(No Model.)

2 Sheets—Sheet 1.

G. SMITH & E. S. BRIGHT.

CRACKER STACKING MACHINE.

No. 424,435. Patented Mar. 25, 1890.

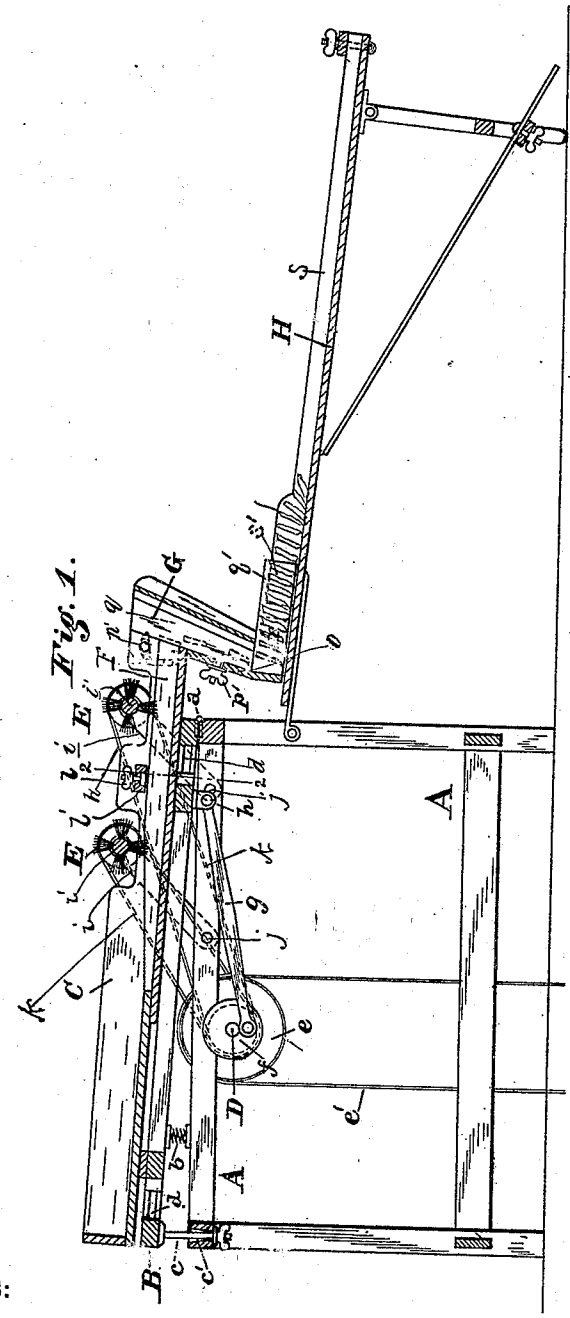


Fig. 1.

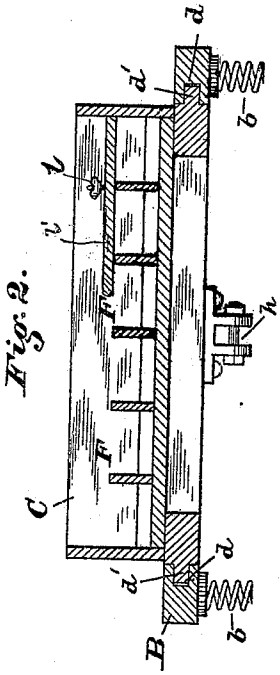


Fig. 2.

