

M. CHRISTENSEN.
BOOK STITCHING APPARATUS.
APPLICATION FILED MAY 25, 1906.

937,925.

Patented Oct. 26, 1909.

6 SHEETS—SHEET 1.

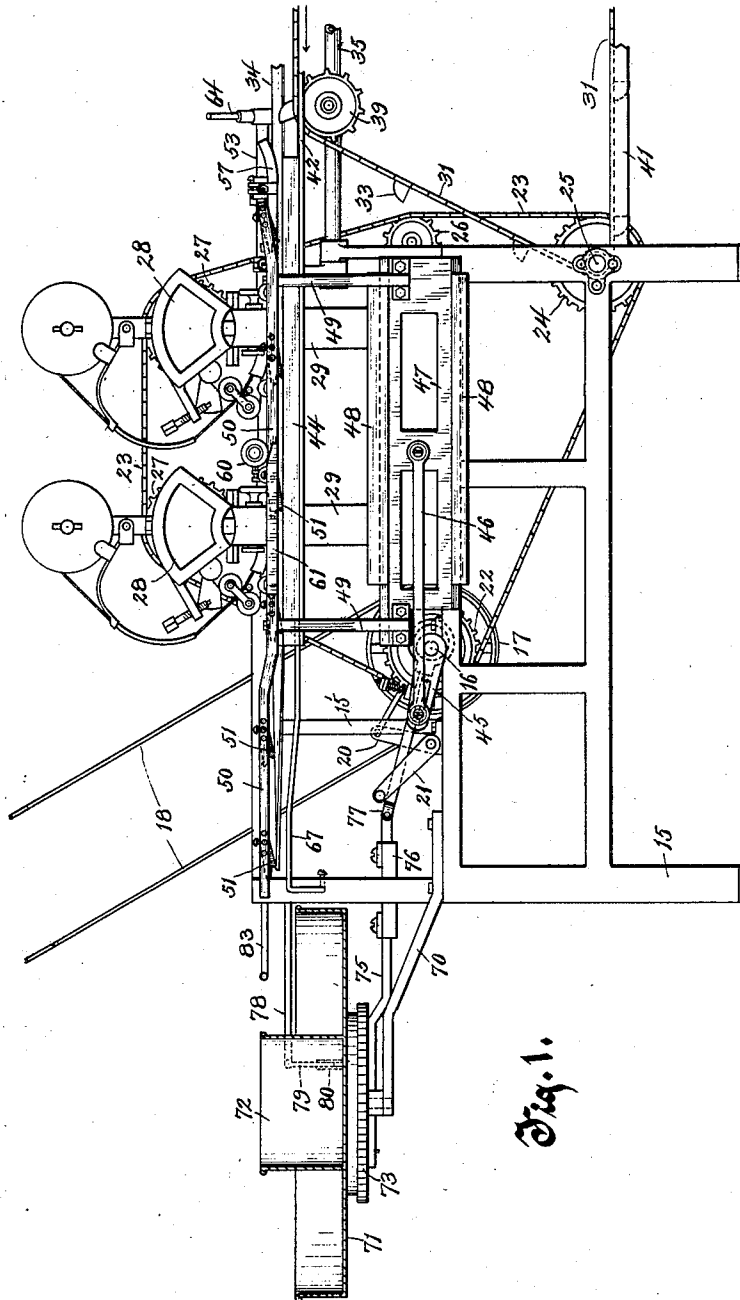


Fig. 1.

Witnesses.

