

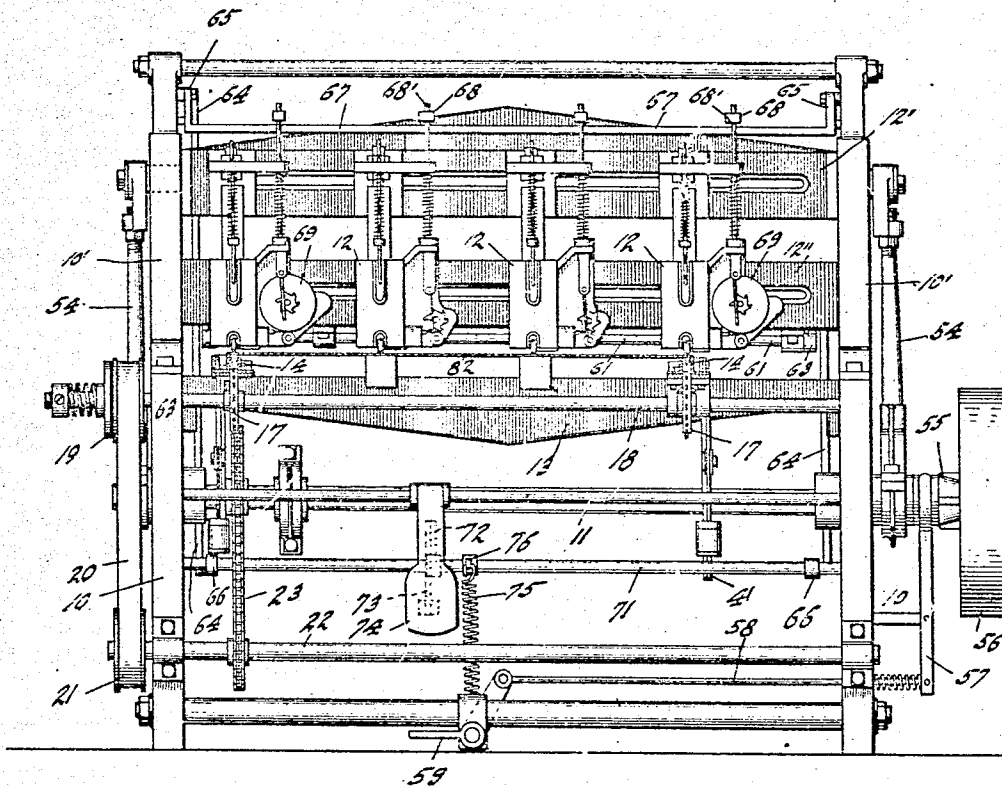
J. H. GREENSTREET.
WIRE BOUND BOX MACHINE.
APPLICATION FILED MAY 11, 1910.

985,996.

Patented Mar. 7, 1911.

5 SHEETS—SHEET 1.

Fig. 1.



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6 SHEETS—SHEET 2.

