

No. 648,131.

Patented Apr. 24, 1900.

G. L. MERRELL.  
FRUIT BREAKING MACHINE.

(Application filed Aug. 5, 1899.)

(No Model.)

2 Sheets—Sheet 1.

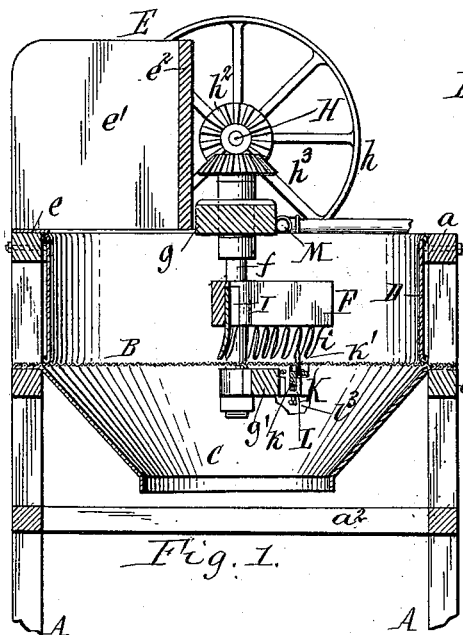


Fig. 1.

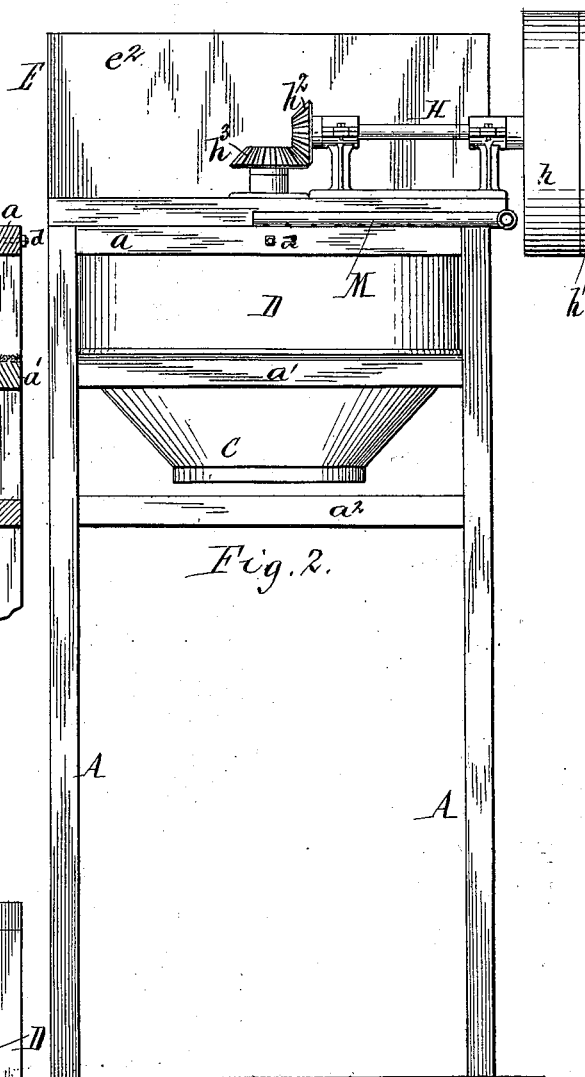


Fig. 2.

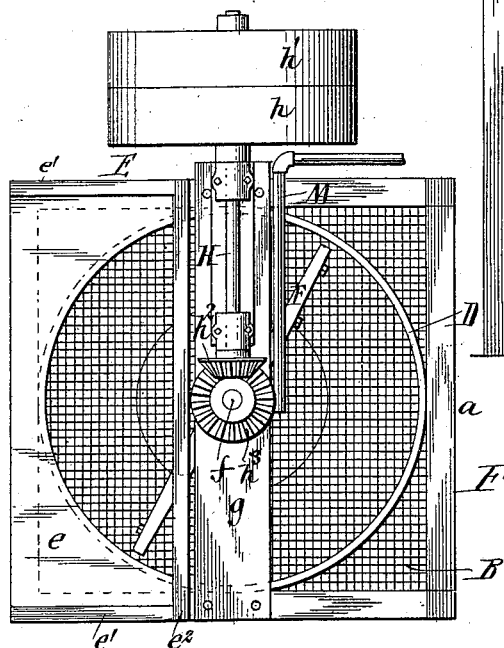


Fig. 3.

