(No Model.) 4 Sheets—Sheet 1.

A. N. CLARK.

FRUIT PACKING MACHINE.

No. 392,106. Patented Oct. 30, 1888.

Fig. 1.

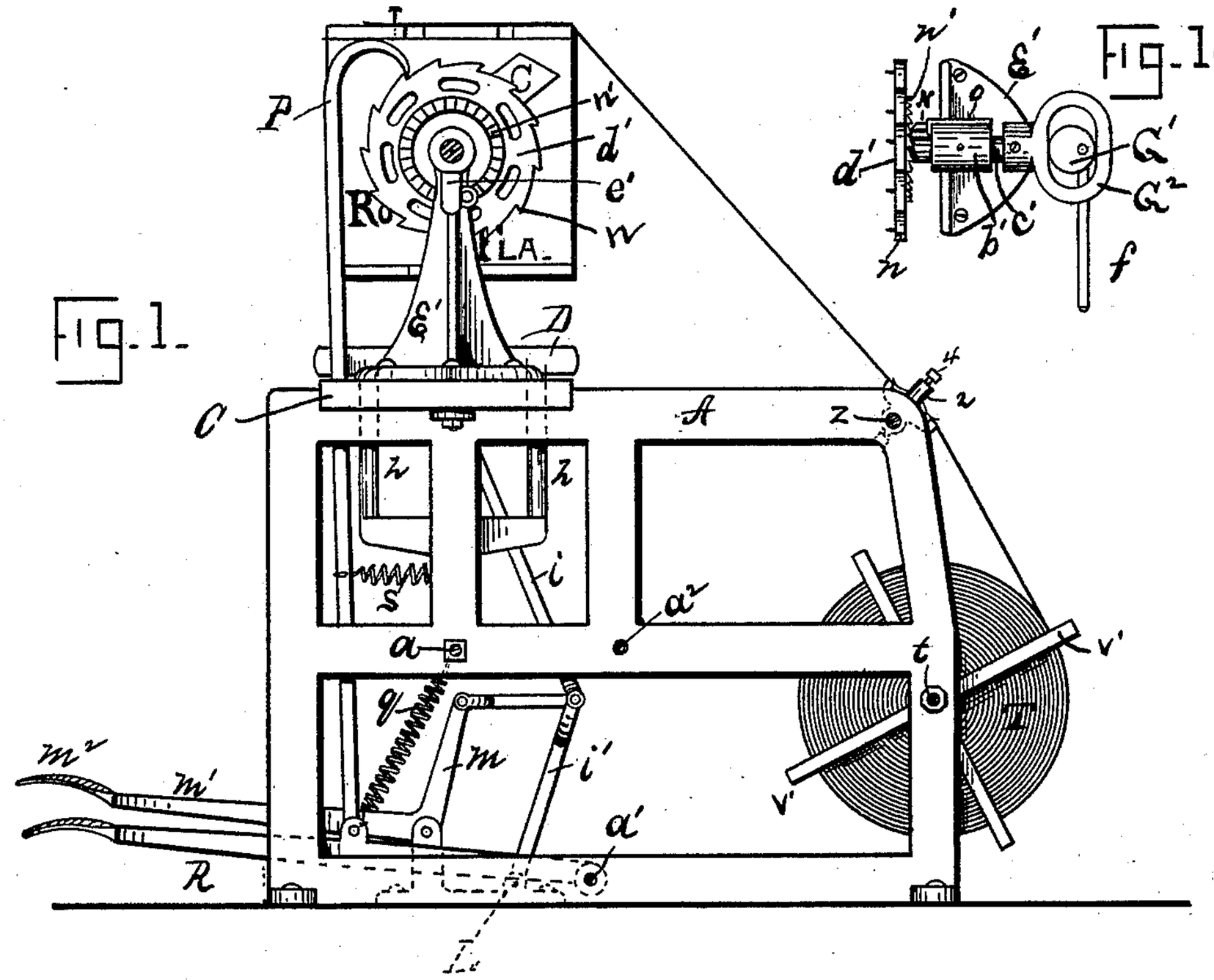


Fig. 1a.

Fig. 4.

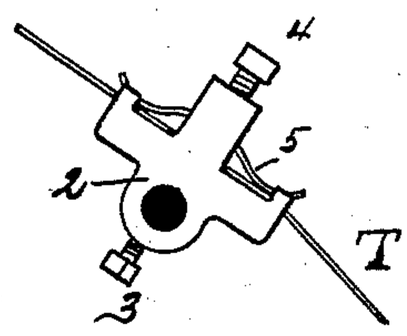
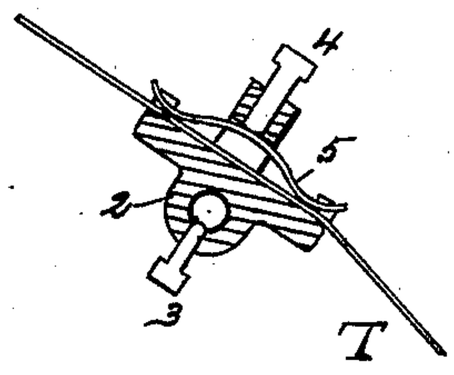


Fig. 5.



