S. F. BAUWENS.

BOX BLANK MACHINE.

APPLICATION FILED FEB. 24, 1911.

1,131,460.

Patented Mar. 9, 1915.

4 SHEETS—SHEET 1.

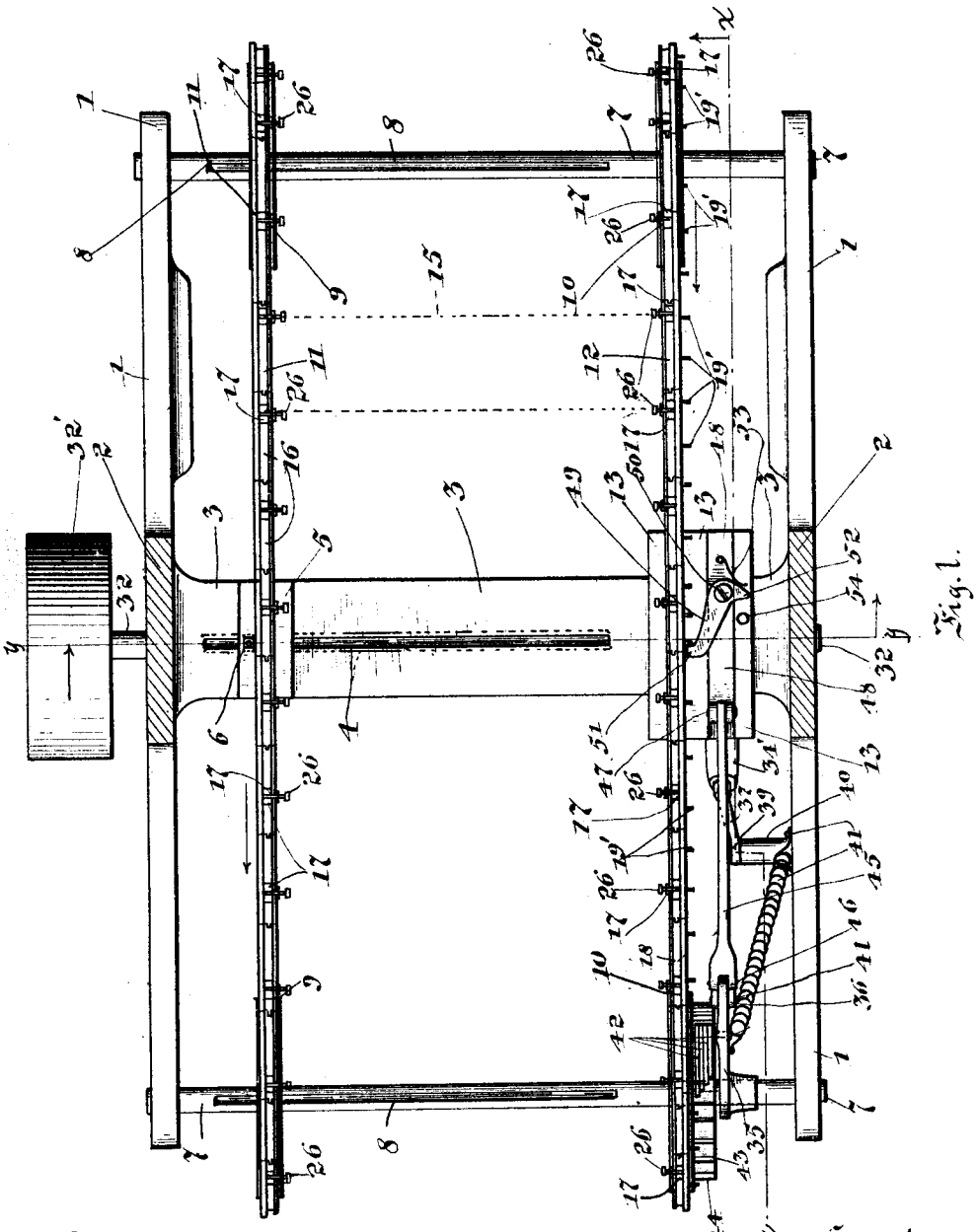


Fig. 1.

