(No Model.)

G. A. & C. F. FLEMING.

FRUIT GRADER.

No. 475,497. Patented May 24, 1892.

Fig. 1.

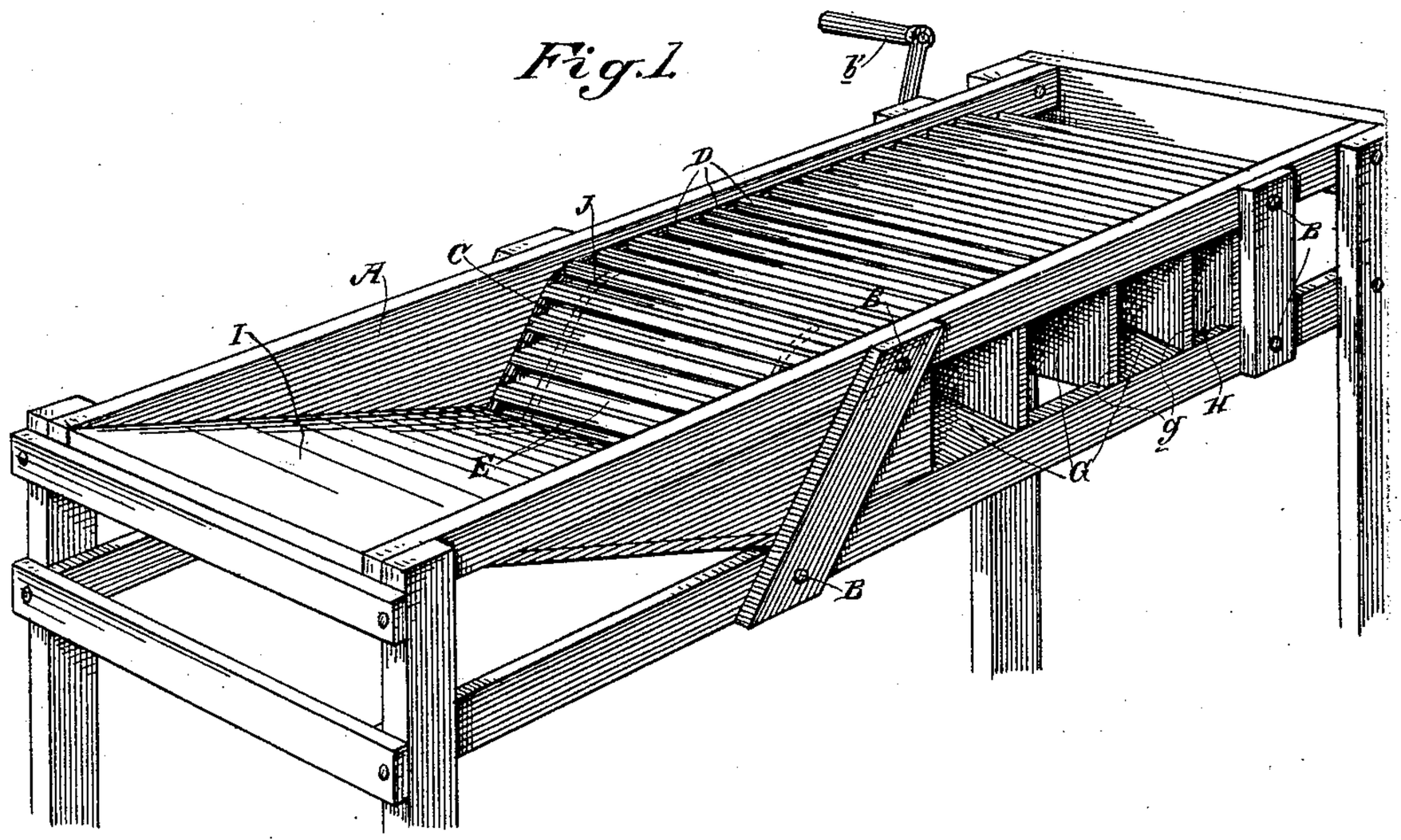


Fig. 2.