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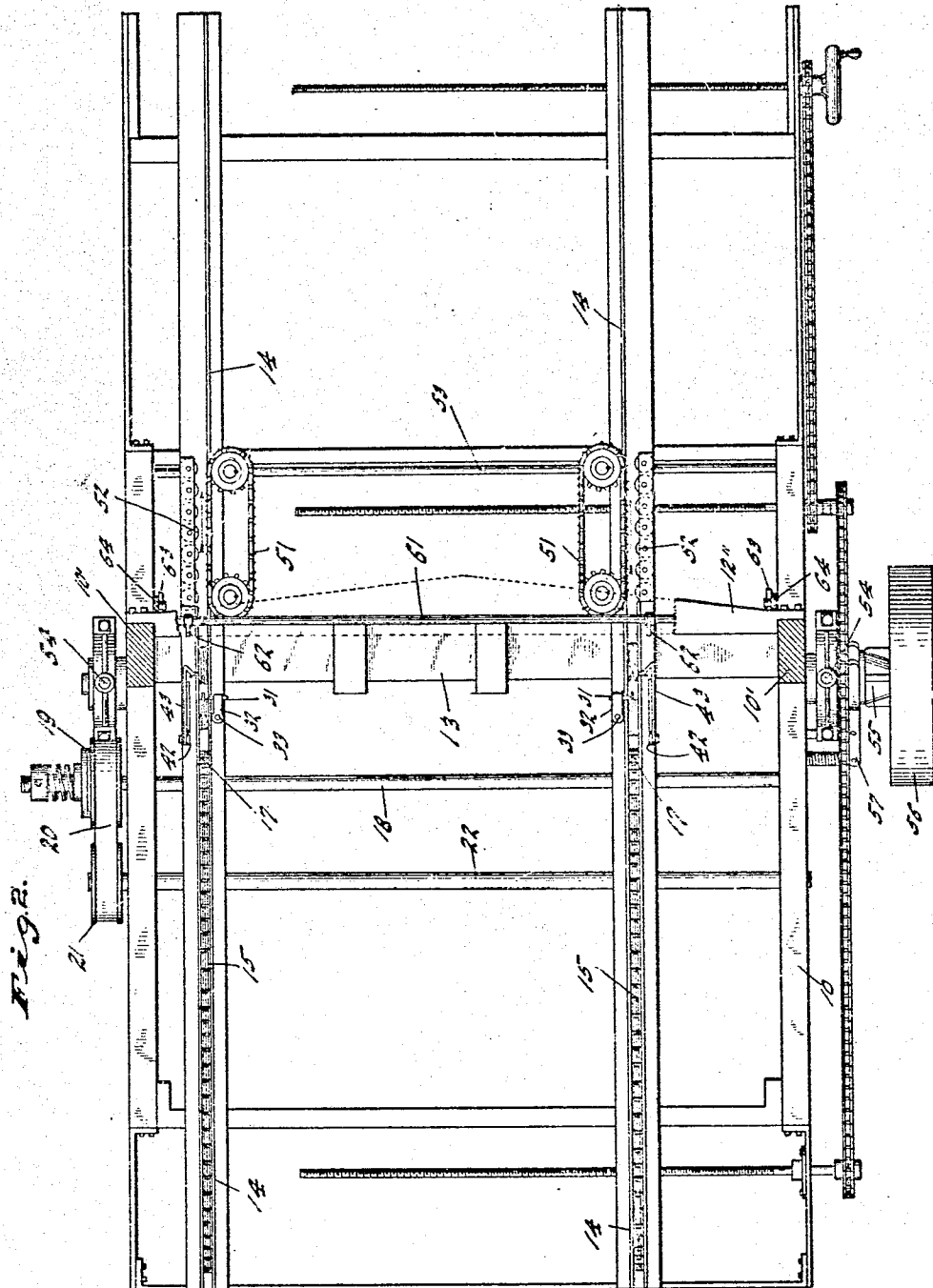


Fig. 2.

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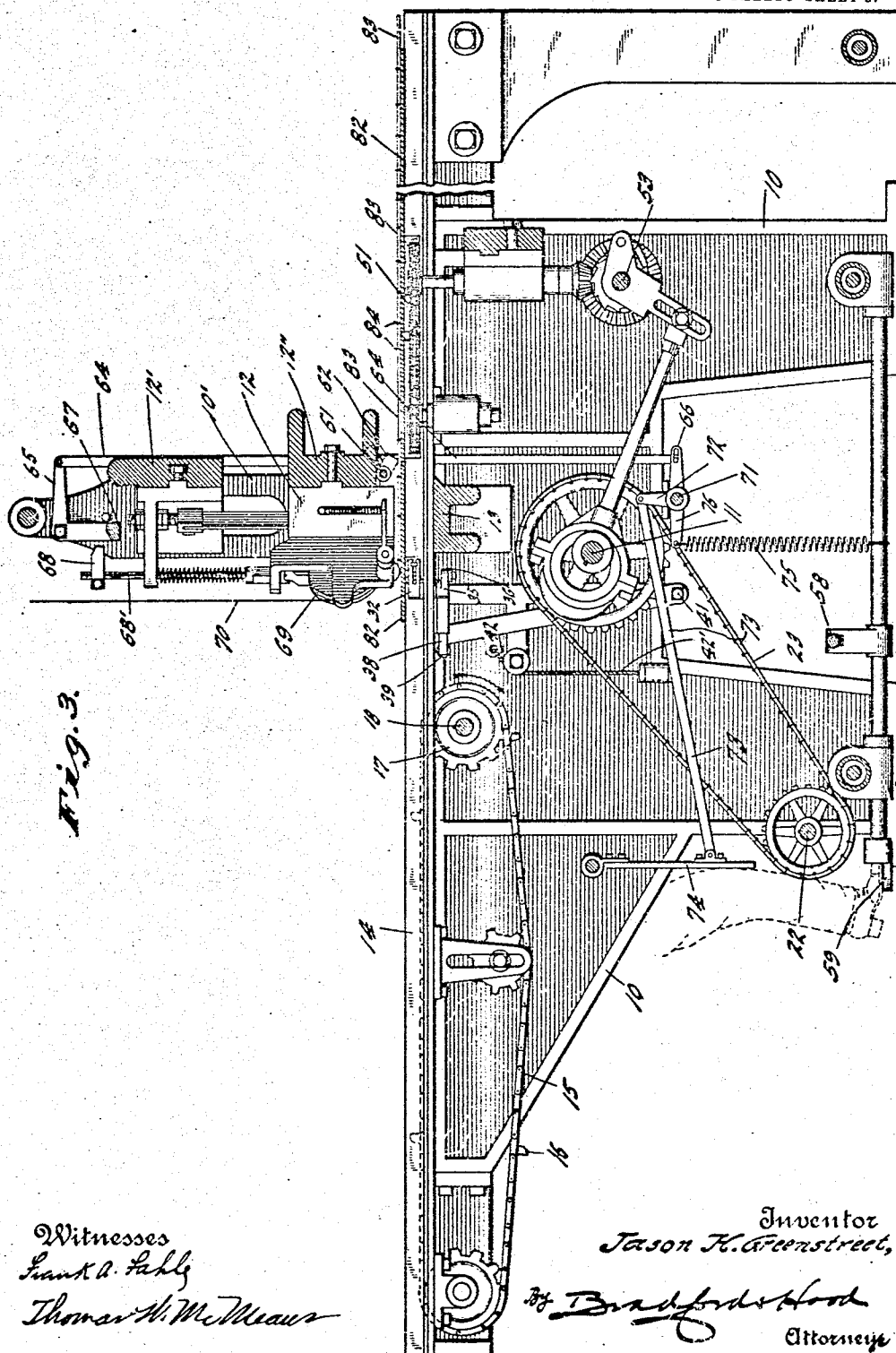
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5 SHEETS-SHEET 3.