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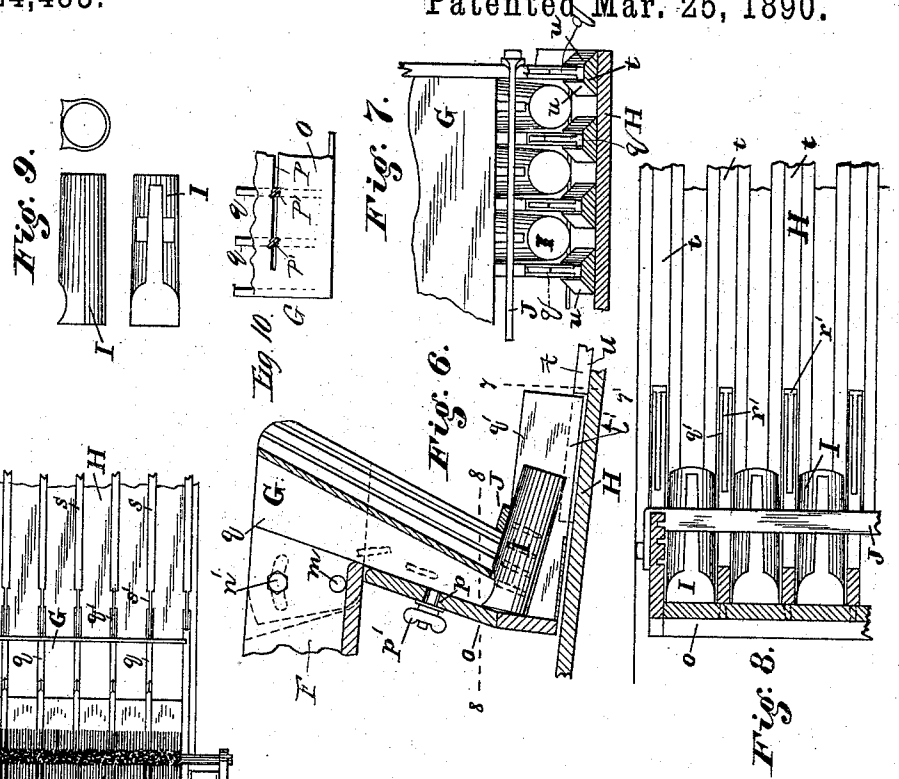
N. PETERS. Photo-Lithographer, Washington, D. C.

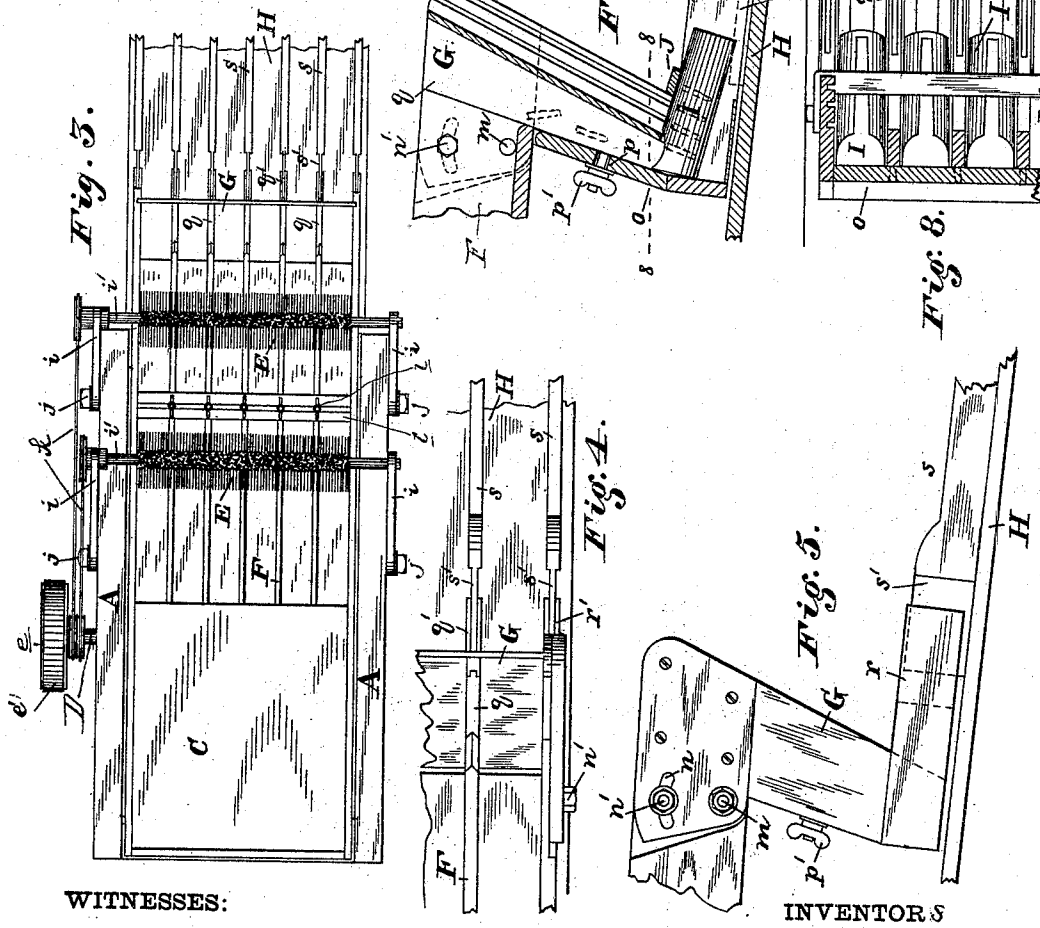
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UNITED STATES PATENT OFFICE.