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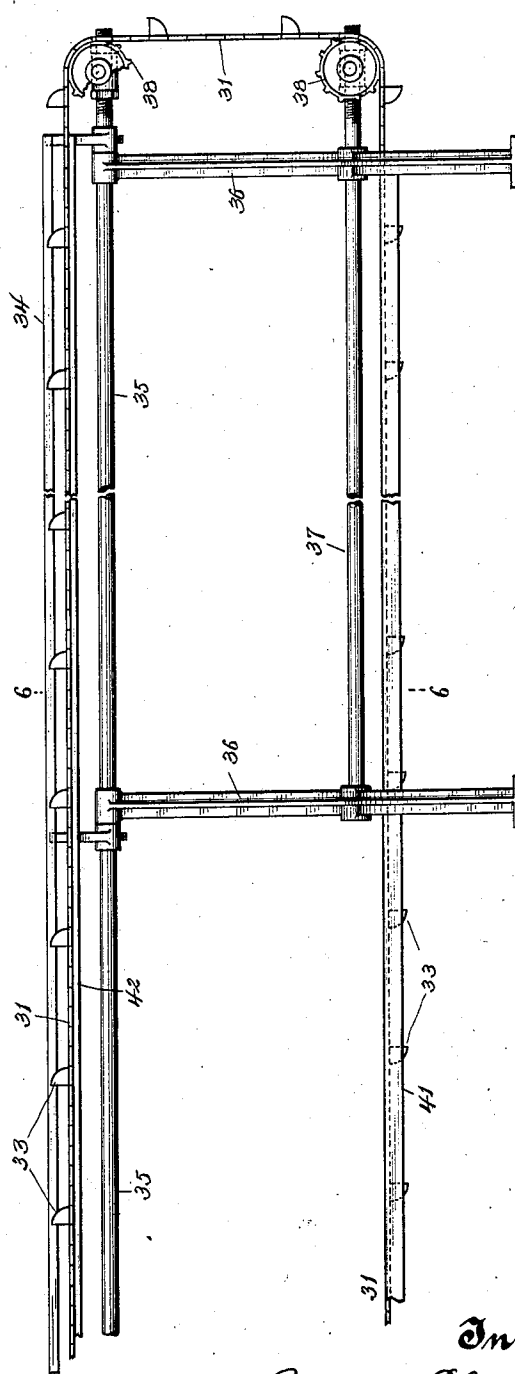
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6 SHEETS—SHEET 2.

Fig. 2.



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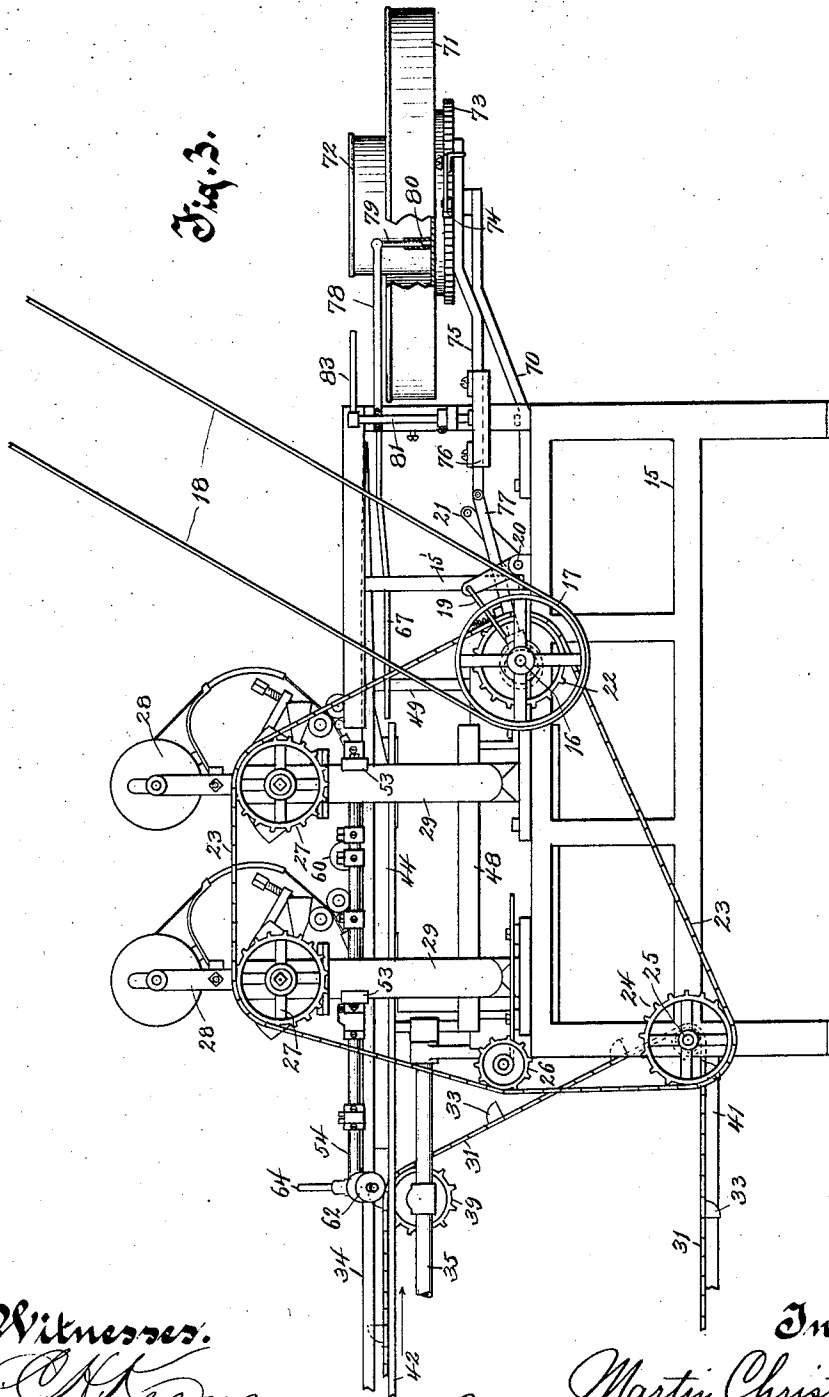
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6 SHEETS—SHEET 3.



