A. STEARNS.

Machine for Trimming Boxes.

No. 167,583. Patented Sept. 7, 1875.

Fig. 1.

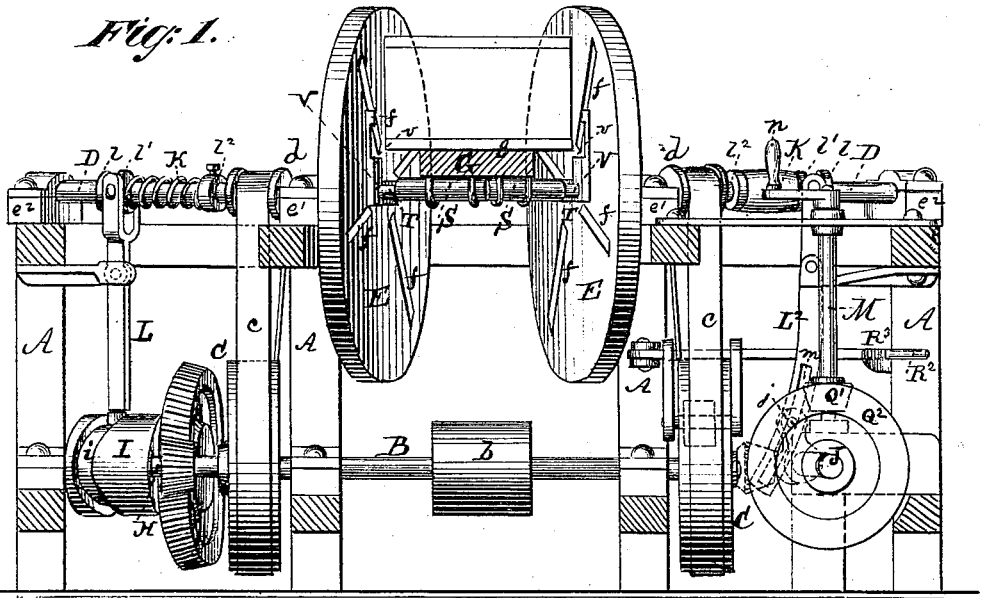


Fig. 2.

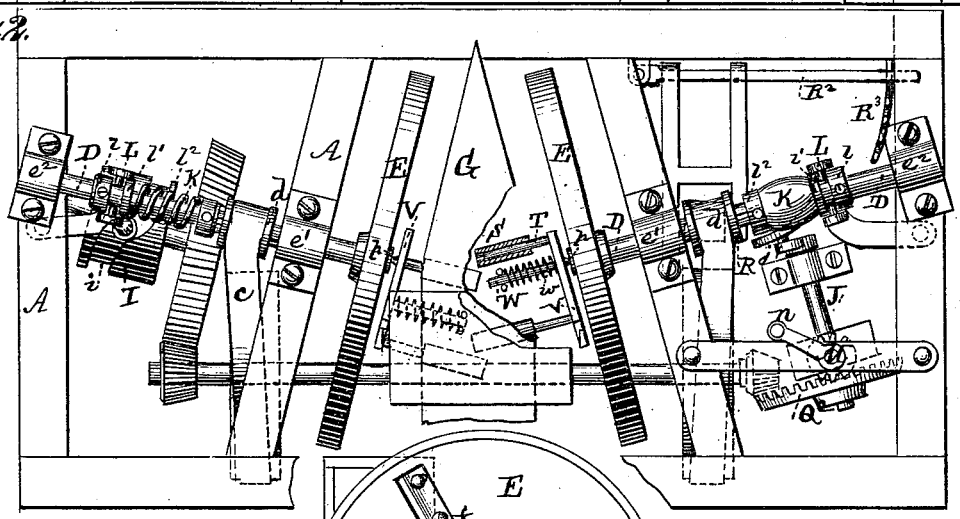
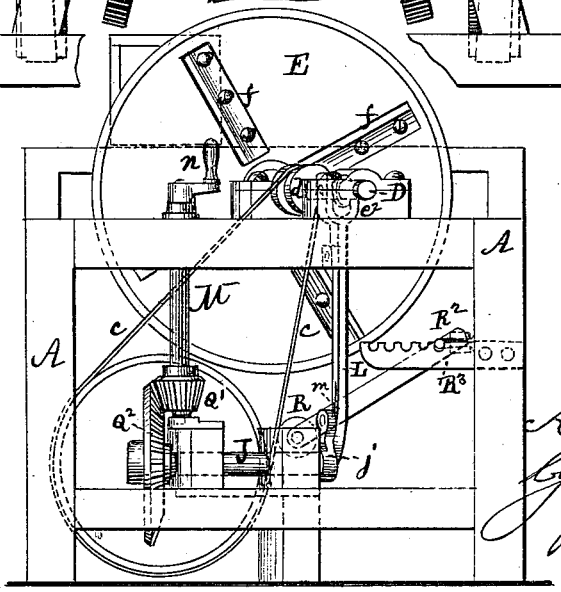


Fig. 3.



