G. A. COX.

BOX MAKING MACHINE.

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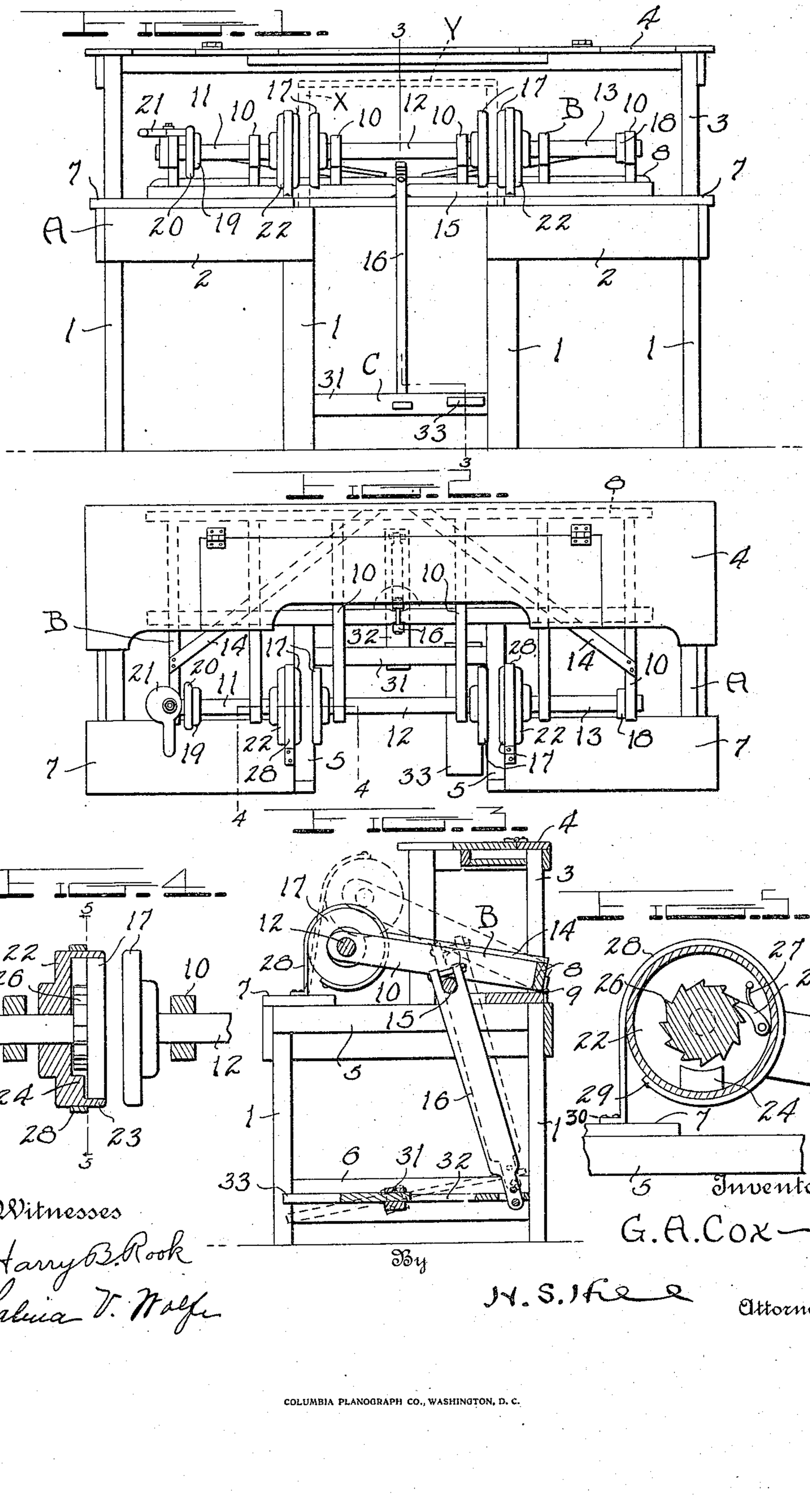
Patented Jan. 4, 1916.



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GEORGE A. COX, OF BREWSTER, WASHINGTON.

BOX-MAKING MACHINE.

1,166,818. Specification of Letters Patent. Patented Jan. 4, 1916.