Witnesses.,

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(No Model.)

4 Sheets—Sheet 2.

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FRUIT PACKING MACHINE.

No. 392,106. Patented Oct. 30, 1888.

FIG. 2.

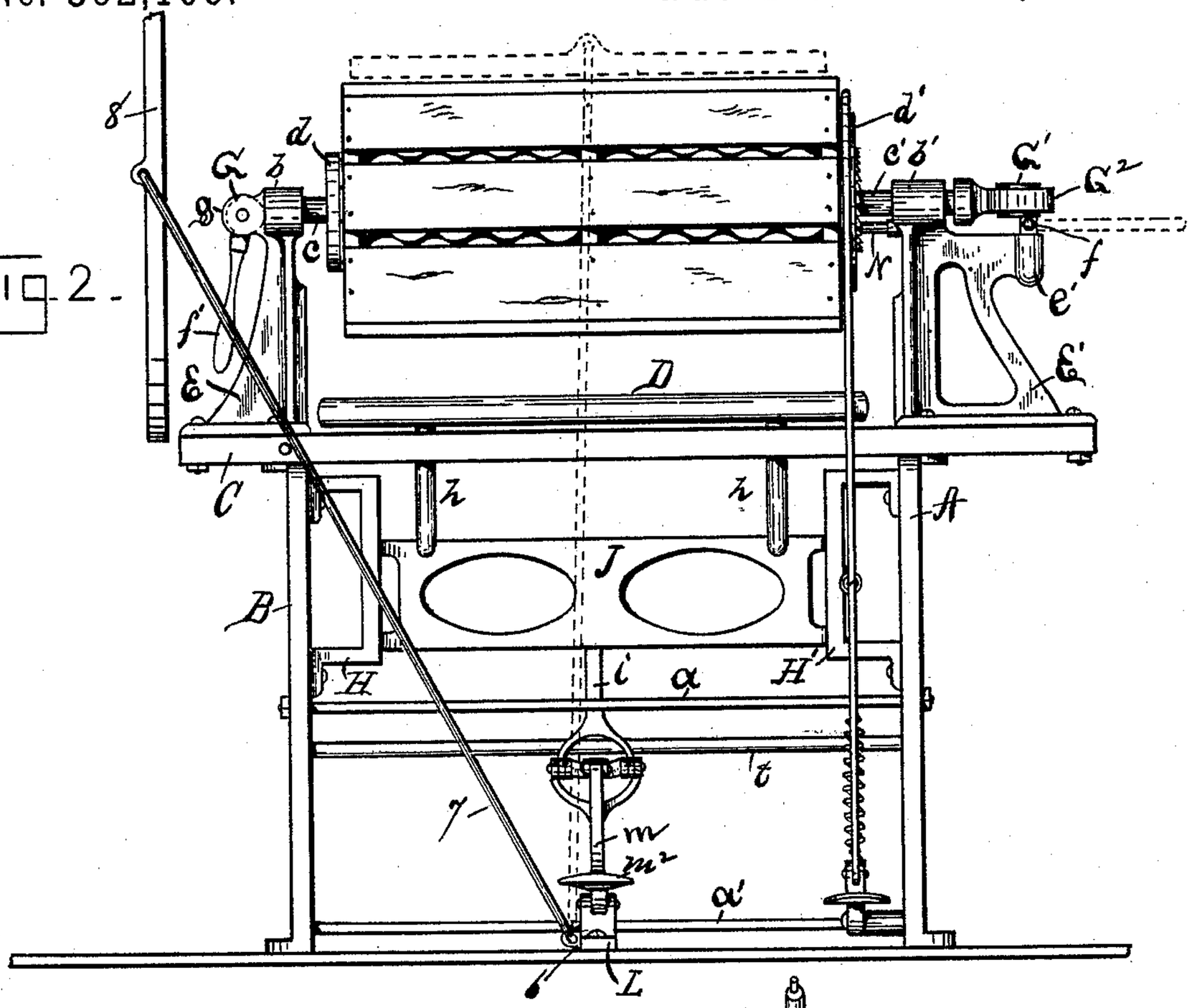
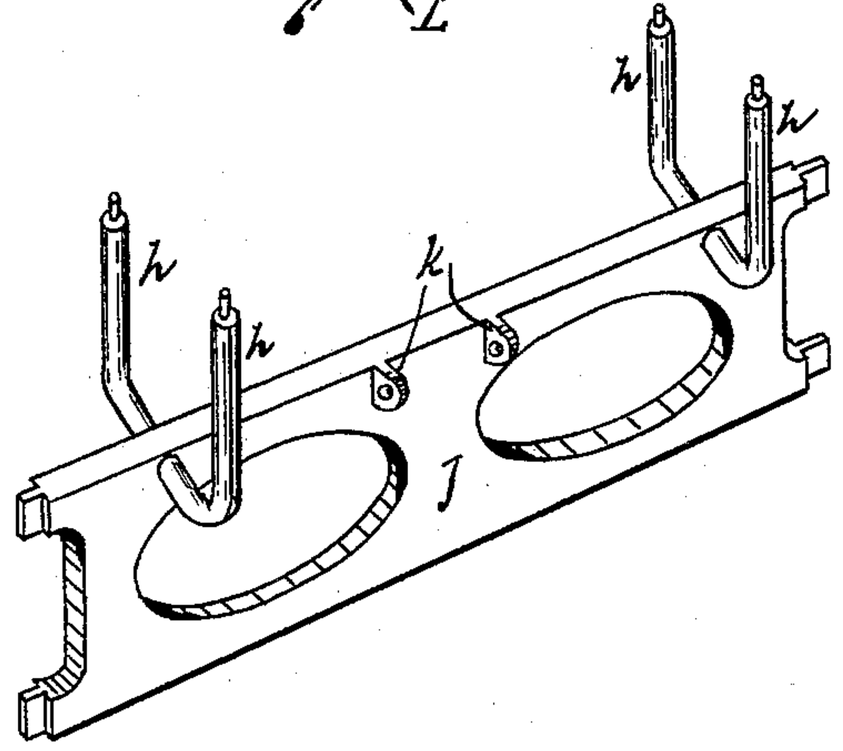