GEORGE SMITH AND EDWARD S. BRIGHT, OF BALTIMORE, MARYLAND, ASSIGNORS OF ONE-THIRD TO JAMES D. MASON & CO., OF SAME PLACE.

CRACKER-STACKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 424,435, dated March 25, 1890.

Application filed May 15, 1889. Serial No. 310,859. (No model.)

To all whom it may concern:

Be it known that we, GEORGE SMITH and EDWARD S. BRIGHT, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Cracker-Stacking Machines, of which the following is a specification.

This invention relates to an improved machine for "stacking" or arranging crackers and other bakery products in rows preparatory to packing them in boxes or barrels, as hereinafter described.

The features of our invention are illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical longitudinal section of the machine. Fig. 2 is a vertical cross-section taken on the line 2 2 of Fig. 1. Fig. 3 is a top plan view of the machine. Figs. 4 and 5 are top and side views, respectively, on a larger scale, of the chute-frame. Fig. 6 is a sectional elevation of a portion of the machine, showing the chute-frames and tubes. Figs. 7 and 8 are vertical and horizontal sections, respectively, on the lines 7 7 and 8 8 of Fig. 6. Fig. 9 represents detached views of the tube; and Fig. 10 represents a view of a portion of the chute-frame, the vertical partitions located therein, and means for adjusting them.

The letter A designates a supporting-stand. Upon the top of the stand is an inclined frame B, which is connected by hinges *a* at its front end to said stand, and its rear elevated end is supported by spiral springs *b*, and thereby may yield. A bolt *c* depends from the rear end of the frame and passes through a hole *c'* in the stand-top, whereby the frame B is allowed a limited vertical movement when the machine is in operation. The two side bars of the inclined frame B have longitudinal slide-grooves *d*, and a hopper C, to receive the unstacked crackers or other bakers' productions, has tongues *d'*, which occupy the said slide-grooves *d* on the yielding frame. The hopper inclines down from the rear toward the front end. A drive-shaft D has a pulley *e* and receives motion from any source by a belt *e'*. The shaft also has a crank-head *f*, and a pitman-rod *g* is attached to the crank-head and connects with a knuckle-plate *h*, fixed on the bottom of the hopper. By this construction the hopper C will be caused to vibrate longitudinally.

Revolving brushes E above the hopper, and extending crosswise thereof, are mounted in bearings *i*, wholly independent of the hopper C, so that they are not affected by the vibration of the hopper, but continue to revolve steadily while the hopper below them is vibrating. This is accomplished by each end of the brush-shaft *i'* having a pivoted arm *i* for its bearing, and each of the said arms being pivotally connected to the top bar of the stand A by a pivot-pin *j*, and the arms incline forward. The brushes are made to revolve by belts *k*, running over pulleys on the drive-shaft D and brush-shaft *i'*. The revolving brushes, of which one, two, or more may be used, keep the crackers spread on the bottom of the hopper, and prevent one cracker from lapping over on top of another.

The machine is constructed to stack and arrange both round and square crackers, a certain change or adjustment being necessary to adapt it for each kind. For square crackers we place parallel guides or partitions F longitudinally in the front part of the hopper and adjust them apart by set-screws *l* on a cross-bar *l'*. The square crackers pass or slide down the spaces between the guides F, and the latter prevent them from turning or rotating, which causes them to get choked up. For round crackers the guides F are removed, and the hopper-bottom is a plain unobstructed surface. The hopper has at its front a depending chute-frame G, attached to the hopper by a pivot *m*, as shown in Fig. 6, at each side. The chute-frame at each side has a segment-slot *n*, and a set-screw *n'* in the hopper projects through each slot.

