

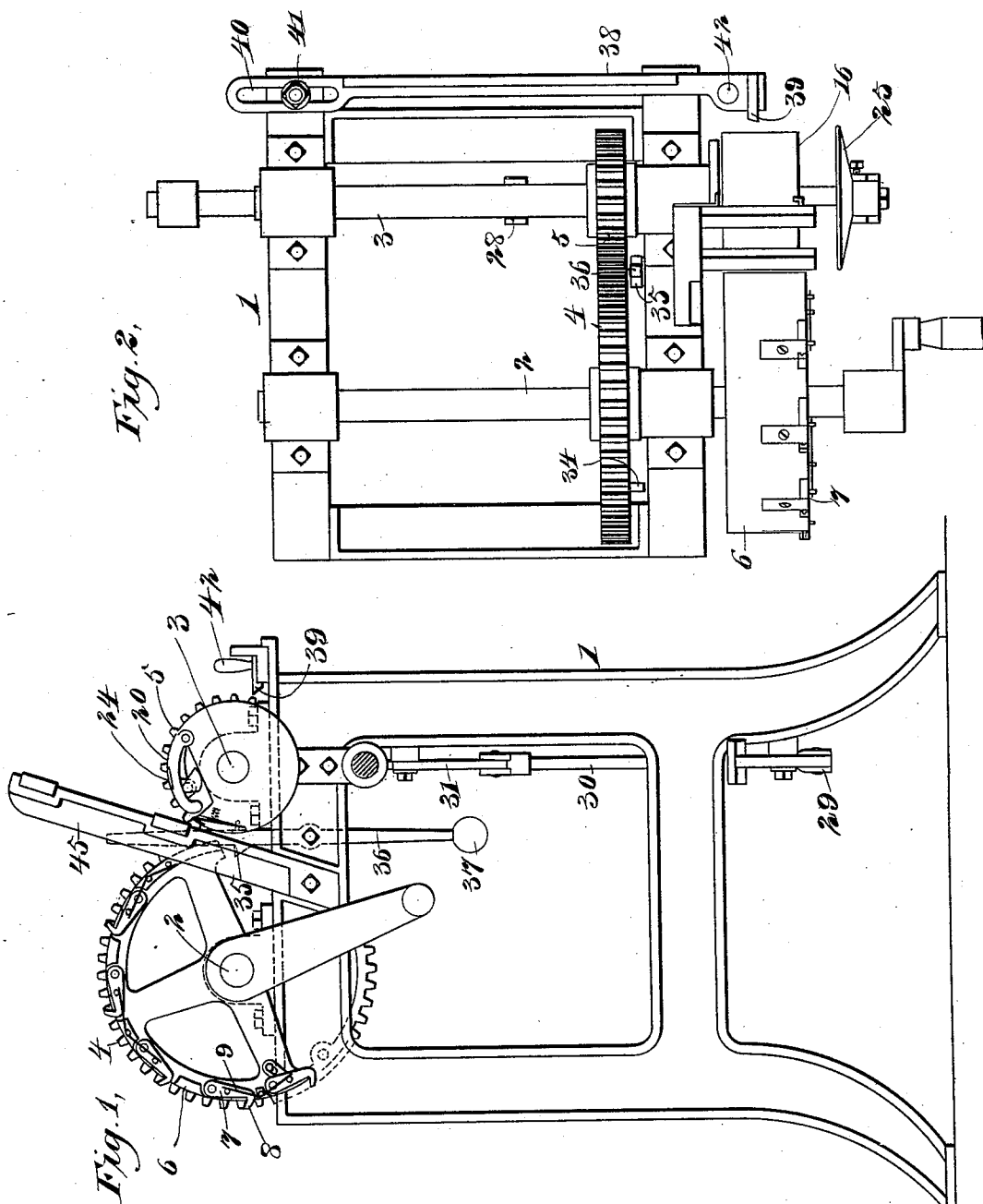
(No Model.)

2 Sheets—Sheet 1.

P. D. PIKE.
BOX NAILING MACHINE.

No. 582,947.

Patented May 18, 1897.



