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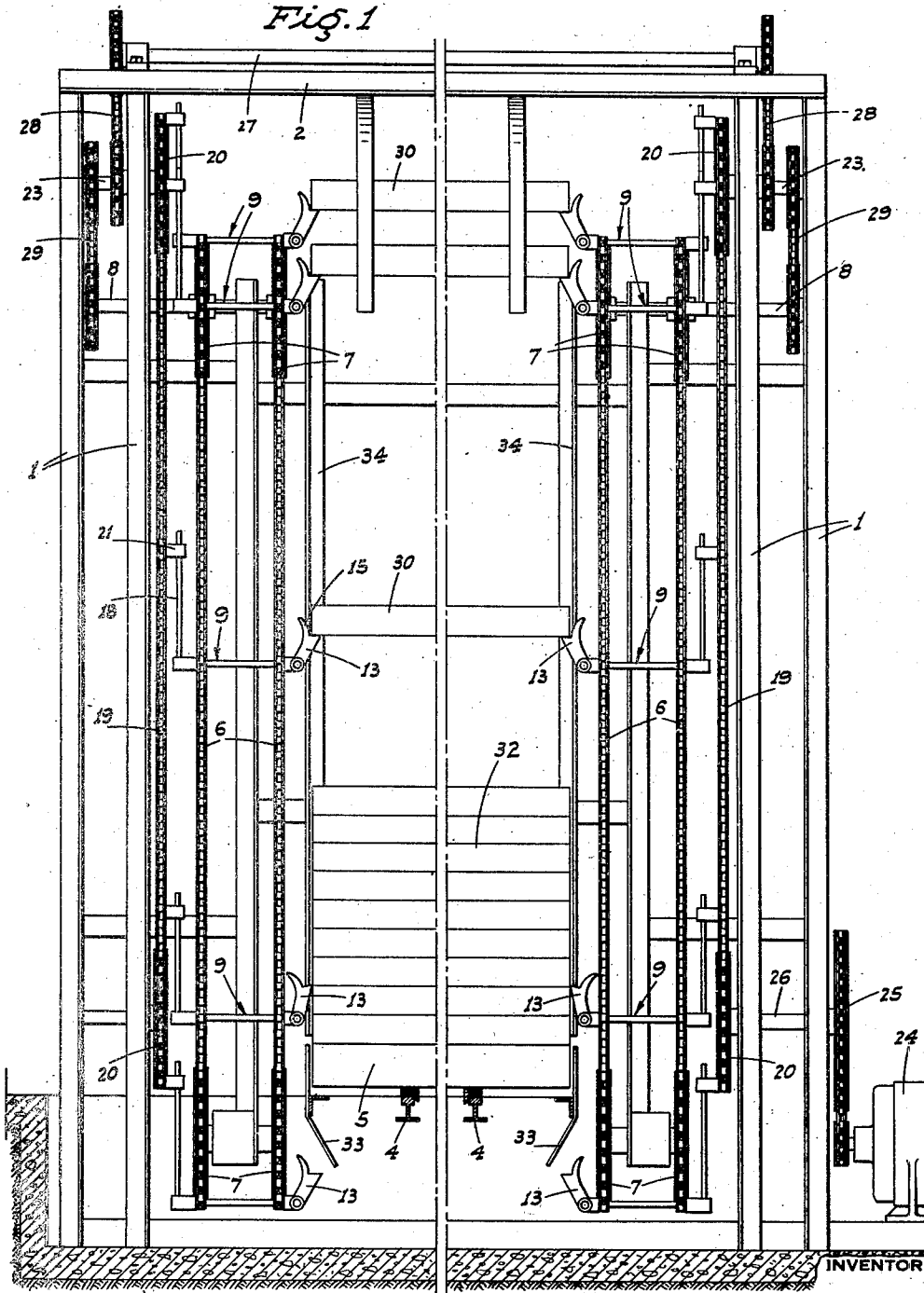
2,407,782

