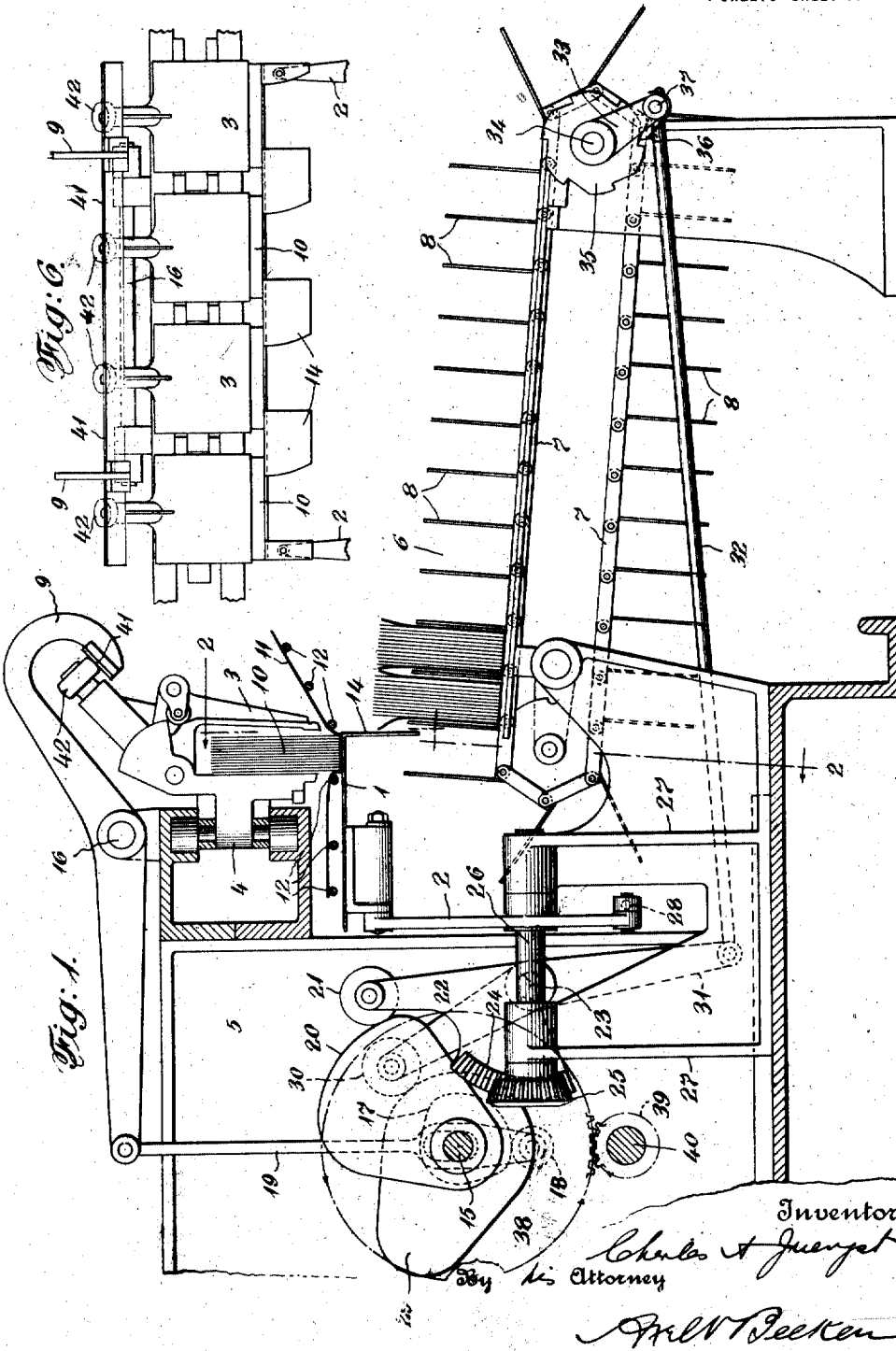


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DELIVERY MECHANISM.
APPLICATION FILED OCT. 31, 1916.

Patented Aug. 13, 1918.
4 SHEETS—SHEET 2.