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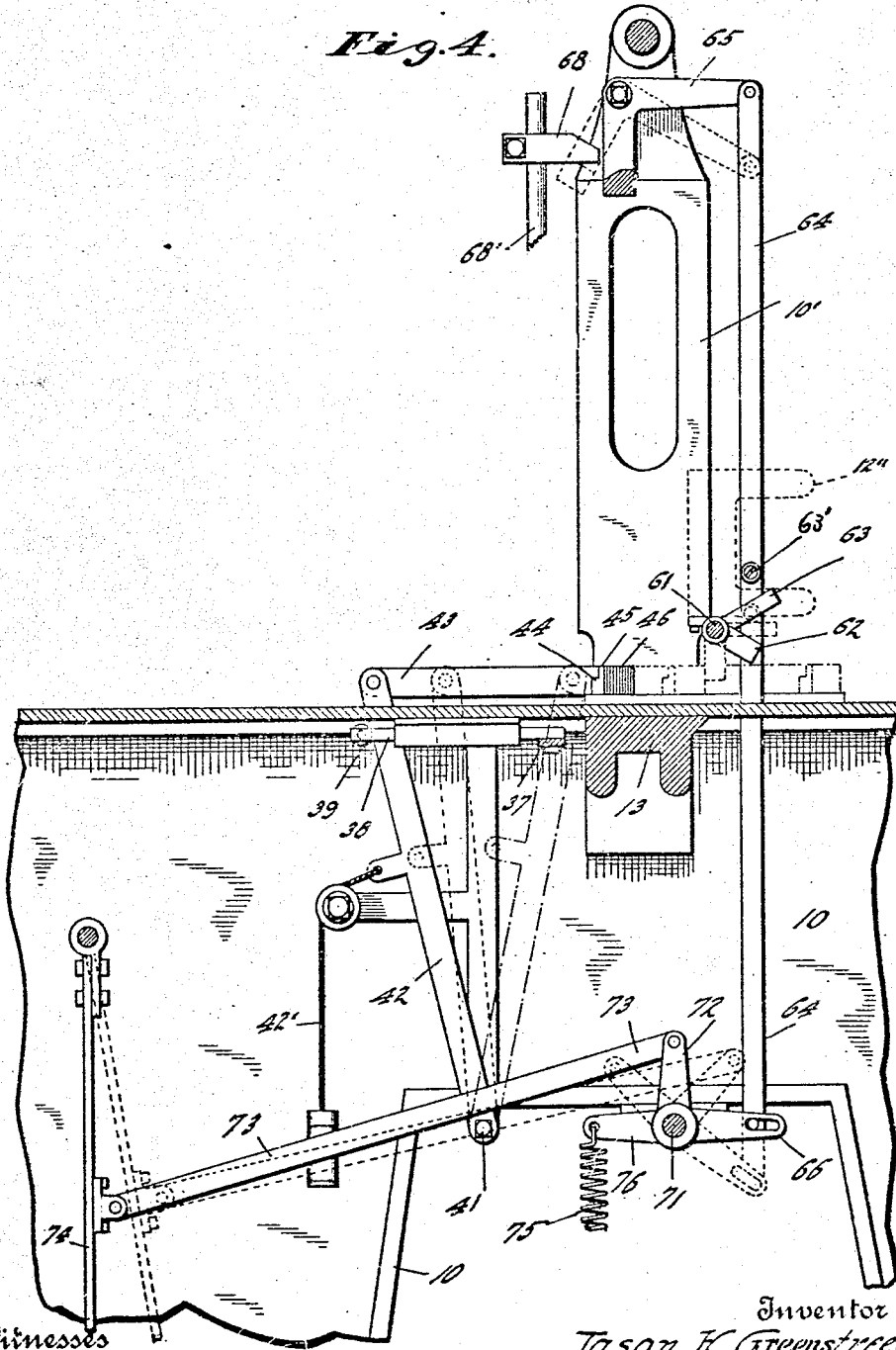
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5 SHEETS-SHEET 4.