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ALBERT STEARNS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MACHINES FOR TRIMMING BOXES.

Specification forming part of Letters Patent No. **167,583**, dated September 7, 1875; application filed June 23, 1875.

To all whom it may concern:

Be it known that I, ALBERT STEARNS, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Machines for Trimming Wooden Boxes, and for similar purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making part of this specification.

My invention relates to a machine, which is designed more particularly for trimming and finishing the edges and corners of wooden packing-boxes; but which may be used for planing and dressing the two opposite sides or edges of pieces of wood of various shapes and sizes.

The invention consists, first, in the combination, hereinafter specifically described, of two rotary cutter-disks, mounted upon suitable shafts, and having cutting-knives upon their inner faces, with a mechanism for adjusting the said cutter-disks and their shafts toward or from each other without interfering with the rotary motion of the same; and, secondly, of a stop mechanism for arresting the advancing motion of the rotary cutter-disks immediately on the completion of the desired cut, all of which will be fully hereinafter described.

In the accompanying drawing, Figure 1 is a side view of a machine, constructed according to my invention. Fig. 2 is a top view of the same. Fig. 3 is an end view.

The frame A, which supports the working parts, is of any suitable construction. In the lower portion of the frame is journaled the main shaft B, which carries, about midway of its length, a driving-pulley, *b*, and near its ends two pulleys, C C, which impart motion to the cutter-shafts D D by means of belts *c c* passing around the pulleys C C, and around pulleys *d d* on the shafts D D. These shafts carry at their inner ends the disks E E, which are provided with any suitable number of knives or cutters, *f*, arranged adjustably in slots in the disks in a similar manner to that in which plane-bits are arranged in their stocks. The shafts D D have their bearings in boxes e^1 e^1 e^2 e^2. These boxes rest on seats in the upper part of the frame A, and are secured thereto by screws or bolts passing through holes in the boxes and in the seats. There are different sets of holes provided in the seats for the screws or bolts, so that by removing them and sliding the boxes along in the seats, and then placing the screws or bolts in other sets of holes, the shafts may be adjusted to revolve in different planes. To further facilitate this result the innermost boxes e^1 e^1 may be attached to their seats by pivots, so as to obviate the necessity of removing them in order to change the position of the shafts. When it is desired to change the position of the cutter-disk, so as to cause it to revolve in other than a vertical plane, the outermost box e^2 is elevated above its seat by means of wedges or blocks placed under it, or by means of screws, or in any other suitable manner, so as to incline the shaft from a horizontal position, and cause the disk to revolve in the desired plane.

The bed G, for holding the work, is located in the upper part of the frame, between the cutting-faces of the disks. The edges of the bed are tapering from about its mid-length toward one end, in directions about parallel with the planes of revolution of the disks; and when said planes of revolution are materially changed by changing the positions of the shafts, the bed may be removed and replaced by another, with its edges tapered to correspond more nearly with the planes of revolution of the disks, and to this end the the bed may be arranged, so as to be readily removable.

The bed is provided with a gage, *g*, against which the work is held while being operated upon by the cutters. When the work is in place upon the bed the cutter-disks are fed up to it simultaneously, which operation may be accomplished in either of the following modes, one of which is shown in the drawing at one end of the machine, and the other is shown at the other end. When either mode is used it is in duplicate—one set of the mechanism being applied at each end in order to render the operation uniform. Referring to Figs. 1 and 2 of the drawing, at the left-hand end of the machine is a shaft, H, driven by gear-

ing from the main shaft B. This shaft H may be so arranged with relation to the main shaft as to be driven therefrom by either spur or bevel gearing. The shaft H carries a cam, I, having a groove, *i*, in its face. A lever, L, is pivoted to the frame A so as to oscillate in an upright position. The lower end of the lever L engages with the groove *i* in the face of the cam, and may be provided with a friction-roller. The upper end of the lever is forked, and engages with a fixed collar, *l*, and a loose collar, l^1, on the cutter-shaft D. Between the collar l^1 and the pulley *d* is another collar, l^2, provided with a set-screw for holding it in place at different points on the shaft. Between the collars l^1 l^2, surrounding the shaft D, is a spring, K, which may be made of metal, rubber, or any other suitable material. The pressure of the spring may be regulated by adjusting the collar l^2 nearer to or farther from the collar l^1. The pulley *d* being attached to the shaft D by a spline and feather, said shaft is allowed a longitudinal motion without interfering with its rotary motion. As the shaft D is revolved by the belt from the main shaft the cam-shaft H is also revolved, and the engagement of the cam I and lever L imparts an oscillating motion to the lever, causing its forked upper end to press against the collar l^1 and force the cutter-disk toward the bed G during one-half revolution of the shaft H, while during the other half revolution of said shaft the forked end of the lever bears against the fixed collar *l* and forces the disk in the opposite direction. Should the pressure of the lever when forcing the disk toward the bed G be so strong as to have a tendency to press the disk too closely against the bed or the work, the spring K will overcome such tendency and allow only the proper degree of pressure to be exerted.