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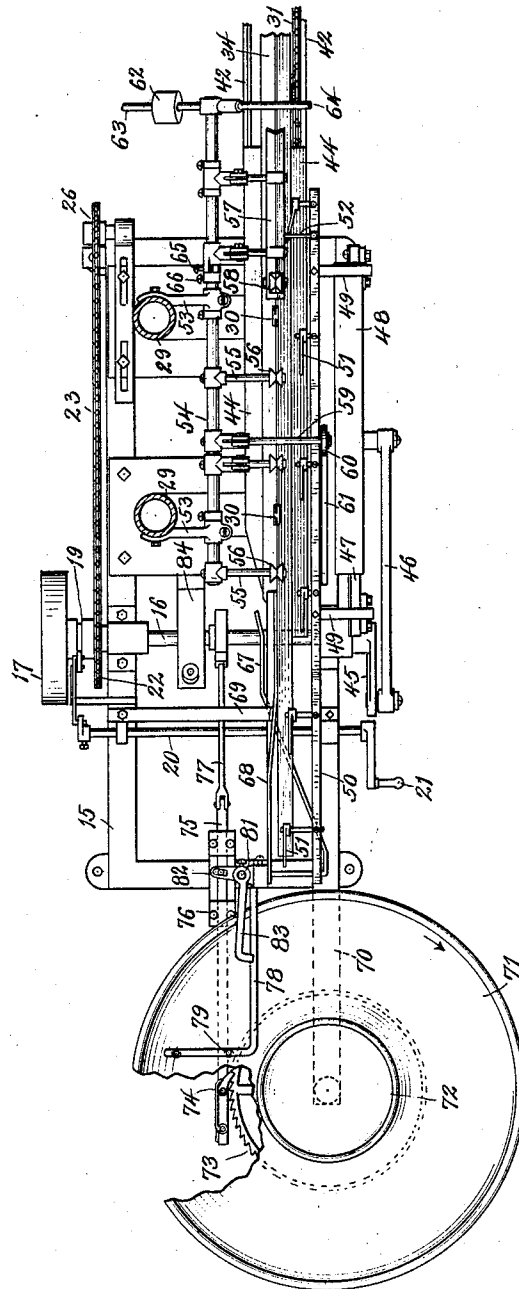
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6 SHEETS—SHEET 4.

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Fig. 4.



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6 SHEETS—SHEET 5.

Fig. 6.