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2 Sheets—Sheet 2.

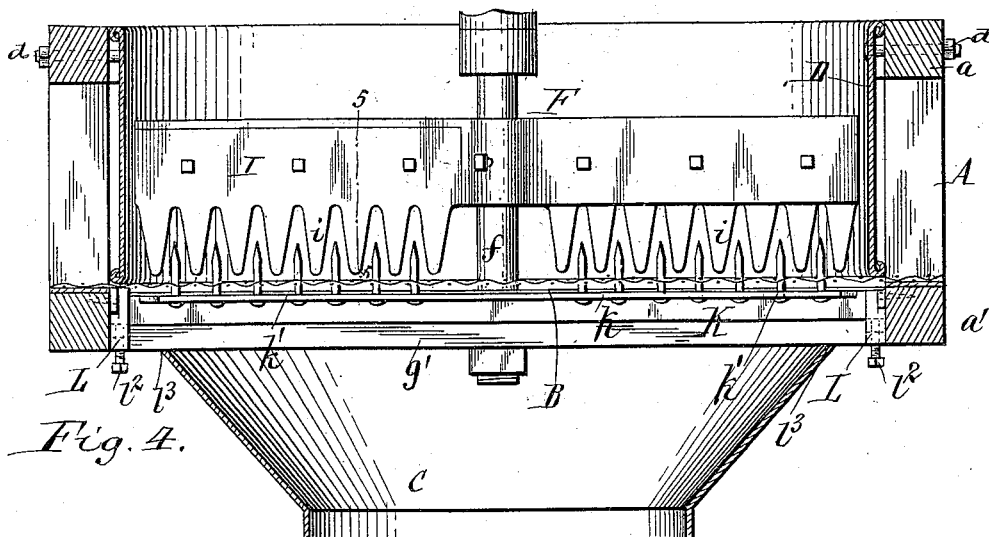


Fig. 4.

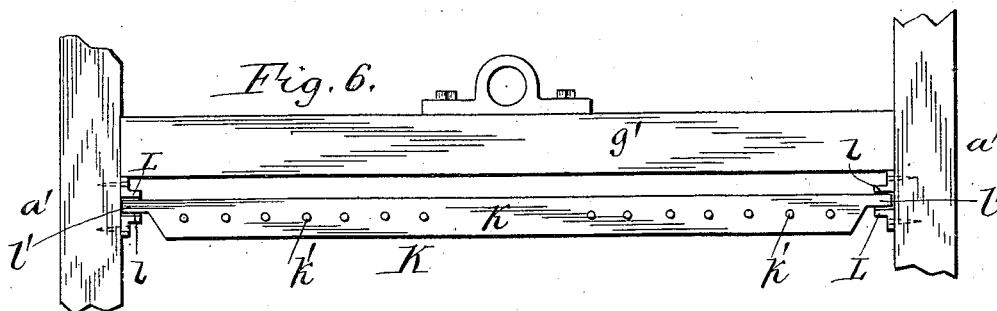


Fig. 6.

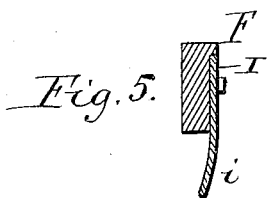


Fig. 5.