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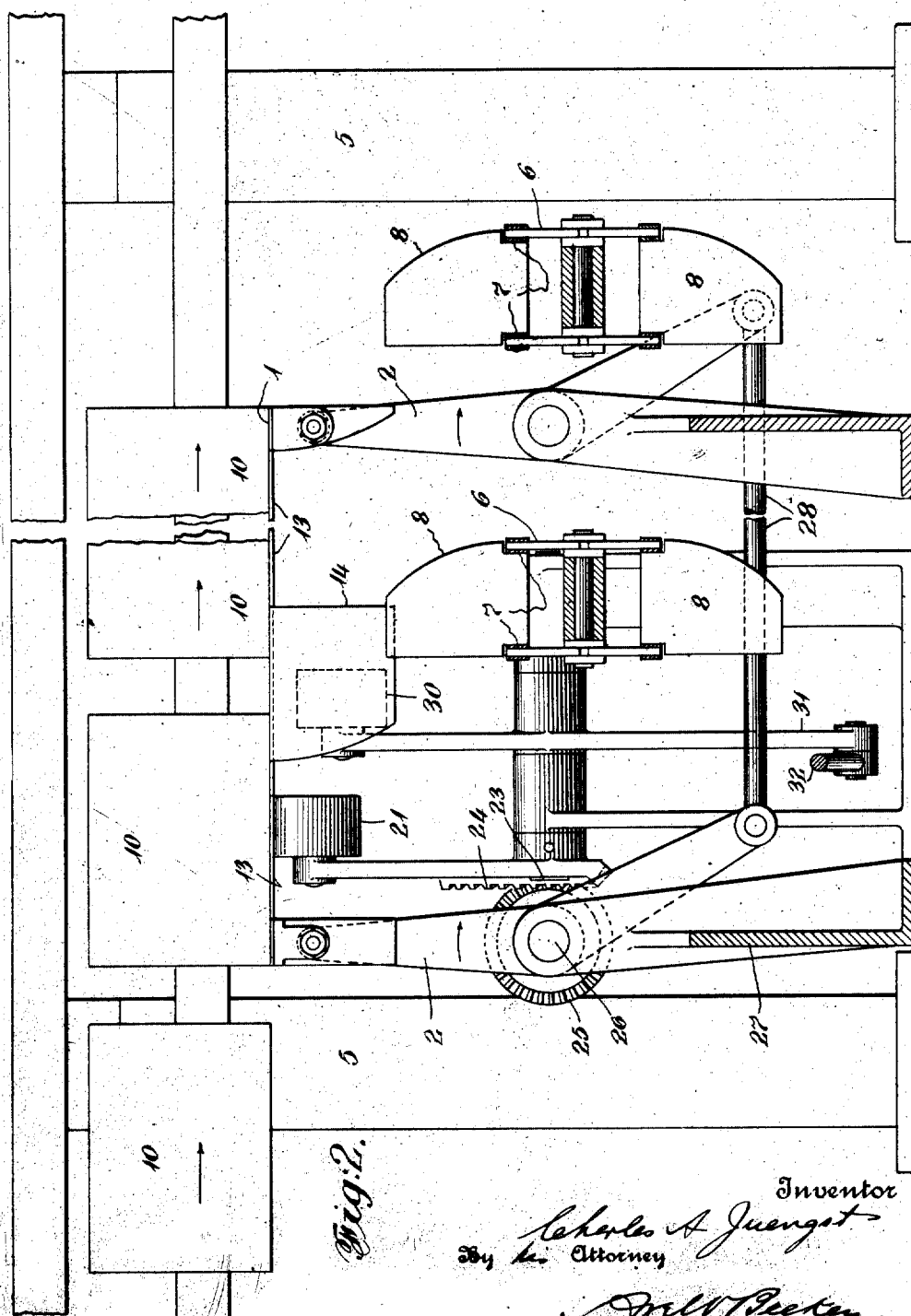
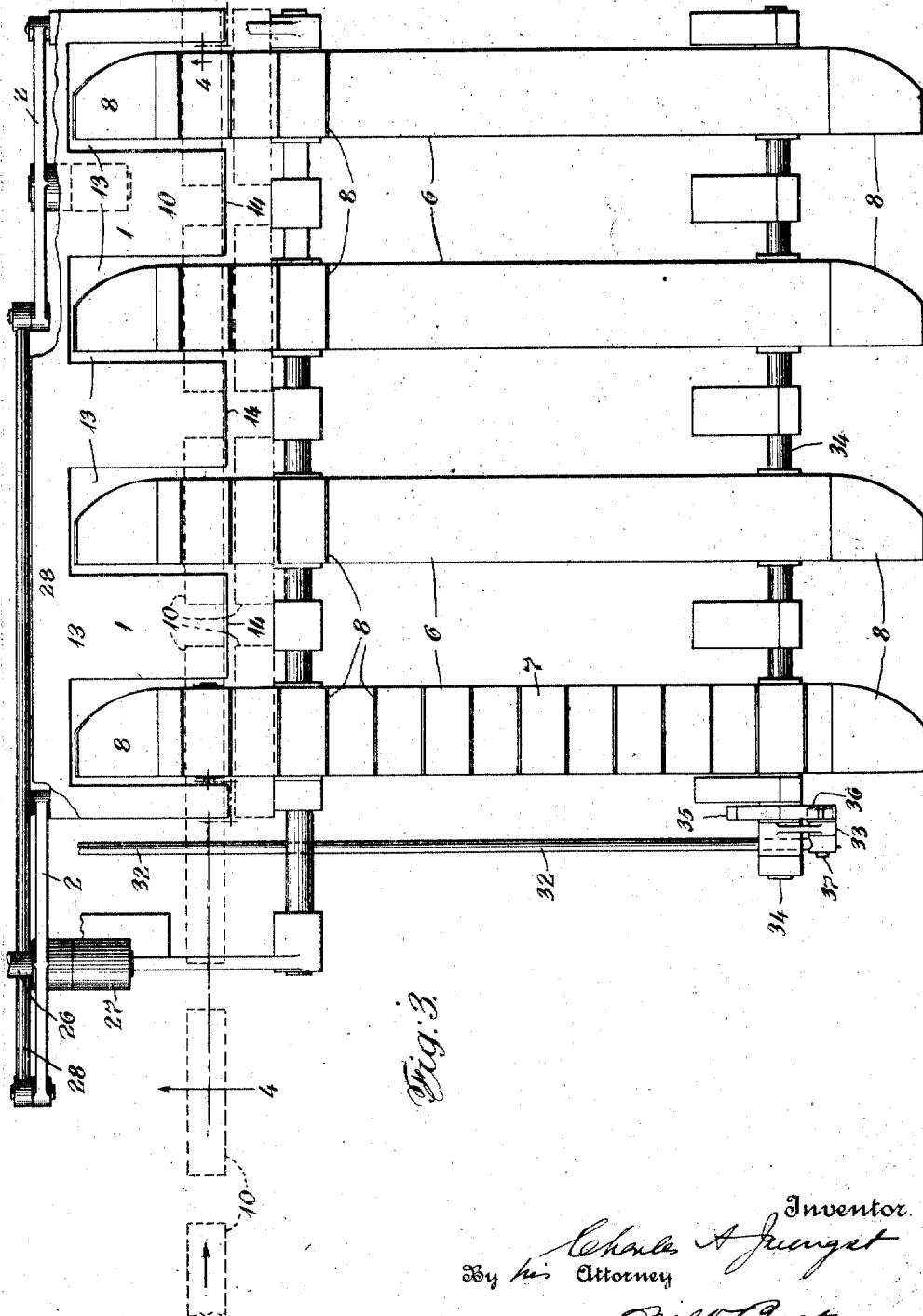