Another mode of feeding the cutter-disks to and from the work is represented in the same figures of the drawing as the mode above described, but at the opposite end of the machine. The main shaft B drives, by means of crown or bevel gearing, a shaft, J, arranged transversely of the frame, and carrying at one end a crank, *j*, which engages with a slot, *m*, in a lever, L^2. This lever is pivoted to the frame A, and has its upper end forked and engaging with two collars, *l* l^1, on the shaft D, which is also provided with an adjustable collar, l^2, and a spring, K. The collars and spring are similar to those before described, and for the same purpose. When the crank-shaft J is rotated the engagement of its crank with the slot *m* gives an oscillating motion to the lever I^2, so as to feed the disk to and from the work, as before described.

In some cases it may be desired to operate the feeding mechanism by hand instead of having it operated from the main shaft. In such cases the gearing is removed from each end of the main shaft, or by suitable means thrown out of engagement with the feeding mechanism, and instead thereof each set of mechanism is driven by an independent shaft worked by hand. Such an arrangement is shown at the right-hand end of Figs. 1 and 2, and also in Fig. 3, in which M represents a shaft, provided with a crank-handle, *n*, at its upper end, and carrying at its lower end a gear-wheel, q^1, meshing into the gear-wheel q^2, which is attached to the crank-shaft J. By turning the crank *n* motion is imparted to the crank-shaft J, and the cutter-disk is fed to and from the work. This mode of operating the feed mechanism can be applied to the cam-shaft H with equal facility. The belts from the main shaft to the cutter-shafts may each be provided with an idler or tightening pulley, R, which may be adjusted by means of a rod, R^2, having one end pivoted and the other end engaging with a notched bar, R^3.

For arresting the advancing motion of the cutter-disks when the desired cut is completed, I employ devices constructed and operating in the following manner: On the under side of the bed G are four cylinders, S, attached to the bed by staples or keepers of any suitable construction. These cylinders are arranged in two pairs, one pair on each side of the longitudinal center of the bed. Each pair is arranged in a direction parallel with the axis of rotation of the cutter-disk nearest to it. The cylinders S are hollow, and in each pair of cylinders works a pair of rods or plungers, T, to the outer ends of which a plate, V, is attached at right angles to the axis of revolution of the cutter-disk, and parallel with the plane thereof. A portion of the plate V extends above the top surface of the bed G, and has a notch or offset, *v*, formed in the side toward the center of the bed. Attached to the plate V, between the rods or plungers T, and in the same horizontal plane and parallel therewith, is a rod, W, surrounded by a spring, *w*, one end of which bears against the plate V and the other end against a seat provided on the under side of the bed. On the side of the plate toward the cutter-disk, at a point exactly opposite the center of said disk, and also opposite the rod W, is a pointed or conical projection, *p*. If desired, the rod W may be continued through the plate V to form this projection. This stop mechanism and the gage *g* are so arranged, with relation to each other and to the work, that the plates V will come in contact with the lateral sides or ends of the work at certain stages of the operation of the machine. Their operation is as follows: As the disks are fed up to the work as soon as the desired cut is completed, the centers of the disks bear against the projections *p*, and the plates V are forced in contact with the lateral sides or ends of the box, and thus arrest the inward motion of the disks, so that, although said disks may continue their rotary motion, yet the cutters are prevented from acting on the work while the plates V are in contact therewith. Should the inward press-

ure of the feed-lever continue after the advancing motion of the disk is arrested, the spring K, between the collars l^1 l^2, yields to such pressure and prevents any injury to the work or the mechanism.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, substantially as hereinbefore set forth, of the two rotary cutter-disks, mounted upon suitable shafts, and having cutting-knives on their inner faces, with a mechanism for adjusting the said cutter-disks and their shafts toward or from each other without adjusting the rotary motion of the same, in the manner and for the object specified.

2. The combination, with the cutter-disks, of the stop mechanism for arresting the advancing motion of said disks immediately on the completion of the desired cut, substantially as herein described.

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Witnesses:

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