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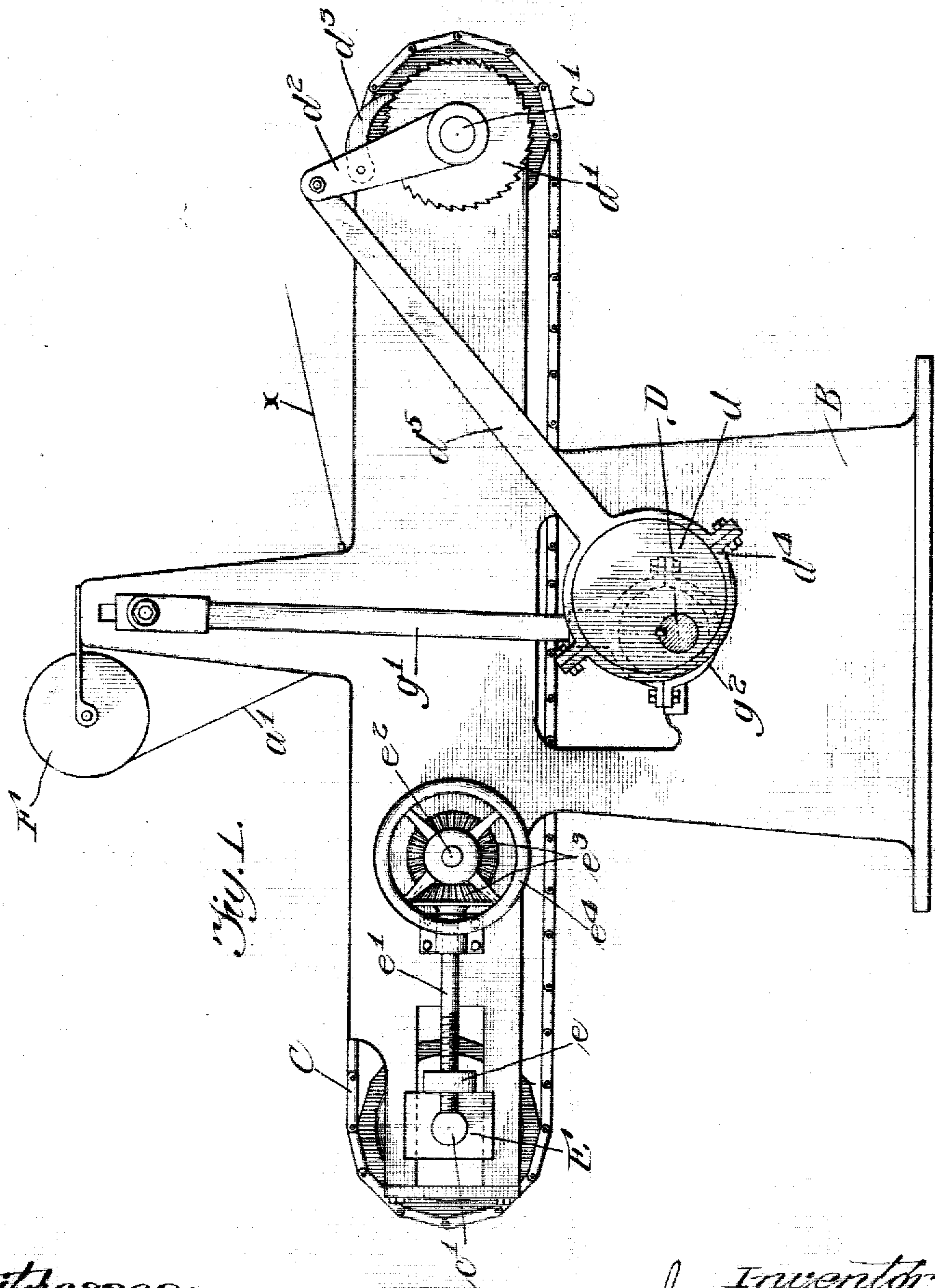
PATENTED MAR. 13, 1906.

J. J. MILLER.

MACHINE FOR USE IN MAKING METAL BOUND PACKAGES.

APPLICATION FILED NOV. 18, 1904.

6 SHEETS—SHEET 1.



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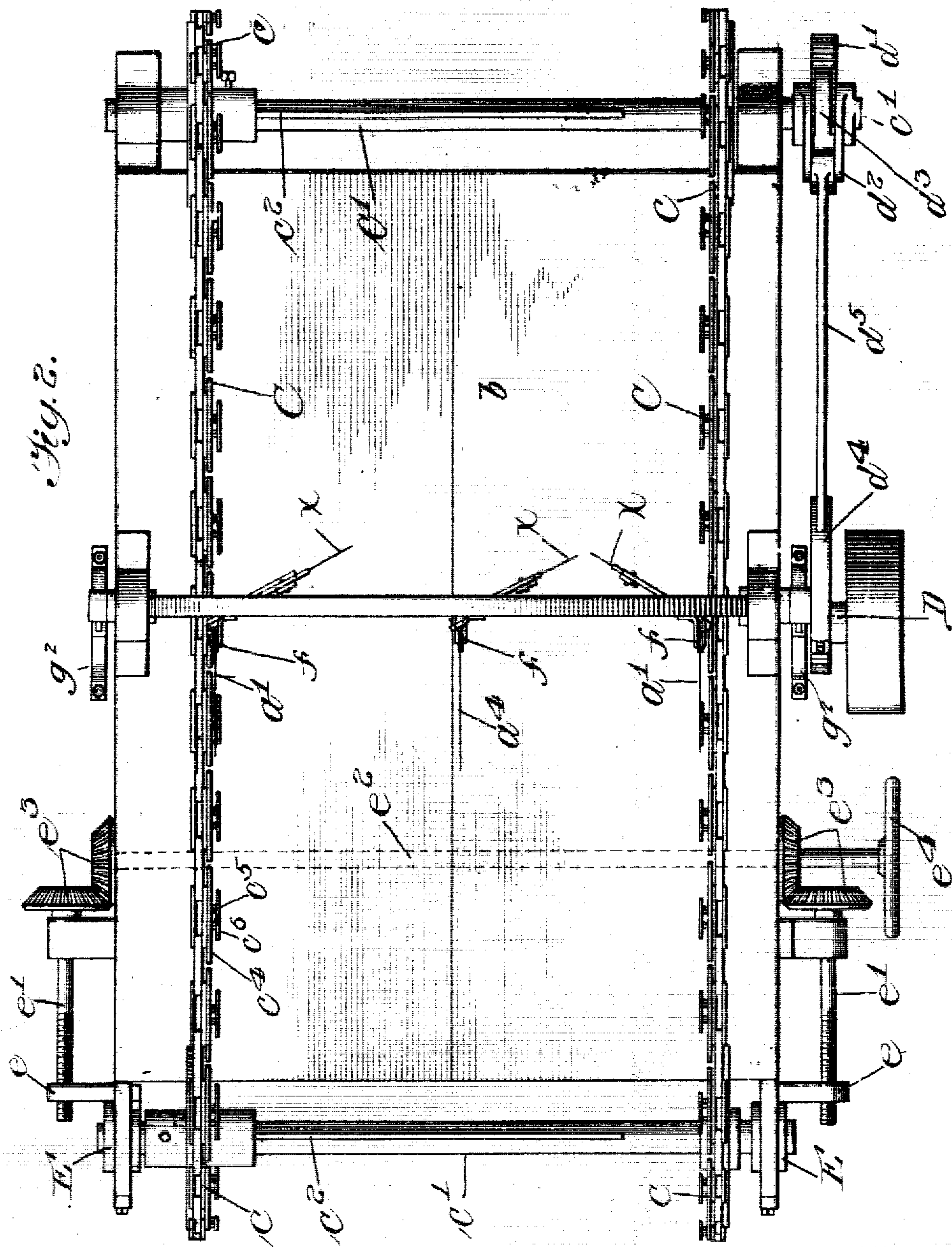
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6 SHEETS—SHEET 2.