Fig. 2.

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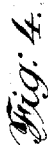
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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DELIVERY MECHANISM.

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Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed October 31, 1916. Serial No. 128,704.

To all whom it may concern:

Be it known that I, CHARLES A. JUENGST, a citizen of the United States, and a resident of Croton Falls, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Delivery Mechanism, of which the following is a specification.

This invention relates to conveying apparatus and particularly relates to an apparatus designed for use as a delivery mechanism for book covering machines.

In the prior art of book binding, book covering or binding machines in which an endless book conveyer is employed to carry the books consecutively in a vertical position from one operating means to another in order to have performed thereon the successive steps necessary in applying a cover to or in binding a book, are well known. When the book carrying conveyers in such machines have carried the books in succession past the various operating devices they then convey the covered books to a point in the path of travel of the conveyer where they are discharged into the delivery apparatus. A delivery mechanism that has been employed for conveying the books away from the point of discharge consists of an endless conveyer provided with upwardly projecting blades arranged to hold the books while they are being carried by the delivery mechanism in the same vertical position in which they were received from the book conveyer. It has been the practice to allow the books as they were discharged by the book conveyer to drop vertically downward to the places on the delivery mechanism. When large and heavy books were being operated upon, the momentum gathered by the book in its fall was sufficient to cause the impact thereof against the delivery conveyer to loosen to some extent the freshly applied cover and otherwise injure the book. The main object of this invention is to provide means for transferring the books from the book conveyer to the delivery conveyer without injury to the books.

The invention consists principally of means for discharging loads in combination with means movable into substantial engagement with the loads before they are discharged to receive the loads as they are released and transfer them to a delivery means with a substantially uniform motion, where-

by the loads are delivered without concussion.

Other features of the invention will appear as the specification proceeds.

In the accompanying drawings there is illustrated a preferred embodiment of the invention, but it is to be understood that the invention may be carried out by other embodiments and by mechanism widely different from that selected for illustration.

Figure 1 is a side elevation of a device embodying the invention together with a portion of a book covering machine shown in vertical section.

Fig. 2 is a transverse vertical section taken through the delivery mechanism along the line 2-2 of Fig. 1 with the transferring member shown in book receiving position.

Fig. 3 is a plan view of the device.

Fig. 4 is a transverse vertical section taken along the line 4-4 of Fig. 3 and showing the transferring member in its lowered position.

Fig. 5 is a view similar to Fig. 4 showing the transferring member in a position at the beginning of its travel with the transferring member in book receiving position.

Fig. 6 is a diagrammatic view looking toward the left of Fig. 1 and showing the device for simultaneously opening a plurality of clamps of the book conveyer.

In the particular embodiment of the invention chosen for illustration there is shown a plurality of conveyers arranged to serve as a delivery mechanism for a book covering machine of the type in which a horizontally traveling book conveyer carries the books successively in a vertical position with their backs lowermost from one operating mechanism to another, and finally deposits the covered book at the delivery apparatus. A preferred method for causing the books to be carried by the traveling book conveyer of the machine is by means of clamps, one or more of which may be opened to discharge the books by the movement of an opening member driven from some moving part of the machine. The delivery mechanism employed is of the endless carrier type and is arranged to maintain the books in their vertical position and to convey them away from the machine in a direction transverse to the path of travel of the book conveyer. The receiving end of the delivery mechanism is arranged adjacent to and pref-

erably at a lower level than the point or points of discharge of the book conveyor and, in order to avoid dropping the books into place on the delivery conveyers, a device is employed for receiving the books as they are discharged and transferring them to the delivery mechanism without impact.

In the preferred embodiment of the invention this device takes the form of a transfer plate 1 carried by the arms 2 and adapted to be swung from an elevated position in proximity to the clamps 3 of the conveyor 4 of the book covering machine 5; and in which books are received from the clamps, to a lowered position, in which the books are delivered to the delivery conveyers indicated generally at 6. The transfer plate 1 is preferably of such a length that it will serve to simultaneously transfer a plurality of books, in this instance four, from the main book conveyor 4 to the delivery conveyers 6.

The delivery conveyers 6 are preferably of the endless carrier type and are made up of links 7 each of which has projecting outwardly at right angles therefrom a blade 8 adapted to hold the books in an upright position as they are conveyed away from the machine. The conveyers 6 are simultaneously and intermittently driven and are arranged to dwell after each step each with a link in position to receive a book from the clamp 3 of the main conveyor 4, this position of the parts being indicated in Fig. 1 of the drawing.

