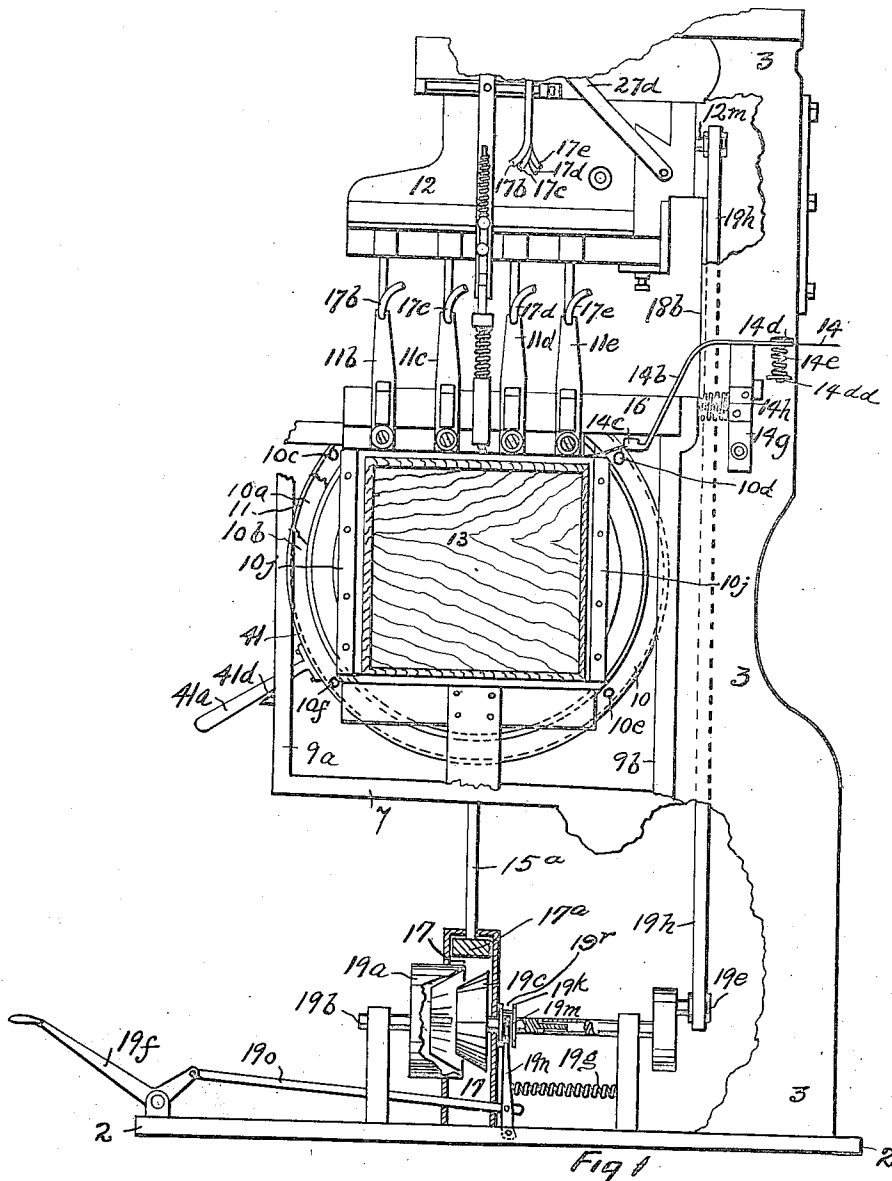


D. W. RIPLEY,
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APPLICATION FILED JAN. 3, 1921.

1,436,293.

Patented Nov. 21, 1922.

