(No Model.) 2 Sheets—Sheet 1.

T. W. MOORE.

ORANGE GRADER.

No. 395,793. Patented Jan. 8, 1889.

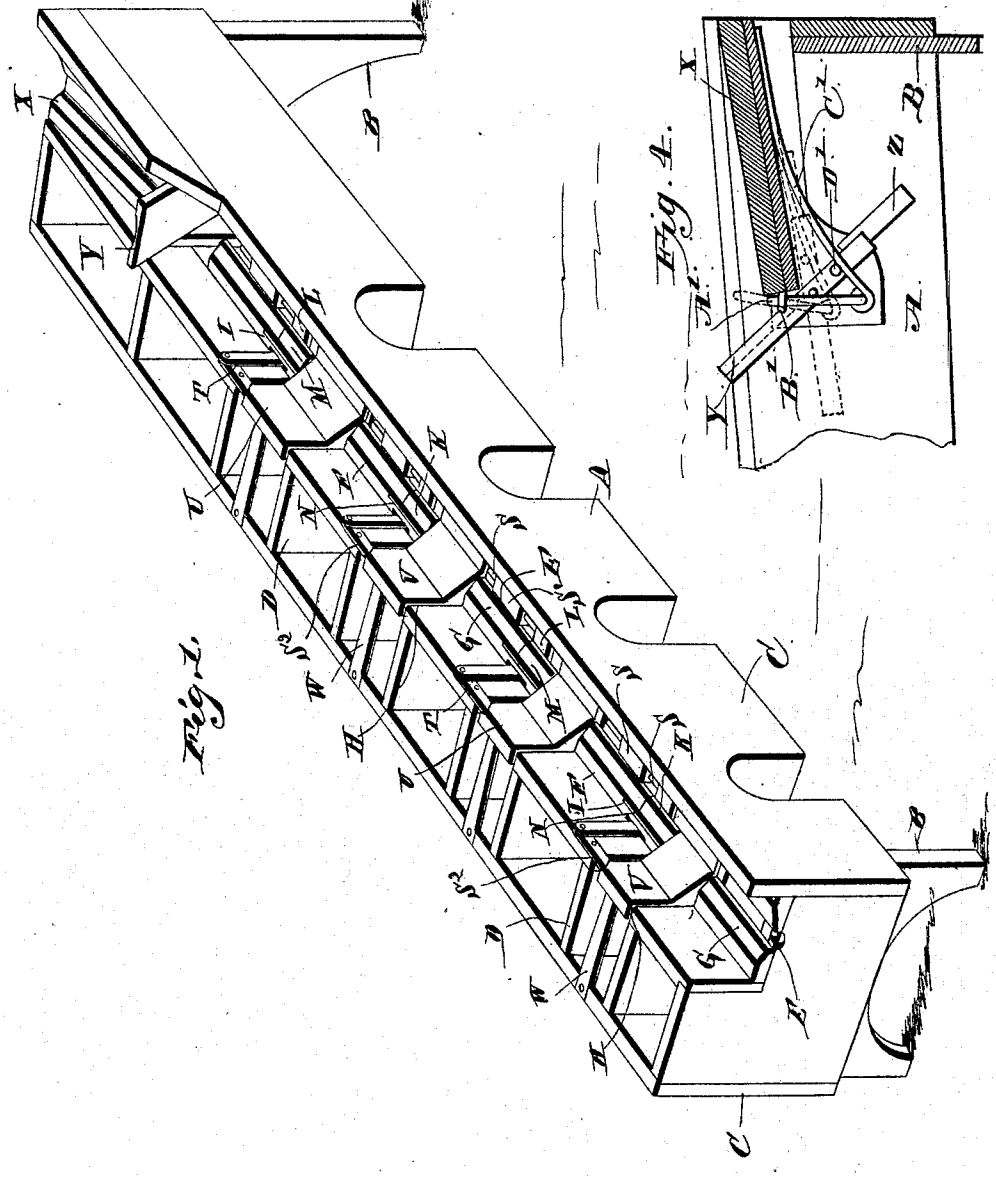


Fig. 1.