The relative operation of the three main operating parts, that is, the book covering machine conveyor 4, the transferring member 1, and the delivery conveyers 6, is so timed and coordinated that the transferring member makes one complete cycle of movement while the main conveyor 4 is carrying four books into position to be delivered to the transferring member. Also during each cycle of operation the four delivery conveyers 6 are moved one step thus advancing the four books last transferred thereto and bringing the next links into position to receive books in their turn.

Preferably the main book conveyor 4 is continuously driven and in order to transfer the books from the clamps to the transferring member 1 means are provided for moving the books and the transferring member in unison at the position in which the transferring operation takes place. In order to effect this, when the transferring member is elevated from its lowered position shown in Fig. 4, it is carried from the book receiving position indicated in Fig. 2 to the position indicated in Fig. 5. At this latter position the direction of movement of the arms 2 is reversed and the transferring member 1 is carried from the position slightly beneath the books to the position where it engages the books in Fig. 2. At the same time the

movement of the transferring member through the books engaging and receiving position is made substantially at the same speed as the speed of travel of the books and in the same direction, so that when the clamps are opened by the rocking of the clamp opening member 9 the books are already in engagement with and traveling at the same speed as the transferring member and there is consequently no shock imparted to the books by the transfer.

When the books 10 are brought into position to be released by the clamps the freshly applied covers 11 are in opened position and are supported by the rods 12 arranged in positions paralleling the path of travel of the books as shown in Fig. 1 of the drawing. The movement of the books downwardly through the bars 12 serves to close the covers 11 up against the sides of the books as will be evident. It will be seen that the books will be carried for a considerable distance into the spaces between the delivery conveyor blades 8 before the upper edges move downwardly out of contact with the guide rails 12. This combined with the inertia of the books retains them in their upright position as they are transferred from the clamps 3 of the conveyor 4 to the delivery conveyers 6.

When the books are carried downwardly with the movement of the transferring member they are brought to the level of the upper carrying stretch of the delivery conveyers as shown in Fig. 4. With the books in this position the conveyers are given a forward step and the books are moved outwardly off the transferring member 1 leaving the member free for the following upward movement. Cut out portions 13 in the transferring member permit the conveyor blades 8 to pass therethrough into book engaging position as can be seen in the plan view of the delivery mechanism shown in Fig. 3.

The transfer member 1 is provided with downwardly extending guard plates 14 adapted in the elevated position of the transferring member indicated in Fig. 1 to prevent the overhanging edges of the letters of the book last deposited from falling over into the path of the transferring member 1 in its downward travel. The guard plates 14 are so shaped and located as to move in between the individual conveyers of the delivery mechanism in the lowered position of the transferring member as is shown in Fig. 4.

Means are provided for operating the clamp opening member 9, the transferring member 1, and the delivery conveyor 6 by the action of cams mounted on a drive shaft 15 journaled in the framework of the book covering machine. The clamp opening member 41 is moved into opening engage-

ment with the clamp rollers 42 to open the clamps when the rock shaft 16, carrying the arms 9 and the member 41, is swung about its center by the downward pull of the rod 19 on the rearward extension of one of the arms 9. A cam 17 on the shaft 15 acts on the roller 18 to give the downward movement to the rod 19 as shown in Fig. 1. The member 41 simultaneously opens four of the clamps as shown in Fig. 6.

A second cam 20 on the shaft 15 engages a cam roller 21 on the gear segment carrying arm 22 pivoted on the shaft 23. The gear segment 24 carried by the arm 22 meshes with a pinion 25 which pinion is mounted on the counter shaft 26, supported in the brackets 27. Secured to shaft 26 is one of the arms 2 which by its rocking motion raises and lowers the transferring member 1 as the cam 20 oscillates the gear segment carrying arm 22. A rod 28 connects the arms 2 to cause them to move in unison and to impart a parallel motion to the transferring member 1, carried by the other end of the arms, to thereby hold said transferring member constantly horizontal. While a single operating means has been illustrated both to advance the transfer device and to lower it to its delivering position, the invention is sufficiently comprehensive to include separate operating means for effecting the two movements should it be found desirable. It is also not intended to restrict the movement of the transfer device to an oscillating motion, it being considered that the use of a straight-line reciprocating motion or a rotatable movement, is within the scope of the invention.