4 SHEETS—SHEET 1.



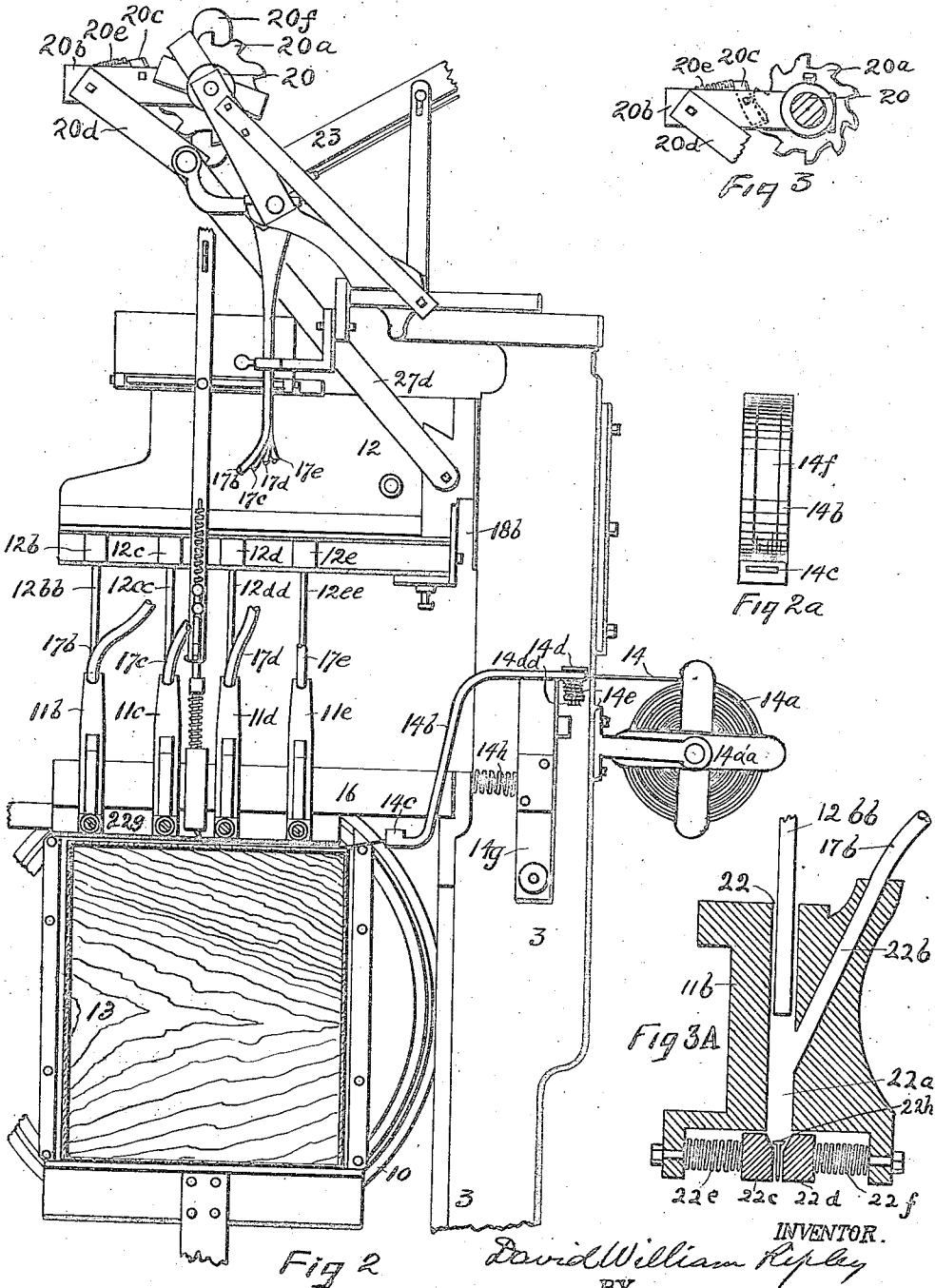
David William Ripley
INVENTOR.