Witnesses

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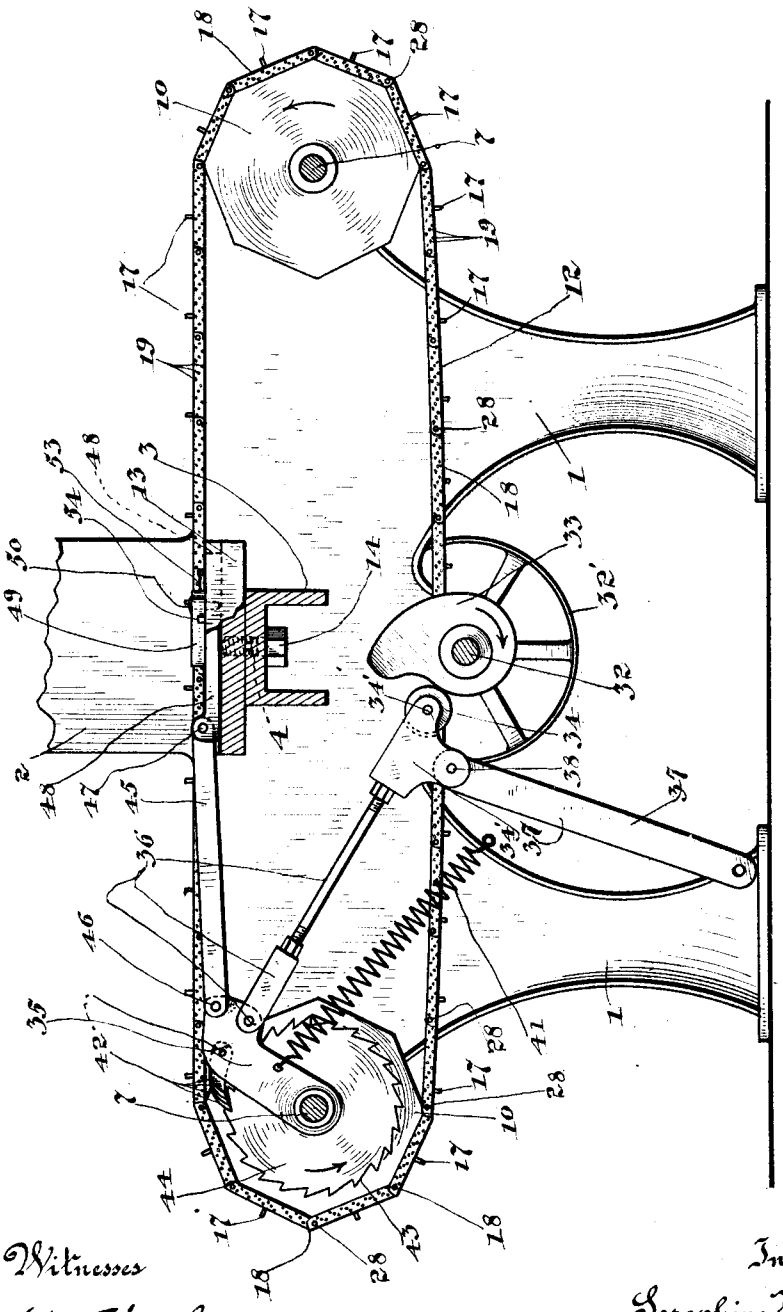


Fig. 2.