In order to regulate the delivery of the cakes or crackers through the chute, the chute-frame G is made adjustable by means of the set-screw, so that the chute can be set at various angles. The delivery of the cakes and crackers through and from the chute depends upon the inclination of the chute, which is effected by means of the chute-frame. For instance, if the upper branch of the chute should be in a perpendicular position and the lower branch in a horizontal

position, the crackers or cakes would drop rapidly and almost perpendicularly through the upper branch and would have positively no feed action through the lower branch. If, on the contrary, the upper and lower branches of the chute are at an angle to a vertical and horizontal line, respectively, the delivery through the upper branch will not only be retarded, but the cakes or crackers will be delivered to the lower branch in an inclined position, while the lower branch, being inclined, will allow the cakes or crackers to be delivered through it by gravity, thus insuring their escape from the same. The back plate *o* of the chute-frame G has a horizontal slot *p*, and vertical partitions *q* are in the chute-frame, and each one has a set-screw *p'*, which occupies the said horizontal slot *p* in the back. By this means the partitions *q* may be adjusted laterally in the chute-frame, so as to form down-passages of widths to suit crackers of any size. It will be noticed that the ends of the guides F on the hopper-bottom abut against the edges of the vertical partitions *q* in the chute-frame.

The lower end of the chute-frame G has a forward-projecting foot *r*, which receives the crackers as they drop down the chute. This foot is provided with guides *q'*, each of which has a vertical slit or slot *r'*, and a stationary delivery-table H has parallel passages or spaces formed by guide-boards *s*, provided at their ends with tongues *s'*, which loosely enter the slits *r'* in the said guides *q'*. The slit and tongue connection thus made allows the hopper A, its chute-frame G, and foot *r* to vibrate longitudinally without breaking the continuity of the passages from the chute-frame G to the delivery-table H.

The operation is as follows: The drive-shaft D being set in motion, the hopper C will vibrate, as described, and the brushes E will revolve unaffected by said vibration. Crackers, biscuits, cakes, ginger-snaps, or other products of the bakery may be placed in bulk or mass upon the hopper C, and the motion caused by the vibrating mechanism will give rise to a tremulous or up and down yielding motion, which the spiral springs *b* afford. These motions of the hopper C cause the crackers to spread over the bottom evenly, which result the revolving brushes E assist. In the case of square crackers, the guides F keep them from turning as they move along and prevent their corners from interfering with each other. When the crackers reach the front edge of the hopper they tilt and pass edgewise down the passages of the chute-frame G, and on reaching the foot *r* they rest on their edges. Each cracker that drops down the chute-frame takes position behind the cracker that dropped previously, and thus the crackers are delivered one at a time through the narrow passage at the lower end of the chute-frame G, so as to remain on their edges with their flat surfaces in contact and form stacks or rows which extend along the top of the delivery-table H, from whence they are lifted by manual labor.

The particular construction shown in Figs. 6, 7, 8, and 9 is a modification of the foot of the chute-frame employed, by preference, when round crackers are to be stacked. The changes consist of adding tubes I to the foot of the chute-frame, so that each passage between the guides *q* will have a tube. These tubes, as shown in Figs. 6, 7, and 8, are confined to their place by a cross-bar J, which sets across the tops of the said tubes. The tubes I are attached to the lower end of the chute G, and are held in position thereby. The vertical side guide-boards *s*, used on the delivery-table for square crackers, (see Figs. 3 and 4,) are removed and guide-bars *t* substituted, the said guide-bars *t* being provided with tongues *t'* for the purpose. These latter have two bevel sides *u*, (see Figs. 7 and 8,) which better serve to sustain the round crackers edgewise.

Having described our invention, we claim—

1. In a machine for arranging crackers, &c., the combination of a supporting-stand, an inclined frame hinged on top of the stand and supported by springs, and a vibrating hopper resting on said spring-frame and provided with a depending chute-frame.

2. In a machine for arranging crackers, &c., the combination of a supporting-stand, an inclined frame hinged on top of the stand and supported by springs, a hopper connected with the said frame by slides, a crank-shaft mounted on the stand, and a pitman-rod attached to the crank and hopper.

3. In a machine for arranging crackers, &c., the combination of a supporting-stand, a vibrating hopper, arms *i*, secured to the stand and projecting up at each side of the hopper, and a revoluble brush mounted at the upper ends of said arms.

4. In a machine for arranging crackers, the combination of a vibrating hopper, a depending chute-frame having a curved slot, and a set-screw seated therein, whereby the chute-frame is adjusted and held at any angle, as set forth.

5. In a machine for arranging crackers, &c., the combination of a vibrating hopper, and a chute-frame attached thereto, having a foot, guides on the foot, each having a vertical slit, and a delivery-table having guide-boards provided with tongues which loosely enter the said slitted foot-guides.

In testimony whereof we affix our signatures in the presence of two witnesses.

GEORGE SMITH.
EDWARD S. BRIGHT.

Witnesses:
JOHN E. MORRIS,
JNO. T. MADDOX.