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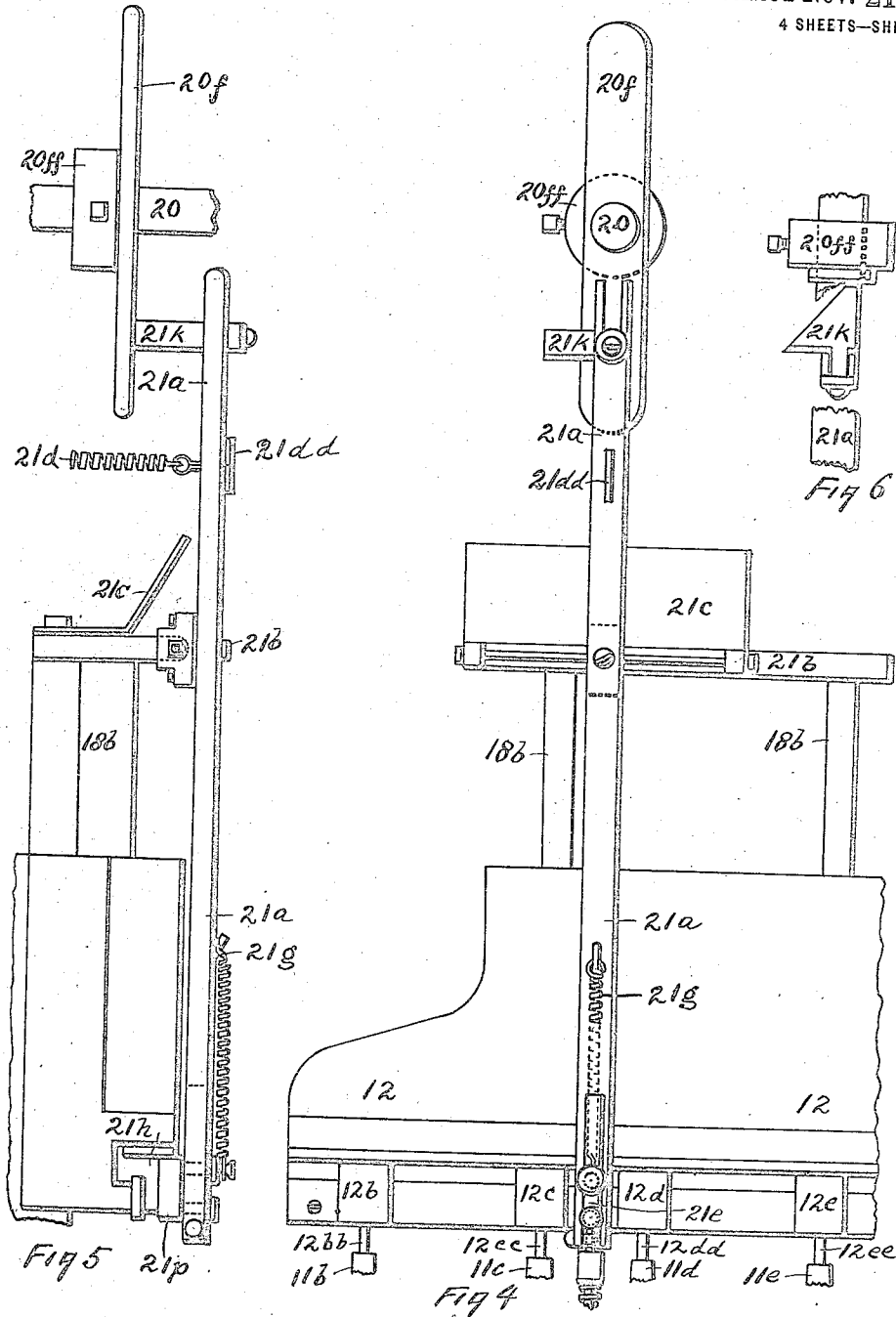