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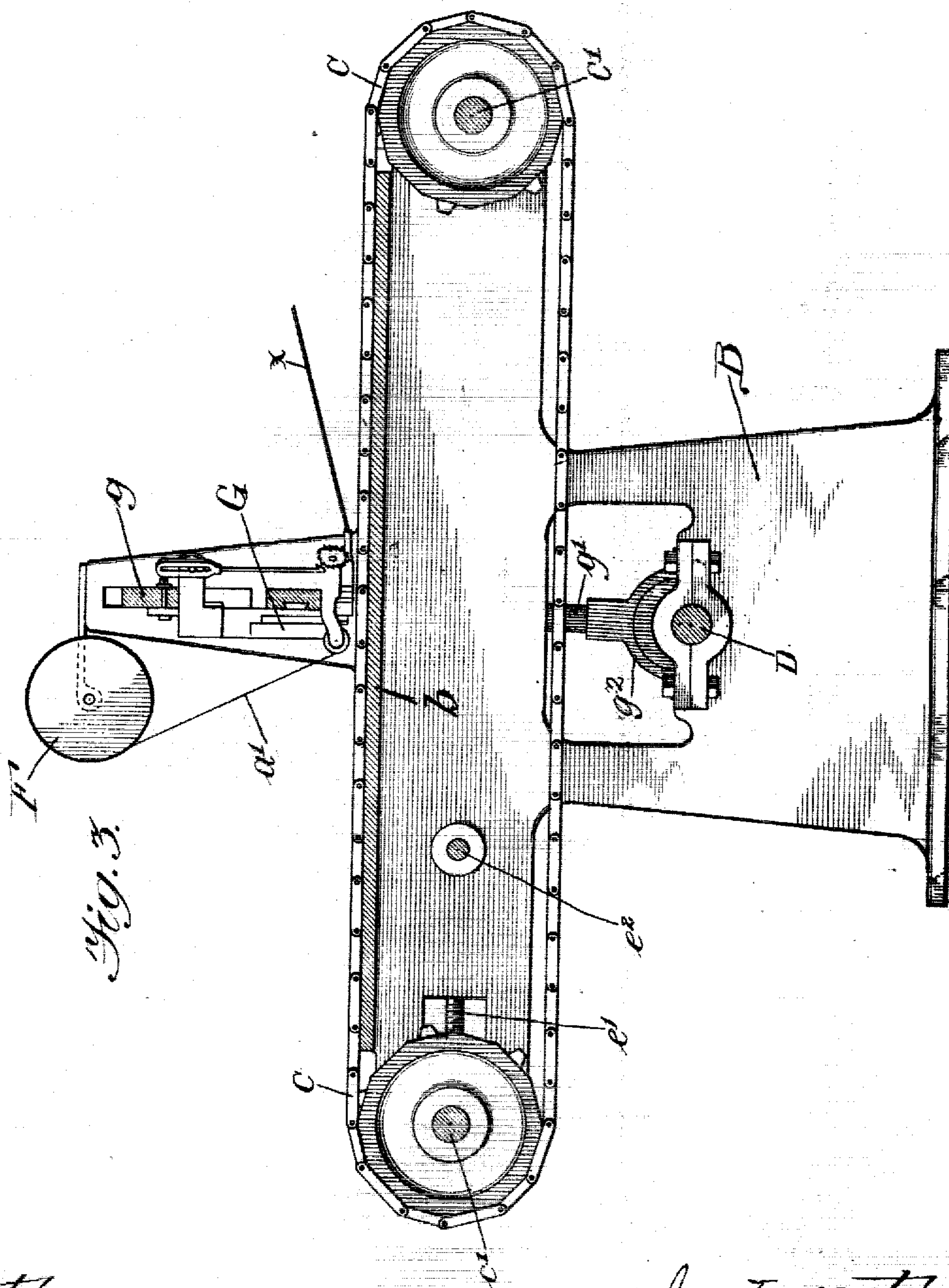
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**MACHINE FOR USE IN MAKING METAL BOUND PACKAGES.**

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6 SHEETS—SHEET 3.