WITNESSES:
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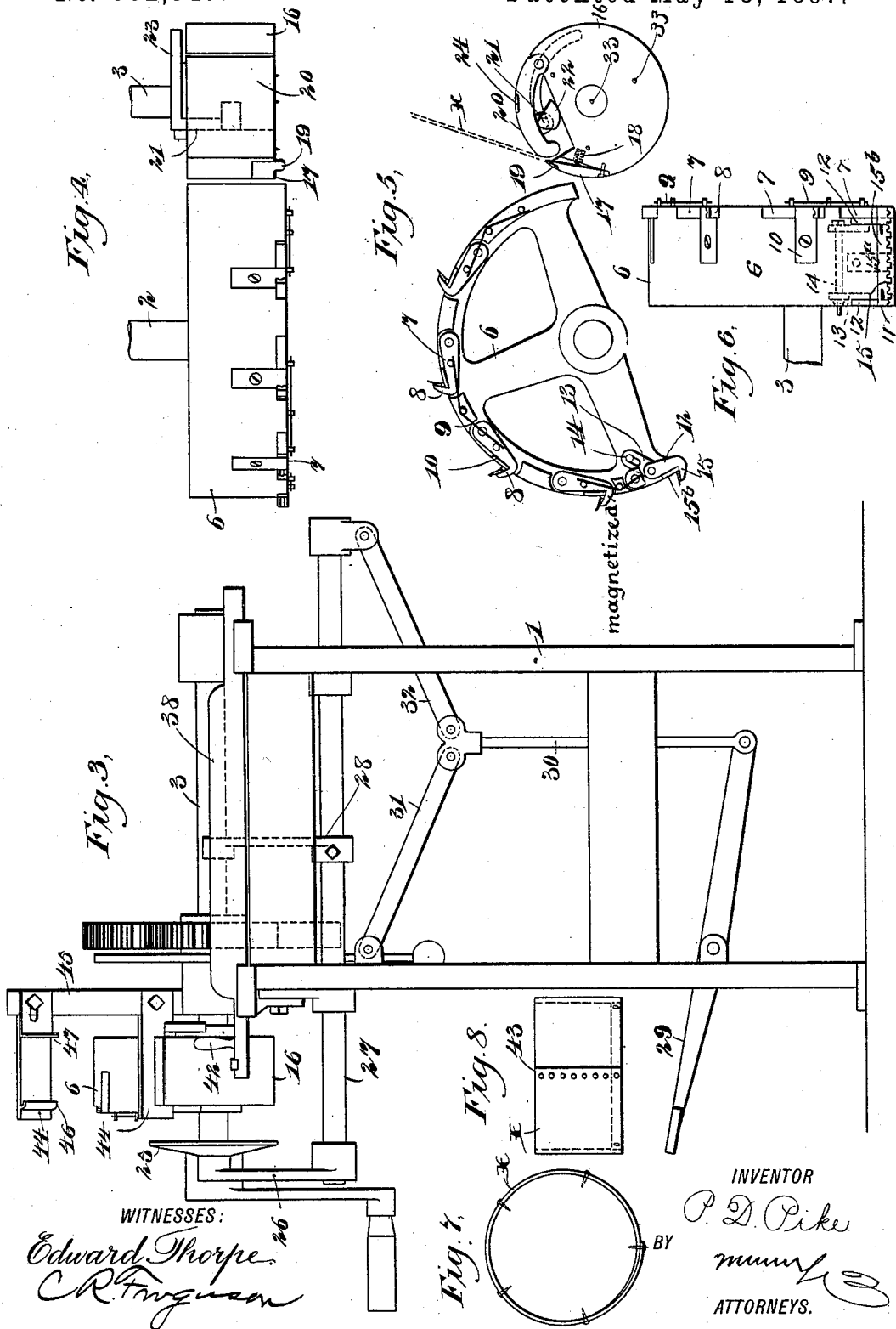
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UNITED STATES PATENT OFFICE.

PAPHRO D. PIKE, OF STOWE, VERMONT.

BOX-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,947, dated May 13, 1897.

Application filed July 9, 1896. Serial No. 598,554. (No model.)

To all whom it may concern:

Be it known that I, PAPHRO D. PIKE, of Stowe, in the county of Lamoille and State of Vermont, have invented a new and Improved
5 Box-Nailing Machine, of which the following is a full, clear, and exact description.

