No. 620,045. Patented Feb. 21, 1899.

W. MORLEY & A. M. PATRICK.

FRUIT GRADER.

(No Model.) (Application filed Jan. 29, 1898.) 2 Sheets—Sheet 1.

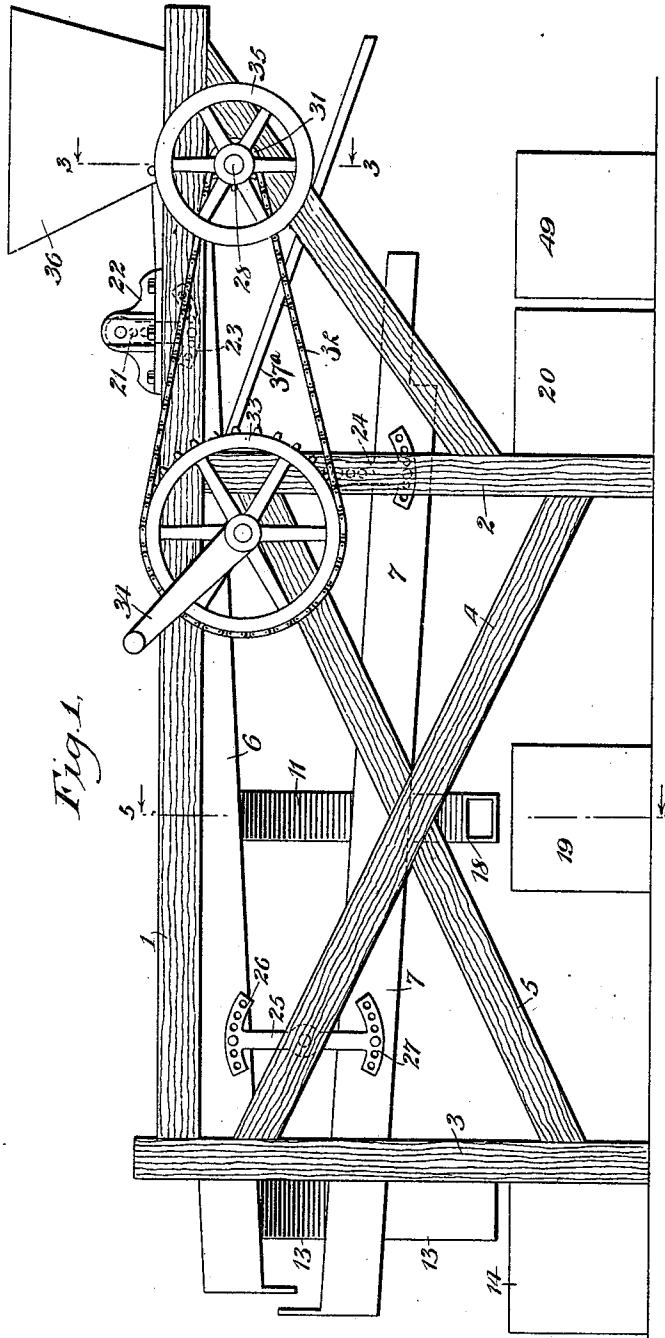


Fig. 1.

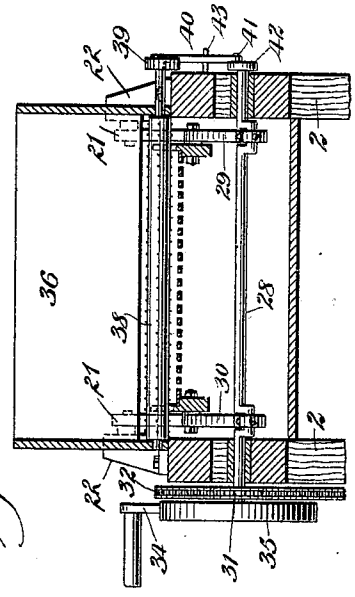


Fig. 3.

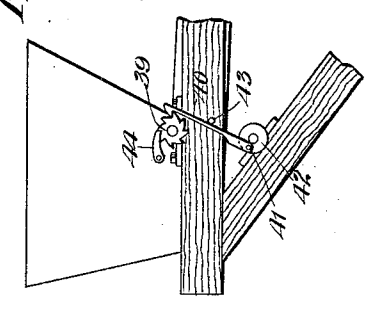


Fig. 2.