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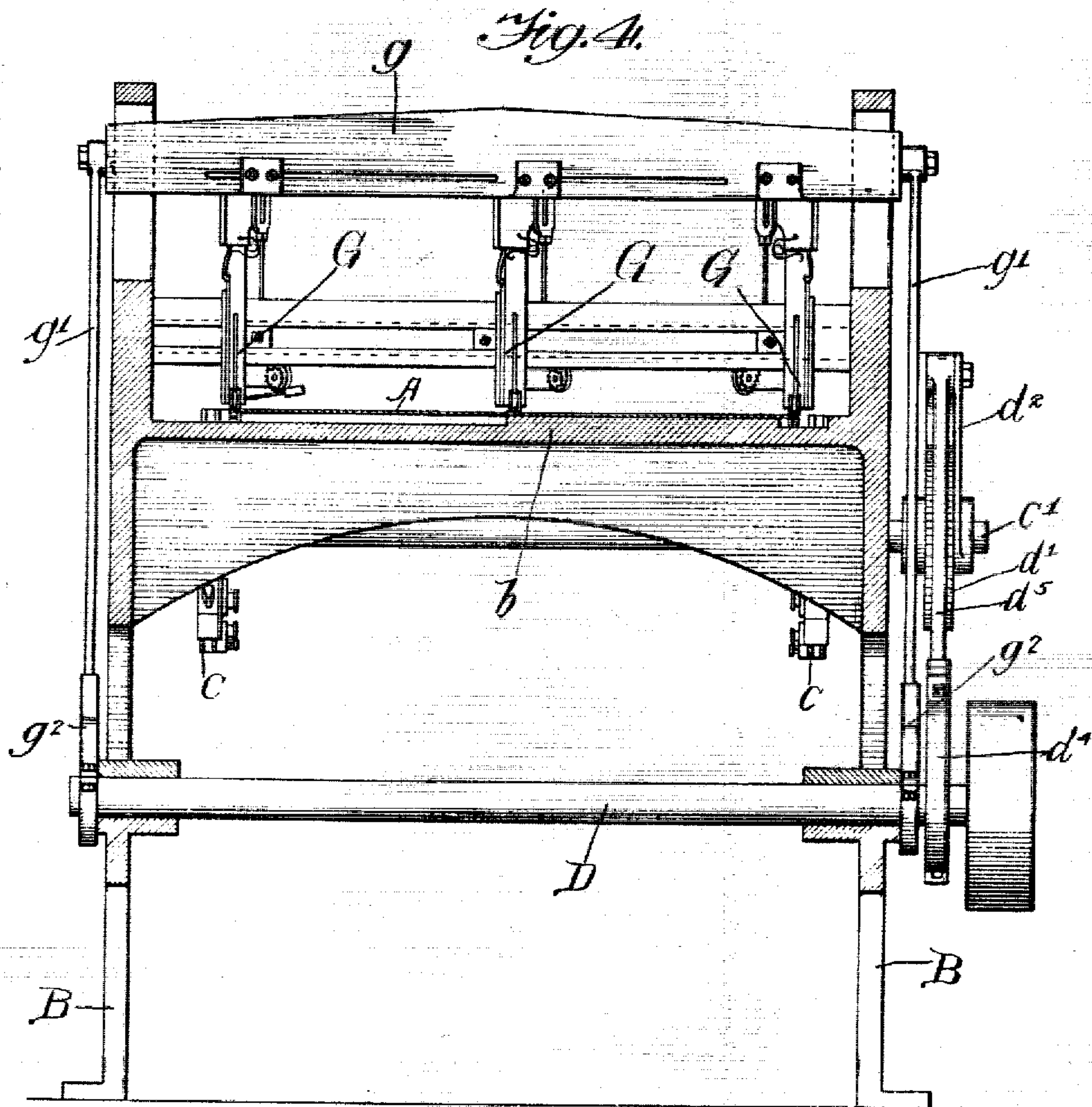
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8 SHEETS—SHEET 4.



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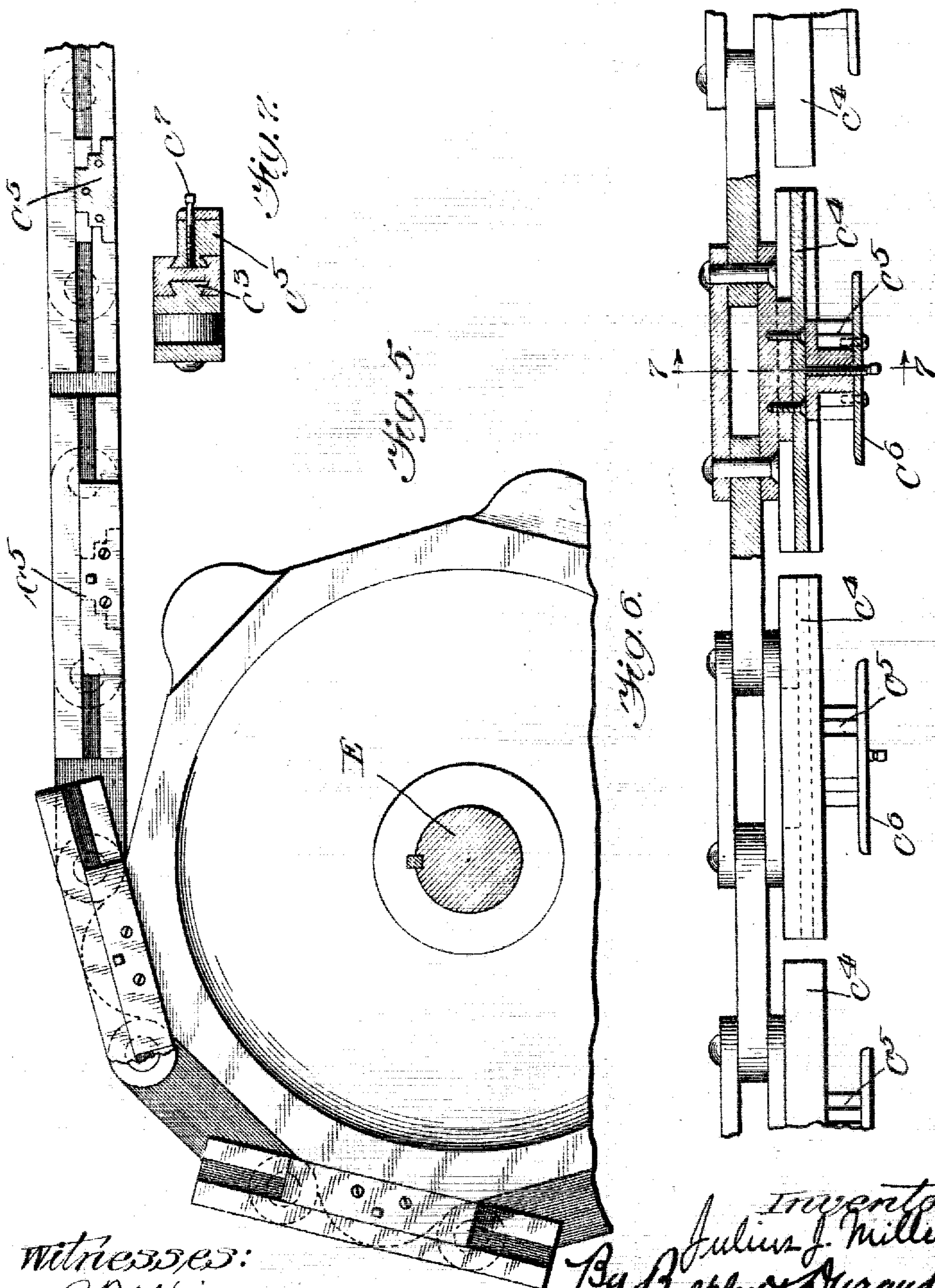
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6 SHEETS.—SHEET 5.