Witnesses

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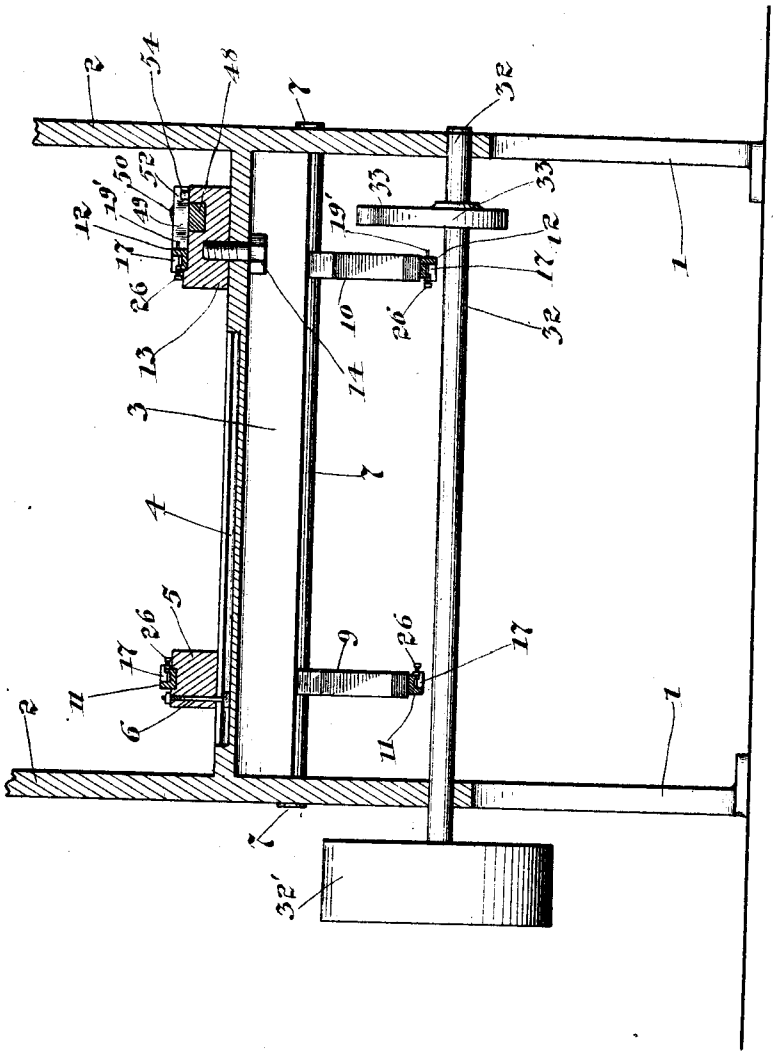


Fig. 3.

Witnesses

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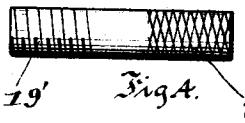


Fig. 4.

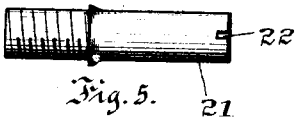


Fig. 5.

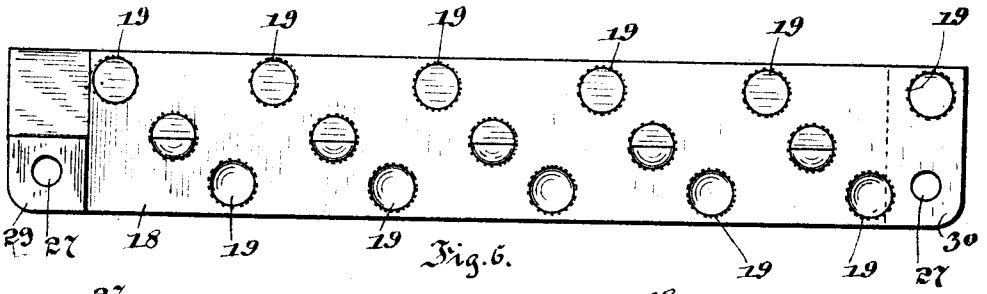


Fig. 6.