The delivery conveyers 6 are also driven from the shaft 15 and a cam 29 on said shaft cooperates with a cam roller 30 on the rock arm 31 for this purpose. The rock arm 31 is pivoted on the shaft 23 and is connected through a rod 32 with the end of an arm 33 mounted to turn on the shaft 34 on which the driving sprockets of the conveyers 6 are mounted. A ratchet 35 fixed to the shaft 34 is adapted to be engaged by a pawl 36 carried by the pin 37 which connects the rod 32 and arm 33. Thus the oscillation of the rock arm 31 by the cam 29 will reciprocate the rod 32 and thereby cause the pawl 36 to intermittently rotate ratchet 35 and the shaft 34 carrying the conveyer driving sprockets. Therefore with each rotation of the shaft 15 in the book covering machine the cam 17 will operate the clamp opening member 9 to release the books, the cam 20 will operate the transferring member to transfer the books from the clamps 3 to the delivery conveyer, and the cam 29 will operate the pawl 36 to advance the delivery conveyers one step. The shaft 15 is driven at the required speed through the gear 38 fixed thereon which meshes with a pinion 39

mounted on the main drive shaft 40 of the book covering machine. The proper sequence of operation of the various parts is secured by means of the relative angular arrangement of the cams 17, 20 and 29 on the shaft 15 as is obvious.

While the invention has been described and shown as including delivery conveyers for carrying the finished work away from the machine, it is not intended to limit the invention to such a construction. The construction by which the releasing device releases a plurality of loads and operates at intervals which provide for the conveying of a plurality of loads into position for simultaneous release, is considered to be a distinct invention *per se* as well as in combination with the delivery conveyers.

The feature of having a longitudinal book conveyer with a downwardly opening clamp 85 to support a book in upright position together with means for causing the clamp to release the book into an inclined chute below the clamp and an endless delivery conveyer adjacent to the chute and moving transversely of the longitudinal conveyer provided with upstanding leaves that pass through an opening in the chute and assume an inclined position during the passage of the book from one conveyer to the other and to maintain it in an upright position is not claimed in this application but forms the subject matter of and is claimed in a companion application Ser. No. 855,646, filed August 7, 1914.

What is claimed is:

1. A book covering machine comprising: a horizontally disposed and continuously moving book conveyer having a delivery point, clamps on said conveyer for clamping the sides of books to carry them in an upright position with their backs lowermost and exposed, means for opening a clamp at the delivery point of said conveyer, and a device extraneous of the book conveyer and located at the delivery point thereof for receiving a book on the run from said conveyer, said device including means movable in the same direction as the book conveyer for engaging the back of a book substantially at the moment of its release from the clamp and for supporting it in an upright position.

2. A book covering machine comprising: a horizontally moving book conveyer having a delivery point, clamps on said conveyer for clamping the sides of books to carry them in an upright position with their backs lowermost and exposed, a delivery conveyer, engaging the back of a book for receiving and conveying a book in an upright position with its back lowermost, extending substantially at right angles to said book conveyer and located below the delivery point thereof, means for opening a clamp to release a book at the delivery point

of said book conveyer, and a movable device adjacent the delivery point of said book conveyer intermediate the two conveyers for engaging the back of a book substantially at the moment of its release from the clamp and for transferring said book in an upright position with its back lowermost from the book conveyer to the delivery conveyer.

3. A book covering machine comprising:
 10 a horizontally moving book conveyer having a delivery point, clamps on said conveyer for clamping the sides of books to carry them in an upright position with their backs lowermost and exposed, a delivery
 15 conveyer, engaging the back of a book for receiving and conveying a book in an upright position with its back lowermost, extending substantially at right angles to said book conveyer and located below the delivery point thereof, means for opening a
 20 clamp to release a book at the delivery point of said book conveyer, and a movable device adjacent the point of said book conveyer intermediate the two conveyers, said
 25 device including a support engaging the back of a book substantially at the moment of its release from the clamp to hold it in an upright position, and means for moving said support in the same direction as the
 30 conveyer at the moment of transfer of the book and for thereafter gradually bringing the book to a state of rest.