This invention relates particularly to machines for forming and nailing circular boxes, such, for instance, as are used for packing
10 butter or similar material, also covers for same, and the object is to provide a machine by means of which the rim of a box may be quickly and readily turned around the bottom portion and nailed thereto, and in which
15 the overlapped ends of the box may be quickly tacked together.

I will describe a box-nailing machine embodying my invention, and then point out the novel features in the appended claims.

20 Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a top plan view thereof. Fig. 3 is an end elevation. Fig. 4 is a plan view of a nail-carrier and forming-block. Fig. 5 is a side elevation of said parts. Fig. 6 is a rear elevation of the nail-carrier, showing the devices for supporting
30 the tacks employed in securing the lapped edges of the box together. Fig. 7 is a plan view of a completed box, and Fig. 8 is a side view thereof.

35 The machine comprises a frame 1, on the top of which is journaled the drive-shaft 2 and a former-carrying shaft 3. On the drive-shaft 2 is mounted a gear-wheel 4, meshing with a gear-wheel 5 on the shaft 3, the said gear-wheel 5 being smaller than the gear-wheel 4, whereby it may be rotated twice to one rotary movement of the gear 4.

On the outer projected end of the shaft 2 is mounted a nail-carrier 6, having a width substantially that of the box side designed to be nailed to a bottom portion. This nail-carrier is here shown in the form of a half-circle, and arranged around the outer side at suitable distances apart are nail-holders 7. These
45 nail-holders 7 are pivoted at one end to the outer surface of the carrier 6 and at their free ends have outwardly-projecting fingers 8,

which normally project beyond the periphery of the carrier, and they are held yieldingly in this position by means of springs 9, secured
55 to the carrier and engaging their free ends with pins extended outward in the holders. The finger portions 8 of the holders are extended at an angle relatively to the body portion of the holder, so that said fingers will project
60 radially or substantially at right angles to the carrier. These finger portions may be suitably grooved on their inner surfaces to receive a nail, and these holders are preferably magnetized or made as permanent magnets,
65 so as to hold the nail during the movement of the carrier.

At the inner side of each finger 8 a metal driving-plate 10 extends outward from the carrier. These driving-plates are designed to
70 be engaged by the head of a nail and to force the nail through the box material, as will be hereinafter described.

Mounted on one end of the carrier 6 is a tack-holder 11. This tack-holder 11 extends
75 across the end of the carrier and at its ends has upwardly-extended arms 12, having pivotal connection with links 13, adjustably secured to the carrier. These links 13 have slot-openings through which a clamping-rod 14
80 passes, the said rod being provided with a head at one end and with a tightening-nut at the other end, as indicated in Fig. 6. By adjusting these links 13 the projecting fingers 15 of the tack-holder may be made to extend more
85 or less beyond the periphery of the carrier, and also by said adjustment the angle of said fingers may be changed with relation to the carrier.

The holder 11 has any desired number of
90 fingers 15, and the holder is pressed outward yieldingly by means of a spring 15^a, secured to the inner side of the carrier and bearing on the tack-holder. A plate 15^b is secured to the carrier 6 and extends transversely across
95 the carrier, such plate serving the same purpose as that served by the plates 10, and the plate 15^b taking the place of the plate 10 for the lowermost holder 7, such lowermost holder being shown broken away in Fig. 5. Of course
100 this tack-holder will be magnetized similarly to the holders before mentioned.

On the outer end of the shaft 3 is rigidly mounted a holding and forming block 16,

around which the side piece of the box material is designed to be wound. This former 16 is arranged forward of the carrier 6, and the distance between the former and carrier 5 is substantially that of the thickness of the box material. On this former 16 is mounted a clamping device for engaging the end of the box material, as indicated in dotted lines in Fig. 5. This clamp comprises a block 17, 10 seated in a recess in the periphery of the former 16 and having a yielding connection therewith, so as to move slightly outward and inward with relation to the former. This block is shown as pressed normally outward by means of a spring 18, seated in a socket in 15 the former and engaging the inner side of the block 17. The block 17 at its free end has an outwardly-extended finger 19, which is very thin and is adapted to engage between the 20 edge of the bottom of the box and the side wall thereof. As this finger is quite thin it is obvious that it will not change the circular formation of the box to any perceptible extent.