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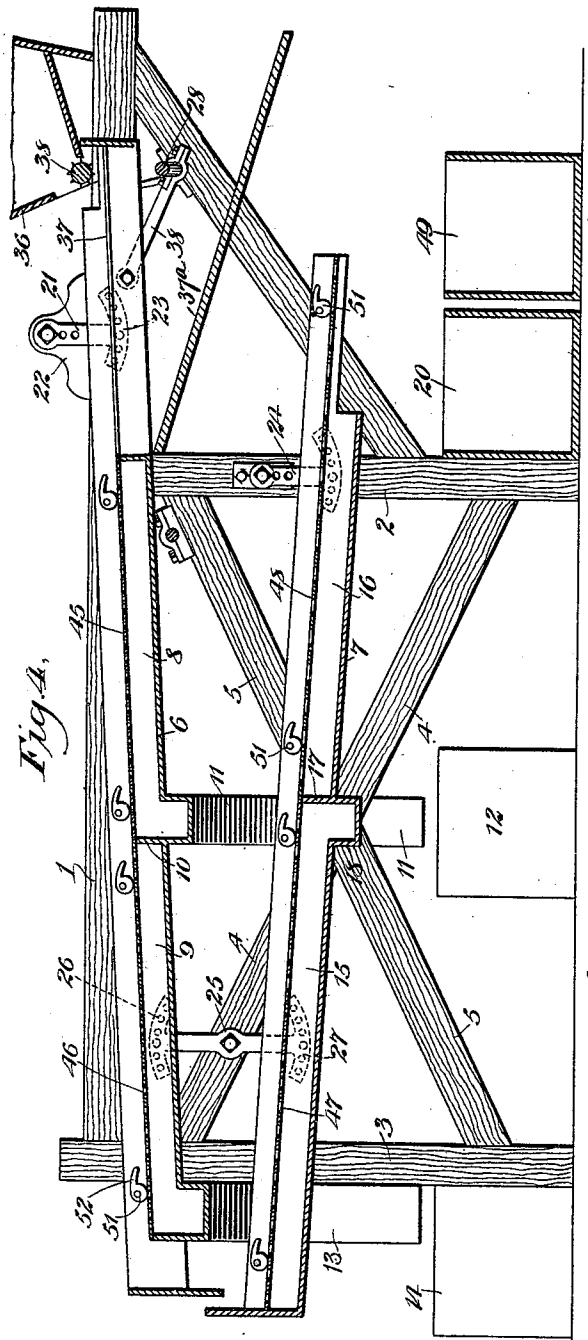


Fig. 4.

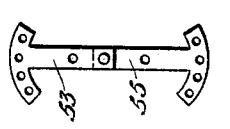


Fig. 7.

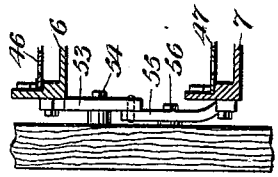


Fig. 6.

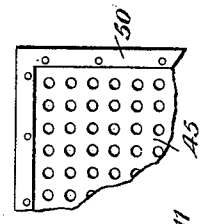


Fig. 8.

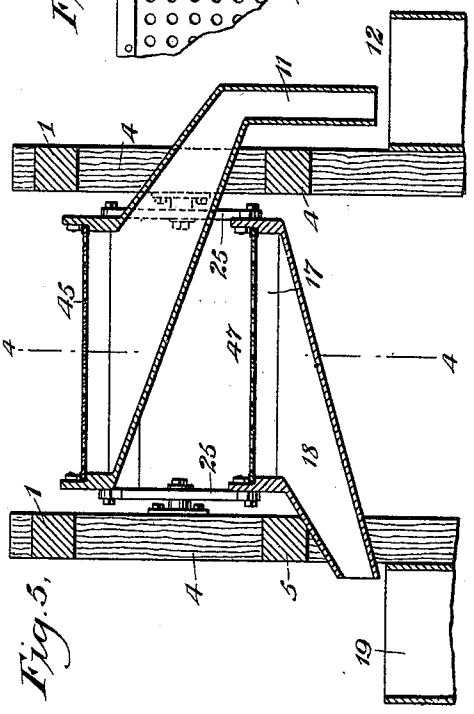


Fig. 5.

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UNITED STATES PATENT OFFICE.

WALTER MORLEY AND ALBERT M. PATRICK, OF SALEM, OREGON; SAID PATRICK ASSIGNOR TO SAID MORLEY.

FRUIT-GRADER.

SPECIFICATION forming part of Letters Patent No. 620,045, dated February 21, 1899.

Application filed January 29, 1898. Serial No. 668,468. (No model.)

To all whom it may concern:

Be it known that we, WALTER MORLEY and ALBERT M. PATRICK, of Salem, in the county of Marion and State of Oregon, have invented a new and Improved Fruit-Grader, of which the following is a full, clear, and exact description.