4. A book covering machine comprising:
 35 a horizontally moving book conveyer having a delivery point, clamps on said conveyer for clamping the sides of books to carry them in an upright position with their backs lowermost and exposed, a delivery
 40 conveyer, engaging the back of a book for receiving and conveying a book in an upright position with its back lowermost, extending substantially at right angles to said book conveyer and located below the delivery point thereof, means for opening a
 45 clamp to release a book at the delivery point of said book conveyer, and a movable device adjacent the delivery point of said book conveyer intermediate the two conveyers, said
 50 device including a support engaging the back of a book substantially at the moment of its release from the clamp to hold it in an upright position, and means for moving said support in the same direction as the conveyer at the moment of transfer of the book
 55 and downwardly into a lower plane.

5. A book covering machine comprising:
 60 a book conveyer having a delivery point, clamps on said book conveyer for clamping the sides of the books to carry them in an upright position with their backs lowermost and exposed, means for opening a
 65 clamp at the delivery point of book conveyer, a delivery conveyer below said book conveyer adapted to receive a book in an upright position with its back lowermost,

and transfer means including a shelf at said delivery point having an opening cut therein, for engaging the back of a book as it is released from the clamp of the book conveyer, and means for moving said shelf
 70 with its cut out portion into straddling position with respect to the delivery conveyer to place the book with its back lowermost on said delivery conveyer.

6. A book covering machine including:
 75 a horizontally disposed book conveyer having a delivery point, clamps on said conveyer for clamping the sides of books to carry them in an upright position with their backs lowermost and exposed, means for
 80 opening a clamp at the delivery point of said conveyer, a horizontal shelf at said delivery point to engage the back of a book delivered by the clamp and to hold said book in an upright position, rocking arms
 85 connected to each other and to the shelf to have a parallel motion supporting said shelf at all times in a horizontal position, and means for rocking said arms in unison.

7. A book covering machine comprising:
 90 a continuously moving book conveyer including book holding clamps, a movable cam operated at intervals to open a plurality of said clamps to release a plurality of
 95 books, and means for delivering the plurality of books received from said clamps.

8. A book covering machine comprising, a movable book conveyer having clamps supporting a book in an upright position with its back lowermost, a delivery conveyer in a plane different from that of the book conveyer, supporting means which
 100 when in book receiving position moves substantially in the plane of the back of the book carried by clamps of the book conveyer, and substantially at the same speed
 105 and in the same direction as the book conveyer, means for opening a clamp thereby releasing a book from the book conveyer when said supporting means is in book
 110 receiving position, and means for moving said supporting means into the plane of the delivery conveyer.

9. A book covering machine comprising, a movable book conveyer having clamps
 115 supporting a book in an upright position with its back lowermost, a delivery conveyer in a plane different from that of the book conveyer, a support for engaging with the back of the book when said support is
 120 substantially in the plane of the back of the book carried by the book conveyer, means for opening a clamp thereby releasing the book from the book conveyer when the support is in book receiving position, and means
 125 for moving the support substantially in unison with and in the same direction as the movement of the book conveyer and from the plane of the book conveyer into the plane of the delivery conveyer.
 130

10. A book covering machine comprising, a continuously moving book conveyer including clamps to carry books in an upright position, a plurality of delivery conveyers, 5 means for opening the clamps to release books from the book conveyer, at intervals of such length that a plurality of books are carried by the book conveyer into releasing position, and means for simultaneously 10 transferring the plurality of released books in an upright position to the delivery conveyers.

11. A book covering machine comprising, a continuously moving conveyer including 15 book holding clamps, a plurality of delivery conveyers, means for simultaneously open-

ing a plurality of said clamps to release the books therefrom, and means for simultaneously transferring the released books to the delivery conveyers. 20

12. A book covering machine comprising, a book conveyer including: book holding clamps for supporting books in an upright position, means for simultaneously opening 25 a plurality of said clamps to release the books therefrom, and means for delivering said books simultaneously in an upright position.

Signed at New York city, in the county of New York and State of New York this 30 25th day of October A. D. 1916.

CHARLES A. JUENGST.