FIG. 3.



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(No Model.) 4 Sheets—Sheet 3.

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FRUIT PACKING MACHINE.

No. 392,106. Patented Oct. 30, 1888.

Fig. 6.

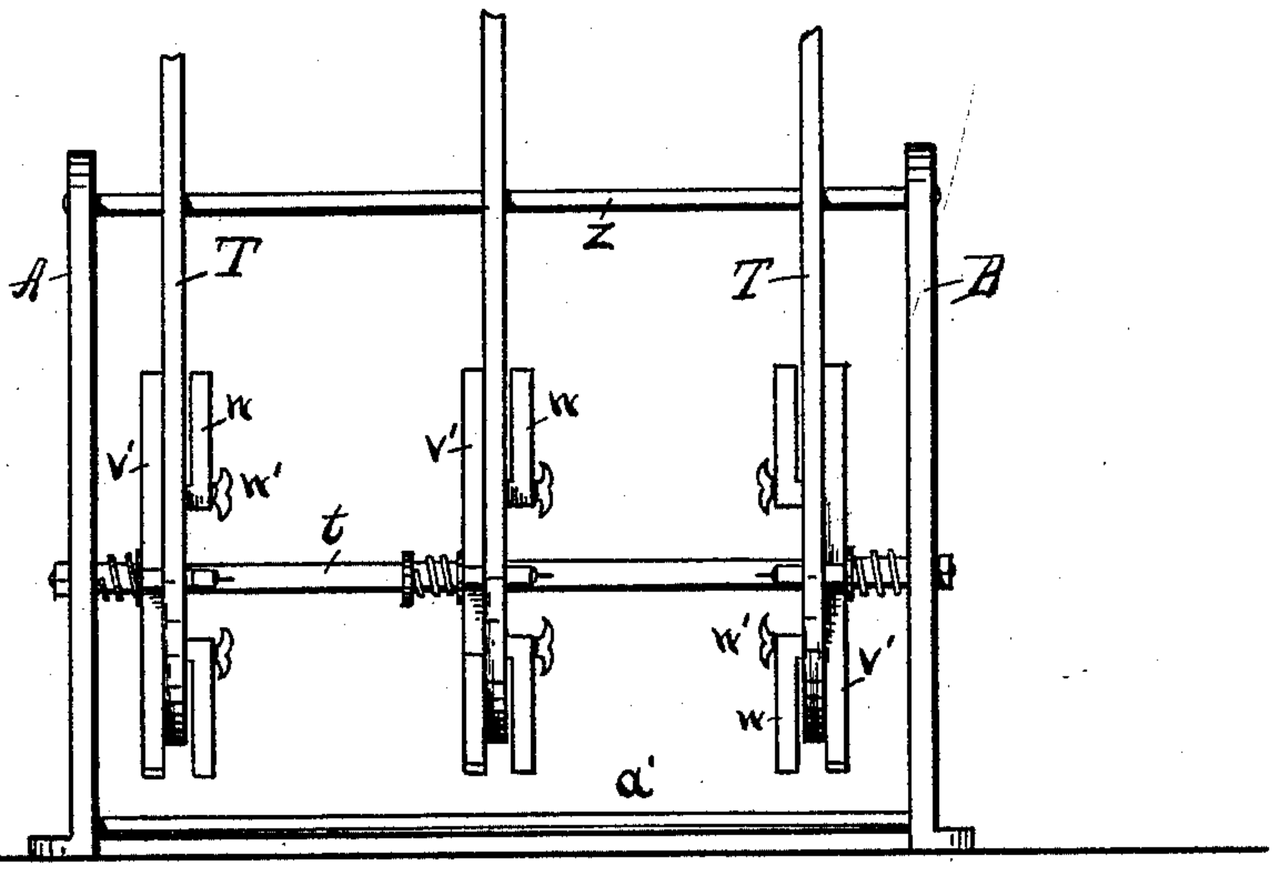
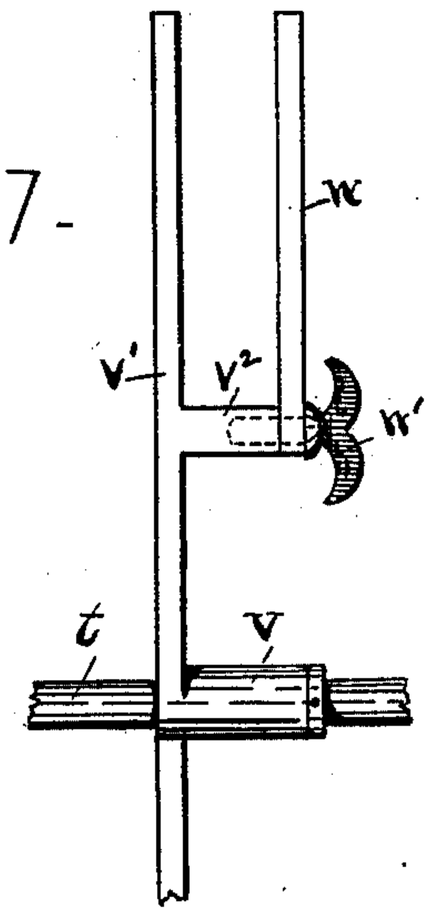