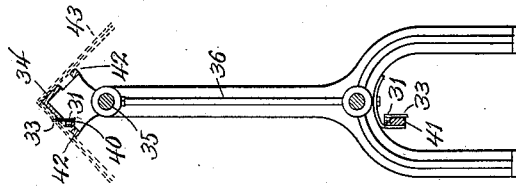
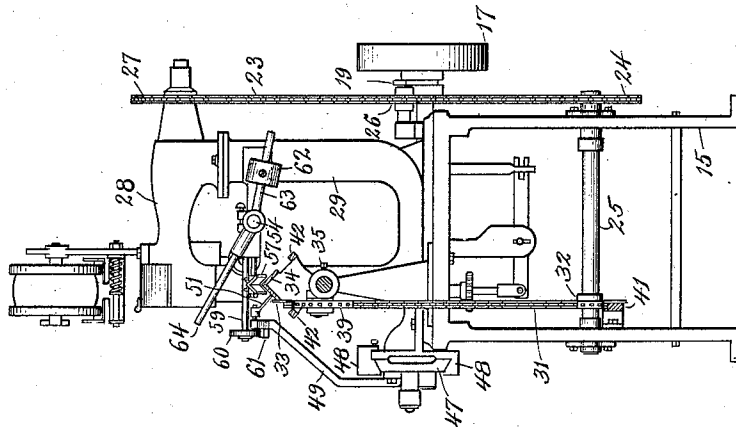


Fig. 5.



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6 SHEETS—SHEET 6.

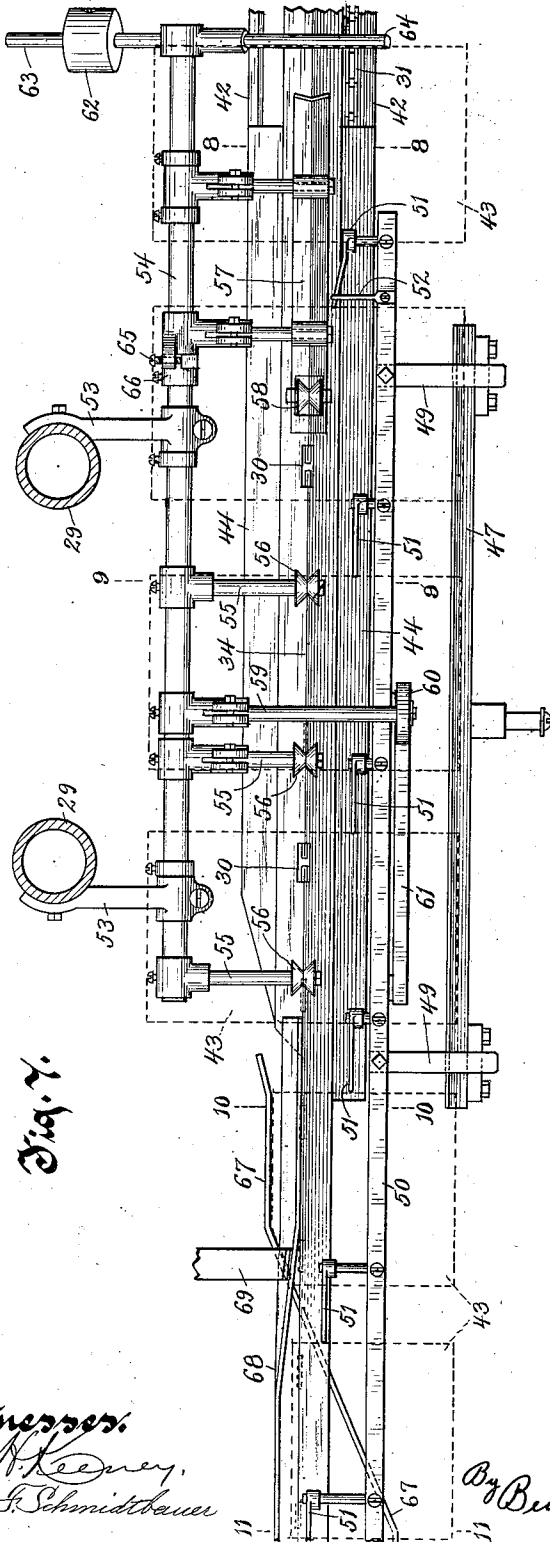


Fig. 7.