Fig. 4.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

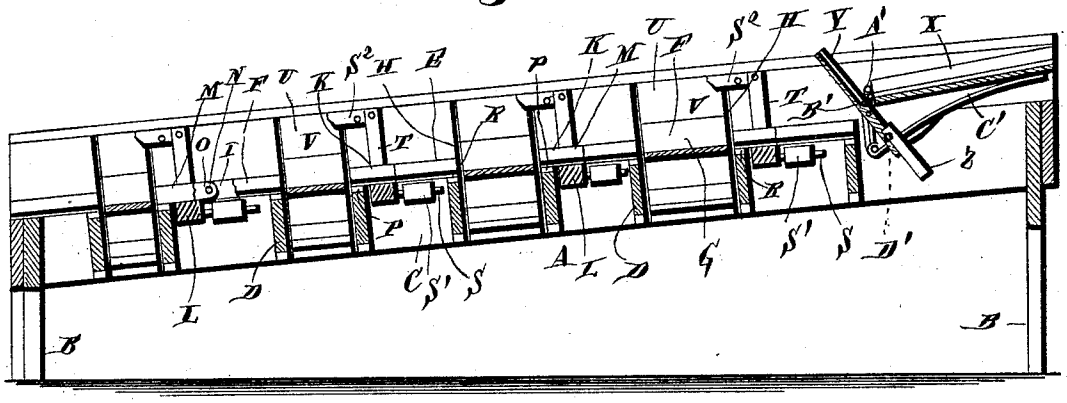
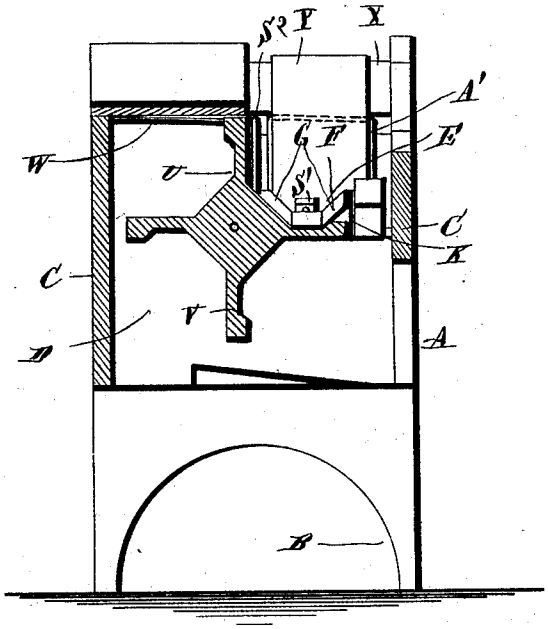


Fig. 3.



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UNITED STATES PATENT OFFICE.

THEOPHILUS WILSON MOORE, OF FRUIT COVE, FLORIDA.

ORANGE-GRADER.

SPECIFICATION forming part of Letters Patent No. 395,793, dated January 8, 1889.

Application filed May 31, 1888. Serial No. 275,666. (No model.)

To all whom it may concern:

Be it known that I, THEOPHILUS WILSON MOORE, a citizen of the United States, residing at Fruit Cove, in the county of St. John's and State of Florida, have invented a new and useful Improvement in Orange-Graders, of which the following is a specification.

My invention relates to an improvement in orange-graders; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

Oranges, as is well known, are oblate spheroidal in shape, and it is desirable in packing them in crates for transportation to assort the oranges into sizes of approximately the same mean diameter, so that the oranges may be compactly arranged in the crates and the latter filled to their maximum density.

The object of my invention is to provide a machine which is adapted to assort oranges into sizes of nearly the same mean diameter; and this object is accomplished by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of an orange-assorting machine embodying my improvements. Fig. 2 is a vertical longitudinal sectional view. Fig. 3 is a vertical transverse sectional view. Fig. 4 is an enlarged detailed sectional view.

A represents an inclined plane, which has supporting-legs B at its ends. Said frame comprises the sides C, connected together by a series of transverse partitions, D, which are arranged at right angles to the sides. One side C has its upper edge partly cut away, and is thereby lowered. In one side of the frame, at a suitable distance below the upper edge thereof, is arranged an inclined trough, E, the bottom of which is formed by the series of slats F, which are supported on the upper edges of the partitions D, and are arranged at suitable distances apart. The opposing edges of the said slats F are beveled upwardly, as at G. The said slats F connect the partition-plates D in pairs, thereby leaving openings H between the said sections of the slats. In the lower end of each slat F is a vertical longitudinal recess, I.

K represents a series of traps or tumblers, each of which comprises a cross-bar, L, and side bars, M, which are secured to the ends thereof. On the outer side of each of the side bars, M, is secured a plate, N, which projects beyond the upper end thereof and is arranged in a vertical slit at the lower end of the proximate bar F, and is pivoted to the said bar by a pin, O. The lower partition-plate of each pair has a concave recess, P, in its upper edge between the bars F, and the upper partition-plate of each pair has a recess, R, in its upper edge. The function of the said recesses is to enable the oranges to clear the upper sides of the partitions as they roll down the inclined trough. From the upper side of each cross-bar L projects an arm, S, having an adjustable weight, S′, the function of which is to counterbalance the trap to which it is attached, so as to raise the latter to the level of the bottom of the inclined trough. The weights S′ are adjusted on the arms S, so as to exert varying degrees of pressure on the traps, and thereby adapt the latter to support oranges of different weights.

