G. D. PARKER.

BOX ELEVATING AND DUMPING MACHINE.

APPLICATION FILED DEC. 9, 1911.

1,049,523.

Patented Jan. 7, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

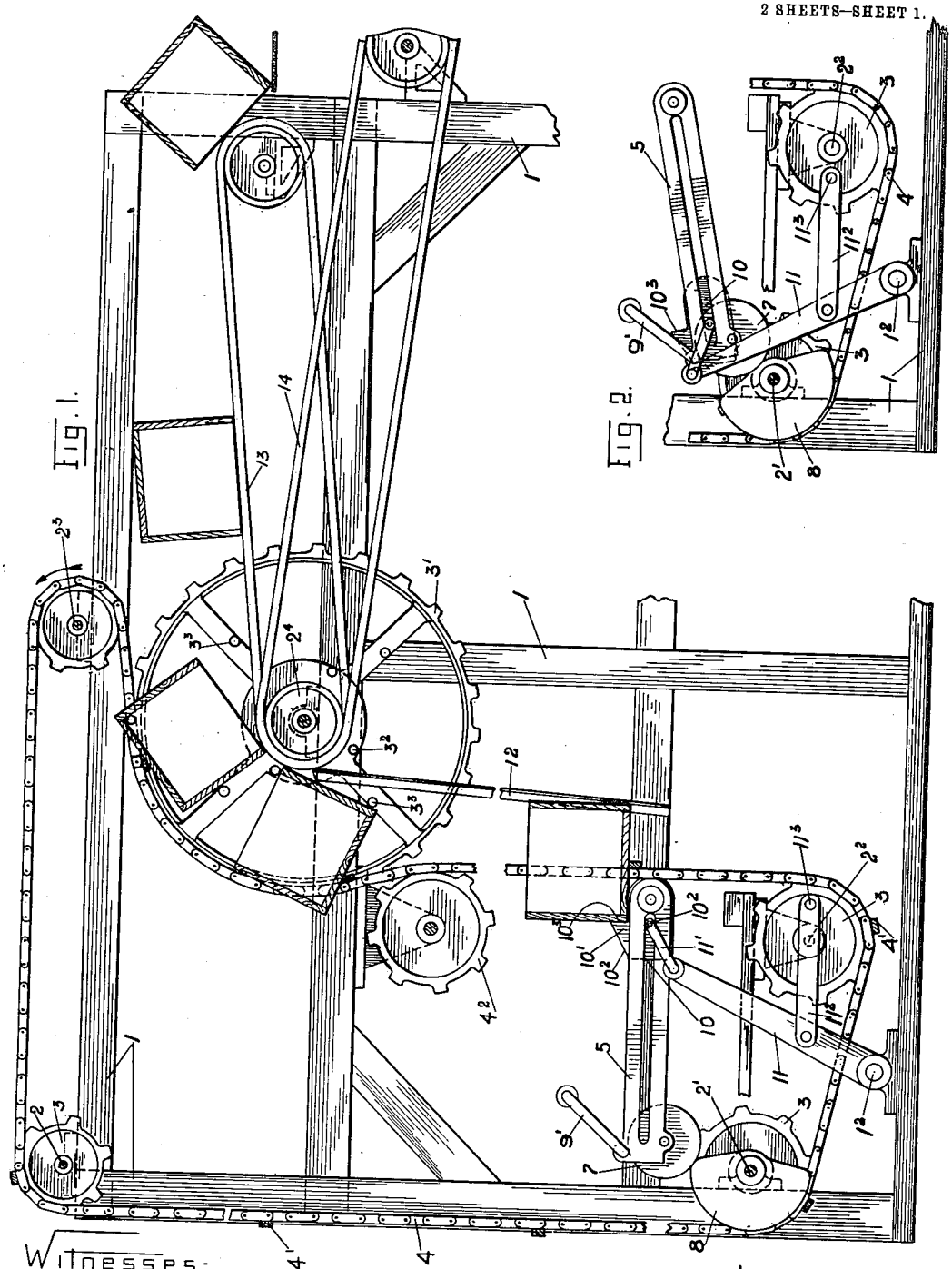

Fig. 2.