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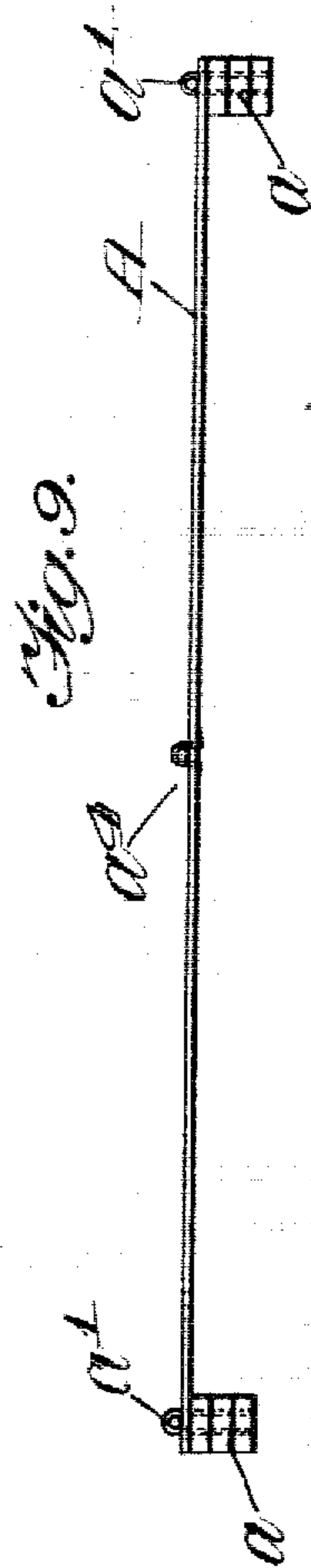
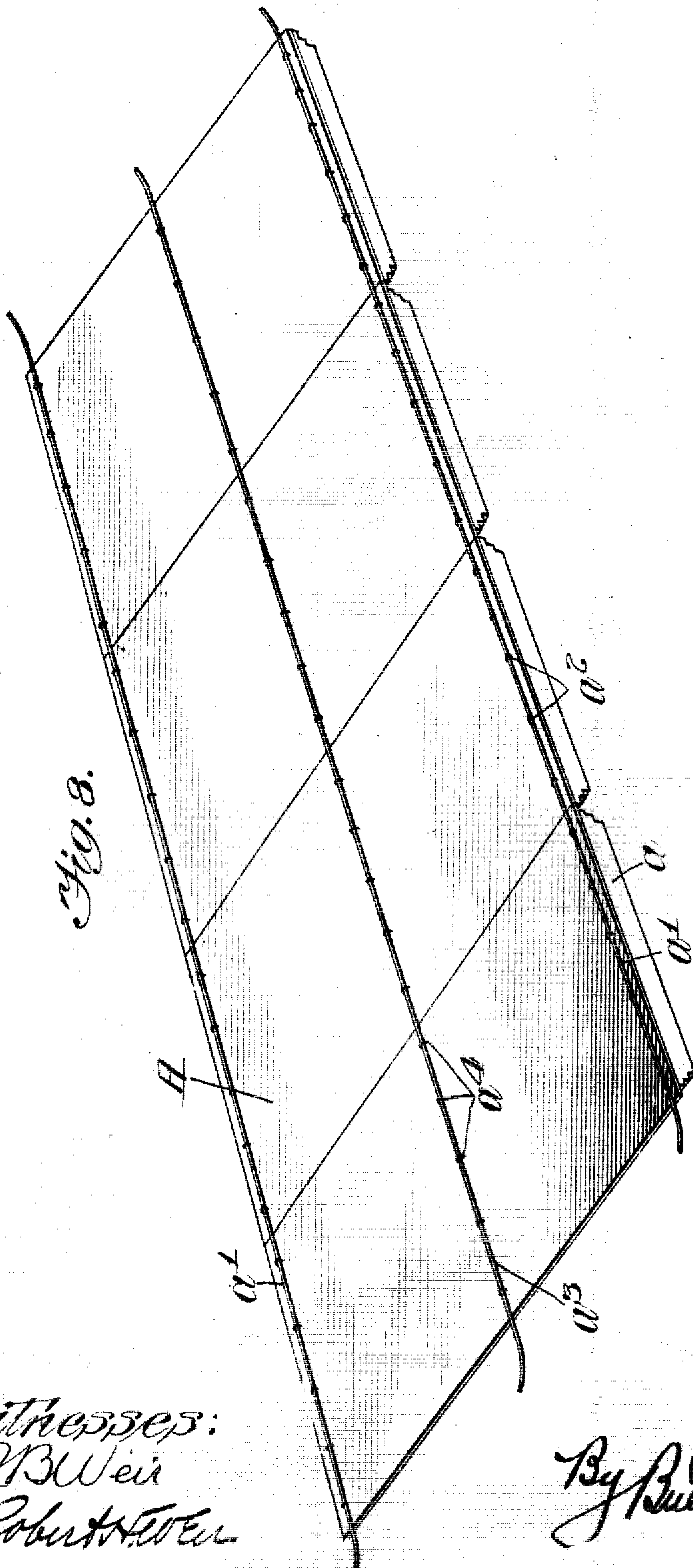
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6 SHEETS—SHEET 6.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR USE IN MAKING METAL-BOUND PACKAGES.

No. 815,197.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed November 18, 1904. Serial No. 233,274.

*To all whom it may concern:*

Be it known that I, JULIUS J. MILLER, a citizen of the United States of America, and a resident of St. Joseph, Berrien county, Michigan, have invented a certain new and useful Improvement in Machines for Use in Making Metal-Bound Packages, of which the following is a specification.

My invention relates to machinery for use in making metal-bound packages of that particular character in which the side walls of the package are constructed from a blank having its edges provided with cleats and reinforced by parallel lengths of wire or other suitable metallic binding.