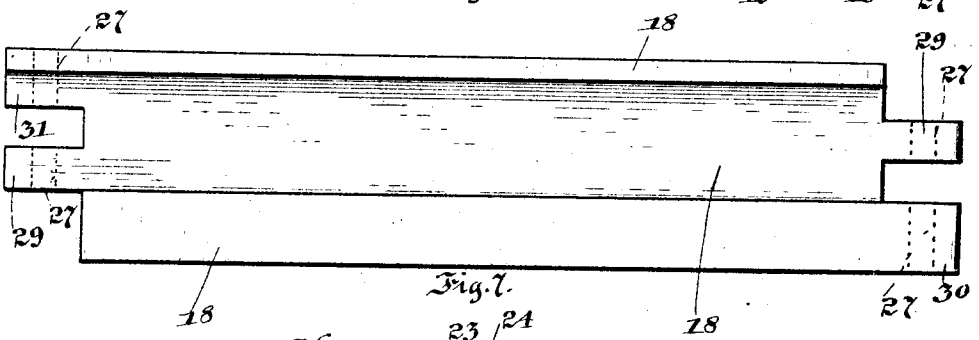


Fig. 7.

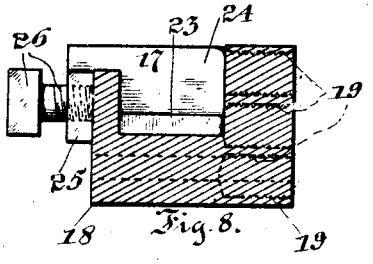


Fig. 8.

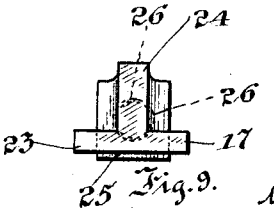


Fig. 9.

Witnesses

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UNITED STATES PATENT OFFICE.

SERAPHINE F. BAUWENS, OF CHICAGO, ILLINOIS.

BOX-BLANK MACHINE.

1,131,460. Specification of Letters Patent. Patented Mar. 9, 1915.

Application filed February 24, 1911. Serial No. 610,550.

To all whom it may concern:

Be it known that I, SERAPHINE F. BAUWENS, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Box-Blank Machines, of which the following is a specification.

My invention relates to improvements in wire-bound box-blank machines and more particularly to a feed mechanism therefor, the object of the invention being to provide an improved feed mechanism which shall be simple of construction and efficient in operation.

A further object of my invention is to provide a variable feed mechanism which is capable of adjustment to suit the varying widths of box-blanks.

Other objects will appear hereinafter.

With these objects in view my invention consists in the novel construction and arrangement of parts all as will be hereinafter more fully described and particularly pointed out in the appended claims.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a top plan view of my improved feed mechanism, the conventional stapling apparatus located above the center of the machine being broken away for clearness of illustration, Fig. 2 is a vertical section taken substantially on line x—x of Fig. 1, Fig. 3 is a transverse section taken on line y—y of Fig. 1, Fig. 4 is a detail elevation of a stud employed in the machine, Fig. 5 is a similar view of a modified form of stud, Figs. 6 and 7 are respectively a side elevation and top plan view of a link of a chain conveyer employed in the machine, Fig. 8 is a detail transverse section, and Fig. 9 is a detail elevation.

The preferred form of construction of my invention as illustrated in the accompanying drawings comprises a frame 1 having upward extensions 2 by means of which the stapling apparatus, not shown, is supported. A medial transverse member 3 of the frame 1 is preferably although not necessarily provided with a T-slot 4 by means of which a guide-block 5 is readily adjusted transversely, a bolt 6 the head of which projects into said slot being provided to lock any adjustment of said block. Journaled in the frame 1 is a pair of parallel shafts 7 having longitudinal slots 8 whereby a splined connection is effected therebetween and a pair of chain conveyer sprockets 9 mounted thereon. A pair of sprockets 10 which are polygonal in form and corresponding in size with the sprockets 9 are rigidly secured to the shafts 7 and consequently rotate therewith. Said sprockets are of a uniform size and rotate synchronously. A pair of chain conveyers 11 and 12 are mounted for longitudinal movement on the sprockets 9 and 10 respectively, the former being guided in its movement by the guide-block 5, and the latter by a guide-block 13 secured to the member 3 by means of a screw 14.