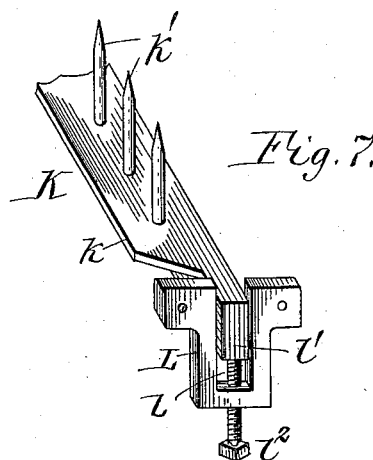


Fig. 7.

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# UNITED STATES PATENT OFFICE.

GAIUS L. MERRELL, OF SYRACUSE, NEW YORK, ASSIGNOR TO EDWARD B. MCKAY, OF PHILADELPHIA, PENNSYLVANIA.

## FRUIT-BREAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,131, dated April 24, 1900.

Application filed August 5, 1899. Serial No. 726,242. (No model.)

*To all whom it may concern:*

Be it known that I, GAIUS L. MERRELL, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented new and useful Improvements in Fruit-Breaking Machines, of which the following is a specification.

This invention relates to a machine for breaking up the bunches of currants, raisins, and similar fruit which are more or less adhesive and which when packed in barrels or boxes form bunches or lumps which require to be broken up before the fruit can be used.

The objects of my invention are to produce a simple and effective machine for this purpose and to render the machine readily adjustable for operating upon fruits of different kinds or conditions.

My improved machine consists, generally stated, of a coarse horizontal screen supported in a stationary frame, teeth projecting upwardly through the screen, and a rotary toothed breaker which is arranged above the screen and sweeps with its teeth through the spaces between the teeth on the screen, thereby breaking up the lumps or bunches of fruit and working the loosened fruit through the meshes of the screen.

In the accompanying drawings, consisting of two sheets, Figure 1 is a vertical section of my improved fruit-breaking machine. Fig. 2 is an elevation at right angles to Fig. 1. Fig. 3 is a top plan view of the machine. Fig. 4 is a vertical section, on an enlarged scale, of the screen, rotary and stationary breakers, and connecting parts. Fig. 5 is a vertical section through one arm of the rotary breaker in line 5 5, Fig. 4. Fig. 6 is a top plan view of the stationary breaker and adjacent parts. Fig. 7 is a perspective view of one end of the stationary breaker and its adjusting device.

Like letters of reference refer to like parts in the several figures.

A represents the posts of the stationary frame, connected by top cross-bars  $a$ , middle cross-bars  $a'$ , and lower cross-bars  $a''$ .

B represents the horizontal screen, which is secured to the middle cross-bars  $a'$  and constructed of coarse wire cloth having a

mesh suitable for the kind of fruit to be treated—for instance, for currants half an inch in the clear.

C represents a four-sided hopper arranged underneath the screen for receiving the fruit which has been worked through the screen and conducting it to a cleaning-machine or receptacle. This hopper is preferably constructed of sheet metal and secured with its marginal portion upon the middle cross-pieces  $a'$  underneath the marginal portion of the screen.

D represents a cylindrical curb, casing, or hoop which rests upon the screen within the cross-pieces of the frame and is secured by bolts  $d$  or other means to the upper cross-pieces  $a$ . This curb or casing extends to the top of the upper cross-pieces, and the space outside of the curb and inside of the upper cross-pieces is closed on the front side of the machine by a horizontal plate  $e$ .

E represents a three-sided feed-box arranged on the front side of the machine upon the top cross-pieces  $a$  and consisting of upright side boards  $e'$  and a connecting rear board  $e''$ , so that this box is open at the front and top and closed at the sides and rear. The plate  $e$  forms the bottom of this box outside of the curb D.

F represents a rotary breaker which is arranged over the screen and within the curb. This breaker is secured to a vertical shaft  $f$ , which is journaled near its upper end in a bearing secured to a bridge-tree  $g$  and near its lower end in a bearing secured to a bridge-tree  $g'$ . The upper bridge-tree  $g$  is secured to the upper cross-pieces  $a$  and the lower bridge-tree  $g'$  to the middle cross-pieces  $a'$  below the screen. This breaker is rotated by any suitable means—for instance, as shown, by a horizontal shaft H, which is provided with tight and loose pulleys H H' and a bevel-wheel  $h^2$ , which meshes with a bevel-wheel  $h^3$  on the upper end of the breaker-shaft. The breaker is provided with depending teeth  $i$ , which are preferably arranged on each side of the shaft and formed in plates I, secured to the advancing or front sides of the arms of the breaker, as shown in Figs. 4 and 5.