This invention relates to machines for grading or selecting fruit according to its size; and the object is to provide within a comparatively short space a considerable length of screening devices, and, further, to provide a simple means whereby the screens arranged one above another may be given both a vertical and longitudinal reciprocating movement.

We will describe a fruit-grader embodying our invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a fruit-grader embodying our invention. Fig. 2 is a side elevation of a portion of the machine, showing a means for operating a feed-roller employed. Fig. 3 is a section through the line 3 3 of Fig. 1. Fig. 4 is a vertical section on the line 4 4 of Fig. 5. Fig. 5 is a section on the line 5 5 of Fig. 1. Fig. 6 is a detail view showing a modified form of link connections that may be employed for imparting motion to the screen-frames. Fig. 7 is a front view of such modified links, and Fig. 8 is a plan view of a portion of a screen employed.

The machine comprises a frame having the top rails 1 and the front and rear end supporting legs 2 3, the two legs of a side being braced by cross-braces 4 5. Arranged in the frame are inclined screen-trays 6 and 7, arranged one above the other and inclined in opposite directions, the upper one being inclined downward from the feed end of the machine and adapted to discharge at its lower end into the upper end of the lower screen-tray. While we have shown but two screen-trays, it is obvious that a greater number may be employed without departing from the spirit of our invention.

The upper tray 6 is divided into two sections 8 and 9 by means of a partition 10, and from the lower end of the section 8 a discharge-spout 11 extends laterally outward and at a downward angle. This spout 11 is designed to discharge fruit into a receiver 12. The lower end of the section 9 is provided with a similar spout 13, designed to discharge fruit into a receiver 14. The lower screen-tray 7 is also divided into two sections 15 and 16 by the partition 17, and at the lower end of the section 15 is a spout 18 discharging into a receptacle 19, and the lower end of the section 16 discharges directly onto a receiver 20.

At the feed end of the machine the tray 6 is supported by links 21, pivoted at their upper ends to blocks 22 on the top rails, and these links have eccentric plates 23 on their lower ends, these eccentric plates being provided with perforations, through either one of which bolts may pass into engagement with the tray. By making these plates eccentric to the pivotal point of the links 21 the vertical movement of the trays may be regulated by shifting the links, so that the bolt connection between the links and the tray will be nearer to or farther from the pivotal point of the links. The shank portions of the link 21 are also provided with a series of perforations, through either one of which the pivot-bolt may pass, thus providing for regulating the longitudinal movement of the tray.

The tray 7 is supported at the feed end of the machine by links 24, similar in all respects to the links 21, these links 24 being pivoted to the legs 2. The tray 6 at its lower end and the tray 7 at its upper end are supported by links 25, pivoted on the braces 4. These links 25 have arms extended upward and arms extended downward. The upwardly-extended arms have segmental plates 26, eccentric to the pivotal point of the links, the plates being provided with perforations, through which the pivot-bolts may pass into the tray, and the downwardly-extended arms are provided with segmental plates 27, similar to the plates 26 and designed to be engaged with the tray 7. By this construction of the links 25 it is obvious that the trays 6 and 7 will be moved alternately in opposite directions.

As a means for imparting motion to the

trays we employ a crank-shaft 28, from the cranks of which links 29 30 extend to a pivotal connection with the tray 6, here shown as near its upper end. From a sprocket 31 on the outer end of the crank-shaft 28 a chain 32 extends to a drive-sprocket 33, mounted on the frame of the machine and having a crank 34, whereby the machine may be driven manually; but obviously it may be driven by a suitable motor, if desired. A fly-wheel 35 is mounted on the crank-shaft, and obviously by rotating the crank-shaft by the mechanism described a longitudinal and vertical swinging motion will be imparted to the upper tray 6, and this upper tray will impart a similar motion to the lower tray 7 through the medium of the links 25.

A hopper 36 is mounted on the frame of the machine and is designed to discharge into the upper end of the tray 6, or, rather, upon a grating 37, supported above the bottom of the tray. This grating 37 is designed to separate dirt, leaves, loose stems, &c., that may be mingled with the fruit and discharge the same on an inclined board 37^a.

Extended across the outlet of the hopper 36 is a feed-roller 38, having a series of radial pin-points that will cause the fruit to feed should it become packed in the outlet, as is liable to happen with fruit that may be slightly damp or wet. It may be here stated that this machine is designed particularly for grading dried fruit—such, for instance, as prunes; but it may be employed for green fruit as well, although in such case the feed-roller 38 should be omitted.