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To all whom it may concern:

Be it known that I, GEORGE A. COX, a citizen of the United States, residing at Brewster, in the county of Okanogan and State of Washington, have invented certain new and useful Improvements in Box-Making Machines, of which the following is a specification.

The present invention relates to certain new and useful improvements in box making machines, and has for its object to provide a device of this character which embodies novel features of construction whereby packing boxes may be rapidly assembled and nailed together, thereby enabling such boxes to be manufactured in large quantities at a comparatively small cost.

Further objects of the invention are to provide a box making machine which is comparatively simple and inexpensive in its construction, which can be operated by a single person, which enables the sides and bottom of a box to be quickly and accurately nailed to the end pieces thereof, and which comprises few and durable parts such as are not liable to get out of adjustment or repair.

With these and other objects in view, the invention consists in certain novel combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawing, in which:—

Figure 1 is a front elevation of a box making machine constructed in accordance with the invention, a partly completed box being shown as clamped between the clamping heads thereof by dotted lines. Fig. 2 is a top plan view thereof. Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1. Fig. 4 is a longitudinal sectional view through one of the clamping heads taken on the line 4—4 of Fig. 2. Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 4.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, which illustrate one embodiment of the invention, the reference character A designates the stand, said stand being shown in the present instance as formed with eight upright legs 1 which are arrranged in corresponding groups of four legs each. The upper ends of the legs 1 of each group are suitably connected by the boards or brace members 2, and at the rear of the stand there is provided a superstructure 3 which supports a material shelf 4. Suitable boards for forming the ends and sides of the boxes are placed upon the shelf 4 so that they are within convenient reach of the operator and can be quickly removed from the shelf as necessary when assembling and nailing the boxes. The stand A provides an open space at the front thereof between the two groups of legs 1, and the inner pair of each group of the legs is connected at the top thereof by a transverse sill or seat 5, and at the lower end thereof by a transverse bar 6. If desired, suitable ledges or shelves 7 may be applied to opposite end portions of the stand A at the front thereof.

Mounted upon the stand A is a swinging frame B, said frame including a horizontally disposed and longitudinally extending back piece 8 which is hinged at 9 to the rear of the stand A so as to be susceptible of being tilted or swung about a horizontal axis. Projecting forwardly from the back piece 8 are three pairs of arms 10 which are provided with suitable bearings within which the shafts 11, 12 and 13 are journaled, said shafts being horizontally disposed and arranged in alinement with each other. At opposite ends of the swinging frame B diagonal braces 14 are applied to the tops of the arms 10 and back pieces 8 so as to reinforce the said arms and hold them rigidly in position. It will also be observed that a reinforcing strip 15 is applied to the lower faces of the arms 10 and extends longitudinally of the machine, the middle portion of the strip 15 being connected by a pitman 16 to a suitable treadle mechanism C, by means of which the frame B can be swung up and down.

The middle shaft 12 and one of the end shafts, in the present instance the left hand shaft 11, are mounted so as to have a limited sliding movement within their respective bearings. The adjacent ends of the several shafts 11, 12 and 13 are provided with clamping heads 17 which, as illustrated by Fig. 1, are adapted to grip box ends X which rest upon the sills 5 and are arranged in an

upright position. The shaft 13 is provided with a set collar 18 which engages one of the arms 10 to limit the sliding movement of the said shaft toward the right hand end of the machine. The opposite end shaft 11 is provided with a set collar 19 which provides an abutment for a loose collar 20, said loose collar being adapted to be engaged by a cam lever 21 for the purpose of forcibly moving the shaft 11 toward the right hand end of the machine so as to cause the two sets of clamping heads 17 to securely grip the box ends X which were previously inserted between the same. These box ends X rest upon the sills 5 and are rigidly held in proper position by the action of the clamping heads 17 so that a side Y of the box can be applied to the upper edges thereof and readily nailed in position thereon.

A ratchet drum 22 is loosely mounted upon each of the shafts 11 and 13, being arranged adjacent to the clamping heads 17 of the said shafts, and being shown as provided with peripheral flanges 23 which extend over the edges of the said clamping heads. These drums 22 are provided with weights 24 applied to one side thereof so that after being rotated through a partial revolution the drums will return to their original positions by the action of gravity. Each of the drums 22 is also provided with a pawl 25 which is held in a yielding engagement with a ratchet wheel 26 upon the adjacent clamping head 17 by means of a spring 27. It will thus be obvious that when the drums 22 are rotated in one direction the pawls 25 will interlock with the ratchet wheels 26 to produce a corresponding rotation of the shafts 11 and 13, although when the drums are rotated in a reverse direction the spring actuated pawls will slip over the teeth of the ratchet wheels 26.