TRAY STACKER

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3 Sheets-Sheet 1

Fig. 1



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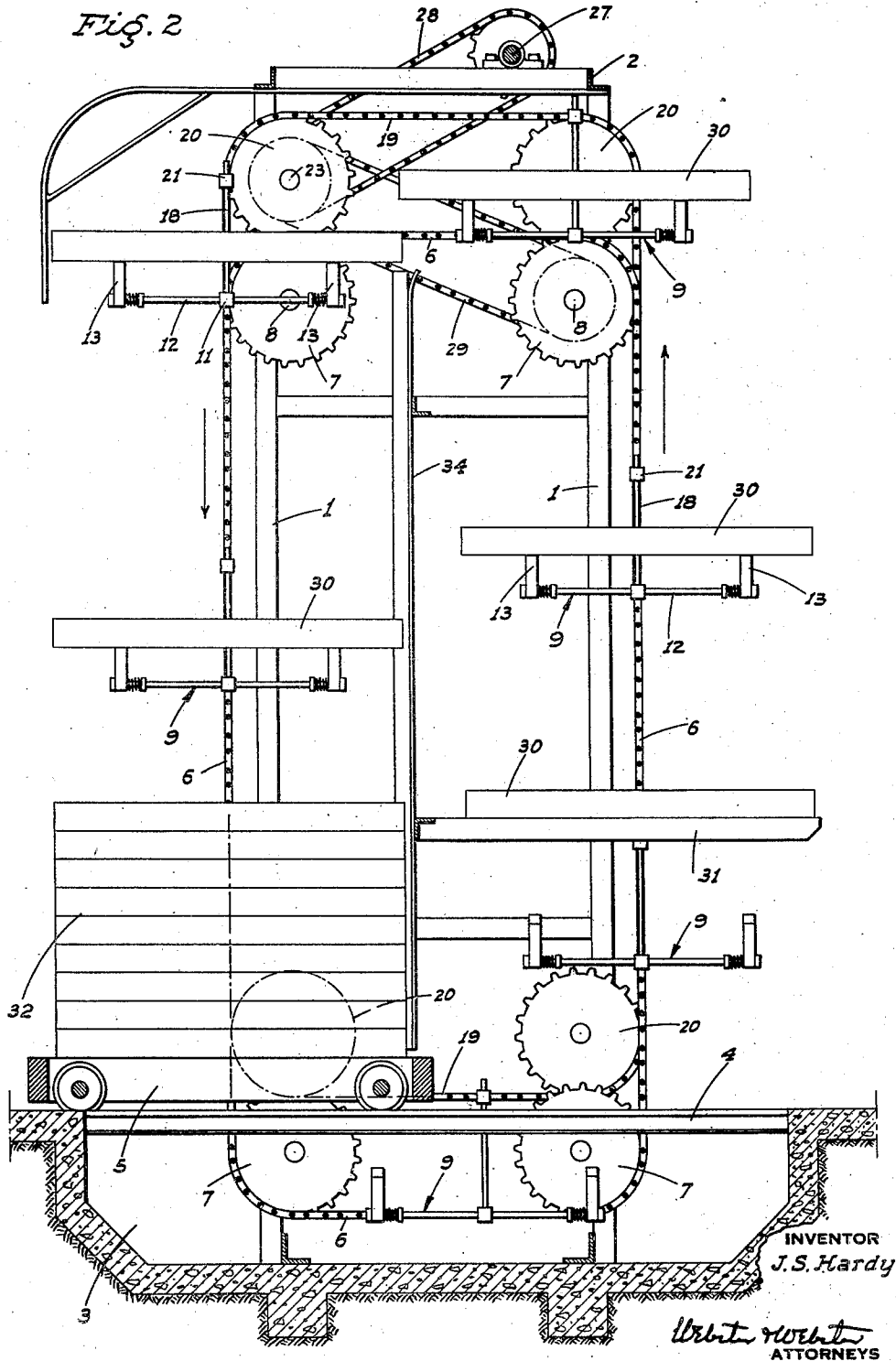