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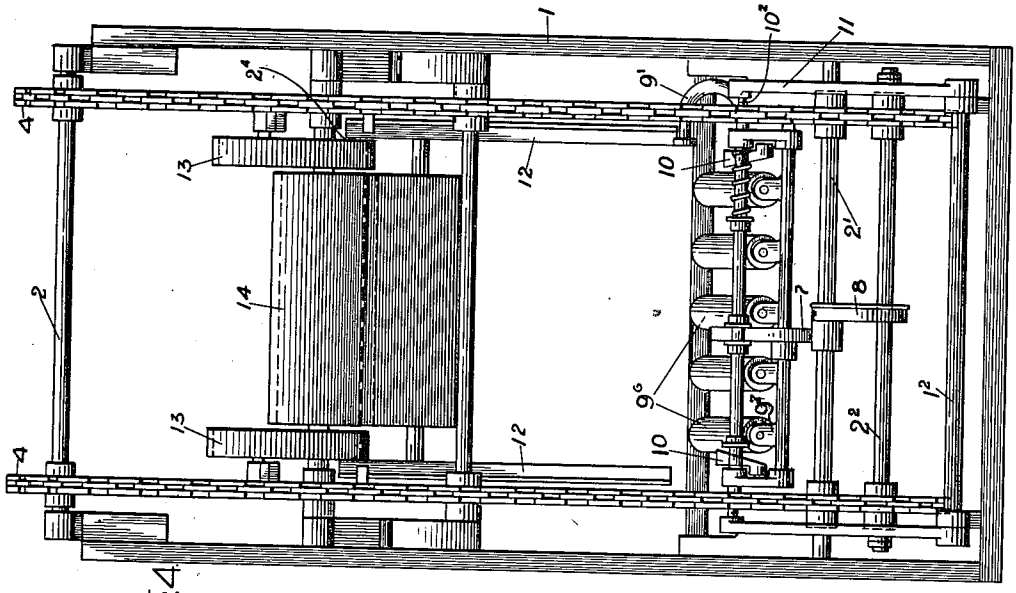