The openings H, which are formed between the connected pairs of the partitions D, are of varying sizes, the smallest being nearest the lower end of the inclined trough, and said openings increasing in width as they approach the upper end of the trough. To the inner side of the inclined trough, near the upper edge thereof, is pivoted a series of stops or detents, S^2, which are each connected to one of the traps by means of a link, T, the lower ends of the said stops or detents projecting rearwardly over the spaces H, between the partitions D.

U represents a series of revoluble gates, which are journaled axially in the openings H on the inner side of the trough, the said revoluble gates being each provided with a series of radial blades or arms, V, which are grooved on one side to correspond with the groove or channel formed in the bottom of the inclined trough. On one side of the frame or casing is attached a series of spring-detents, W, the free ends of which bear against the inner sides of the arms or blades of the revoluble gates, so as to keep the same in engagement with the stops or detents S^2, and thereby hold one of the arms or blades of each gate in the same plane with the bottom of the inclined trough, so that the gates form por-

tions of the said trough, as will be readily understood.

At the upper end of the inclined trough is arranged an inclined chute, X, the bottom of which is grooved to correspond with the bottom of the trough, the said chute being arranged in a higher plane than the said trough. At the lower end of the said inclined chute is pivoted a rocking gate, Y, which has one end extended and provided with a counterbalancing-weight, Z, the function of which is to normally turn the rocking gate upward to an inclined position.

A′ represents an inverted-U-shaped cut-off yoke, which is also arranged transversely at the lower end of the chute and has its vertical arms arranged in suitable loops or guides, B′. The lower ends of the said arms are connected to the free end of spring-arms C′, which are arranged under the bottom of the chute, and said spring-arms are engaged by tappet-pins D′, which project from the weight end of the rocking gate at opposite sides of the same.

From the foregoing description it follows that when the rocking gate is in its normally upwardly-inclined position at the upper end of the chute the cut-off yoke is lowered below the level of the bottom of the chute.

The operation of my invention is as follows: A number of oranges are placed on the chute and are fed thereto continuously. As each orange in succession rolls down the chute it strikes against the rocking gate Y, thereby lowering the same, and automatically releases the springs, which raise the yoke A′, so as to stop the next succeeding orange. As the gate lowers, the orange thereon drops onto the inclined trough and starts to roll down the same. If the orange is sufficiently heavy, it depresses the first trap, K, which it passes, thereby lowering the said trap so as to cause the link T to raise its detent or stop S, and thereby disengage its companion revoluble gate, so that when the orange runs over the said gate the latter is caused to rotate partly by the weight of the orange, the latter being thereby dropped through the opening H, in which the gate is arranged, into a suitable receptacle. The gate turns by the weight of the orange through a portion of its revolution sufficiently far to cause the next succeeding arm or blade thereof to come into contact with the stop or detent S^2, which immediately resumes its normal position when the orange passes from its trap. The function of the spring-arms W is to prevent retrograde rotation of the revoluble traps.

Inasmuch as the traps are adapted to sustain oranges of different weights, it follows that each orange passes over the more heavily-weighted traps until it reaches its weight, and thereby the oranges are assorted by weight, and it is found that this method of assorting them by weight also assorts them by their mean diameters.

Having thus described my invention, I claim—

1. The combination of the frame having the inclined trough provided with the openings H of varying sizes, the revoluble gates arranged in the said openings, the detents or stops to engage the gates, and the weighted traps arranged in the bottom of the trough and connected to and adapted to operate the detents, substantially as described.

2. The combination of the inclined trough having the beveled groove in its bottom, the weighted traps pivoted in said bottom forming a portion thereof and communicating with the groove, and the revoluble gates arranged in openings in the bottom of the trough, the detents engaging the gates, and the links connecting said detents with the traps, substantially as described.

3. The combination of the inclined trough having the openings of varying sizes, the revoluble gates arranged in said openings, the detents engaging the gates and the counterbalanced traps in the bottom of the trough connected to the said detents, substantially as described.

4. The combination of the inclined trough having the openings H, the revoluble gates arranged in said openings, the traps in the bottom of the trough having the detents connected thereto to engage the gates, and the arms or springs W, engaging the rear sides of the vertical wings of the gates, substantially as described.

5. The combination, with the inclined chute, of the pivoted gate Y, having the counterbalancing-weight Z, the yoke A′, arranged transversely at the lower end of the chute and having the vertical arms, guiding-loops B′ for the said arms, the spring-arms C′, having their free ends connected to the lower ends of the yoke-arms, and arranged under the bottom of the chute, and the tappet-pins D′, secured to the gate and engaging the spring-arms, for the purpose set forth, substantially as described.

6. The combination of the inclined chute, the gate at the lower end thereof, adapted to tilt or incline, and the stop or yoke guided in suitable ways and connected to the gate, for the purpose set forth, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

THEOPHILUS WILSON MOORE.

Witnesses:
KATY HOOVER,
T. V. MOORE.