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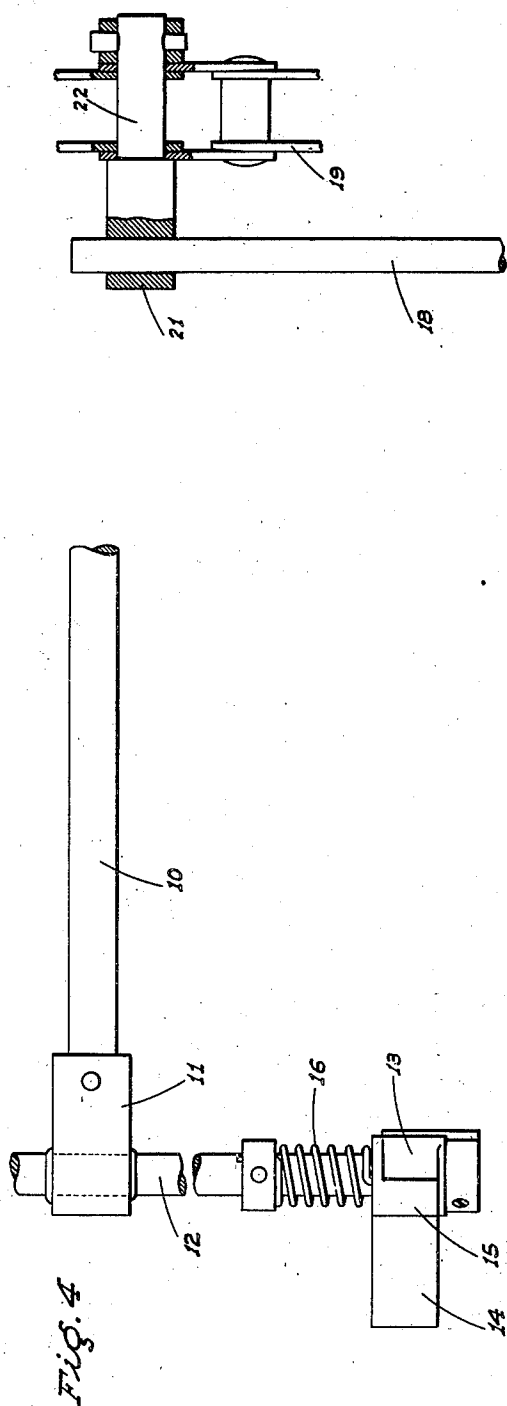
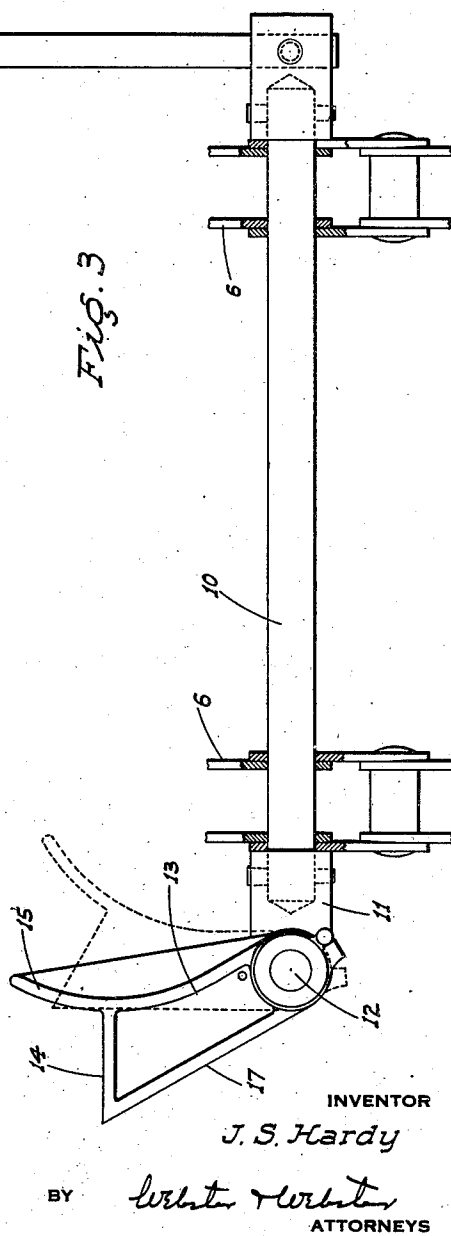
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3 Sheets-Sheet 3