A flexible strap or cable 28 is secured to the exterior of each of the drums 22 at a suitable point on the periphery thereof, as indicated at 29, said straps being also connected at 30 to the stand A. When the frame B is swung upwardly by the action of the treadle mechanism C, the straps 28 unwind from the peripheries of the drums 22 and produce a rotary movement thereof. The pawls 25 coöperate with the ratchet wheels 26 during this movement to rotate the shafts 11 and 13 for a quarter revolution. The box ends X which are clamped between the clamping heads 17 will also be rotated a quarter revolution, with the result that the side Y which was previously nailed to the box end X will be swung toward the front of the machine and the box ends brought into position for nailing another side thereto. This operation is repeated until the two sides and bottom have been successively nailed to the ends. The cam lever 21 is then moved into inoperative position so as to release the box and permit the same to be removed from the machine. A fresh set of box ends may now be inserted between the clamping heads 17 and the operation repeated, the proper rotation of the box heads for a quarter revolution each time the treadle mechanism is operated enabling the sides to be very quickly and accurately nailed to the ends so that a single operator can assemble and nail a large number of boxes in a short period of time.

The treadle mechanism C includes a rock shaft 31 which is journaled between the transverse bars 6 at the bottom of the stand A and extends longitudinally of the machine. Projecting rearwardly from the middle of the rock shaft 31 is an arm 32 which is pivotally connected to the pitman 16. In a similar manner a foot piece 33 projects forwardly from one end of the rock shaft 31 so that it can be readily depressed by the foot of the operator. Upon depressing this foot piece 33 the frame B is swung upwardly together with the box ends X which may be gripped between the clamping heads 17 thereof, the said box heads being simultaneously rotated through a quarter revolution, so as to bring fresh edges into proper position for having a side piece Y nailed thereto. As soon as the pressure upon the foot piece 33 is released, the swinging frame B will drop back into its original position by the action of gravity and the drums 22 will be rotated by the weights 24 so as to again wind the straps 28 upon the peripheries thereof. The machine requires but very little attention from the operator and with its assistance a single man can assemble and nail a large number of boxes in a short period of time and at comparatively small cost. The machine is more particularly intended for use in the manufacture of those boxes which are used in enormous quantities for the packing of fruit in those parts of the country where fruit growing is one of the important industries, although the machine can also be used for manufacturing packing boxes for any purpose.

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

1. A box making machine including a stand provided with a box end supporting sill, a swinging frame mounted upon the stand, a clamping head carried by the swinging frame, a shaft mounted upon the swinging frame to have both a rotary and a longitudinal movement, a clamping head carried by the shaft and arranged for cooperation with the before mentioned clamping head to grip a box end resting upon the supporting sill of the stand, means for moving the shaft longitudinally to bring the clamping head into operative position,

and means for rotating the shaft to turn the box ends when the swinging frame is manipulated to move the same away from the supporting sill.

2. A box making machine including a stand provided with a box end supporting sill, a swinging frame mounted upon the stand, a clamping head rotatably mounted upon the swinging frame, a shaft mounted upon the swinging frame to have both a sliding and a rotary movement, a clamping head carried by the shaft and arranged for coöperation with the before mentioned clamping head to grip a box end resting upon the supporting sill of the stand, means for moving the shaft to bring the clamping heads into operative position, means for swinging the frame to move the box end away from the supporting sill, and means actuated by the swinging of the frame to rotate the box end into a different position.

3. A box making machine including a stand provided with a box end supporting sill, a swinging frame mounted upon the stand, a pair of rotatably mounted clamping heads carried by the swinging frame and arranged to grip a box end resting upon the supporting sill of the stand, means for swinging the frame to move the box end away from the supporting sill, and means actuated by the swinging of the frame to rotate the clamping heads and turn the box ends into a different position.