Generally stated, the object of my invention is to provide an improved and highly-efficient machine for making said blanks; and a special object is to provide an improved construction and arrangement whereby the machine may be employed for making blanks of different sizes; and a further object is to provide improved means for supporting the cleats and the balance of the blank and for guiding the cleats and giving the metallic binding and the balance of the blank a proper feeding movement in a direction lengthwise of the said cleats; and another object is to provide an improved construction and arrangement of such character that the blanks can be made rapidly and one after the other and, if desired, continuously or practically continuously without stopping the machine; and it is also an object, of course, to provide certain details and features of improvement tending to increase the general efficiency and serviceability of a machine of this particular character.

To the foregoing and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying the principles of my invention. Fig. 2 is a top plan of the said machine. Fig. 3 is a longitudinal section of the said machine. Fig. 4 is a transverse section of said machine. Fig. 5 is an enlarged detail view of a portion of one of the sprocket-wheels and a portion of one of the link belts or cleat-holders. Fig. 6 is a top plan view of a portion of one of said link belts or cleat-holders, the portion thereof being shown in horizontal section. Fig. 7 is a cross-section on line 7-7 in Fig. 6. Fig. 8

is a perspective of the complete box-blank. Fig. 9 is a cross-section of the said blank.

The box-blank (shown in Figs. 8 and 9) is adapted to become the side walls of a metal-bound package. This blank comprises a sheet of veneer A, consisting of one continuous sheet for each of the four sections of the blank or of as many strips of veneer or other suitable material as may be found desirable or necessary. Along its edges the said blank is reinforced on its lower surface by means of cleats *a*, each cleat preferably having a mitered end portion. On its upper surface the blank is reinforced by binding-wires or other suitable metallic binding. These wires or metallic binding-strips *a'* are secured lengthwise of the said cleats by means of staples *a''* or other suitable fastening devices. In other words, the same staples or fastening devices serve to secure both the cleats and the metallic binding to the sides or edges of the blank. Also, as shown, the longitudinal center of the blank is reinforced by a third wire *a'''*, held in place by staples *a''*. With this construction the four sections of the blank are bound together by the lengths of wire or other metallic binding, and the sections are thus flexibly or hinge connected with one another. Preferably the end portions of the wire or metallic binding are allowed to project for some distance from the ends of the blank.

The machine, as illustrated, comprises a suitable body-frame B, adapted to support the various operative or movable parts in suitably-elevated positions. The parts of the blank before and after being stapled together are supported and carried by an endless traveling work-holder comprising a couple of parallel link-belts C. The said link belts are horizontally disposed, so as to carry the work forward from one end of the machine to the other, and are mounted on sprocket-wheels *c*. These sprocket-wheels are in turn mounted on transversely-arranged shafts *c'*, the sprocket-wheels at one side of the machine being preferably secured to the shafts by splines or feathers *c''*, whereby the two link belts may be relatively adjusted toward and away from each other with respect to blanks of different widths. As shown, the upper horizontal strand of each link belt rests and travels upon a horizontal table *b*, so as to prevent the link belts



from sinking under the weight of the work and the pressure of the mechanism for driving the staples or other fastening devices. These link belts thus mounted for motion in unison with each other are each provided on their inner sides with portions  $c^3$ , preferably of a dovetailed character in cross-section. Upon these portions  $c^3$  are adjustably mounted the blocks  $c^4$ , which extend lengthwise of the link belt and which are lengthwise adjustable relatively to the link belt and relatively to each other. Each block  $c^4$  has its inner sides provided with a dovetailed groove adapted to receive a correspondingly-shaped portion of a supporting-piece or miter-block  $c^5$ , the latter being provided at its inner side with a guard-plate  $c^6$ . A set-screw  $c^7$ , extending through each supporting-piece or miter-block and engaging the block  $c^4$ , constitutes the means whereby the said blocks  $c^5$  may be adjusted lengthwise of the link belt without adjusting the block  $c^4$ . Referring to Fig. 5, it will be seen that each supporting-piece or miter-block  $c^5$  is preferably provided with inclined end portions adapted to engage the ends of the cleats  $a$ , and thereby support the latter in position to receive the sheet of veneer or other material  $A$  and in position to receive the staples or other fastening devices by which both the said veneer or other material and the metallic binding are secured to the upper edges or top surfaces of the cleats. When placed in position, the said cleats are of course held end to end in a horizontal position and parallel with the two link belts. Consequently the said link belts serve as cleat-supports and are adapted to carry the cleats and the balance of the blank in a direction lengthwise of the cleats and the metallic binding. Inasmuch as the two link belts or cleat-supports are relatively adjustable toward and away from each other, it is evident that the machine can be employed in making blanks of different widths. Also with the adjustability of the supporting-pieces or miter-blocks which engage the ends of the cleats, and which therefore support and carry the cleats along, it will be seen that cleats of different lengths can be received and held by the cleat-holders and that the machine can be employed for making blanks of different lengths.

As shown in Fig. 4, the staples or other fastening devices can be inserted entirely through the blank and their ends clenched upon the upper surface of the table  $b$  or upon suitable anvils mounted on said table. It will be seen that an intermittent feeding movement is desirable for the work-holder thus composed of two endless traveling cleat-supports—that is to say, providing the means for driving the staples or other fastening devices do not have any movement along with the work. For this purpose a driving-shaft  $D$  is provided and mounted in bearings on

each side of the machine. This shaft preferably extends below the link belts and is provided with an eccentric cam  $d$ . At the discharge end of the machine—that is to say, the end of the machine where the finished blank is thrown off or delivered—the shaft  $c'$  is provided with a ratchet-wheel  $d'$ . Said shaft is also provided with a vibratory arm  $d^2$ , carrying a pawl  $d^3$ , adapted to engage the said ratchet-wheel. The eccentric cam  $d$  is provided with a strap  $d^4$ , connected by an arm or pitman  $d^5$  with the vibratory arm  $d^2$ . With this arrangement it is evident that the rotation of the driving-shaft  $D$  results in an intermittent feeding movement on the part of the work-holder composed of the two parallel link belts or cleat-supports. In order that the said link belts or cleat-supports may be given the proper tension, the shaft  $c'$  at the receiving end of the machine can be mounted in sliding boxes or bearings  $E$ . These boxes or bearings are provided with rigid portions  $e$ , which serve as nuts and which are adapted to travel upon the threaded adjusting-screw  $e'$ . The transversely-arranged shaft  $e^2$  is provided, together with bevel-gears  $e^3$ , as the means for simultaneously rotating the two adjusting-screws. To such end the shaft  $e^2$  is provided with a hand-wheel  $e^4$ . By rotating the said hand-wheel it is obvious that the shaft  $c'$  will be given a bodily adjustment in the desired direction. In this way the link belts may have any suitable tension.