K represents a stationary breaker consist-

ing of a horizontal bar  $k$ , which is arranged below the screen, and pins or teeth  $k'$ , which project upwardly through the meshes of the screen. The pins or teeth on the rotary and stationary breakers are so spaced that the teeth of the rotary breaker pass through the spaces between the teeth of the stationary breaker. The latter is vertically adjustable, so that its teeth can be projected to a greater or less distance above the screen or entirely withdrawn below the screen, as the nature or condition of the fruit may require. For instance, when the fruit is fresh and moist the pins should not project as much as when the fruit is hard and dry. Different kinds of fruit also require different breaking effects. For instance, for raisins the teeth should project more than for currants.

The adjustment of the stationary breaker may be effected by various means. The devices shown in the drawings for that purpose consist, as most clearly represented in Figs. 4, 6, and 7, of guide-pieces  $L$ , which are secured to the inner sides of the middle cross-pieces  $a'$  and provided with vertical guide ways or slots  $l$ , in which the ends  $l'$  of the breaker-bar  $k$  are arranged upon set-screws  $l''$ , by which the bar can be raised and lowered. The stationary breaker is shown as extending across the screen and the hopper below the screen, and the sides of the hopper are provided with vertical openings  $l^3$ , through which the ends of the stationary breaker pass. The stationary breaker may, however, extend only across half the width of the screen, if desired.

$m$  represents a water-pipe which is arranged above the screen, preferably upon one of the top cross-pieces  $a$ , and which is perforated in its under side to deliver a spray of water upon the screen and the material under treatment when required. This spray is not necessary on all kinds of fruit, but is generally used on currants.

The fruit is introduced upon the screen through the feed-box and is broken by the action of the rotary and stationary breakers and the screen and worked through the meshes of the latter. The action of the breakers can be nicely regulated by adjusting the stationary breaker so as to produce the desired breaking effect without injuring the fruit.

I claim as my invention—

1. The combination with the stationary frame and the screen supported in the same, of stationary breaker-pins projecting upwardly from the screen-surface, and a rotary breaker arranged above the screen and breaker-pins and provided with downwardly-projecting teeth which pass through the spaces between the breaker-pins, substantially as set forth.

2. The combination with the stationary frame and the screen supported in the same, of a rotary breaker arranged above the screen and a stationary breaker, composed of a bar which is arranged below the screen and pins or teeth projecting from said bar through the screen, substantially as set forth.

3. The combination with the stationary frame and the screen supported in the same, of a rotary breaker arranged above the screen and a stationary breaker arranged at the screen-surface and made adjustable toward and from the same to regulate the extent to which the stationary teeth or pins project beyond the screen, substantially as set forth.

4. The combination with the stationary frame and the screen supported in the same, of a rotary breaker arranged above the screen, a stationary breaker-bar arranged below the screen and having pins or teeth which project toward the screen, vertical guideways arranged on the frame and receiving the ends of said breaker-bars, and set-screws by which said bar is adjusted toward and from the screen, substantially as set forth.

5. The combination with the stationary frame provided with a horizontal screen and a cylindrical curb above the screen, of a rotary breaker arranged above the screen within said curb and secured to the lower end of a vertical shaft, a hopper arranged below the screen, a breaker-bar extending through said hopper below said screen and provided with pins or teeth projecting toward the screen, and adjusting devices connecting the ends of the breaker-bar with the stationary frame, substantially as set forth.

Witness my hand this 31st day of July, 1899.

GAIUS L. MERRELL.

Witnesses:

WM. B. GERE,  
M. D. CLARK.