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TRAY STACKER

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Application May 19, 1944, Serial No. 536,337

1 Claim. (Cl. 214—6)

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This invention is directed to, and it is an object to provide, a novel power actuated tray stacker; the invention being especially designed to receive fruit or vegetable drying trays at a predetermined convenient point, to elevate and advance the trays while maintaining the same horizontal, and then, while continuing to hold the trays horizontal, to lower them onto a dehydrator truck or the like in a symmetrical stack.

An additional object of this invention is to provide a tray stacker, as above, which includes a pair of vertically mounted endless conveyors disposed in transversely spaced facing relation and on the runs of which conveyors tray-supporting units, for conveying and depositing the trays, are turnably attached in spaced, matching position; the matching tray supporting units on corresponding runs of the conveyors being adapted to engage under opposite ends of a tray, and means cooperating with said units to rotatably control the same whereby to maintain the trays horizontal through their entire path of movement.

A further object of the invention is to produce a simple and inexpensive device, and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claim.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is an end elevation, foreshortened, of the tray stacker viewed from the outlet end.

Figure 2 is a sectional elevation of the tray stacker.

Figure 3 is an enlarged fragmentary end view of one of the tray supporting units and its control mechanism.

Figure 4 is a fragmentary plan view of one of the tray supporting units and its control mechanism.

Referring now more particularly to the characters of reference on the drawings, the improved tray stacker comprises an upstanding skeleton frame of substantial height which includes, adjacent the corners thereof, vertical posts 1 connected at their upper ends by top beams 2. This frame is preferably supported at its lower end in a pit 3. Transversely spaced truck supporting rails 4 extend across the pit centrally between the sides of the frame and said rails may be extended directly from the tray stacker to a

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dehydrator. For the purpose of receiving loaded drying trays, a truck 5 is supported on rails 4 in the position shown in Fig. 2.

The tray stacking mechanism is supported in the above frame and comprises, on each side of the rails 4 and path of truck 5, a pair of vertically disposed, transversely spaced endless chains 6 which extend at their upper and lower ends about longitudinally spaced, horizontally aligned sprockets 7 whereby the side runs of said chains are vertical and the end runs horizontal, as shown. The endless chains 6 are supported at opposite ends by shafts suitably journaled in the frame, the uppermost shafts being indicated at 8, and comprising the means by which the chains 6 are driven at equal and constant speed.

Each pair of the endless chains 6 is provided, at equally spaced points along the length thereof, with tray supporting and conveying units, indicated generally at 9; the units of the respective pairs of chains 6 being disposed in alignment whereby said units travel in cooperative tray supporting relation to each other.

The units 9 are each of identical construction, and therefore a description of one will suffice. Each tray supporting unit comprises a shaft 10 extending between and turnably mounted in connection with the endless chains 6, which together form a conveyor for the tray supporting units and trays thereon. The shaft 10 of each unit is disposed parallel to the conveyor axis and projects at the ends beyond the corresponding chain. At its inner end the shaft 10 is provided with a fixed head 11 which carries an elongated cross member 12; the head 11 being disposed centrally between the ends of said cross member. Adjacent its ends the cross member supports pivotally mounted, laterally swingable shoes 13 which include upwardly facing shoulders 14 which extend laterally inwardly from back stops 15. The shoes 13 are normally urged laterally inwardly to the position shown in full lines in Fig. 3 by means of a torsion spring 16; such shoes being yieldable outwardly, however, to the position shown in dotted lines in Fig. 3. Below the shoulder 14 each shoe includes an outwardly and downwardly diverging face 17.

The shafts 10 of the tray-supporting units 9 are turnably controlled, by the following mechanism, in order to maintain the cross members 12, together with supported trays, horizontal at all times during movement of said trays between a loading position and stacked position, as hereinafter described:

This mechanism comprises, for each tray sup-

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porting unit, a radial control rod 18 fixed on and extending upwardly from the outer end of the corresponding shaft 10. Laterally out from each pair of endless chains 6 the device includes another endless, vertically disposed chain 19 supported at its upper and lower ends by longitudinally spaced, horizontally aligned sprockets 20; the spacing of the sprockets horizontally being exactly the same as the spacing of the sprockets 7, whereby the vertical runs of chains 6 and 19 are aligned. However, the sprockets 20 are offset upwardly relative to the sprockets 7 a distance approximately the length of the control rods 18. Thus, while the upper and horizontal runs of the chains 19 are parallel to corresponding runs of the chains 6, they are nevertheless spaced vertically thereabove.