While the machine is operated the cleats are placed in the cleat-holder at the receiving end of the machine, and the sheets or strips of veneer are laid on top of the cleats. This can be done each time the cleats are momentarily brought to a standstill, the work-holder thus intermittently remaining stationary not only long enough to permit the staples to be driven, but also long enough to permit the operator to adjust the cleats and veneer in place. The binding-wires  $a'$  and  $a''$  or other suitable metallic binding can be guided or directed or fed upon the upper surface of the blank by any suitable means. For example, the said binding-wires can be mounted on reels  $F$  and each strand of wire or metallic binding then guided or directed to the proper point upon the upper surface of the blank by means of a sheave  $f$ , one for each wire. In this way the said binding-wires or other metallic binding are made to pass in the well-known manner directly through or under the lower ends of the stapling-heads  $G$ , it being understood that each staple when driven must straddle one of the cleats or metallic binding-strips. The suitable mechanism thus provided can of course be of any suitable known or approved character, and, in fact, any suitable or desired mechanism can be employed for driving fastening devices of any desired character. In other words, it is obvious that



other kinds of metallic binding can be employed, if desirable or necessary, and also that devices other than staples can be employed for securing the metallic binding to the blank. With the arrangement shown, however, the said stapling-heads are operated by a transversely-arranged and vertically-reciprocating bar *g*. This bar, it will be seen, is connected with the driving-shaft *D* by means of pitmen *g'* and eccentric devices *g''*. In this way the wire *X* for the staples is conveyed to the stapling-heads in the usual and well-known manner, and the staples can then be formed and driven into the blank each time the work is momentarily stationary. With the arrangement shown the said stapling-heads are relatively adjustable with respect to the relative adjustment of the two link belts or cleat-supports. Thus both the work-holder and the stapling mechanism are adjustable with respect to blanks of different widths.

As shown, the feed mechanism alternates with the stapling mechanism—that is to say, the work-holder is stationary while the staples are being driven, but is given the desired extent of feeding movement immediately after the driving of the staples. In this way the feeding mechanism is adapted and timed to move the work ahead just after the driving of each set of staples.

In use the operation is as follows: The operator places the cleats and the veneer upon the work-holder at the receiving end of the machine, the travel of the work-holder being sufficiently slow for the materials to be easily adjustable in place, or if the feeding movement is quite rapid the operator may take advantage of each pause in the feeding movement to place the materials upon the work-holder. The binding-wires or other metallic strips are secured to the blank as fast as it travels beneath the stapling-heads, and the staples which secure the outside wires to the edges serve also to secure the cleats to the under side of the blank. It is obvious that the blank can be made with any desired number of rows of cleats and of any desired shape or size. Consequently the number of link belts or cleat-supports will vary in accordance with the desired number of rows of cleats, and the number of stapling-heads will also vary in accordance with the desired number of binding-wires or metallic binding-strips. The operation of the machine and the adjustment of the material on the work-holder can be so controlled as to leave the end portions of the binding-wires of sufficient length. It will be seen that these binding-wires or other metallic binding-strips can be severed or cut by any suitable means or at any appropriate time or step in the operation for the purpose of disconnecting the blanks from each other. Thus it will be seen that the said link belts or endless cleat-holders constitute the medium

through which motion is communicated to the blank in a direction lengthwise of the cleats and the metallic binding. In other words, the said endless traveling cleat-supports support the cleats and the metallic binding and the balance of the blank in position to receive the staples or other fastening devices. Furthermore, the said link belts or endless cleat-supports may, and with the particular arrangement shown do, constitute connections through which the feeding mechanism is employed for pulling or feeding the metallic binding along in unison with the balance of the blank. Preferably the means for guiding the binding-wires *a'* or other metallic binding are located immediately above the line of travel of the cleat-holders having the supporting-pieces or miter-blocks *c'*.

From the foregoing it will be seen that I provide endless traveling cleat-supports in combination with means for directing wires or other metallic binding onto the upper surface of the blank and in combination with means for driving fastening devices into the blank for the purpose of securing the cleats and the metallic binding to opposite surfaces thereof. Consequently by my invention I provide a machine whereby metal-bound box-blanks provided at their edges with reinforcing-cleats may be made with much greater certainty, facility, and rapidity than heretofore. Also, as explained, my machine has the further advantage of all adjustments necessary for the manufacture of blanks of different widths and lengths.

The link belts thus trained over guide-sprockets serve as guides to keep the endwise motion of the cleats direct—that is to say, they serve as guides for holding the cleats to straight lines of travel.

It will be seen that the chains are provided with means for holding the cleats—that is to say, with means adapted to hold the cleats against lateral displacement and to keep them in position to move endwise along straight lines extending below the staple-drivers.

The endless traveling work-holder holds the cleats in parallel and fixed relation thereto, communicates the feeding motion through the cleats to the strengthening-wires or metallic binding, and guides the cleats while the same are subject to the drag or back pull of the strengthening-wires or metallic binding.

Preferably, as explained, the cleat-holders are secured to the inner sides of the link belts or cleat-supports and are adjustable longitudinally thereon, as well as readily removable therefrom. Each cleat-holder is provided with a block adapted to engage between the ends of the cleats and which is adjustable longitudinally of the cleat-holder with respect to cleats of different lengths. These blocks, which are preferably miter-blocks in character, are adapted not only to suitably separate



the ends of the cleats, but are also adapted to prevent the drag or back pull of the binding-wires from causing endwise displacement of the cleats in the cleat-holders.

5 With further respect to the traveling work-holding means and to the capacity of the same to guide the cleats it will be seen that the pockets for the ends of the cleats have portions which engage both sides of the cleats  
10 to prevent lateral displacement of the same therefrom.

With further respect to the driving means—that is to say, the means for applying flexible connections between the ends of the cleats—  
15 it will be seen that said driving means are adapted and timed in their operations to bridge the flexible connections across the gaps or joints between the ends of the cleats, the work-feeding and staple-driving mechanisms being so relatively timed in their operations  
20 that staples are driven at each side of the said gaps or joints, thus leaving the flexible connections to serve as hinges between the different sections of the blank. It is obvious, however, that any other suitable known or approved connections can be applied between the ends of the cleats for the purpose of connecting together the different sections of the blank. In addition, it is also  
25 obvious that the link belts provided with pockets can be employed as cleat carrying and guiding devices for use in making cleat-reinforced articles of many different kinds and shapes.