Fig. 7.



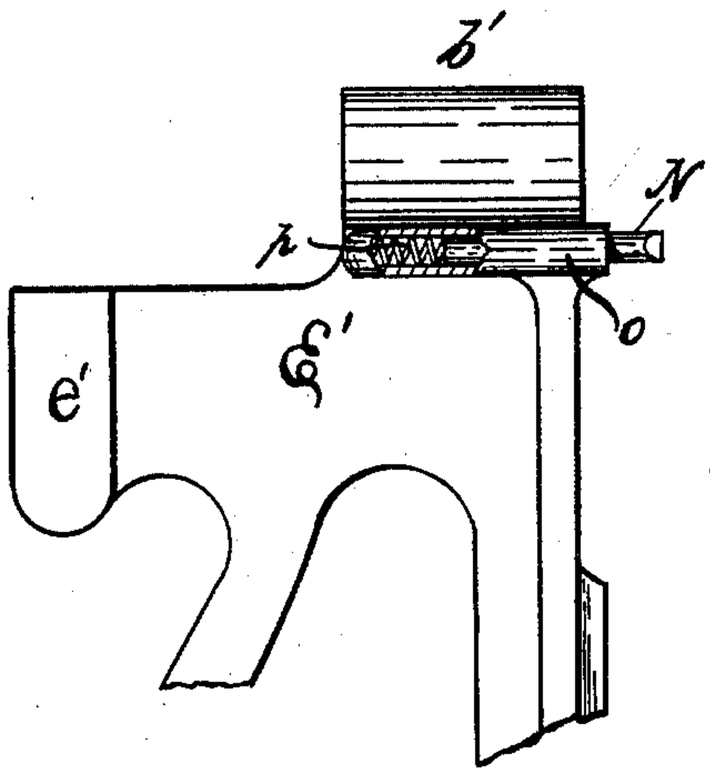


Fig. 8.

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(No Model.) 4 Sheets—Sheet 4.

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FRUIT PACKING MACHINE.

No. 392,106. Patented Oct. 30, 1888.

Fig. 9.

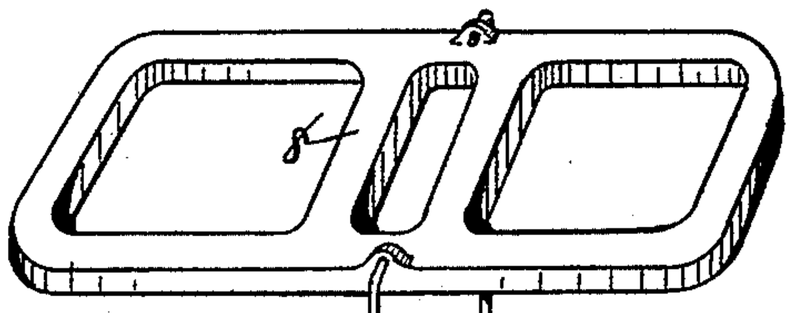


Fig. 10.