Fig. 8.

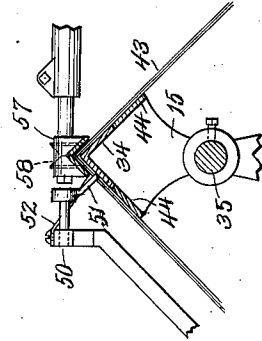


Fig. 9.

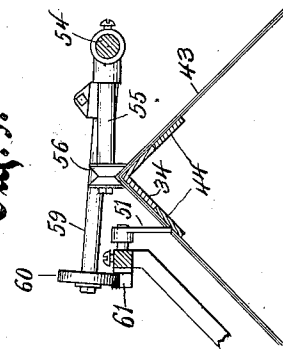


Fig. 10.

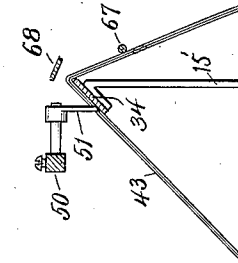
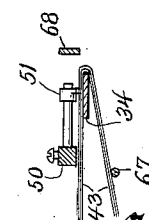


Fig. 11.



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UNITED STATES PATENT OFFICE.

MARTIN CHRISTENSEN, OF RACINE, WISCONSIN, ASSIGNOR OF ONE-HALF TO FREDERICK J. GREENE, OF RACINE, WISCONSIN.

BOOK-STITCHING APPARATUS.

937,925.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed May 25, 1906. Serial No. 318,627.

To all whom it may concern:

Be it known that I, MARTIN CHRISTENSEN, residing in Racine, in the county of Racine and State of Wisconsin, have invented new and useful Improvements in Book-Stitching Apparatus, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 This invention relates to book stitching apparatus, for fastening the leaves of books or pamphlets by means of wire staples, and has for its object to provide a plurality of stitching or stapling machines with a single
15 feed mechanism, said stitching machines being adapted to operate upon the books or pamphlets successively to apply the stitches or staples at the different portions of their folds.

20 Another object of this invention is to provide a conveyer independent of the feeding mechanism for delivering the books or pamphlets thereto.

25 Another object of this invention is to provide a feeding mechanism of novel construction for feeding the books or pamphlets to the stitching machines and carrying them away therefrom.

30 Another object of this invention is to provide mechanism for guiding the books in their movements and for clamping them in their positions of rest during the stitching operations.

35 Another object of this invention is to provide a suitable receiving means for collecting the finished books or pamphlets in a manner that will enable them to be easily removed.

40 With the above and other objects in view the invention consists in the book stitching apparatus herein shown and described, its parts and combinations of parts, and all equivalents.

45 Referring to the accompanying drawings, in which like characters of reference indicate the same parts in the several views:—
Figure 1 is a front elevation of one portion of a book stitching apparatus constructed in accordance with this invention; Fig. 2 is a similar view of the remainder thereof, being a portion of the conveyer mechanism; Fig. 3 is a rear elevation of the portion of the ap-

paratus shown in Fig. 1, with parts broken away; Fig. 4 is a plan view thereof, the stitching machine being removed and the receiver being broken away to show the construction of the ratchet turning means; Fig. 5 is an end elevation of the portion of the apparatus shown in Fig. 1; Fig. 6 is a transverse sectional view of the portion of the apparatus shown in Fig. 2, taken on the plane of line 6—6 of Fig. 2; Fig. 7 is an enlarged plan view of portions of the feeding mechanism, the clamping mechanism and the folding device as shown in Fig. 4, the books or pamphlets being represented in dotted lines; and Figs. 8, 9, 10 and 11 are transverse sectional views taken on the planes of the sectional lines of corresponding numbers in Fig. 7.