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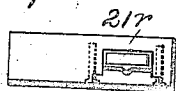
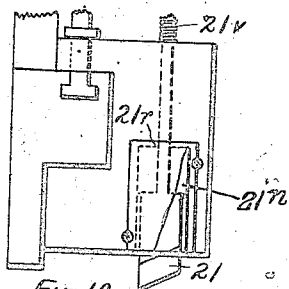
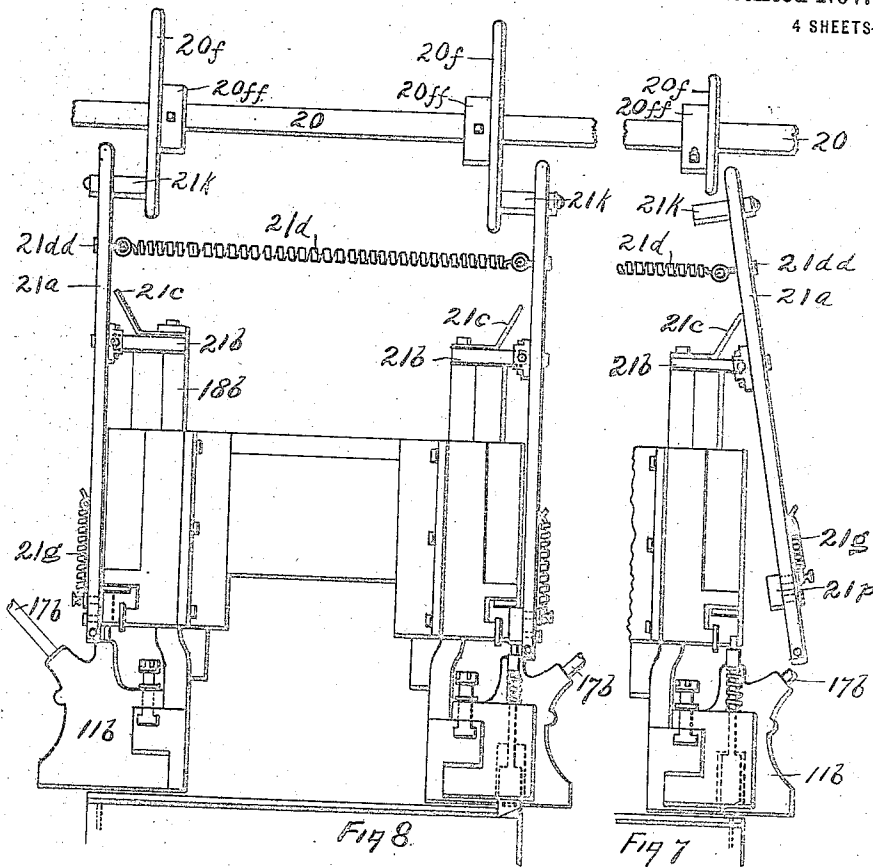


Fig 11

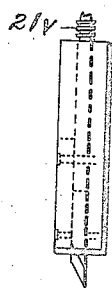


Fig 9.

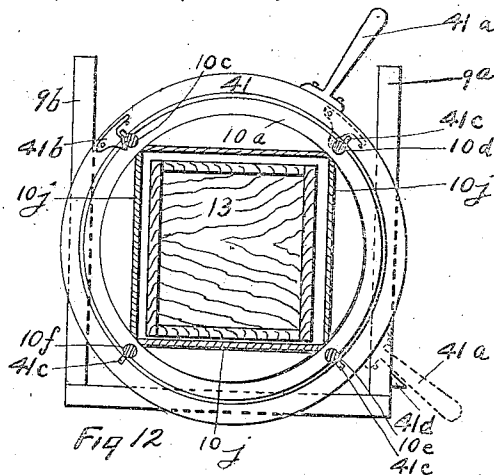


Fig 12

David William Ripley INVENTOR.
BY Francis C. Kuebler. ATTORNEYS.

UNITED STATES PATENT OFFICE.

DAVID WILLIAM RIPLEY, OF FRESNO, CALIFORNIA.

BOX-STRAPPING MACHINE.

Application filed January 3, 1921. Serial No. 434,593.

To all whom it may concern:

Be it known that I, DAVID WILLIAM RIPLEY, a citizen of the United States, and resident of Fresno, in the county of Fresno and the State of California, have invented a new and useful Improvement in Box-Strapping Machines, of which the following is a specification.

My application relates to box strapping machines, and has for one of its objects to provide a device to automatically cut the metal tape used in strapping the box. Another object of the invention is to provide a nailing device to attach the metal tape used in reinforcing a box, or connecting together a plurality of boxes.

In an application filed by me on January 3, 1921, Serial No. 343,592, nail feeding device for a box nailing machine, I have disclosed a box strapping machine in which one end of a tape used in strapping the box is nailed approximately to the middle of a box side and the tape is then wound around and attached by nails to the box and is cut off near the starting point. The automatic tape cutter disclosed in this application is adapted to be used in connection with the strapping machine disclosed in the above designated pending application.