Fig. 4

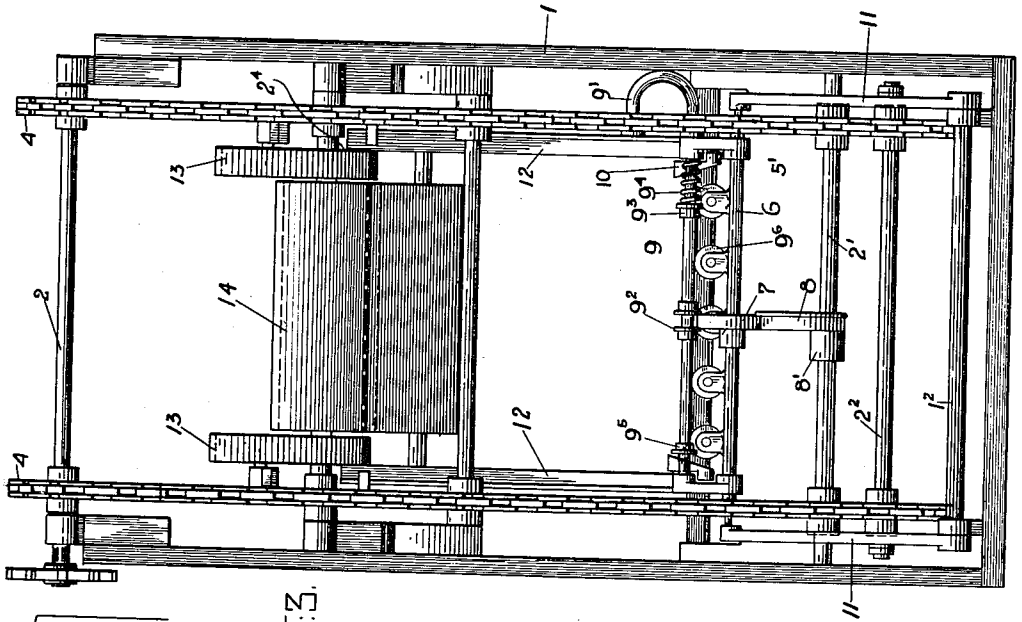

Fig. 3

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UNITED STATES PATENT OFFICE.

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BOX ELEVATING AND DUMPING MACHINE.

1,049,523. Specification of Letters Patent. Patented Jan. 7, 1913.

Application filed December 9, 1911. Serial No. 664,841.

To all whom it may concern:

Be it known that I, GEORGE D. PARKER, a citizen of the United States, residing at Riverside, in the county of Riverside and State of California, have invented certain new and useful Improvements in Box Elevating and Dumping Machines, of which the following is a specification.

The hereinafter described invention relates to an improved apparatus for elevating and dumping filled receptacles, and is of a size and particularly adapted for the handling of boxes containing fruit, but is not necessarily limited to this purpose, and comprises a pivoted box receiving table normally in an inclined position and adapted to receive a box, an arm carried by the frame and so positioned to be engaged by the box for automatically throwing into operation a means for elevating the table to a horizontal position, mechanism carried by the table for removing the box from the table into the path of a pair of endless elevating conveyers, carriers mounted on the conveyers for engaging one edge of the box, a guide carried by the frame for supporting the other side of the box, a box dumping mechanism arranged in an elevated position on the frame and operated by the box elevating means, devices carried by the dumping mechanism which, with the aid of the conveyers, turn the box in an upturned position allowing its contents to be emptied onto an endless conveyer, and a means for removing the emptied box from the machine.

The object of the machine is to render automatically the work of elevating boxes of oranges or the like, dumping the contents thereof into a grader or conveyer and conveying away the empty receptacles, to materially expedite the work of performing these various operations, and by doing so materially increasing the capacity of a packing factory and correspondingly reducing the cost of handling the material.

With these and other objects in view, the invention consists in the novel construction and combination of parts hereinafter fully described; illustrated in the accompanying sheets of drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims hereto appended, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To comprehend the invention reference should be had to the accompanying sheets of drawings illustrating a simple apparatus for successively carrying out the invention, wherein—

Figure 1 is a side elevation of the machine showing the endless conveyer chains, the box receiving table, boxes in their path of travel from the receiving table and into the dumping device above, the means for carrying the dumped boxes to the rear of the frame, and the means for conveying the dumped contents thereof to the rear of the frame. Fig. 2 is a side elevation of the box receiving table in its downwardly inclined position, showing the box moving lugs and the mechanism for operating the same. Fig. 3 is a front elevation of the machine, showing the box receiving table in a horizontal position, the endless conveyer chains with the box elevating devices removed therefrom, the lugs for moving the box into the path of the elevating conveyer chains, the means operatable by the box for throwing into operation other means for elevating the table from an inclined position to a vertical position, and the mechanism for dumping the box. Fig. 4 is a front elevation of the box receiving frame in its downwardly inclined position, the frame elevating means out of contact with the elevating cam, and the arm operatable by the box for throwing the frame elevating means into operative relation.

In the drawings, 1 represents a frame of a suitable construction to sustain the operating parts of the machine, and has mounted thereon, in suitable journals, transversely extending shafts 2, 2′, 2^2 and 2^3, each provided at its ends with toothed wheels 3 around which extend endless conveyer chains 4, connected together at suitable points by horizontal box engaging bars 4′. The shafts 2 and 2′ are positioned at the front of the frame, one at the top and one near the bottom thereof, the shaft 2^2 is positioned immediately in the rear of and slightly below shaft 2′, and the shaft 2^3 is located at the top of the frame in the rear of the shaft 2, as disclosed in Fig. 1 of the drawings. The endless conveyer chains 4 also extend partly around sprockets 3′ at

each end of a box engaging and dumping drum 2^4 rotatably mounted in journals on the frame below the shaft 2^3 and are held in contact therewith by an idler 4^2.