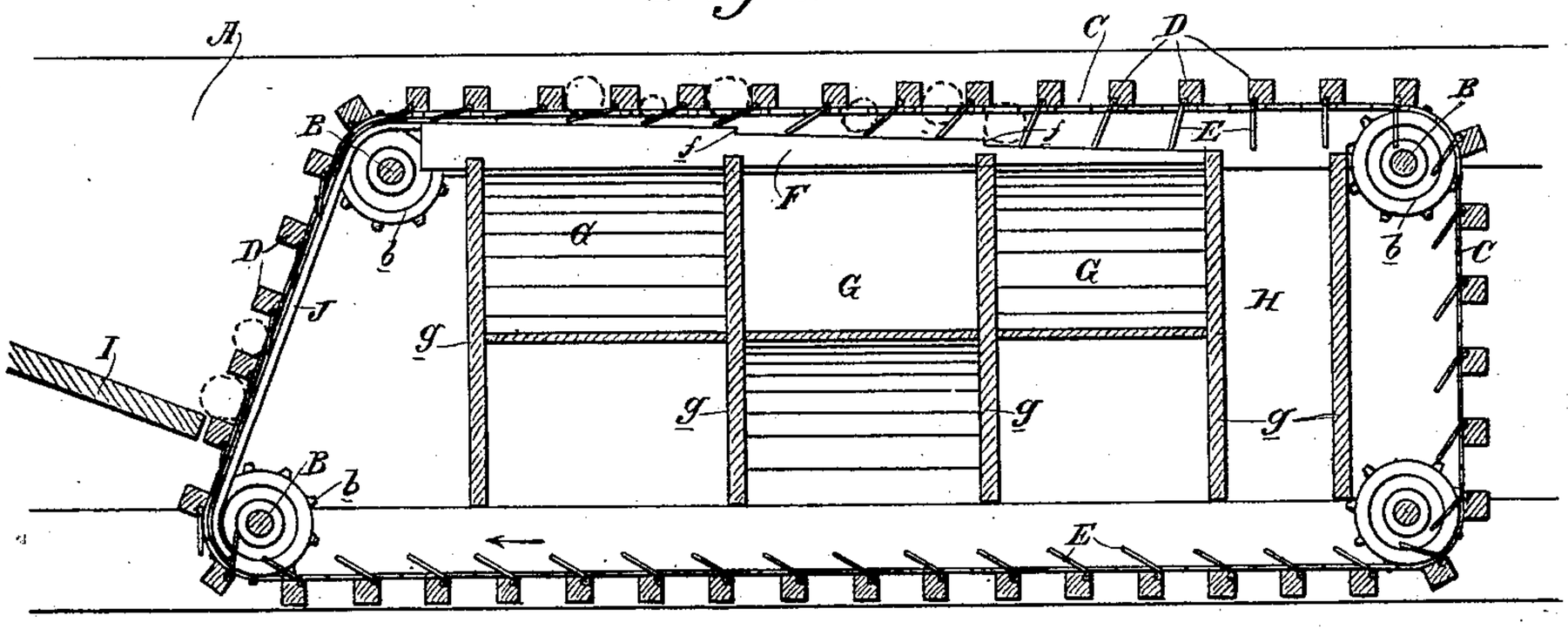


Fig. 3.

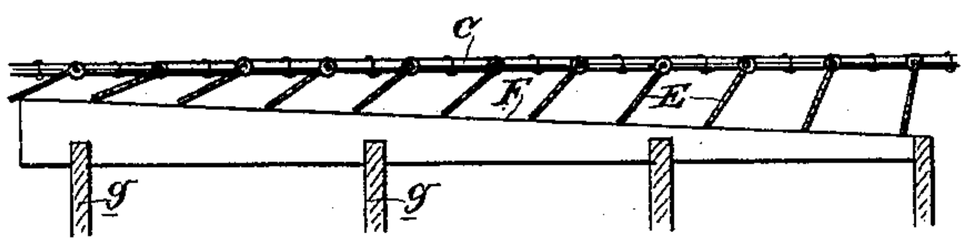
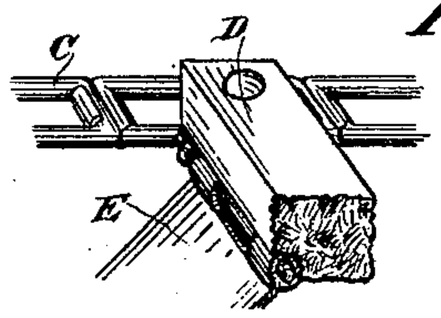


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE A. FLEMING AND CHARLES F. FLEMING, OF SAN JOSÉ, CALIFORNIA.

FRUIT-GRADER.

SPECIFICATION forming part of Letters Patent No. 475,497, dated May 24, 1892.

Application filed July 16, 1891. Serial No. 399,748. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. FLEMING and CHARLES F. FLEMING, citizens of the United States, residing at San José, Santa Clara county, State of California, have invented an Improvement in Fruit-Graders; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the class of grading-machines for fruit and other materials composed of particles or pieces of different sizes.

Our invention consists in the several details of construction and relative arrangement of parts, hereinafter fully described, and specifically pointed out in the claims.

The object of our invention is to provide a grader of great capacity, simple in operation, and accurate and effective in results.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a perspective view of our machine. Fig. 2 is a vertical longitudinal section of same. Fig. 3 is a detail showing a continuously-inclined guide F and the drop-flaps E hinged directly to the charms. Fig. 4 is a perspective detail and section of one of the charms, cross-bars, and flaps.