Coacting with the block 17 is a jaw portion 25 20, extending circumferentially of the former 16 and pivoted at one end thereto. This jaw 20 is seated in a recess formed in the outer surface of the block 17, and on its inner side it is provided with a lug through which a shaft 30 21 extends. This shaft 21 is provided with a cam-lug 22, adapted to engage against the wall of the recess formed in the former 16, as shown in Fig. 5. The inner end of the shaft 21 is provided with a portion 23, turned at 35 right angles to the shaft and forming a handle or lever by means of which said shaft may be rotated.

In operation the thin or beveled end of a straight strip of box material *x* is placed between the free ends of the parts 17 and 20, 40 and the jaw 20 is moved outward to clamp the same by means of the cam 22. This jaw 20 extends entirely across the former 16, and it will be seen that as the parts are rotated 45 the carrier 6 will force the block 17 inward tightly against the box material arranged between it and the jaw 20, the said jaw being held rigidly by means of the cam, as before described. Extended across the jaw portion 50 is a metal plate 24, designed to be engaged by the ends of the fastening-tacks to clench the same.

Arranged forward of the former 16 and adapted to move toward and from the same 55 is a clamp or holder 25, adapted to hold the bottom of the box in contact with the outer surface of the former 16. This clamp or holder consists of a metal disk mounted on an arm 26, extended upward from a shaft 27, 60 having longitudinal movement in bearings supported on the machine-frame. This shaft or rod 27 is preferably round, so that the clamp or holder 25 may be adjusted radially, if necessary, but to prevent its rotary movement while in operation I attach to it, by 65 means of a set-screw, an arm 28, which extends outward and has at its upper end a yoke en-

gaging around and adapted to slide on the shaft 3. Longitudinal movement is imparted to the rod or shaft 27 by means of a treadle 29, fulcrumed to the machine-frame and having a link connection 30 with toggle-links 31 and 32, the link 31 being pivotally connected to the machine-frame, and the end of the link 32 opposite its connection with the part 30 has 75 pivotal connection with the rod or shaft 27.

Obviously by pressing downward on the treadle 29 the links 31 and 32 will be moved upward in parallel lines, and this movement of the links will move said shaft or rod 27 80 and cause the part 25 to engage closely against the bottom of the box previously placed against the former 16. If desired, the front face of the former 16 may be provided with pointed projections 33 to engage in the box 85 material forming the bottom.

After the completion of a box it is desirable that the parts be brought to a stop, so that a knife may be operated to cut off the surplus material forming the side portion of the box. 90 As here shown, this stop consists of a pin 34, extended outward from the gear-wheel 4 and adapted to engage with a projection 35 on a lever 36, fulcrumed to the frame of the machine and having a weight 37 at its lower 95 end which serves to hold the said lever in a substantially vertical position.

Mounted to slide on the upper side of the frame 1 is a bar 38, having a cutter 39 at one end movable across the former 16. This bar 100 38 has a slot-opening 40 at one end, through which a bolt 41 extends to a connection with the machine-frame, and at its end near the cutter 39 the said bar 38 is provided with a handle 42. After nailing the box material 105 the cutter 39 may be moved across the same to cut the under or surplus material below the line of transverse tacks 43, as indicated in Fig. 8.

In forming a box a straight strip of material is employed for the side. As before 110 stated, the end of this strip *x* of material will be placed in the clamping device carried by the former, and as the said former rotates the strip will be curved or turned around the 115 same. The strip is guided during this feeding operation by means of guide-arms 44, adjustably supported on an arm 45, extended upward from the machine-frame. Each 120 guide-arm 44 has a fixed guide-finger 46 and an adjustable guide-finger 47. The adjustable guide-finger 47 has in its body portion a slot-opening through which a bolt passes to an engagement with the arm 45.

In the operation of the machine a nail will 125 be placed by an attendant upon each one of the nail-supports 7, and also the tacks will be placed upon the tack-holder 11. After the bottom portion of the box shall have been clamped against the former 16 the side strip 130 *x* may be placed in position, and then, upon a rotary motion imparted to the shaft 2 by means of the crank-handle thereon, the parts will be rotated to turn the side portion *x*

around the bottom portion of the box, and the nail-holders 7 will successively present the nails, and they will be gradually forced inward by means of the plate 10. Of course the nail-holders 7 will be moved inward against the resistance of their holding-springs by the contact of the fingers 8 with the material of the carrier 6. The tack-holder 15 will be brought into position and the several tacks 43 will be forced through the overlapped ends of the box material, and then after cutting off the surplus material the finished box may be removed from the former.