Fig. 4.



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6 SHEETS-SHEET 5.

Fig. 5.

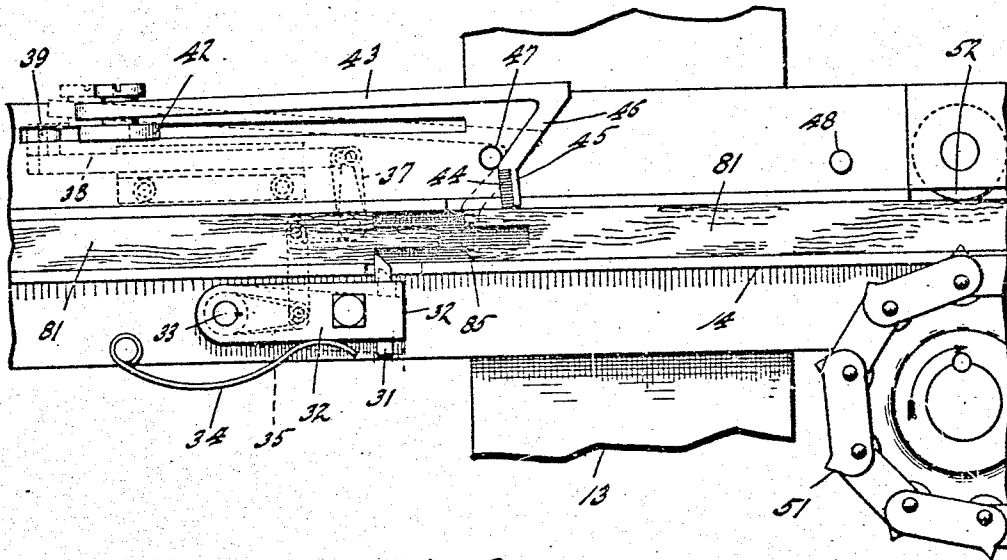


Fig. 6.

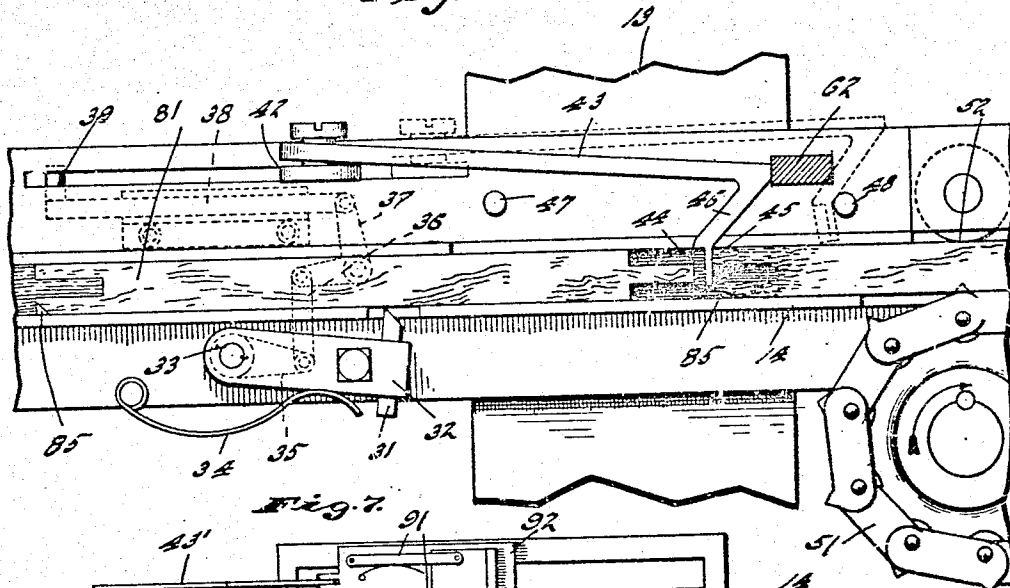
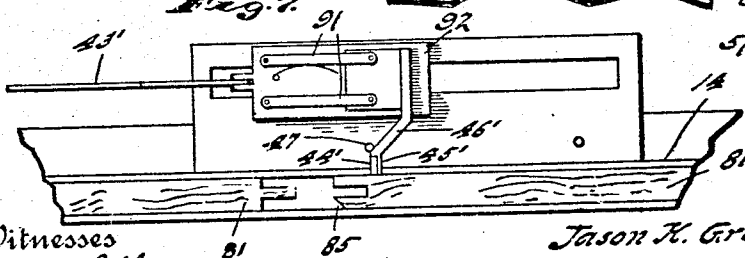