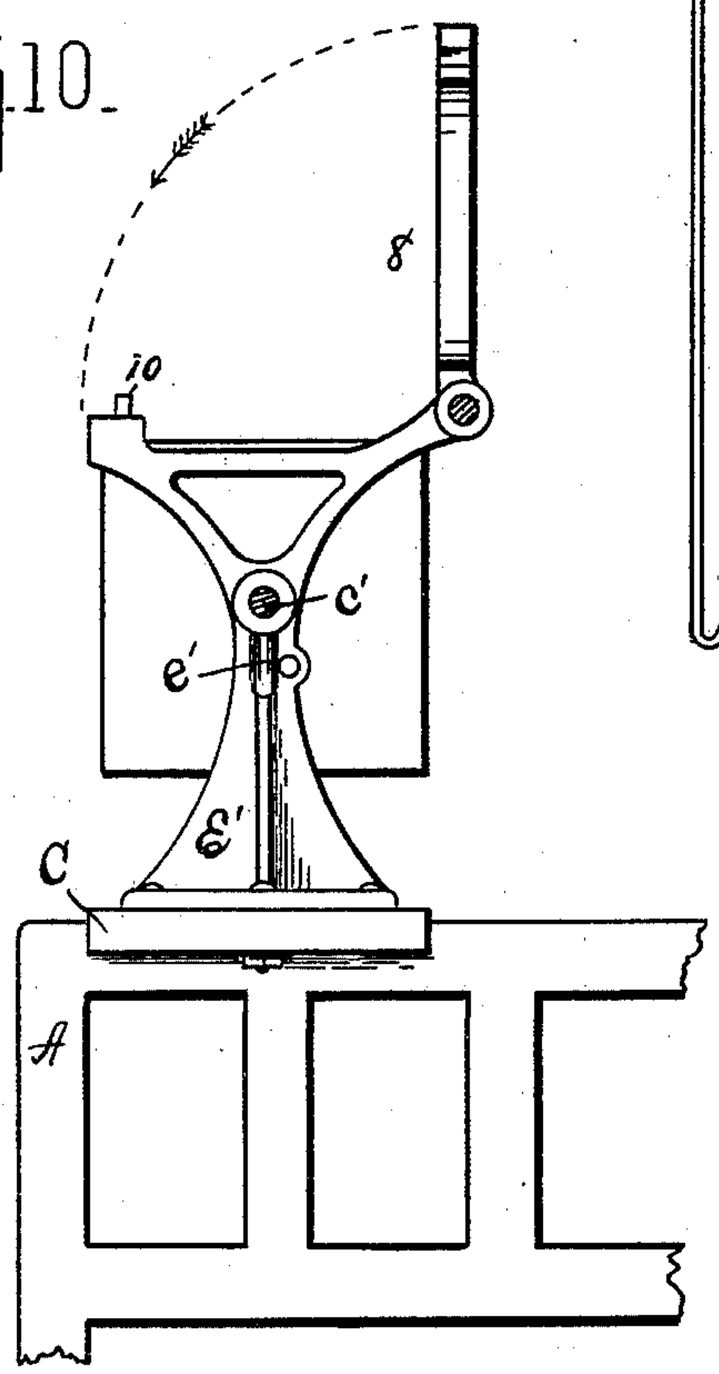
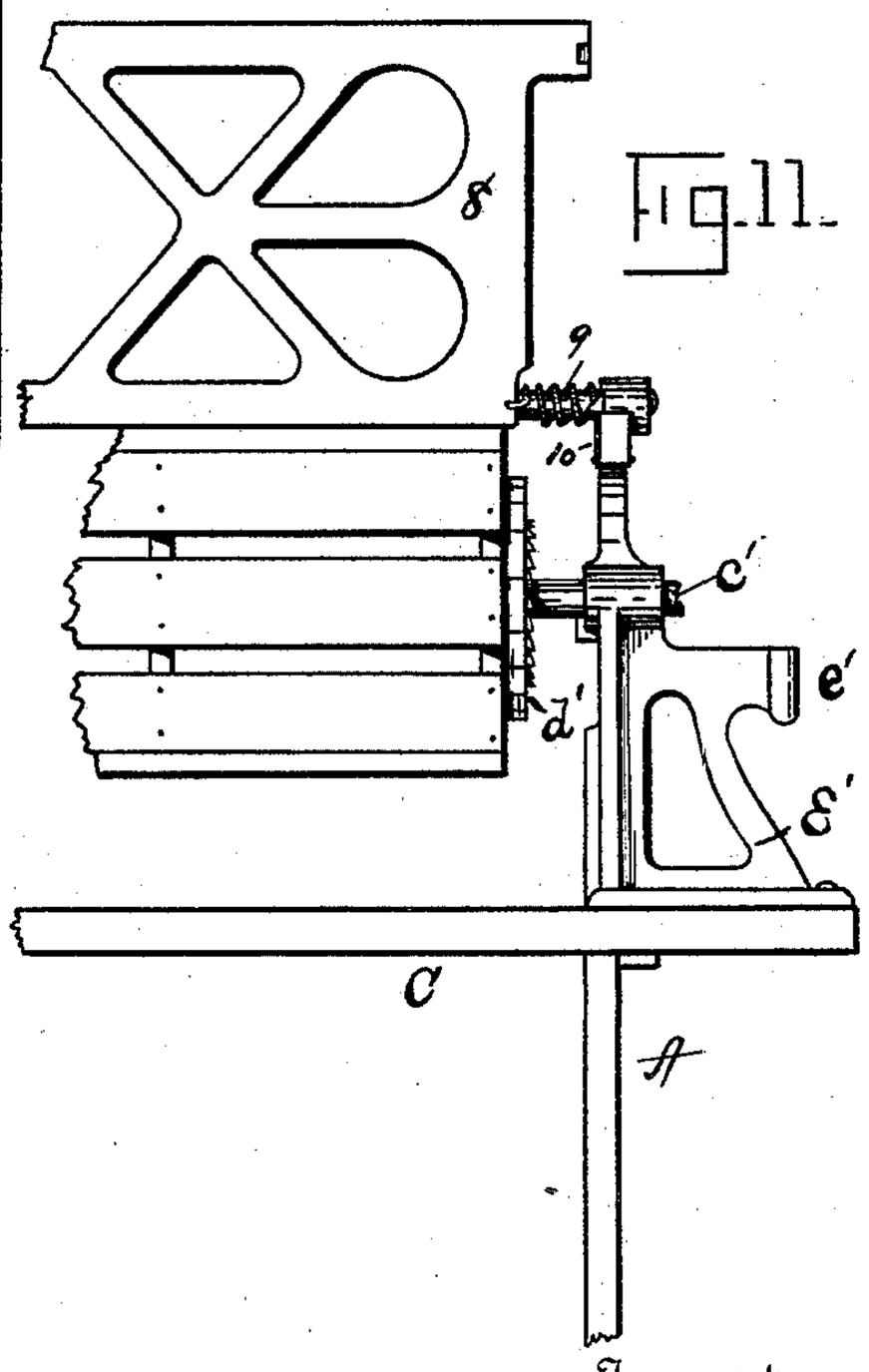