A is the frame of the machine. In this are mounted cross-shafts B, each carrying end sprocket-pulleys *b*. Over these pulleys pass endless chains C, one on each side, to which a travel in the direction of the arrow is given by suitable means, as by the crank *b'*. Extending transversely between and secured to these side chains are the cross-cleats D, to which are hinged the swinging drop-flaps E. The flaps are of sufficient width when horizontal to practically close the spaces between the cross-cleats, and they thus form with the chains and cleats a continuous traveling table.

To the sides of frame A are secured the guides F for the flaps. These may be continuously inclined, as shown in Fig. 3, or they may be graduated by shoulders or offsets, as shown in Fig. 2 at *f*, whereby a series of breaks are formed, each lower than the one preceding. These guides lie directly under the ends of the flaps, which travel over and in contact with them. The head or top end of the guides is high enough to hold the flaps up approximately horizontal; but as the flaps travel they are allowed to swing downwardly to increased distances, either gradually, as with the inclined guides, or abruptly, as with offset or shouldered guides. Thus the space between the lower edge of each drop-flap and the upper edge of the succeeding flap or of the succeeding cross-cleat is gradually widened as the flaps approach the tail end of the machine.

At proper intervals in the length of the machine under the traveling table and between the guides F are the several discharge-hoppers G, separated by partitions *g*, adjacent hoppers being preferably inclined in opposite directions. The final division H may be a straight chute to receive all the material which has failed to pass into the previous hoppers.

The forward sprocket-pulleys are arranged in such a manner that the chains and flaps may travel upwardly at an inclination the better to receive the fruit, which is supplied to the flaps by a feed-chute I.

The distance between the cross-cleats D is such that only one row of even the smallest fruit can be received from the feed-chute. Front guides J are located to hold the uprising flaps in position.

The flaps, as shown in Fig. 3, may be hinged directly to the side chains, dispensing with the cross-cleats; but we prefer to use the cleats as furnishing a better support for the fruit.

The operation of our grader is as follows: The fruit is placed upon the feed-chute I and by gravity runs down thereon to its lower end. Here it is deposited, one row at a time, upon each uprising flap, and said row is carried up thereby to the top. Where the cross-cleats D are used the fruit is held well between them. Now as the flaps travel over the inclined or graduated guides F they gradually or intermittently drop down to increasingly-lower positions or angles. When over the first hopper, they have dropped only enough to allow the smallest fruit to pass through the space between their lower edge and the upper edge of the succeeding one or of the succeeding cross-cleat. When over the second hopper, they have dropped enough farther to allow fruit of the size next larger to drop through, and so on throughout the machine.

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

1. In a fruit-grader, a traveling table upon which the fruit is carried, said table having a drop-bottom, and an underlying inclined or graduated guide upon which said bottom rests, whereby it may drop to different distances to discharge fruit of different sizes, substantially as herein described.

2. In a fruit-grader, a traveling table for carrying the fruit, consisting of the series of swinging drop-flaps forming the table-bottom, and means for separately controlling the drop of each flap to different angles to effect the discharge therefrom of different-sized fruit, substantially as herein described.

3. In a fruit-grader, a traveling table for carrying the fruit, consisting of a series of swinging drop-flaps forming the table-bottom and underlying inclined or graduated guides upon which said flaps rest and travel, whereby they are allowed to drop to different angles to discharge fruit of different sizes, substantially as herein described.

4. In a fruit-grader, the combination of endless traveling side chains, a series of parallel transverse drop-flaps carried by said chains and forming therewith a table for the reception and carrying of the fruit, and a means for controlling the drop of said flaps to different angles to discharge fruit of different sizes, substantially as herein described.

5. In a fruit-grader, the combination of endless traveling side chains, a series of parallel transverse drop-flaps carried by said chains and forming therewith a table for the reception and carrying of the fruit, and a means for controlling the drop of said flaps to different angles to discharge fruit of different sizes, consisting of inclined or graduated guides over and upon which the flaps travel and rest, substantially as herein described.

6. In a fruit-grader, the combination of endless traveling side chains, a series of parallel cross-cleats secured to said chains, a series of parallel transverse drop-flaps hinged to the cross-cleats and adapted to receive and carry the fruit, and means for controlling the drop of said flaps to different angles to discharge fruit of different sizes, substantially as herein described.

7. In a fruit-grader, the combination of the endless traveling side chains, the series of drop-flaps carried thereby, the inclined or graduated guides over and upon which said flaps travel and rest, and the underlying series of hoppers, substantially as herein described.

8. A fruit-grader consisting of the frame, the endless traveling side chains mounted therein, the series of drop-flaps carried by the chains, the front guides for holding the uprising flaps in position, the feed-chute for supplying the fruit to the flaps, the inclined or graduated guides over and upon which the flaps travel and rest, and the underlying hoppers, substantially as herein described.

In witness whereof we have hereunto set our hands.

GEORGE A. FLEMING.
CHARLES F. FLEMING.

Witnesses:
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