4. A box making machine including a supporting frame formed with a box end supporting sill, a swinging frame mounted thereon, a pair of rotatably mounted clamping heads carried by the swinging frame and arranged to grip a box end resting upon the supporting sill of the stand, means for swinging the frame to move the box end away from the supporting sill, a drum carried by the swinging frame and having a pawl and ratchet connection with one of the clamping heads, and a flexible cable wound upon the drum and connected to the stand so that the swinging movement of the frame operates to rotate the clamping heads and turn the box ends into a different position.

5. A box making machine including a stand provided with a box end supporting sill, a swinging frame mounted upon the stand, a rotatably mounted clamping head carried by the swinging frame, a shaft mounted upon the swinging frame to have both a rotary and a sliding movement, a clamping head applied to the shaft and arranged for coöperation with the clamping head of the frame to grip a box end resting upon the supporting sill of the stand, means for sliding the shaft to bring the clamping heads into operative position, means for swinging the frame to move the box end away from the supporting sill, a drum loosely mounted upon the shaft, a pawl and ratchet connection between the drum and the clamping head of the shaft, a flexible cable wound upon the drum and connected to the stand so that the swinging movement of the frame operates to unwind the cable from the drum and rotate the clamping heads to bring the box end into a different position, and means for causing the drum to rotate and take up the slack in the flexible cable upon the return movement of the swinging frame.

6. A box making machine including a stand provided with a box end supporting sill, a swinging frame mounted upon the stand, a rotatably mounted clamping head carried by the swinging frame, a shaft mounted upon the swinging frame to have both a rotary and a sliding movement, a clamping head carried by the shaft and arranged for coöperation with the clamping head of the swinging frame to grip a box end resting upon the supporting sill of the stand, a collar upon the shaft, a cam lever coöperating with the collar to slide the shaft and bring the clamping heads into operative position, means for swinging the frame to move the box end away from the supporting sill, a drum loose upon the shaft and having a pawl and ratchet connection with the clamping head thereof, a cable wound upon the drum and connected to the stand so as to rotate the clamping heads and swing the box end into a different position when the swinging frame is actuated, and means for rotating the drum to wind up the cable upon the return movement of the swinging frame.

7. A box making machine including a stand provided with a pair of box end supporting sills, a swinging frame mounted upon the stand, a rotatably mounted clamping head carried by the stand, a pair of shafts mounted upon the swinging frame to have both a sliding and a rotary movement and arranged in alinement with each other, clamping heads upon the said shafts for cooperation with each other and with the clamping head of the swinging frame to grip a pair of box ends resting upon the supporting sills of the stand, means for sliding one of the shafts to bring the clamping heads into operative position, means for swinging the frame to move the box ends away from the supporting sills, and means actuated by the swinging of the frame for rotating the shafts and box ends to bring the box ends into a different position.

8. A box making machine including a stand provided with a pair of box end supporting sills, a swinging frame mounted thereon, a rotatably mounted clamping head carried by the swinging frame, a pair of shafts mounted upon the swinging frame to have both a rotary and a sliding movement and arranged in alinement with each other,

clamping heads upon the said shaft for co-operation with each other and the clamping head of the swinging frame to grip a pair of box ends resting upon the supporting sills of the stand, means for sliding one of the shafts to bring the clamping heads into operative position, means for swinging the frame to move the box ends away from the supporting sills, a drum loose upon one of the shafts and having a pawl and ratchet connection with the clamping head thereof, a cable wound upon the drum and connected to the stand so as to coöperate with the drum to rotate the shaft and turn the box ends into a different position when the swinging frame is manipulated, and means for rotating the drum to wind up the cable upon the return movement of the swinging frame.

9. A box making machine including a stand provided with a pair of box end supporting sills, a swinging frame mounted thereon, three shafts journaled upon the swinging frame and arranged in alinement with each other, the middle shaft and one of the end shafts being mounted to have a sliding as well as a rotary movement, clamping heads applied to the adjacent ends of the shafts and arranged for coöperation with each other to grip box ends resting upon the supporting sills, means for moving the sliding end shaft to bring the clamping heads into operative position, means for swinging the frame to move the box ends away from the supporting sills, drums loose upon the end shafts and having pawl and ratchet connections with the clamping heads thereof, and cables wound upon the said drums and connected to the stand so as to rotate the shafts and turn the box ends into a different position when the swinging frame is manipulated.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. COX.

Witnesses:
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