Fig. 11.



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Allen Tenney.

Inventor,
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By his Attorney
Frank H. Allen

UNITED STATES PATENT OFFICE.

ALLISON N. CLARK, OF PLAINVILLE, CONNECTICUT.

FRUIT-PACKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 392,106, dated October 30, 1888.

Application filed February 27, 1888. Serial No. 265,645. (No model.)

To all whom it may concern:

Be it known that I, ALLISON N. CLARK, a citizen of the United States, residing at Plainville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Fruit-Packing Machines, which improvements are fully set forth and described in the following specification, reference being had to the accompanying four sheets of drawings.

This invention has for its object the production of a machine for use in boxing oranges and similar fruits, and seeks to provide a device that shall lessen in a considerable degree the labor incident to such work. Combined in said machine are devices for pressing down the fruit within the box, for delivering the hoops or straps under suitable tension, and for holding and rotating said box.

So far as I am familiar with the methods of packing oranges for shipment to market, such labor has been most commonly done heretofore by first placing the fruit in the box and then pressing down and nailing the cover. The package thus formed is then ready to receive the straps, which are usually wooden hoops, which must be water-soaked a considerable time to render them pliable and capable of turning the angular corners without breaking. This soaking process leaves such hoops slippery and unpleasant to handle, and most woods used for the purpose are certain to stain the hands of the user. These wooden hoops (usually three in number) are fastened to the box by nailing at one end, and are then drawn taut one at a time and thoroughly nailed. In carrying such hoops around the four corners of the box it becomes necessary to lift or roll said box several times, which, with drawing the hoops taut and holding them so while nailing, renders the operation of boxing a very laborious one. A great part of such labor is avoided, or, rather, is performed mechanically, by my new form of machine.

In order to explain said invention more clearly, I have annexed hereto four sheets of drawings, in which—

Figure 1 is an end elevation of said machine with an orange-box supported therein, having the binding-strips attached to said box as in the act of strapping it. The cam G′, by means of which the spurs on disk *d′* are forced into the end of the box, is removed to show more clearly the said disk. A detached top view of said cam and its attached parts is shown in Fig. 1ª. Fig. 2 is a front side elevation of said machine with the reels of banding removed from the back side. Fig. 3 is a detached perspective view of the vertically-movable frame J. Figs. 4 and 5 show, respectively, a side elevation and longitudinal section of one of the tension devices which govern the delivery of the banding from the reels. Fig. 6 shows the several reels of banding, the shaft on which they are located, and the supporting-frames A B as they appear from the rear side of the machine. Fig. 7 is an enlarged detached view of a portion of one of the banding-reels. Fig. 8 is an enlarged view of the upper portion of the standard E′ from the rear side, and is provided to illustrate the construction and location of the spring-pressed pawl N. In Fig. 9 I have shown a perspective view of the plate S, which assists in pressing down the cover and fruit, as hereinafter described in detail. In Figs. 10 and 11 I have shown a different means of supporting said plate S.

Referring to said drawings, the letters A B indicate cast-metal frames, in or on which the operative parts of my machine are located and supported.

C indicates a bed or table extending from one of said main frames to its companion and securely bolted thereto. Said frames are further stiffened and connected by tie-bolts *a a′ a²*.