35 What I claim as my invention is—

1. A machine for making wire-bound and cleat-reinforced box-blanks, comprising means for guiding the metallic binding onto the blank, means for inserting fastening devices to secure the metallic binding to the blank, an endless traveling work-holder adapted to support the work, and a power-operated feeding device connected with the said work-holder, the said work-holder having parallel-side portions adapted to support  
40 and hold the cleats of the blank in parallel relation thereto, and against lateral displacement therefrom, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, the said side portions of the endless work-holder being held, at least for a suitable portion of their path of travel, to a direct motion and thereby constituting guides  
50 for holding the cleats to straight lines of travel.

2. A machine for making wire-bound and cleat-reinforced box-blanks, comprising means for guiding the metallic binding onto the blank, means for inserting fastening devices to secure the metallic binding to the blank, a power-operated feeding device, and an endless traveling work-holder actuated by said feeding device and having parallel side  
60 portions adapted to receive and hold the

cleats end to end, in two parallel longitudinal rows, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, said side portions of the endless work-holder being  
70 held, at least for a suitable portion of their path of travel, to a direct motion and thereby constituting guides for holding the cleats to straight lines of endwise or longitudinal travel, the means on the work-holder for receiving said cleats being adapted to hold the same against lateral displacement therefrom.

3. A machine for making wire-bound and cleat-reinforced box-blanks, comprising means for guiding the metallic binding onto the blank, means for inserting fastening devices to secure the metallic binding and cleats to the opposite surfaces of the blank, a power-operated feeding device, and a work-holder composed of a plurality of link belts  
80 suitably connected with said feeding device, said link belts being provided with means for receiving and holding the said cleats in positions lengthwise of the work-holder, constituting guides for holding the cleats to straight lines of endwise or longitudinal travel, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, the said endless work-holder being held, at least for a suitable  
90 portion of its path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including  
100 portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

4. A machine for making wire-bound and cleat-reinforced box-blanks, comprising means for guiding the metallic binding onto the blank, means for inserting fastening devices to secure the metallic binding to the blank, a feeding device, and an endless traveling work-holder comprising a plurality of  
110 parallel link belts connected with said feeding device, said belts being provided at their inner sides with means for receiving and holding the cleats of the blank in positions lengthwise of the work-holder, constituting guides for holding the cleats to straight lines of endwise travel, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, the endless work-holder being held, at least  
120 for a suitable portion of its path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

5. A machine for making wire-bound and cleat-reinforced box-blanks, comprising



means for guiding the metallic binding onto the blank, a plurality of endless traveling cleat-supports each adapted to hold the cleats end to end, in longitudinal rows, means for inserting fastening devices to secure the cleats and metallic binding to the blank, and means for operating said endless traveling cleat-supports, said cleat-supports constituting guides for keeping the endwise motion of the cleats direct, the means on the cleat-supports for receiving said cleats being adapted to hold the same against lateral displacement therefrom, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, the endless cleat-supports being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats.

6. A machine for making wire-bound and cleat-reinforced box-blanks, comprising a plurality of parallel link belts provided with means for receiving and holding said cleats, said link belts being also provided with blocks adapted to engage the ends of said cleats, and thereby prevent the drag or back pull of the binding from causing endwise displacement of the cleats, the blocks being adjustable toward and away from each other to accommodate cleats of different lengths, means for guiding the metallic binding onto the blank, means for inserting fastening devices to secure the metallic binding lengthwise of said cleats, and means for operating the said link belts and thereby communicating motion to the blank in a direction lengthwise of said cleats and metallic binding, said link belts also constituting guides for keeping the endwise motion of the cleats direct, the means on the work-holder for receiving said cleats being adapted to hold the same against lateral displacement therefrom, and the endless work-holder being held, at least for a suitable portion of its path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats.

7. A machine for making wire-bound and cleat-reinforced box-blanks, comprising a plurality of endless traveling cleat-supports, said cleat-supports being adapted to hold the cleats longitudinally thereof, means for guiding the metallic binding onto the blank, means for inserting fastening devices to secure the metallic binding lengthwise of said cleats, together with means for operating said cleat-supports, the said cleat-supports constituting guides for keeping the endwise motion of the cleats direct, and being relatively adjustable toward and away from each other with respect to the making of blanks of different widths, the means on the cleat-supports for receiving said cleats being adapted to hold the same against lateral displacement there-

from, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless cleat-supports being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats.

8. A machine for making wire-bound and cleat-reinforced box-blanks, comprising means for feeding the metallic binding, means for inserting fastening devices to secure the cleats and binding to the blank, a pair of endless traveling link belts provided with means for receiving and holding the said cleats end to end, in two parallel rows, and constituting guides for holding the cleats to straight lines of travel, said link belts being relatively adjustable toward and away from each other and adapted to support and carry the blank bodily in a direction lengthwise of said cleats and metallic binding, the means on the link belts for receiving said cleats being adapted to hold the same against lateral displacement therefrom, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless link belts being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats.

9. A machine for making wire-bound and cleat-reinforced box-blanks, comprising an endless traveling link belt provided with cleat-holders adapted to hold the cleats parallel with said belt, and communicate motion to the blank in a direction lengthwise of said cleats and metallic binding, said link belt also constituting a guide for keeping the endwise motion of the cleats direct, together with means for inserting fastening devices to secure the metallic binding lengthwise of the cleats, guiding devices for directing the metallic binding onto the blank as the latter moves along, and spacing-blocks secured to said cleat-holders and adapted to prevent the drag or back pull of the binding from causing endwise displacement of the cleats, the endless link belt being held, at least for a suitable portion of its path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

10. A machine for making wire-bound and cleat-reinforced box-blanks, comprising a plurality of parallel and endless traveling cleat-supports adapted to support and carry the blank forward in a direction lengthwise of the said cleats and metallic binding, and constituting guides for holding the cleats to



straight lines of endwise travel, said cleat-supports being relatively adjustable toward and away from each other with respect to the making of blanks of different widths, and the said cleat-supports being provided with spacing-blocks which engage the ends of the cleats, and which are adjustable lengthwise of the said cleat-supports with respect to blanks of different lengths, together with means for guiding the metallic binding onto the blank as the latter moves along, means for inserting fastening devices to secure the metallic binding to the blank, and suitable means for operating said cleat-supports, the said blocks being adapted to prevent the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless cleat-supports being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