Fig. 7.



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UNITED STATES PATENT OFFICE.

JASON H. GREENSTREET, OF INDIANAPOLIS, INDIANA.

WIRE-BOUND-BOX MACHINE.

985,996.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed May 11, 1910. Serial No. 560,760.

To all whom it may concern:

Be it known that I, JASON H. GREENSTREET, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Wire-Bound-Box Machine, of which the following is a specification.

The object of my invention is to produce a machine for making wire bound box blanks from cleats, sheets and binding wire secured to the cleats and sheets by suitable staples.

The accompanying drawings illustrate my invention.

Figure 1. is a front elevation of a machine embodying my invention; Fig. 2. a plan in section below the stapling mechanism; Fig. 3. a longitudinal vertical section; Fig. 4. a vertical section on a larger scale showing in detail the connections for producing the desired spacing between the last section of one blank and the first section of the succeeding blank; Fig. 5 a fragmentary plan of the cleat spacing mechanism in its two positions adjacent the initial end of its stroke; Fig. 6 a similar view showing the parts in their two positions adjacent the end of the stroke, and Fig. 7 a plan of a slight modification of the spacing finger.

In the drawings, 10 indicates a suitable supporting frame in which is journaled a main drive shaft 11. Rising from the frame 10 are suitable brackets 10' 10' which support the stapling mechanisms 12 of any desired type, said mechanisms being arranged above a stapling anvil 13. The details of this stapling mechanism are not material so far as my present invention is concerned, and, therefore, need no further description.

Extending longitudinally through the machine and over the anvil 13, are cleat guides 14, 14; one of which is preferably adjustable toward and from the other by any suitable mechanism, as shown. Arranged in the receiving end of each cleat guide, is a cleat feeding belt 15, preferably provided at one or more points in its length with fingers 16 adapted to positively engage the cleats and drive them forwardly through the guide. Each chain 15 is driven by means of a sprocket wheel 17, and the two sprocket wheels are secured to a shaft 18, which is driven by means of a friction clutch 19, the pulley element of said clutch being driven by means of a belt 20 coming from a pulley 21 carried by a shaft 22 driven by a chain

23 from the main drive shaft 11, the arrangement being such that the chains 15 are under a constant but yielding driving force.

Arranged closely adjacent the forward end of each chain 15, is an interrupter finger 31, which is adapted to be projected into and out of the adjacent cleat guide. The finger 31 is carried by an arm 32 mounted upon a rock shaft 33, and is yieldingly urged toward the cleat guide by a spring 34. Secured to the lower end of shaft 33 (see dotted lines Figs. 5 and 6) is an arm 35 connected by a link 36 with one arm on the bell crank lever 37, the other arm of which is connected to a slide 38 provided with a finger 39 at its rear end.

Pivoted at 41 on the main frame is a swinging arm 42, the upper end of which is projected into position where it may engage finger 39 at the rear end of its stroke. Arm 42 is yieldingly urged to the position shown in full lines in Fig. 4 by means of a weighted cable 42'. Loosely connected with the upper end of arm 42 is the rear end of a spacing finger 43, the forward end of which is provided with a cleat-spacing portion 44, and a sheet-spacing portion 45, which two portions may be projected laterally into and withdrawn from the cleat guide. The finger 43 is provided with a cam portion 46 which, at the rear end of the stroke, comes into engagement with a pin 47 which serves to project portion 44-45 into the cleat guide, and at the forward end of its stroke comes into engagement with a pin 48 which serves to withdraw said portion from the cleat guide. The travel of finger 43 is over the anvil 13, and, therefore, the portion 44-45 of the finger is moved from one side to the other of the stapling plane.