I accomplish these and other objects hereinafter set forth by means of the device described in the following specifications and illustrated on the accompanying drawings in which Figure 1 is a side view of parts of the machine showing the means for moving the nail driving mechanism. Figure 2 is a side view of the upper portion of the device. Figure 2^a is an end view of the tape or strap guide. Figure 3 is a separate view of a ratchet forming part of the nail feeding means. Figure 3^a is a sectional view of the nail box. Figure 4 is an enlarged side view of the tape cutter showing its relation with a timing cam, and with the driving block. Figure 5 is an enlarged front view of the same mechanism shown in Figure 4. Figure 6 is a separate top view of a cam more specifically hereinafter described. Figure 7 is a side view of the cutter actuating means showing the cutter in idle or inoperative position. Figure 8 shows the cutters on both sides of the machine in operative relation ready for cutting the tape on the downward movement of the nail driving block. Figure 9 is a side view showing the cutter in its slideway. Figure 10 is a front

view of the cutter and the slideway. Figure 11 is a top view of the slideway for the cutter. Figure 12 is a detail end view of the cradle for holding the boxes and the means for turning the boxes.

Referring to said drawings, 2 is the base on which the machine stands. 3 is an upright post attached to base 2 to support the mechanism hereinafter described. 7 is a bracket attached to upright post 3. Its upper surface should be on a horizontal plane. 10 is a cradle for holding the boxes to be strapped. It consists of two circular frames 10^a and 10^b which are attached together a spaced distance apart, so they are concentric, by means of four connecting rods 10^c, 10^d, 10^e and 10^f. I have formed a cradle holder consisting of slideways 9^a and 9^b adapted to engage the peripheries of the circular frames 10^a and 10^b and to permit said cradle 10 to slide upward and to rotate within the cradle holder, but which will not permit the cradle to have a horizontal movement. The interior of the cradle is formed rectangular, with rigid supports 10^g connecting the circular frames on lines of segments of the frames. The size and relative shape of the rectangular opening should be adapted to receive boxes to be strapped so that the ends of the box extend beyond the cradle.

Means for rotating the cradle consist of an auxiliary ring 41 of such diameter that it will easily rotate around the four connecting rods 10^c, 10^d, 10^e and 10^f when it is placed concentric with cradle rings 10^a and 10^b. 41^a is a handle extending radially therefrom. 41^b is a dog pivoted to auxiliary ring 41. 41^c are a plurality of pairs of guide pins, extending radially from the connecting rods 10^c, 10^d, 10^e and 10^f, said pins forming an annular path in which the auxiliary ring 41 can travel. 41^d is a stop attached to cradle support slideway 9^a in line with the travel of handle 41^a, its purpose being to stop the rotation of the cradle at a point where one of the faces of the box is on a horizontal plane. In raising the handle 41^a it will be noted that the dog will drag over one of the rods 10^c, 10^d, 10^e, or 10^f, and that by reversing the movement of the handle 41^a the dog 41^b will engage one of the rods 10^c, 10^d, 10^e or 10^f, and that the cradle and its contents will be turned on its axis. 12 is a cross head consisting in part of a plurality of blocks 12^b, 12^c, 12^d and 12^e which are horizontally adjustable on cross

head 12. The blocks 12^b, 12^c, 12^d and 12^e are placed in a horizontal line beyond the ends of the cradle and are adapted to be adjusted so that the blocks will be on line with the ends of the box. 12^{bb}, 12^{cc}, 12^{dd}, and 12^{ee} are drivers attached to the blocks 12^b, 12^c, 12^d, and 12^e.