A box-blank is indicated by dotted lines 15 in Fig. 1, the spacing of the chain conveyers 11 and 12 being such as to receive the blanks, as will be understood by those skilled in the art. The chain conveyer 11 comprises a series of links 16 which are of a length corresponding with the sides of the sprockets over which the conveyer travels, said links being pivoted together and of such a conformation as to readily receive and hold cleat spacing blocks 17 to be described hereinafter. The links 18 of the chain conveyer 12 are similar to the links 16 with the addition of a series of threaded perforations 19 which are designed to receive threaded studs 19′ having knurled ends 20 as shown in detail in Fig. 4. The modified form of stud 21 having a screw-driver slot 22 may be used if so desired. These studs serve as stops for controlling the intermittent movement of the chain conveyers, as will be explained hereinafter, it being understood that any desired number of studs may be used and so spaced by means of the perforations 19 as to suit the width of the box-blanks to be run through the machine.

Each cleat spacing block 17 preferably comprises a rectangular base 23 and a vertical rectangular portion 24 having an overhanging extension 25 which is threaded to receive a locking set-screw 26, as clearly illustrated in Figs. 8 and 9. The links 16 and 18 are of channel form, the channel portion forming a seat for the box cleats, not shown. Each link 18 is provided with pivotal holes 27 for the reception of pivotal pins 28, there being interlocking fingers 29, 30 and 31 provided on the ends of the links as shown in detail in Fig. 7.

In order to drive the chain conveyers 11 and 12 synchronously, a power shaft 32 carrying a driven pulley 32′ is provided, said shaft being driven at a constant speed by power from any available source. Mounted on the power shaft 32 adjacent the end thereof opposite the pulley 32′ is an eccentric cam 33, the throw of which represents the maximum single movement of the intermittently movable chain conveyers 11 and 12. The mechanism for transmitting this movement and any desired lesser movement to the chain conveyers will now be described, this means for transmitting a variable movement constituting the principal feature of the present invention.

The variable feed mechanism comprises a cam roller 34 rotatably mounted in a block 34′ and adapted to travel on the periphery of the cam 33 for transmitting motion to the oscillatory arm 35 loosely mounted on the shaft 7, there being a rod 36 connecting said block with said arm. The block 34′ is maintained in operative position by means of an oscillatory support 37, a pivotal pin 38 connecting said support to said block and a pivot 39 connecting the same with an inward projection 40 of the frame 1. In this manner motion to the left is transmitted to the arm 35, reference being had to Fig. 2. Return movement or movement to the right is automatically effected by means of a tension helical spring 41, the inherent resiliency of which is only sufficient to move the arm 35, rod 36, block 34′, cam roller 34, and support 37, these parts being light and mounted to move with a minimum of frictional resistance. It will be apparent that this limitation of the spring 41 is of importance, since if it were too stiff and powerful it would overcome the inertia and friction of the chain conveyers and cause them to move to the right when they are designed to remain in an inert condition during the stapling operation.

During the movement of the oscillatory arm 35 to the left motion is transmitted to the chain conveyers by means of a series of pawls 42 one of which automatically engages a tooth 43 of the ratchet wheel 44, the latter being adapted to rotate with a sprocket 10 as illustrated in Fig. 2. Said ratchet may be formed integral with the contiguous sprocket or a rigid connection between the two may be effected, the only requirement being that they rotate synchronously. A link 45 is pivoted to the oscillatory arm 35 at 46 adjacent the rod 36 and extends to the right, as shown in Fig. 2, where a pivotal connection 47 is made with a reciprocatory member 48 which operates on the guide-block 13. To the top of the member 48 and arranged approximately at the center thereof is pivoted a bell-crank 49 by means of the screw 50, said bell-crank comprising a dog 51 at one end and a pawl 52 at the other. A leaf spring 53 is secured to the member 48 and automatically maintains the bell-crank 49 in the normal position as shown in Fig. 1. A stop stud 54 on the member 48 is provided for a purpose to be explained hereinafter.