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

1. A box-nailing machine, comprising a rotary former, means for holding the bottom of a box against the same, a rotary nail-carrier, and a series of nail-holders on said carrier, substantially as specified.

2. A box-nailing machine, comprising a former, means for holding the bottom portion of the box in contact with the same, a rotary nail-carrier, and a series of nail-holders on said carrier, the said holders being magnetized, substantially as specified.

3. A box-nailing machine, comprising a former, means for holding the bottom of a box in contact with the same, a nail-carrier, a series of spring-pressed nail-holders mounted on the outer side thereof, and a tack-holder extended transversely of said carrier, substantially as specified.

4. A box-nailing machine, comprising a former, means for holding the bottom of a box in connection therewith, a nail-carrier formed in the segment of a circle, magnetic nail-holders on said carrier, and magnetic tack-holders on said carrier, substantially as specified.

5. A box-nailing machine, comprising a nail-carrier, means for imparting rotary motion to the same, nail-holders on said carrier, a rotary former, and a clamping device on said former, substantially as specified.

6. A box-nailing machine, comprising a rotary nail-carrier, nail-holders on said carrier, each consisting of a body portion pivotally connected to the carrier and having a finger portion normally extended beyond the periphery of the carrier, springs for holding the holders in such outward position, a rotary former coacting with the carrier, and a clamping-plate for the bottom of the box, substantially as specified.

7. A box-nailing machine, comprising a rotary carrier, nail-holders pivotally mounted on said carrier, tack-holders pivotally mounted on said carrier, a rotary former forward of the carrier, a clamping device on said former, and a stop for the carrier, substantially as specified.

8. A box-nailing machine, comprising a rotary carrier, nail-holders pivotally mounted on said carrier, a former mounted to rotate

with said carrier, and a cutter adapted to operate across the former, substantially as specified.

9. A box-nailing machine, comprising a rotary former, a rotary nail-carrier coacting therewith, gear connections between the shafts of said former and carrier, nail-holders pivotally mounted on the carrier, a clamping-plate for holding the bottom of the box against the former, a shaft or rod on which said plate is mounted, and means for moving said rod longitudinally, substantially as specified.

10. A box-nailing machine, comprising a rotary former having a clamping device thereon, a rotary nail-carrier, nail-holders pivotally mounted thereon, and guides for the box material extended above the former, substantially as specified.

11. A box-nailing machine, comprising a nail-carrier, a series of nail-holders pivotally connected thereto tack-holders extended transversely of the carrier and having yielding connection therewith, a shaft on which said carrier is mounted, a gear-wheel on said shaft, a pin extended from said gear-wheel, a lever mounted to swing on the frame and having a projection for engagement with said pin, a rotary former, a gear-wheel on the shaft of said rotary former meshing with the first-named gear-wheel, and a clamping-plate adapted to hold the bottom of a box in engagement with the former, substantially as specified.

12. In a box-nailing machine, a segmental rotary nail-carrier, nail-holders pivotally connected thereto, a tack-holder having pivotal connection with said carrier, means for adjusting said tack-holder relatively to the carrier, and a rotary former forward of the carrier, substantially as specified.

13. In a box-machine, the combination with a frame, of a rotary former, a rotary carrier, a series of independently-movable nail-holders carried by the carrier, and gearing for driving the former and carrier in unison, substantially as described.

14. In a box-machine, the combination with a frame, of a rotary former, a rotary carrier adjacent to the former, a plate projecting from the carrier, a pivoted nail-holder spring pressed against the plate, the plate serving to engage the nail and drive the same, and means for driving the former and carrier in unison, substantially as described.

15. In a box-machine, the combination of a rotary former, a rotary carrier, a series of independently-movable magnetized nail-holders held by the carrier, and means for driving the former and carrier in unison, substantially as described.

PAPHRO D. PIKE.

Witnesses:

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L. A. PIKE.