Power is transmitted from any suitable source to a sprocket on the end of the shaft 2^3, rotating it in the direction of the arrow, Fig. 1 of the drawings, which in turn, by means of the endless conveyer chains 4, transmits motion for operating the various parts of the machine.

Pivotally mounted at its rear end in journals in the frame 1 above the shaft 2 and between the path of movement of the conveyer chains 4 is a box receiving frame consisting of parallel spaced longitudinally slotted arms 5, connected at their outer ends by a transverse shaft 6 on which is slidably mounted a cam engaging roller 7, normally resting on an idler 8′ and adapted to be thrown into engagement with a frame elevating cam roller 8 mounted midway of the shaft 2′, and adjacent the idler 8′. Slidably mounted at the front end of the arms 5 and extending transversely thereof above the shaft 6 is a rod 9 provided at one end with an upwardly extending curved arm 9′ positioned so as to engage one end of the box after it has been fed onto the table by the endless feed belt or other suitable means at the opposite side of the table. The rod 9 is provided at a point slightly to the side of the center of its length with a pair of spaced collars 9^2 which serve as guides for shifting the cam roller 7, and is also provided at the end adjacent the curved arm 9′ with a collar 9^3 between the outer face of which and the inner face of one of the arms 5 is interposed a coiled compression spring 9^4 which tends to force the rod inwardly and the cam roller 7 out of the path of the rotating cam 8, and onto the idler 8′. The inward movement of the rod 9 is limited by a collar 9^5 secured to the end of the rod opposite the curved arm 9′.

The table is provided with longitudinally extending rollers 9^6, on which the box is adapted to rest, and which are mounted to rotate in suitable bearings in transversely extending plates 9^7 connected at their ends to the arms 5.

The arms 5 are each provided at their inner faces with longitudinally extending grooves 5′ which communicate with the slots in said arms and in which are slidably mounted box engaging dogs 10 having an upstanding lug 10′ projecting slightly above the arms 5. The lug 10′ is provided with a downwardly beveled front edge 10^2 and a vertical rear edge 10^3, the rear edge 10^3 being adapted to engage the box after it has been fed to the table and moves the same rearwardly thereon into the path of the elevating bars 4′ which are so spaced on the endless conveyer chains 4 as to only present themselves when the box is in this position. A reciprocating motion is transmitted to the dogs by levers 11 pivoted to the base of the frame as at 12 and connected at their upper ends through links 11′ to pins 10^2 projecting from the sides of the box dogs 10 and extending through the slots in the arms 5, the levers are also connected near their centers by links 11^2 to pins 11^3 eccentrically mounted on the sides of the toothed wheels 3 at each end of the shaft 2^2. As the box is moved rearwardly on the table by the dogs 10 it projects between the endless conveyer chains 5 and rests at one side in parallel spaced upwardly extending, rearwardly inclined tracks 12, the upper ends of which terminate at a point even with the outer edge of the dumping drum 4 and between the sprockets 3′ at the outer ends thereof.

Projecting inwardly from the sprocket wheels 3′ and in spaced relation to each other around the drum 2^4 are short pins 3^2, so positioned as to be engaged by the top of the box and delay the same in its upward movement, and with the assistance of other inwardly projecting spaced pins 3^3, located nearer the peripheries of the wheels 3′ assist in turning the box upside down upon spaced endless box conveying belts 13 allowing the contents thereof to drop between the empty box conveying belts 13 onto an endless conveyer belt 14. The belts 13 extend around the ends of the drum 2^4 and project in an upwardly inclined direction around an idler journaled at the rear of the frame. The endless conveyer 13 extends around the drum 2^4 and projects in a downwardly inclined direction around an idler also journaled at the rear of the machine, the spaced belts 13 conveying the boxes to the rear of the machine and there deposit them onto any suitable conveyer, and the belt 14 conveying the fruit to the rear of the machine and onto a sorting table or the like.