Secured on table C are standards E E′, the distance between them being somewhat greater than the length of the box to be handled. These standards are formed with confronting journal-bearings *b b′*, in which are located journals *c c′*, carrying face-plates *d d′*, whose inner faces are provided with spurs. (See Fig. 1ª.) In practice the spur-centers thus formed are forced into the ends of the box, and the journals *c c′* then provide a convenient means by which said box may be rotated to strap and nail it. The forcing of said spurs into the ends of the box is effected by cams, as best illustrated in Figs. 1ª and 2.

The principal cam G′ is located at the right hand of the operator, and is supported by a stud or stem which is rotatably stepped in an extension, *e′*, of the standard E′. A handle, *f*,

projects from said cam within easy reach of the operator in charge. Swiveled to the outer end of the journal c' is a yoke, G^2, which encircles the cam G'. In Figs. 1ª and 2 the handle f is shown as swung forward to force the spurs of the face-plate d' into a box. To withdraw said spurs, it is only necessary to swing handle f outward into longitudinal alignment with journal c'. The cam G at the left-hand of the machine is of somewhat simpler construction, being hung in lugs g, formed as a part of standard E. Said cam is provided with an operating-handle, f', which is depressed to force the disk d inward toward the box and elevated to release said disk.

Secured to the inner sides of the main frames A B are frames H H', whose confronting edges are grooved to form ways in which a frame, J, may move vertically. This frame has secured to it arms h h, which project upward through the fixed table C and support a movable table, D, of a size sufficient to receive the box to be strapped. The frame J and its attached parts may be elevated by a system of levers, treadle, and knuckle-joints. (Best illustrated in Fig. 1.) The knuckle proper is formed of a two-part jointed rod, i i', one of whose ends is hinged in lugs k on the rear side of frame J, the other (lower) end being pivoted in a stand, L, secured to the floor. This stand L is indicated by dotted lines in Fig. 1. Pivoted also in said stand is an angle-lever, one of whose arms, m, is connected at its free end with the joint of rod i i'. The longer or horizontal arm, m', of said angle-lever is formed as a foot-treadle, m^2. When suitable pressure is applied to depress said treadle, the jointed rod i i' is straightened and the table D is carried upward.

The disk d' (which I have described above as provided with spurs to enter the box) is formed with ratchet-teeth n on its outer edge, and with similar teeth, n', on its outer face, which latter teeth are engaged by a pawl, N, seated in a boss, o, formed on one side of the standard E'. This pawl N is forced outward into the path of said teeth n' by a spiral spring, p. The teeth n on the periphery of disk d' are engaged by a hook-shaped pawl, P, whose lower end is pivoted to a foot-lever, R. This foot-lever is hinged to the main frame A, and is held in its elevated position by a spiral spring, q, attached to one of the tie-bolts. A second spring, s, may also be provided to draw pawl P inward and hold it in engagement with its ratchet-disk. The office of pawl P is to partially rotate the box during the act of strapping it, while the spring-pressed pawl or bolt N is provided to check the box in any desired position and hold it against the strain of the banding, or, in other words, to prevent said box from turning backward.

The banding which I prefer to use is of thin tough metal, and is drawn from reels located on a shaft, t, supported in frames A B at the rear of the machine. These reels are formed with a hub, v, having a series of radial arms, v', with laterally-projecting arms v^2, on which the coiled banding T is placed. Guard-arms w are then secured to arms v^2 by set-screws w', to prevent the accidental displacement of the banding and to insure its free delivery. The reels of banding thus provided are located in vertical alignment with the ends and center of the box to be strapped and pass upward through tension devices secured to a tie-bolt, z, and thence to the upper side of the box. (See Fig. 1.) Said tension devices consist, in brief, of a cast-metal frame, 2, bored to fit the tie-bolt z, and secured thereto by a set-screw, 3. The upper portion of frame 2 is formed as a yoke, which is tapped to receive an adjusting-screw, 4. The banding T passes under said yoke, as illustrated in Fig. 5, and is prevented from running too freely by a bow-spring, 5, interposed between said banding and the end of the screw 4, above referred to. By turning said screw home the spring 5 is flattened against the banding, affording a degree of friction amply sufficient to draw the banding taut around the box as said box is rotated.

Hinged in bearings 6 beneath the machine is a frame, 7, whose free end supports a plate, 8, which when not in service is swung to the left-hand side, as in Fig. 2. This plate 8 is provided to furnish a substantial backing or support for the cover when the box is forced up to said cover, as hereinafter set forth.

In Figs. 10 and 11 I have illustrated a modification of my invention in which the said plate 8 is provided with trunnions, and is hinged to the rear side of the standards E E', the said standards being shaped to receive and support said trunnions. Fig. 10 is an end view of standard E' and a portion of frame A, and shows the plate 8 in its elevated position, as during the act of strapping a box. Fig. 11 is an elevation of the right-hand portion of said parts as they appear from the front side. Said plate 8 is held normally in an upright position by a spiral spring, 9, coiled about one of the trunnions, and secured at its ends to standard E' and the said plate. (See Fig. 11.) When it is desired to use plate 8, it is swung downward until its free side snaps under a spring-catch, 10, which holds it securely in a horizontal position until released by withdrawing said spring-catch. The spiral spring 9 then immediately carries the plate upward and rearward out of the operator's way during the process of strapping a box.