The operation of the machine is as follows: The stapling apparatus being installed and the longitudinal wires to be stapled to the box-blank and cleats being arranged vertically over the chain conveyers, the machine is ready for operation. The operator on each side of the machine places the cleats and box-blanks in position during the movement of the conveyers, this placing of the box-blanks and cleats being performed at the right end of the machine, as shown in Fig. 2. During the passage of the box cleats and blank laid thereon under the stapling apparatus the wires are stapled in the conventional manner. The scope of this invention being limited to the feed mechanism whereby the box-blanks are intermittently moved and stopped for the stapling operation, the mechanism for the latter is not illustrated since any well known type of mechanism may be installed and operated in a manner as will be thoroughly understood by those familiar with machines of this character.

Suppose it is desired to transmit a maximum movement to the chain conveyers, then the operative parts will assume the positions as shown in Fig. 2. The cam roller 34′ is in the extreme position to the right and will move to the left during a revolution of the cam 33 which rotates as indicated. The motion will be transmitted to the chain conveyers which will move to the left a distance approximately equal to the throw of the cam 33. When the cam roller 34 passes the highest point of the cam 33 the chain conveyers will stop and the stapling operation will be performed. During this operation the spring 41 will draw the oscillatory arm 35 and the reciprocatory member 48 back to their initial positions providing that the next movement of the chain conveyers is to be a maximum movement as just described. The stapling operation is accomplished during the time of travel between the highest and lowest positions of the cam roller on the cam, the latter having a constant rotary movement as hereinbefore described.

Now, suppose it is desired to transmit a movement to the chain conveyer less than the maximum as is rendered necessary when the width of the box-blanks is such that the staple will not be properly spaced if the full available movement is imparted to the conveyers at each operation thereof. To accomplish this result the studs 19′ are spaced to correspond with the desired spacing of the staples, any spacing less than

the maximum being accomplished by suitably arranging the studs 19′ in the large number of threaded perforations 19 provided therefor in the chain conveyer 12. The cam roller will not assume the lowest position as shown in Fig. 2 during these lesser movements since the spring 41 will be incapable of returning the reciprocatory member 48 to the position shown. This is due to the fact that the dog 51 will engage a stud 19′ of the chain conveyer before it has completed a full stroke. The action is explained by assuming that at the beginning of the movement of the chain conveyers to the left that the dog 51 is in contact with a stud 19′ as shown in Fig. 1. Then the chain conveyers and dog 51 will move together to the left until just prior to the completion of the stroke, when the pawl 52 will engage the stationary stop stud 54. The dog 51 will now jump over the stud 19′ by the combined action of the stop stud 54 and the spring 53. The chain conveyers will complete the stroke when the reciprocatory member 48 and the cam roller 34 will be moved to the left by the action of the tension spring 41. The cam roller will not, however, regain the lowest position on the cam as shown in Fig. 2, since the spacing of the next stud 19′ to the right is insufficient to permit of their full movement. The dog 51 during its return movement to the right will engage said stud 19′ and stop the action of the spring 41, it being kept in mind that during the return movement of the reciprocatory member 48 and the cam roller 34 that the chain conveyers are stationary. Now, the next movement of the chain conveyers to the left will be less than the maximum since the cam roller will not engage the cam until after the same has completed a partial revolution. In a similar manner the succeeding movements of the chain conveyers will be controlled by the spacing of the studs 19′.

A variable feed mechanism of the type set forth is not susceptible of easy derangement of parts and is simple in construction and efficient in operation.

While I have illustrated and described the preferred form of construction for carrying my invention into effect this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details set forth but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A machine of the class described comprising a conveyer; means for moving said conveyer intermittently; reciprocating mechanism arranged to control the operation of said moving means; and means on said conveyer for controlling said reciprocating mechanism automatically, substantially as described.

2. A machine of the class described comprising a conveyer, means for moving said conveyer intermittently; reciprocating mechanism arranged to control the operation of said moving means; and adjustable means on said conveyer for controlling said reciprocating mechanism automatically, substantially as described.

3. A machine of the class described comprising an endless chain; means for moving said chain intermittently; reciprocating mechanism arranged to control the operation of said moving means; and means on said endless chain for controlling said reciprocating mechanism automatically, substantially as described.