On the outer end of one of the journals of the feed-roller 38 is a ratchet-wheel 39, the teeth of which are alternately engaged by the hook end of a pawl 40, connecting at its lower end with a wrist-pin 41 on a disk 42, attached to the crank-shaft 28. Obviously as the crank-shaft rotates the pawl 40 will be moved up and down, and on its downward movement it will impart a step-by-step rotary movement to the feed-roller 38, and, further, as the pawl engages the front side of the ratchet-wheel 39 it is immaterial as to the direction in which the crank-shaft may be rotated, as the feed-roller will rotate in the desired direction. The pawl 40 of course moves somewhat in the arc of a circle, and to guide it we employ a pin 43, extended outward from the front of the machine and against which the pawl slides. The feed-roller is prevented from backward rotation by means of a dog 44, pivoted on the hopper 36 and engaging the ratchet-wheel 39.

Arranged above the floor of the section 8 of the tray 6 is a screen 45, and arranged above the section 9 of said tray is a screen 46. Arranged above the section 15 of the tray 7 is a screen 47, and arranged above the section 16 of said tray is a screen 48. These screens are of successively larger mesh—that is, the screen 45 is of small mesh, being nearest the feed end of the machine, the screen 46 is of somewhat larger mesh than the screen 45, the screen 47 is of somewhat larger mesh than the screen 46, and the screen 48 is of larger mesh than the screen 47.

It will be seen that the screen 48 extends beyond the outlet of the section 16 in the tray 7, so that fruit too large to fall through the mesh of the screen 48 and drop into the receiver 20 will discharge over the end of said screen into a receiver 49. It will also be seen that fruit too large to pass through the mesh of the screen 46 will discharge over the end thereof into the screen 47. These several screens are removably placed in the trays, so that they may be easily taken out for the purpose of cleaning or otherwise.

The screens may be made of woven wire, if desired; but we preferably employ perforated sheets of metal the edges of which will be secured in a thin metal frame 50. This frame will give the necessary rigidity to the screens. The side portions of the screen-frame rest upon shoulders formed on the inner side of the side portions of the trays, as plainly indicated in Fig. 5, and they are held rigidly in place by means of cam-blocks 51, pivoted to the inner sides of the trays and having finger-pieces 52, by taking hold of which the cams may be easily operated.

As before described, the links 25 will cause the two trays to move in opposite directions one relatively to the other. In Fig. 6 we have shown a substitute for the links 25, whereby the two trays will be caused to move together in the same direction. This means consists of a link 53, connected to the upper tray and mounted on a pivot 54, and a link 55, mounted on a pivot 56 and connected to the lower tray. These links 53 and 55 are pivoted together at their meeting ends, and obviously as the upper tray moves forward the link 53 at its lower end will move rearward, carrying the upper end of the link 55, so that the lower end of said link carrying the lower tray will move forward.

In operation the fruit to be sorted or graded is placed in the hopper 36, and by turning the wheel 33 motion will be imparted to the trays and also to the feed-roller 38. The feed-roller 38 will force the fruit onto the grate 37, and the shaking motion will cause the dirt, loose leaves, stems, &c., to fall through between the grate-bars. The fruit will then run over the screen 45 and the smaller portions will fall through said screen to the floor of the tray and then fall through the spout 11 to the receiver 12. The fruit too large to pass through the mesh of the screen 45 will pass onto the screen 46 and a portion will fall through said screen and discharge through the spout into the receiver 14. The fruit too large to pass through the mesh of the screen 46 will run over the end thereof and fall upon the screen 47. A portion will fall through this screen and discharge through the spout 18 into the receiver 19. The fruit too large to pass through the mesh of the screen 47 will

pass onto the screen 48 and a portion will fall through the mesh thereof and discharge through the open end of the tray into the receiver 20, and the fruit too large to pass through the mesh of the screen 48 will run over the end thereof into the receiver 49.

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

1. A fruit-grading machine, comprising a frame, an inclined screen-tray in said frame, pivoted links for supporting the upper ends of said tray, the said pivoted links being provided with a number of holes to receive pivot-bolts, and having segmental plates at their lower ends eccentric to the pivotal point of the links, and provided with holes, pins on the tray for engaging in the holes, means for imparting longitudinal reciprocating motion to the tray, and grading-screens in said tray, substantially as specified.

2. In a fruit-grading machine, a frame, screen-carrying trays in said frame, one above another, links connecting an upper with a lower tray near one end, the said links being pivoted at the center and having segment-plates at the end eccentric to the pivotal point, the said segment-plates being provided with holes for the passage of pivot-bolts, substantially as specified.

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Witnesses:
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