The control rods 18 adjacent their upper ends slidably engage through blocks 21 carried on turnable cross pins 22 attached to the adjacent and corresponding chain 19. The supporting sprockets 20 for the chains 19 are carried on frame mounted shafts, the uppermost ones of which are indicated at 23; the chains 19 being driven in the same direction and at the same speed as the chains 6.

Thus, when the tray supporting units are in the vertical runs of the chains 6, the control rods 18 are likewise vertical, holding said units and supported trays in horizontal position. As the tray supporting units pass with the chains 6 about the sprockets 7 at either end of the device said units, together with the supported trays, are still maintained horizontal, for the reason that the control rods 18 are maintained vertical due to the vertical offsetting of endless chains 19 relative to chains 6. This produces the desired relative rotation of the shafts 10 as the chains 6 pass from the vertical runs to the horizontal end runs thereof.

The means for driving the chains 6 and 19 at a constant and equal speed comprises an electric motor 24 connected by a chain drive 25 with the lowermost shaft 26 of one of the sprockets 20. The shafts 23 for the uppermost sprockets 20 are connected in driving relation by means of a countershaft 27 at the top of the frame and endless chains 28 on opposite ends of said countershaft. In addition, shafts 8 of the uppermost sprockets 7 are driven from corresponding shafts 23 by means of other endless chains 29.

In use of the above described tray stacker, the truck 5 is disposed between the downwardly moving runs of adjacent chains 6 and with said runs in a vertical plane centrally between the end of said truck. Trays 30 are then manually placed, one at a time, on a supporting bed 31 which is disposed horizontally between the upwardly moving runs of said adjacent chains 6; the bed being formed so that the upwardly moving shoes 13 of each tray supporting unit clear said bed.

As the tray supporting units 9 move upwardly the spaced shoes 13 of corresponding ones of said units 9 engage beneath opposite end portions of trays 30, as successively placed upon the bed 31. Each of the shoes 13 supports the tray on the shoulder 14 and in correct position transversely of the device by virtue of the back stop 15.

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As thus supported by corresponding units 9 each tray is elevated to a point adjacent the upper end of the device, conveyed forwardly a predetermined distance and then lowered; the trays being maintained horizontal, as previously explained, during their entire path of movement. As the trays lower they are deposited as a symmetrical stack 32 on the truck 5. The shoes 13 escape from the trays as they reach the stack by reason of the fact that the divergent faces 17 of said shoes engage the sides of the stack and are swung laterally to the position shown in dotted lines in Fig. 3. With continued lowering movement of the units 9 the shoes 13 ride down the outside of the stack 32 until they pass onto skirts 33 which extend alongside and to a point below the truck 5. When said shoes escape said skirts 33 they are returned by the springs 16 to normal tray engaging position. Vertical guides 34 are frame-supported in transverse alignment and serve to assure that the trays are deposited on the stack 32 in substantially correct alignment lengthwise of the device.

After a full stack 32 is formed on the truck 5, the stacking device is stopped and the truck, together with the stack thereon, is run on the rails 4 directly to the dehydrator, and another empty truck is positioned in the stacking device.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claim.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

A tray stacked assembly including in combination: two parallel frame elements spaced apart, a track passing between said frame elements and from side to side thereof in a horizontal plane above the lower ends of the frame elements, trucks adapted to be moved along the track, a tray station at one side of the frame elements at a point above the top level of the trucks, an endless chain movable around each frame element, tray engaging elements on the chains yieldably projecting into the space between the frame elements and adapted to pick trays from said station and carry them over the frame elements and deliver them onto a truck standing on the side of the frame elements opposite that side on which the tray station is located, a pair of plates, such plates being spaced apart and one plate lying on each side of the track, such plates being of a height not less than the height of a truck on the track, the tray engaging elements being adapted to engage the plates and to be thereby deflected away from any truck standing on the track between the frame elements as such tray engaging elements move around the lower ends of the frame elements.

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