The nailing device consists of a plurality of nail boxes 11^b, 11^c, 11^d and 11^e attached to a nail spacing support 16, which is rigidly attached to the upright beam 3. Nail boxes 11^b, 11^c, 11^d and 11^e are horizontally adjustable and can be spaced such distances apart as is best adapted for the work to be done. Each of said nail boxes as shown in Figure 3^a has a vertical hole 22 therein into which a driver is fitted. 17^b, 17^c, 17^d and 17^e are a plurality of tubular leads for carrying nails to the nail boxes. These leads are of such size that if a nail starts downward therein with the point downward it maintains that position. 22^b are openings in the nail boxes connecting the tubular leads with the lower portion of the openings. The cross head 12 is mounted on a vertical guide 18^b, attached to post 3 and is adapted to slide thereon so that in its downward travel it will force each driver against a nail deposited in the lower end of hole 22^a into the box 13 which is under the driving blocks. The crosshead 12 is actuated from a pulley 19^a on a shaft 19^b. A foot treadle 19^c is connected by means of a link, 19^d to arm 19^e having a fork 19^m which engages a groove 19^f carried by the clutch 19^g so that when the foot treadle is pressed down the clutch is moved into engagement with the pulley against the resistance of a spring 19^h. The shaft 19^b carries a crank 19ⁱ connected by a link 19^j to a pin on the crosshead 12. It will, therefore, be seen that the crosshead will be actuated whenever the operator places his foot on the treadle 19^c.

The nail boxes 11^b, 11^c, 11^d and 11^e should be spaced far enough from bracket top 7 so that the box 13 when in the cradle can be turned around in the space between said bracket top and the blocks. 14^a is a metal strap coil, and 14 is the single ply of the metal strap which is brought over guide 14^b directly under the nail boxes 11^b, 11^c, 11^d and 11^e, and over the ends of the box, for the purpose of nailing it thereon. Guide 14^b is placed on the machine so that it will guide the tape in line with an end of the box or boxes being strapped and directly under the line of nail boxes. Guide 14^b is constructed with a compound curve, the end from which the tape is drawn having an eye 14^c, shown in Figure 2^a. 14^c is a slot in the lead communicating with eye 14^c. In some portion of the slot, preferably near the end where the tape enters the guide, I have placed a binding block 14^d which bears against the tape 14. 14^e is a tension spring

adapted to regulate the pressure of the block against the tape. 14^f is a tape guide support pivoted at one end to post 3. 14^h is a tension spring adapted to permit the tape guide to have a slight forward movement when the tape is pulled through it. Normally the top surface of the box 13 when in the cradle 10, is below the nailing mechanism hereinbefore described, as the force of gravity keeps the cradle resting on bracket 7. For the purpose of elevating the box to said nailing blocks I have provided a hydraulic press consisting of a cylinder 17, a piston 17^a, a piston stem 15^a, and a table at the top of the piston stem adapted to push box 13 upward as the cylinder 17 is filled with liquid under pressure. By this means it will be noted that a box 13 can be inserted in the cradle, the hydraulic force can be turned on and the piston will move upward lifting the box and the cradle to the level that the top surface of the box will be pressed against the nail boxes 11^b, 11^c, 11^d and 11^e. When the nailing of the tape or strap on the uppermost side of the box is completed a valve is operated to release the hydraulic pressure, the cradle is turned one quarter around thus presenting another side uppermost, and the tape is wrapped around the box as it turns, the hydraulic pressure is again made operative to bring the box in position adjacent to the nail boxes and the nails are driven through the tape into the box. This is repeated until the four sides of the box are in turn placed uppermost and adjacent to the nail boxes, and the tape or strap is wrapped around the box.

20 is a shaft journaled above the cradle, preferably parallel to the axis of said cradle. 20^a is a ratchet wheel attached to said shaft. 20^b is a pawl support fitted on the shaft 20 so that the shaft can be turned therein. 20^c is a pawl pivoted to support 20^b in such relation with ratchet 20^a that it can be engaged therewith. 20^d is a connecting arm pivoted at one end to pawl support 20^b and at the other end to an arm 27^d which is pivoted to driving block 12. 20^e is a spring for holding pawl 20^c normally in engagement with ratchet 20^a. The length of pawl support 20^b is such that shaft 20 has a tenth turn at each down and back movement of the cross head 12. 20^f are cams attached to rod 20. 21^a are timer rods pivoted to supports 21^b which are attached to guides 18^b so that the timer rods can swing in line with the axis of the shaft 20. 21^c is a stop for limiting the swing of timer rod 21^a. 21^e is a slot in the lower end of timer rod 21^a. 21^b is an auxiliary block adapted to slide vertically in slot 21^e. 21^f is a spring adapted to hold auxiliary block 21^b in an upward position. 21^h is a notch in cross head 12 adapted to engage block 21^b and carry it downward with the cross head.