4. A machine of the class described comprising an endless chain; means for moving said chain intermittently; reciprocating mechanism arranged to control the operation of said moving means; and adjustable means on said endless chain for controlling said reciprocating mechanism automatically, substantially as described.

5. A machine of the class described comprising an endless conveyer; means for intermittently moving said conveyer; and means including an adjustable member on said conveyer arranged to control and vary the extent of the effective operation of said moving means, substantially as described.

6. A machine of the class described comprising an endless chain; means for intermittently moving said endless chain; and means including adjustable stops on said endless chain arranged to control and vary the extent of the effective operation of said moving means, substantially as described.

7. A machine of the class described comprising an endless conveyer; means for intermittently advancing said conveyer in one direction only; and means including an adjustable member on said conveyer arranged to control and vary the extent of the effective operation of said advancing means, substantially as described.

8. A machine of the class described comprising an endless chain; means for intermittently advancing said endless chain in one direction only; and means including adjustable stops on said endless chain arranged to control and vary the extent of the effective operation of said advancing means, substantially as described.

9. A machine of the class described comprising a conveyer; a cam; a connection between said cam and said conveyer for driving the latter intermittently; and adjustable stops on said conveyer to limit the extent of the backward or idle movement of the con-

nection whereby the intermittent movements of the conveyer may be made of variable length, substantially as described.

10. A machine of the class described comprising a conveyer; a cam; a cam operated member; a pawl and ratchet connection between said member and conveyer; and adjustable stops on said conveyer arranged to limit the extent of the backward or idle movement of the said member whereby the intermittent movements of the conveyer may be made of variable length, substantially as described.

11. In a machine for making wire-bound and cleat-reinforcing box-blanks, a main frame having a pair of parallel sprocket shafts journaled therein, a pair of chain conveyers adapted to travel over the sprockets of said shaft, a power shaft journaled in said frame, an eccentric cam carried by said power shaft, a cam roller adapted to travel over the periphery of said cam, a ratchet wheel secured to one of said shafts and adapted to impart an intermittent synchronous movement to said conveyers, operative connections between said cam and said ratchet wheel whereby the latter receives the movement imparted by the throw of said cam, adjustable projections on one of said conveyers, and means coöperating with said projections whereby the movement transmitted to the conveyer from said cam may be varied in extent, substantially as described.

12. In a machine for making wire-bound and cleat-reinforcing box-blanks, a main frame having a pair of sprocket shafts journaled therein, a pair of chain conveyers traveling over the sprockets of said shafts, a power shaft journaled in said frame, an eccentric cam carried by said power shaft, a cam roller adapted to travel on the periphery of said cam, means for mounting said cam roller, an oscillatory arm loosely mounted on one of said sprocket shafts and in operative connection with said cam roller, a ratchet wheel secured to the last named sprocket shaft and arranged adjacent said oscillatory arm, a series of pawls pivoted to said oscillatory arm for engaging said ratchet wheel, removable spaced studs on one of said conveyers the links of which are provided with a series of threaded perforations for the reception of said studs, a pivoted spring-pressed bell-crank adapted to engage said studs and to move synchronously with said oscillatory arm, and a stationary arm adapted to cause the oscillation of said bell-crank for disengaging the same from a spaced stud, substantially as described.

13. A machine of the class described comprising a conveyer; a moving driving member; a mechanism adapted to detachably connect the driving member to the conveyer to drive the conveyer in a given direction; and a member selectively adjustable along the conveyer and adapted to coöperate with said connecting means to vary the movement of the conveyer in accordance with the selected position of said adjustable member on the conveyer.

14. A machine of the class described comprising a conveyer; a moving driving member; a mechanism adapted to detachably connect the driving member to the conveyer to drive it in a given direction; and a plurality of members along the conveyer at various distances one from the other and adapted to successively coöperate with said connecting means to cause the conveyer to be moved a distance proportional to the distance between the then coöperative member on the conveyer and one of the members on the conveyer adjacent to it.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SERAPHINE F. BAUWENS.

Witnesses:

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JOSHUA R. H. POTTS.