Arranged beyond the stapling plane is any suitable mechanism for engaging the connected sheets and cleats for the purpose of feeding the same step-by-step through the machine. In the present form, I have shown an intermittently moving feed chain 51 arranged adjacent the cleat guide and cooperating with a suitable series of rollers 52, which serve as an abutment for the chain. The feed chains 51 are driven by a suitable train from the ratchet shaft 53 connected in a well known manner to the main drive shaft 11, as shown.

The reciprocating head 12' of the stapling mechanism is connected by the usual pitmen 54 with the shaft 11, and the shaft 11 is

driven by the common single-throw clutch 55 and the continuously moving pulley 56. Clutch 55 is controlled by means of a lever 57, a link 58, and a foot lever 59.

5 In order to produce a sufficient space between the last portion of one box blank and the first portion of a succeeding box blank, to thereby provide a sufficient length of binding wire to form tying ends, I have provided the following mechanism: Extending
10 across the machine, beneath the stationary head 12", is a rock shaft 61 provided with a pair of stop fingers 62, 62, one of which is adjustable toward the other in order that it
15 may be set to conform with any position of the adjustable cleat guide 14. These stop fingers 62 are intended to be thrown down into the path of movement of the spacing
20 fingers 43 in order to form an abutment therefor at a point where a cleat held thereby will be in position to receive its first staple from the stapling mechanism. This
position is shown in full lines in Fig. 6. In order to control the rock shaft 61, I secure
25 to each of its ends an arm 63 which is operated by a pin 63" carried by a vertical link 64, the upper end of which is connected to an arm 65 and the lower end of which is
connected to an arm 66. The arms 65 carry
30 a bar 67 which extends across the machine in position to be projected beneath fingers 68 carried by the pawl plungers 68', which operate the feed wheels 69, which control
the feeding of the staple wire 70 from which
35 the staples are formed.

The arms 66 are carried by a rock shaft 71 and this shaft carries an arm 72 connected by a link 73 with a lever 74 arranged in position where it may be readily engaged
40 by the knee of the controlling operative. The several parts connected to the rock shaft 71 are held yieldingly in normal position by means of a spring 75 connected to an arm 76 carried by the rock shaft 71.

15 The operation is as follows: The cleat-feeding operative, who may be a cheap boy, will place cleats 81 in the receiving ends of the two cleat guides 14, in regular sequence and these cleats will be engaged by the pro-
50 jections 16 of the chain 15 and be driven forwardly through the cleat guide until the forward cleat comes into engagement with the interrupter finger 31, whereupon the
friction driving mechanism for shaft 15 will
55 yield and movement of the chains 15 will temporarily cease. In this position of parts, the portion 44-45 of each spacer 43 lies within the cleat guide a little in advance of the forward end of the arrested cleat, as indicated in dotted lines in Fig. 5 and the
60 operative will then press upon lever 74 so as to throw finger 62 down into the path of travel of the finger 43, and will, in the case of the very first cleat which passes through
65 the machine, withdraw fingers 31 by hand

so that the initial cleat may be projected forwardly until it comes into engagement with portion 44 of finger 43 at the position indicated in full lines in Fig. 6. A sheet 82 will then be fed in the machine beneath the
70 stapling heads and binding wires 83, carried beneath the stapling heads, in the usual manner. In placing the sheet 82, its forward edge will be moved into engagement with the portion 45 of each finger 43 so as
75 to be properly located in relation to the cleats. In this position of the cleats, the interrupter fingers 31 rest against the sides of the cleats, as shown in Fig. 6. Thereupon, the controlling operative (who stands
80 between the cleat guides to the rear of shaft 22) will step upon lever 59 so as to start the stapling and feeding mechanisms into operation, but there will be no formation of staples because bar 67 lies beneath fingers 68.
85 The operative immediately releases lever 74, whereupon fingers 62 are withdrawn from the path of movement of fingers 43 so that the sheets and cleats may be advanced through the machine and into position to
90 be engaged by the feeding chains 51. Before this advancement takes place, the first staples 84 are driven by the stapling mechanism. As the cleats and sheet are advanced
(by hand for the first cleats) beneath the
95 stapling mechanism, the forward end of finger 43 comes into engagement with pin 48 and the portion 44-45 is withdrawn from the cleat guide, as indicated in dotted lines
in Fig. 6, and the weighted cable 42' serves
100 to immediately draw the finger 43 back to the position shown in full lines in Fig. 5, where cam 46 has just come into engagement with pin 47, but the tip of the portion
44-45 rests against the side of the forwardly moving cleat and thus prevents the
105 completion of the rearward stroke of finger 43. In the meantime, the forwardly moving cleat has been preventing the interrupter 31 from moving into the cleat guide but at its rear end, the cleat is dubbed off, as indicated at 85, so that when this portion of the
cleat comes opposite the interrupter, the interrupter may pass into the cleat guide in
110 front of the oncoming cleat so as to arrest its further movement. The forwardly moving cleat continues, however, until its rear end passes beyond the portion 44-45 of
finger 43 and, as soon as this occurs, the
115 finger 43 may continue its rearward movement so that its portion 44-45 is projected by pin 47 into the cleat guide, as indicated in dotted lines in Fig. 5. At this time, the
lever 42 engages finger 39 of slide 38 and withdraws the interrupter 31 from the path
120 of movement of the oncoming cleats so that the forward one of those cleats may be advanced into engagement with the spacing finger 43, thus definitely establishing a
proper relation between the first two cleats.
130