70 In these drawings 15 represents a frame of suitable construction for supporting the mechanism, and 16 is a drive shaft journaled thereon, carrying at its rear end a loose belt pulley 17 which may be driven by a belt 18 from any suitable driving mechanism. The pulley 17 is adapted to be coupled with the drive shaft 16 by means of a pin clutch 19, which is controlled by a cranked rock shaft 20, extending across the frame 15 and provided with an operating handle 21.

80 A sprocket 22 is fixed on the drive shaft 16 at the rear of the frame and serves to drive a chain 23, which passes around a sprocket 24 on a shaft 25 at the lower part of the supply end of the frame, then against a chain tightening sprocket 26 adjustably mounted on the frame, and then around the drive sprockets 27 of a pair of wire stitching machines 28 of ordinary construction mounted on U-shaped supports 29 which are secured to the frame. The wire stitching machines are driven by the turning of their sprockets 27 and serve to periodically form staples from a continuous length of wire and force them through the article to be stitched and into clenching dies 30 on the upstanding arm of the U-shaped supports 29. Details of construction of the stitching machines are not shown and described as the invention does not depend thereon and any suitable stitching or stapling machine may be employed for the purpose.

The driving of the shaft 25 by means of the chain 23 is for the purpose of operating a suitable conveyer to supply groups of assembled sheets of the books or pamphlets to the feeding mechanism for the stitching machines. This conveyer consists of an endless chain 31 driven by passing around a sprocket 32 on shaft 25 and provided with projecting feeding fingers 33 at regular intervals to engage the groups of assembled sheets which are placed by attendants on an inverted-V-shaped guide rail 34 and cause them to ride on said guide rail toward the stitching machines. The guide rail 34, forming a collecting table for the packs of signatures, extends from the machine proper for a considerable distance and is mounted upon a rod 35 which connects with the frame 15 and is supported at intervals by Y-shaped standards 36. There are two of these standards shown in Fig. 2, but in practice there may be more, according to the length of the conveyer. A rod 37 connects the last two standards 36 at their lower parts, and both rods 35 and 37 project beyond the last standard and have sprockets 38 adjustably mounted on them. The chain 31 travels over these sprockets and also over a fourth sprocket, 39, which is mounted on the rod 35 near the machine proper. The chain 31 is prevented from sagging by riding upon guide strips 40 and 41 mounted upon the conveyer frame from one end thereof to the other. In the planes of the bearing faces of the inverted-V-shaped guide rail 34, and at a short distance from said guide rail, are rods 42 which assist in supporting the assembled sheets 43, as shown in Fig. 6. The upper portion of the conveyer chain 31, which travels toward the stitching machines, projects its blades 33 through the slot formed between the guide rail 34 and the rod 42 on one side, so as to engage the groups of assembled sheets and push them along the guide rail toward the machine proper.

The inverted-V-shaped guide rail 34 which extends the full length of the conveyer frame continues as a supporting table for nearly the full length of the frame 15, being mounted on the upstanding arms of the U-shaped supports 29 of the stitching machines and having openings therein to expose the clenching dies of the stitching machines. The bearing faces of the guide rail 34 beneath the stitching machines are broadened by extension plates 44 on each side which take the place of the rods 42.

For feeding the groups or individual packs of signatures or sheets 43 to and from the stitching machines, there is provided a reciprocating feeding mechanism operated from the drive shaft and provided with dogs for engaging the groups of sheets and

forcing them successively along the guide rail 34 the required distance to bring them properly under the stitching machines.

A crank 45 on the front end of the drive shaft 16 is connected by means of a pitman 46 with a slide or cross-head 47 which is capable of a horizontal reciprocating movement in suitable dove-tail guides 48 which are secured to frame 15. The connection of the pitman 46 with the crank 45 is through a slot in the crank and is adjustable to vary the length of stroke of the slide. Arms 49 extend upwardly and inwardly from each end of the slide 47 and carry at their upper ends a feed bar or frame 50 which is provided with a series of dogs or feeding fingers 51 adjustably mounted thereon and adapted to ride upon the inclined surface of the guide rail 34 or one of its extensions 44. These dogs are provided with notched engaging ends to catch the rear edges of the groups of assembled sheets when the feed bar is moved rearwardly so as to force them to move along the guide rail when the feed bar moves forwardly. The dogs drop into engagement with the rear edges of the groups of sheets by their own weight, being pivotally mounted, but the first dog is provided with a spring 52 reaching out from the feed bar 50 and pressing downwardly on the dog to assure its engagement.