The positioning, timing and mounting of the various parts of the machine is such, that power being transmitted to the sprocket at the end of the shaft 2^3 and the chains 4 driven in the direction of the arrow—Fig. 1 of the drawings—the machine will be automatically operated in a hereinafter described manner.

The box receiving frame when not provided with a box is normally in a downwardly inclined position, as in Figs. 2 and 4 of the drawings, as the cam roller 7 is normally held out of the path of contact with the frame elevating cam 8, by the action of the coiled spring 9^4. The dogs 10 are at all times reciprocating in the slots in the arms of the frame and their movement is so timed that at the beginning of the elevating movement of the cam 8, they

will be in their forwardmost position and as the cam completes this movement will have reached their rearwardmost position. While the frame is in the inclined position, a filled box is delivered endwise thereto, from one side of the frame, either automatically or by hand. The delivered box slides across the frame on the rollers, the end thereof engaging the arm 9′ with sufficient impact to compress the spring 9^4 and move the cam roller 7 mounted between the collars 9^2 along the rod 6 and into the path of movement of the constantly rotating table elevating cam 8, which as it rotates elevates the table to a horizontal position shown in full lines—Figs. 1 and 3 of the drawings. As the table is being elevated the edges 10^2 of the dogs 10 will have engaged the side of the box, and by the movement of the levers 11 by the pins 11^3 on the toothed wheels 3 of the shaft 2^2 will slide the box rearwardly on the frame between the chains 4, against the tracks 12 and in the path of an approaching elevating bar 4′. If a box is fed onto the table while the arms are in their rearwardmost position, the inclined faces 10^2 of the dogs will permit the dogs to ride under the box, allowing the straight edges 10^3 thereof to engage the side of the box in the same manner as if the box was fed to the frame when the lugs were in their forwardmost position. A bar 4′ engages the underside of the box and elevates it to the top of the tracks 12 at which point the top of the box engages one of the pins 3^2 on the wheels 3′ which delays its upward movement and as the wheels 3 rotate carrying on their peripheries the bars 4, the side of the box is engaged by other pins 3^3. The box is engaged at the top by the pins 3^2, supported at the same side by the pins 3^3, and engaged at its outer edge by the bar 4, and as the pins 3^2, 3^3 and bar 4 rotate with the wheel the box will be turned upside down, as in Fig. 1 of the drawings, upon the belts 13 and conveyed thereby away from the frame allowing the contents thereof to drop onto the belts 14 and be disposed of in any suitable manner.

Having thus fully described the invention what I claim as new and desire to secure by Letters Patent is—

1. In a box elevating and dumping machine, the combination of a box receiving table, an endless box elevating means, reciprocating means for moving the box along the table and into the path of the elevating means, and a dumping device located in the path of the elevating means and provided with means coacting with said elevating means for engaging the box and dumping the contents therefrom.

2. In a box elevating and dumping machine, the combination of a box receiving table, an endless box elevating means, reciprocating means operatable by the endless elevating means for moving the box along the table and into the path of the elevating means, and a box dumping device located in the path of the elevating means and operated thereby and coacting therewith for engaging the box and dumping the contents therefrom.

3. In a box elevating and dumping machine, the combination of a supporting frame, endless elevating chains carried by said frame, a box receiving table located within the frame and positioned without the path of the elevating chains, a box dumping means positioned above the receiving table and in the path of the elevating chains and operatable thereby, and reciprocating means carried by the table and operatable by the endless elevating chains for moving the box along the table and into the path of the endless elevating chains.