21^d is a spring adapted to hold timer rod 21^a in an oblique position so that auxiliary block 21^b is normally disengaged with notch 21^b. 21^k is a cam block attached to the upper part of timer rod 21^a, which the cam 20^e engages operating against spring 21^d, and forcing the timer stem to a vertical position so that auxiliary block 21^b is in operative relation with cross head 12. 21 is a cutter fitted to slide in a slideway 21ⁿ in cutter block 21^r. 21^v is a spring adapted to normally hold cutter 21 in a raised position. Cutter block 21^r is attached to support 16, and is directly over the path of the tape as it is wound around box 13 and the cutter 21 is directly under block 21^r when timer rod 21^a is in a vertical position so that on the downward stroke of the cross head 12, the cutter will be moved down to cut the tape. It will be observed that by the operations of the cam described, the notch 21^b in the block 12 engages with the cutter and cuts the tape on each fifth downward movement, when the tape has been wrapped around the four sides of the box and has reached the starting point. In the drawing I have shown the cutter operative approximately midway between the corners of the box. The tape should be started with its end extending about half way across the box. By nailing the tape in this position the box can be turned and the tape will wind around the box. As each side face is successively uppermost the tape is nailed, and as hereinbefore described when the tape has reached the starting point the cutter is forced downward and severs the tape. When the strapped box is removed from the cradle and another box is inserted therein, the tape extending beyond the tape guide 14^b to the knife is first nailed down, and the tape is wrapped around the box as hereinbefore described, and on the fifth movement of the hammer the tape is again cut. It is here noted that if the tape were to be started at one corner of the box and wrapped around, but four strokes of cross head would be required to encircle the box, but as the tape is started between the corners of the box, two strokes of the cross head are required to complete the one side and a total of five strokes for the four sides.

It is also noted that if the tape guide 14^b were rigid the tape would be slackened when the box is raised for nailing. To overcome this objection the tape guide 14^b is held in position by a tension spring 14^h as hereinbefore explained, and as the box is raised the spring 14^h will constantly keep the tape taut.

Having described my invention I claim as new and ask for Letters Patent:

1. A box strapping machine having a re-

ciprocating crosshead carrying a plurality of nail drivers, a rotatable box holder beneath said nail driving means, means to rotate said box holder to successively present the sides of a box to the nail driving means, tape guiding means adjacent the nail driving means, a cutter for severing a tape delivered to said driving means through said tape guiding means, a cam controlled by the crosshead for bringing the cutter operating means into actuating position after a predetermined number of reciprocations of the crosshead and means on the crosshead for actuating the cutter when the same is in actuating position.

2. A box strapping machine having a reciprocating crosshead carrying a plurality of nail drivers, a rotatable box holder beneath said nail driving means, means to rotate said box holder to successively present the sides of a box to the nail driving means, tape guiding means adjacent to the nail driving means, a cutter for severing a tape delivered to said driving means through said tape guiding means and a cam controlled by the crosshead for causing the cutter to sever the tape after a predetermined amount of said tape has been applied to the box.

3. A box strapping machine having a reciprocating crosshead carrying a plurality of nail drivers, a rotatable box holder beneath said nail driving means, means to rotate said box holder to successively present the sides of a box to the nail driving means, tape guiding means adjacent to the nail driving means, a cutter for severing tape delivered to said driving means through said tape guiding means, a cam controlled by the crosshead for causing the cutter to sever tape after a predetermined amount of said tape has been applied to the box, and yieldable means for keeping the tape taut.

4. A box strapping machine having a reciprocating crosshead carrying a plurality of nail drivers, a rotatable box holder beneath said nail driving means, means to rotate said box holder to successively present the sides of a box to the nail driving means, tape guiding means adjacent the nail driving means, a cutter for severing a tape delivered to said driving means through said tape guiding means, a cam controlled by the crosshead for bringing the cutter operating means into actuating position after a predetermined number of reciprocations of the crosshead, means on the crosshead for actuating the cutter when the same is in actuating position, and yieldable means for moving the tape guide in the opposite direction from the strain imposed upon the tape by the box wrapping means.

DAVID WILLIAM RIPLEY.