The chain 15 is driven at a fairly high speed so that the new cleat may be brought promptly into spaced relation with the advance cleat. As soon as this occurs, the operative will place a new sheet 82, urging the same forward by hand until the first staple is driven into it, after which time the step-by-step advancement of the chains 51 will serve to draw it, and the cleats to which it is attached, through the machine without further attention.

The operation described will be continued until four cleats (if four-sided boxes are being made) have passed through the machine. While the fourth cleat is passing beneath the stapling heads, the operative will press forwardly upon lever 74 so as to swing fingers 62 down into the paths of movement of fingers 43 and so as to swing bar 67 into position beneath fingers 68, thus arresting the feeding action of the staple wires 70. As a consequence, the oncoming cleats will be arrested at the position shown in Fig. 6, while the cleats in advance of fingers 43 will continue their forward movement, thus drawing wires 83 beneath the stapling mechanism and furnishing a sufficient quantity at the end of each blank. Whenever enough wire has been provided in this way, the operative will release lever 74 and the operation of the machine will continue as already described.

It will be noticed that the machine is entirely under the control of a single operative and that the operation of the machine may be continuous if the controlling operative is able to feed sheets thereto with sufficient speed.

In case the withdrawal of portion 44—45 from between the spaced cleats should offer any difficulty, by reason of the slight angle resulting from withdrawal, the construction indicated in Fig. 7 may be readily adopted, the portion 44'—45' and cam 46' being carried by parallel motion links 91 mounted upon the sliding block 92 connected by a link 43' or with lever 42.

I claim as my invention: *

1. The combination, with a guide for a plurality of articles of material to be associated together in spaced relation, of a spacing member formed for spacing insertion between such articles and movable for a limited space with such articles, means for causing the insertion of said spacing member into the path of travel of such articles to the rear of each article, means for withdrawing said spacing member from such line, means for returning said spacing member to its initial position, and means other than the spacing member for driving the article along said guide.

2. The combination, with a guide to receive a plurality of articles to be associated in a spaced relation, of a spacing member

arranged adjacent the path of travel of said articles and projectable into said path, said spacing member having a portion adapted to engage an article as it passes to prevent projection of the spacing member into the path of movement of the articles until the article has passed said portion, the said spacing member being subsequently withdrawable from the path of movement of the articles and then returnable to initial position for re-projection into said path of movement.

3. The combination, of a guide arranged to receive a plurality of articles to be associated in a spaced relation, a spacing member arranged adjacent the path of movement of said articles and projectable into and along the path of movement of said articles, means controlled by the passage of an article along its guide for preventing projection of the spacer into the path of movement of said articles, means for withdrawing the spacer from the path of movement of said articles after projection of said spacer along the path of movement of the articles, and means for returning said spacing member to initial position.

4. In a wire-bound box machine, the combination, with cleat guides, and stapling mechanism, of a spacing member arranged adjacent the path of travel of the cleats and projectable into said path, said spacing member having a portion adapted to engage a cleat and be thereby prevented from projection into the path of movement of the cleat until the cleat has passed the spacing member, means for withdrawing said spacing member from the path of movement of the cleat, and means for returning said spacing member to initial position.

5. In a wire-bound box machine, the combination, with cleat guides, of a spacing member arranged adjacent the path of travel of the cleats and projectable into said path, said spacing member having a portion adapted to engage a cleat and be thereby prevented from projection into the path of movement of the cleat until the cleat has passed the spacing member, means for withdrawing said spacing member from the path of movement of the cleat, and means for returning said spacing member to initial position.

6. In a wire-bound box machine, the combination with cleat guides and stapling mechanism, of means for driving sheets and cleats through the machine, a spacing member arranged adjacent each line of movement of the cleats and projectable into and along said line of movement, means controlled by the passage of a cleat for preventing projection of said spacer into the path of movement of the cleats, means serving to project said spacer into the path of movement of the cleats when the cleat has passed

the preventing means, means for withdrawing the spacer from the path of movement of the cleats after projection along said path, and means for returning the spacer to initial position.

