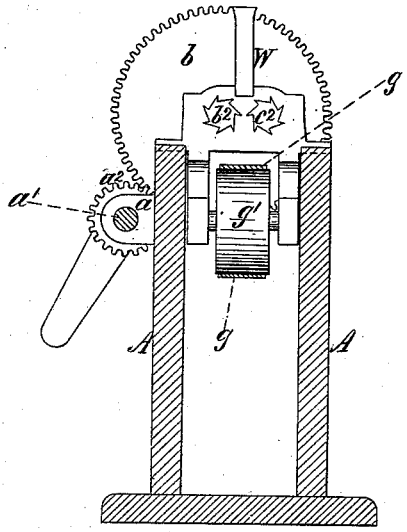
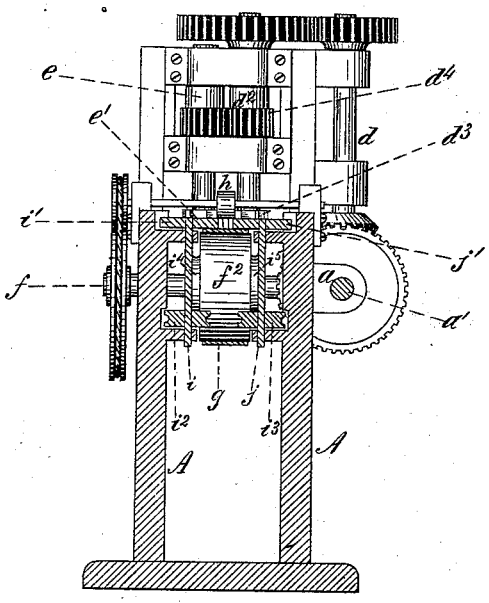


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE DINKEL AND WALTER R. ELMENHORST, OF JERSEY CITY, N. J.

IMPROVEMENT IN MACHINES FOR SPLITTING HARD SUGAR.

Specification forming part of Letters Patent No. **168,728**, dated October 11, 1875; application filed September 10, 1875.

To all whom it may concern:

Be it known that we, GEORGE DINKEL, of Jersey City, New Jersey, and WALTER R. ELMENHORST, of Altona, Germany, now residing in Jersey City, New Jersey, have invented a certain Improvement in Machines for Splitting Hard Sugar into Cubes, of which the following is a specification:

The object of our invention is to divide hard sugar into the small blocks or cubes designed for family use; and it consists in combining two pairs of splitting-rollers (each pair being mounted on axes at right angles to the axes of the other) with suitable devices for feeding slabs of sugar to the first pair of splitting-rollers, and feeding the strips, into which the first pair of splitting-roller split the slabs, to the second pair of splitting-rollers, by which they are split into blocks or cubes of the desired size.

The accompanying drawings are as follows: Figure 1 is a side view of our splitting-machine. Fig. 2 is a top view, partly in section—*i. e.*, through the line *x x* on Fig. 1. Fig. 3 is a transverse vertical section through the line *y y* on Fig. 2, looking toward the front end of the machine. Fig. 4 is a transverse vertical section through the line *z z* on Fig. 2, showing the upright splitters.

Our machine has a substantial frame, A, provided with suitable bearings *a* for the support of the driving-shaft a^1. This shaft is provided with a pinion, a^2, on the front end of the machine, which engages the pinion *b* on the splitter-shaft b^1. The inner end of this shaft carries the splitter b^2, which is a cylinder provided with radially or nearly radially projecting blades. A small pinion, b^3, engages a similar pinion, *c*, upon a parallel splitter-shaft, c^1, which carries on its inner end the splitter c^2.

It will be seen that the edges of these splitters are so placed with reference to each other that they respectively engage the opposite sides of the object introduced between them in the same horizontal plane, and thus, in the case of a brittle material like hard sugar, they pinch or crack off a piece, whose width is determined by the degree of speed with which the material operated upon is fed through the hopper or guide W.

The opposite end of the driving-shaft is geared by a beveled gear to the vertical shaft *d*, provided at its upper extremity with the pinion d^1, which engages a similar pinion on the parallel vertical shaft d^2. This shaft carries one of the vertically-placed splitters d^3, and by means of the small pinion d^4 actuates the parallel vertical shaft *e*, carrying the other vertical splitter e^1.

It will be seen that the vertical splitter-shafts revolve with greater speed than the horizontal splitter-shafts, to which reference was first made. The speed of these splitters is arranged with reference to the speed of the first pair of splitters, as will be hereafter explained.

By means of the gearing *f*, at the back end of the machine, motion is imparted from the driving-shaft to the transverse counter-shaft f^1. This shaft is provided with the pulley f^2, which carries the feed belt or apron *g*, which is sustained at the front end of the machine by the loose pulley g^1. Two oppositely-inclined guides, g^2 and g^3, serve to centralize objects carried upon the apron *g*. A spring feed-roller, *h*, is arranged in front of the vertical splitters, for the purpose of engaging the top of the strip of sugar, and holding it down upon the apron, and assisting in its delivery to the vertical splitters. Motion is imparted to the feed-roller *h* by a crossed belt from the pulley h^1. On either side of the apron are arranged two vertical shafts, *i* and *j*, carrying the friction-rollers i^1 and j^1, the perimeters of which engage the sides of the strip of sugar, which is being fed along the apron and centralize it for presentation, in proper position, to the vertical splitters. These friction-rollers may, if desired, be positively actuated by belting the pulleys i^2 and i^3 to the pulleys i^4 and i^5 on the counter-shaft f^1.

The operation of our machine is as follows: Slabs of hard sugar are successively placed in the hopper or guide W, and fed downward between the first pair of splitters b^2, by the operation of which each slab is cracked into strips of the desired width. These strips fall on the apron *g*, and, being centralized thereupon by the guides g^2 and g^3, are carried forward and engaged on their sides by the friction-rollers i^1 and j^1, and pass under the feed-

roller h, and are thus presented in proper position to a second pair of splitters of like construction to the first, which crack the strips into short blocks or cubes. The speed of these vertical splitters is determined by the width of the original slabs—that is, by the number of cuts necessary to divide each strip split from the slab into cubes or blocks of the desired size. The cubes, as they are cut, pass along the apron and are carried over the pulley f^2, from which they fall into boxes or other receptacles placed for their reception.

We claim as our invention—

1. In a machine for splitting hard sugar into cubes, a pair of rotary splitters, substantially such as described, mounted in parallel horizontal bearings, and a carrying apron or belt arranged under such rotary splitters, and moving in a direction parallel to the axis of such rotary splitters, in combination with a pair of rotary splitters arranged in vertical bearings, substantially as and for the purposes set forth.

2. In a machine for splitting hard sugar into cubes, the traveling apron g, and the friction-rollers i^1 and j^1, in combination with the vertical rotary splitters d^3 and e^1, substantially as and for the purpose set forth.

3. The combination, with a pair of rotary splitters, substantially such as described, of the traveling apron g and the feed-roller h, for the purpose of engaging opposite sides of a slab of sugar and delivering it to the rotary splitters, substantially as set forth.

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