11. A machine for making wire-bound and cleat-reinforced box-blanks, comprising guides for the cleats, said guides comprising parallel endless traveling members adapted to hold the cleats to straight lines of travel, intermittent feed mechanism for advancing the cleats longitudinally with their guides and with a sheet through the machine, an intermittently-actuated staple-driver adjacent the path of each cleat, alternating in its action with said feed mechanism, to fasten the sheet, by successive operations, to the cleat, and means for guiding strengthening-wires with the cleats and sheet across the staple-drivers, the means on the endless traveling members for receiving said cleats being adapted to hold the cleats in parallel relation thereto, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless traveling members being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

12. A machine for making wire-bound and cleat-reinforced box-blanks, comprising intermittently-actuated staple-drivers, guides for the cleats, said guides comprising parallel endless traveling members adapted to hold the cleats to straight lines of travel, intermittent feed mechanism for advancing the cleats longitudinally with their guides and with a sheet through the machine, an intermittently-actuated staple-driver and a guide for a

strengthening-wire adjacent the path of each cleat, the staple-drivers alternating in their action with the said feed mechanism to fasten the strengthening-wires and sheet, by successive operations, to the cleats at intervals in the direction longitudinally of the cleats, the means on the endless traveling members for receiving said cleats being adapted to hold the cleats in parallel relation thereto, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless traveling members being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

13. A machine for making wire-bound and cleat-reinforced box-blanks, comprising intermittently-actuated staple-drivers, guides for the cleats, said guides comprising parallel endless traveling members adapted to hold the cleats to straight lines of travel, guides for the strengthening-wires, and intermittently-actuated feed devices for advancing the sheets and strengthening-wires and cleats and guides longitudinally below the said staple-drivers, the said feed devices alternating in their action with the said staple-drivers, the means on the endless traveling members for receiving said cleats being adapted to hold the cleats in parallel relation thereto, and having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless traveling members being held, at least for a suitable portion of their path of travel, to a direct motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

14. A machine for making wire-bound and cleat-reinforced box-blanks, comprising guides for the cleats, said guides comprising parallel endless traveling members adapted to hold the cleats to straight lines of travel, intermittent feed mechanism for advancing the cleats longitudinally with a sheet through the machine, a series of intermittently-actuated staple forming and driving machines, alternating in their action with the said feed mechanism, disposed above the path of the sheet and cleats and in a horizontal line at right angles to said path, and means for guiding strengthening-wires beneath the staple-drivers, whereby the strengthening-wires and sheets, by successive operations of the staple-drivers, are fastened to the cleats at intervals



in the direction longitudinally of the cleats, the means on the endless traveling members for receiving said cleats being adapted to hold the cleats in parallel relation thereto, and  
 5 having means for preventing the drag or back pull of the binding from causing endwise displacement of the cleats, and the endless traveling members being held, at least for a suitable portion of their path of travel, to a direct  
 10 motion in order to insure the proper extent of endwise or straight longitudinal movement of the cleats, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats  
 15 to prevent lateral displacement of the same therefrom.

15. A machine for making wire-bound and cleat - reinforced box - blanks, comprising means for guiding the binding-wires onto the  
 20 blank, means for driving staples to secure the cleats and binding-wires to the blank, a plurality of endless link belts, cleat-holders removably secured to the inner side of each belt, each cleat-holder being adjustable longitudinally of its belt, and a block secured to  
 25 and longitudinally adjustable of each cleat-holder, said blocks being adapted to engage and separate the ends of the cleats and prevent endwise displacement thereof by the drag  
 30 or back pull of the binding-wires, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.

35 16. A machine for making wire-bound and cleat - reinforced box - blanks, comprising means for guiding the binding-wires onto the blank, means for driving staples to secure the cleats and binding-wires to the blank, a plurality of endless link belts, cleat-holders removably secured to the side of each belt, each  
 40 cleat-holder being adjustable longitudinally of its belt, and a block secured to and longitudinally adjustable of each cleat-holder, said blocks being adapted to engage and separate the ends of the cleats and prevent endwise displacement thereof by the drag or back pull  
 45 of the binding-wires, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom.  
 50

17. In a machine of the character specified, a link belt adapted to carry and guide a plurality of cleats held end to end, and provided  
 55 with members for spacing the cleats apart endwise, and means for operating said link belt.

18. In a machine of the character specified,

a plurality of link belts adapted to carry and guide a plurality of cleats held end to end in  
 60 parallel and longitudinally-moving rows, and provided with means for spacing the cleats apart endwise, and means for operating said link belts.

19. In a machine of the character specified, 65 means for supplying binding-wires, mechanism for securing the binding-wires to the cleats, and a combined endless traveling work-support and cleat-guide and binding-wire puller, the latter having means for engaging  
 70 both sides of the longitudinally-disposed parallel rows of cleats, thereby holding and guiding the cleats endwise, and having also means for preventing endwise displacement of the cleats by the back pull of the binding-wires. 75

20. In a machine of the character described, an endless traveling cleat-guide provided with portions adapted to engage both sides of the longitudinally - disposed cleats and thereby hold the same against displacement  
 80 laterally of their endwise direction of travel.

21. In a machine of the character specified, an intermittently-actuated endless traveling cleat-support adapted to carry and move the cleats endwise, and feed mechanism for giving  
 85 the cleat-support an intermittent motion, said cleat-support having means for engaging both sides of the longitudinally - disposed cleats to prevent displacement of the same laterally of their endwise direction of travel. 90

22. In a machine of the character specified, an intermittently-actuated endless traveling cleat-guide adapted to guide and move the cleats endwise, and feed mechanism for giving the cleat-guide an intermittent motion,  
 95 said cleat-guide having means for engaging both sides of the longitudinally - disposed cleats to prevent displacement of the same laterally of their endwise direction of travel.

23. In a machine of the character disclosed, a pair of endless link belts or cleat-carriers each provided with pockets for holding the cleats, and connections for intermittently operating said link belts and thereby  
 100 advancing said cleats endwise, the traveling work-holding and cleat-guiding means thus provided including portions which engage both sides of the cleats to prevent lateral displacement of the same therefrom. 105

Signed by me at St. Joseph, Berrien county, Michigan, this 7th day of November, 1904. 110

JULIUS J. MILLER.

Witnesses:

WM. E. KREHER,  
 ANDREW KOZLOSKI.