7. In a wire-bound box machine, the combination of a cleat guide, a spacing finger arranged adjacent said cleat guide and movable longitudinally thereof, means for withdrawing said spacing finger laterally from the cleat guide, means for returning the spacing finger to initial position with the spacing finger in contact with the forwardly moving cleat, and means for driving said spacing finger into the cleat guide to the rear of the cleat when the same has passed the spacer.

8. In a box machine, the combination of a cleat guide, a spacing member movable into, along and out of, said cleat guide, a stop projectable into the path of movement of said spacing member along the cleat guide, and means by which said stop may be controlled, stapling mechanism arranged to act on the cleats as they pass through the guides, and means controlled by the stop controller for interrupting the stapling action of the stapling mechanism.

9. In a box machine, the combination of a cleat guide, a spacing member movable into, along and out of, said cleat guide, a stop projectable into the path of movement of said spacing member along the cleat guide, and means by which said stop may be controlled.

10. In a box machine, the combination of a cleat guide, a spacing member movable into, along and out of said cleat guide, a stop member movable into and out of the line of travel of the spacer along the cleat path, means by which said stop member may be controlled, stapling mechanism arranged to act on the cleats as they pass through the guide, means controlled by the stop controller for interrupting the stapling action of the stapling mechanism, a cleat feeder arranged to deliver cleats to the spacer, an interrupter movable into and out of the line of travel of the cleats from said feeder to the spacer, and means controlled by the cleat spacer for intermittently withdrawing the interrupter.

11. In a box machine, the combination of a cleat guide, a spacing member movable into, along and out of said cleat guide, a stop member movable into and out of the line of travel of the spacer along the cleat path, means by which said stop member may be controlled, a cleat feeder arranged to deliver cleats to the spacer, an interrupter movable into and out of the line of travel of the cleats from said feeder to the spacer, and means controlled by the cleat spacer for intermittently withdrawing the interrupter.

12. In a box machine, the combination of

the cleat guide, a reciprocating spacing member movable longitudinally of the cleat guide and also movable laterally of the cleat guide into and out of the path of movement of the cleats, means for projecting said member into the cleat path at one end of its longitudinal movement, means for withdrawing the spacing member from the cleat path at the opposite end of its longitudinal movement, means for returning the cleat spacer longitudinally to its initial position, a cleat feeder arranged to deliver cleats along the cleat guide to the spacer, an interrupter arranged adjacent the cleat guide between the cleat feeder and the spacer and movable into and out of the cleat path, and means controlled by the spacer upon its return movement for withdrawing the interrupter from the cleat path, a stop member projectable into and out of the path of longitudinal movement of the spacer, and means by which said stop member may be controlled.

13. In a box machine, the combination of the cleat guide, a reciprocating spacing member movable longitudinally of the cleat guide and also movable laterally of the cleat guide into and out of the path of movement of the cleats, means for projecting said member into the cleat path at one end of its longitudinal movement, means for withdrawing the spacing member from the cleat path at the opposite end of its longitudinal movement, means for returning the cleat spacer longitudinally to its initial position, a cleat feeder arranged to deliver cleats along the cleat guide to the spacer, an interrupter arranged adjacent the cleat guide between the cleat feeder and the spacer and movable into and out of the cleat path, and means controlled by the spacer upon its return movement for withdrawing the interrupter from the cleat path.

14. In a box machine, the combination of the cleat guide, a reciprocating spacing member movable longitudinally of the cleat guide and also movable laterally of the cleat guide into and out of the path of movement of the cleats, means for projecting said member into the cleat path at one end of its longitudinal movement, means for withdrawing the spacing member from the cleat path at the opposite end of its longitudinal movement, means for returning the cleat spacer longitudinally to its initial position, a cleat feeder arranged to deliver cleats along the cleat guide to the spacer, an interrupter arranged adjacent the cleat guide between the cleat feeder and the spacer and movable into and out of the cleat path, and means controlled by the spacer upon its return movement for withdrawing the interrupter from the cleat path, a stop member projectable into and out of the path of longitudinal movement of the spacer, means by

which said stop member may be controlled, stapling mechanism arranged to act upon the cleats in the cleat guides, and means controlled by the stop member controlling means for interrupting the action of the stapling mechanism during the time of projection of the stop member into the path of longitudinal movement of the spacer.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, 10 this sixth day of May, A. D. one thousand nine hundred and ten.

JASON H. GREENSTREET. [L. S.]

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