4. In a box elevating and dumping machine, the combination of a box receiving table, an endless box elevating means, reciprocating means for moving the box into the path of the endless elevating means, a box dumping device coacting with said endless box elevating means for dumping the contents from the box, and means operated by the endless box elevating means for conveying the emptied box and the dumped contents thereof from the machine.

5. In a box elevating and dumping machine, the combination of a frame, an endless chain box elevating device mounted on shafts journaled in the frame, a box dumping device carried by the frame, a box receiving table pivotally mounted at its rear to the frame and normally extending in a downwardly inclined position, and provided with means operatable by the box for throwing into operative relation a mechanism for elevating the table into a horizontal position, and a device for moving the box to the rear of the table and into the path of the endless chain box elevating device.

6. In a box elevating and dumping machine, the combination of a frame, an endless chain box elevating device mounted on shafts journaled in the frame, a box dumping device carried by the frame, a box receiving table pivotally mounted at its rear to the frame and normally extending in a downwardly inclined position and provided with means operatable by the box for automatically throwing into operative relation a mechanism for elevating the table into a horizontal position, and dogs slidably mounted on the frame and operatable by the box elevating chains for engaging the box and moving it into the path of the elevating chains when the frame is in a horizontal position.

7. In a box elevating and dumping machine, the combination with a receiving ta-

ble for the boxes to be elevated and dumped, of a continuously driven endless elevating chain carrier for the boxes, of means for delivering filled boxes onto the receiving table and within the sphere of the elevating chain carrier, devices co-acting with and placed into operation by the chain carrier for swinging the boxes elevated and causing the tilting thereof for the emptying of the same of their contents, and traveling means associated with the chain carrier for receiving the empty boxes and conveying the same to a suitable place of deposit.

8. In a box elevating and dumping machine, the combination of a frame, a box receiving table mounted thereon, an endless chain box elevating device mounted on shafts journaled in the frame, and a box dumping device rotatably mounted in the frame and comprising a drum, flanges at each end thereof, spaced box engaging members projecting from the inner face of the flanges adapted to engage a box and turn it to a dumped position onto spaced endless conveyers extending around the drum for conveying the empty box from the machine and a downwardly inclined endless conveyer positioned between said box conveyers and extending around said drum for conveying the dumped contents of the box from the machine.

9. In a box elevating and dumping machine, the combination with a receiving table for the boxes to be elevated and dumped, of a continuously driven endless elevating chain carrier for the boxes, of means for delivering filled boxes onto the receiving table and within the sphere of the elevating chain carrier, devices co-acting with and placed into operation by the chain carrier for swinging the boxes elevated and causing the tilting thereof for the emptying of the same of their contents, and means for receiving the fruit discharged from the elevated boxes and conveying the same to a suitable place of deposit.

10. In a box elevating and dumping machine, the combination with a box receiving table for the boxes to be elevated and dumped, an endless carrier provided with box holding devices for removing the boxes from the receiving table and elevating the same, means co-acting with box holding devices of the endless carrier for swinging the same to dump the contents therefrom, and means for receiving the dumped fruit and conveying the same to a suitable place of deposit.

11. In a box elevating and dumping machine, the combination with a box receiving table, a box elevating means, means for moving the box into the path of the elevating means, a box dumping device for dumping the contents thereof from the box, an endless conveyer for conveying the dumped contents of the box from the machine, and spaced endless conveyers positioned one on each side of said box contents conveyer for conveying the empty box from the machine.

12. In a box elevating and dumping machine, the combination with a box receiving table pivotally mounted at one end and normally extending in a downwardly inclined position, a box elevating means, means for dumping the contents from the box upon the same reaching its elevated position, means operatable by the box for throwing into operative relation a mechanism for elevating the table into a horizontal position, and devices for removing the box from the frame into the path of the elevating means.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE D. PARKER.

Witnesses:
N. A. ACKER,
HARRY H. TOTTEN.