Having now described the general construction of my new form of machine, I will proceed to describe the manner of using it.

The fruit is first packed within the box with the upper layer projecting above, so that when the cover is forced down the fruit is tightly packed together, so that it cannot work loose and become jammed while in transit to its destination. The box thus packed is placed on the vertically-movable table D, the cover is laid thereon, and the plate 8 swung inward

until it lies on or over said cover. The box is then elevated to a position between the disks *d d'* by pressing down the treadle m^2, which actuates the knuckle *i i'* and frame J, as before described. During this action the cover is firmly backed by the plate 8, and as the box comes up to said cover the fruit is pressed tightly downward within the box. While the box is in this elevated position the cams at each end of the machine are moved to force the disks *d d'* inward and cause their spurs to enter the box ends. After tacking the cover to the box sufficiently to retain it in position the plate 8 is swung aside. The operator then removes his foot from the treadle m^2 and allows table D to drop to the position shown in Figs. 1 and 2, leaving the box suspended on journals *c c'* and capable of being easily rotated. The ends of the banding T are now brought to the top of the box and nailed, after which the operator presses down the foot-lever R, and thus, by means of the hook-shaped pawl P and its ratchet-disk *d'*, the box is rotated until its rear side comes to the top. As said box rotates, it draws with it the strips of banding, which are then securely nailed, and this operation is repeated until the box is encircled by the banding, which is then cut by means of a suitable hand-tool. Table D is now raised to the box, the spur-centers are withdrawn from the ends, and the box thus packed and strapped may be removed.

It should be noted that no lifting or handling of the box is necessary from the time it is first lifted to the table D until it is removed completely strapped. By thus supporting and rotating the box mechanically during the operation of strapping, the operator's hands are left free to use the nails and hammer and to adjust the banding, if necessary.

Having thus described my invention, I claim as new and wish to secure by Letters Patent—

1. A vertically-movable table and mechanism, as set forth, for elevating the same, in combination with the plate 8 and its supporting-rods 7, hinged below the machine proper, spurred disks supported in standards at each end of said table, and cams for actuating said disks to support a box, substantially as and for the object specified.

2. In combination with fixed table C, standards seated at each end of said table, journals *c c'*, fitted therein and capable of both rotary and longitudinal movement, spurred disks *d d'* on the inner ends of said journals, and cams G G', for actuating said journals and disks, as herein described.

3. In combination with fixed table C, standards seated thereon at each end, journals *c c'*, fitted in said standards, spurred disks *d d'* on the inner ends of said journals, the latter, *d'*, being formed with peripheral ratchet-teeth, cams, as described, for actuating said journals longitudinally, a foot-lever, R, and a pawl connecting said foot-lever and the said peripheral teeth, all being substantially as herein specified.

4. In combination with the standards E E', journals *c c'*, fitted therein, carrying spurred disks, as set forth, one of said disks being formed with ratchet-teeth on both periphery and face, cams G G', for moving said journals longitudinally, a spring-pressed pawl for engaging said face ratchet-teeth, a foot-lever hinged beneath the machine proper, and a pawl connecting said foot-lever and said peripheral ratchet-teeth, all being substantially as herein described, and for the objects specified.

5. In combination with the standards E E', journals *c c'*, fitted therein, carrying spurred disks, as set forth, cams G G', for moving said journals longitudinally, mechanism consisting of pawls and ratchet-teeth, as described, for controlling the rotary movement of said journals, and banding-reels located adjacent to said journals, as herein described, and for the purpose specified.

6. In combination with standards E E', journals *c c'*, fitted therein, carrying spurred disks, as set forth, cams G G', for moving said journals longitudinally, mechanism, consisting of pawls and ratchet-teeth, as set forth, for controlling the rotary movement of said journals, banding-reels located adjacent to said journals, and tension devices in the path of the banding, consisting of spring friction-clamps controlled by adjusting-screws, substantially as herein specified.

7. In combination with standards E E', journals *c c'*, fitted therein, carrying spurred disks, as set forth, cams G G', for moving said journals longitudinally, banding-reels located adjacent to said journals, a vertically-movable table located between said standards, and mechanism, consisting of levers and knuckle-joint, for elevating said table, as described, and for the objects set forth.

8. A vertically-movable table and mechanism, as set forth, for elevating the same, in combination with the plate 8 and its supporting-rods 7, hinged below the machine-table, spurred disks *d d'*, supported in standards at each end of said table, cams G G', for moving said disks to embrace and support a box, and a series of banding-reels located in the rear of the machine proper adjacent to said disks, all being substantially as and for the purpose set forth.

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