The stitching machines 28 are so located that one of them applies a staple at one end of the pamphlet when it is in one of its positions of rest, as shown by dotted lines in Fig. 7, while the other applies its staple at the other end of the pamphlet when it is in another position of rest, both stitching machines operating simultaneously to apply their staples at different parts of different pamphlets, and their combined operation serving to supply each pamphlet with the necessary number of staples applied at the proper positions. In this connection it will be noted that the stitching machines may be in any number, according to the number of staples required in each pamphlet.

In order that the pamphlet may be held against movement during the stitching operation, there is provided a means for pressing upon the pamphlets at this time to hold them in proper position and then release them for the succeeding feeding operation.

Suitable brackets 53 are secured to the supports 29 of the stitching machines and form bearings for a rock shaft 54 which carries a number of adjustable arms 55, some of which are provided with grooved rollers 56 to bear upon the creased portion of the pamphlets as they pass therebeneath on the guide rail. The first two of the arms 55 support an inverted-V-shaped guard plate 57 which carries a grooved roller 58 at the end nearer the stitching machines, the other end thereof be-

ing turned up, as shown in Figs. 1 and 5, to receive the groups of sheets from the conveyor chain 31.

An arm 59, adjustably secured to the rock shaft 54 and similar to the arms 55, extends over the guide rail 34 and carries a roller 60 on its front end to travel upon a track 61 which is carried by the feed bar 50. There is an incline at one end of the track 61 to permit the roller 60 to lower and allow the rock shaft 54 to move so as to swing the arms 55 downwardly and bring the rollers 56 and 58 and the guard 57 more closely into engagement with the pamphlets 43 at the end of the feeding stroke of the feed bar, so that they may thereby hold the pamphlets steady in their positions of rest during the stitching operation. When the feed bar begins its return stroke after the stitching operation the cam or incline of track 61 forces the roller 60 upwardly and thereby moves the rock shaft 54 to lift the rollers and the guard from engagement with the pamphlets.

The degree of pressure of the rollers and the guard upon the pamphlets may be regulated by adjusting the position of a counterweight 62 which is mounted on an arm 63 projecting rearwardly from the rock shaft, there being a forwardly extending arm 64 on the rock shaft by which it may be swung by hand to lift the rollers and the guard from the pamphlets.

In order that the guard 57 may be lifted independently, for clearing obstructions therebeneath, and also that it may be slightly lifted automatically when the roller 60 rides up the incline of track 61, its arms 55 are loosely mounted on the rock shaft, and an adjusting screw 65 carried by one of them is adapted to engage a shouldered collar 66 which is fixed on the rock shaft 54, so that by the adjustment of the set screw 65 the position of the guard 57 at the time the roller 60 is riding on the upper surface of the track 61 may be accurately adjusted to allow the pamphlets 43 to pass therebeneath without binding.

The upward movement of the guard 57 and the rollers 56 produced by the roller 60 on the track 61 is very slight, so as to just remove the pressure of the rollers and guard from the pamphlets while they still remain close enough to the guide rail 34 to cooperate therewith in guiding the pamphlets in their proper course. When the handle 64 is swung the guard 57 is raised along with the rollers 56 so as to be free from the guide rail 34 entirely, allowing the operator to clear obstructions wherever they occur.

Both of the extension plates 44 terminate after passing the last stitching machine, the one in the rear being tapered to a point at which the bearing face of the guide rail 34 on that side is cut away at an angle, leaving

only the bearing face on the front side of the guide rail from there to the end. This cutting away of extension plate 44 and the side of the guide rail is to permit of the rear portion of the pamphlets being turned under or folded by means of a bent folding rod 67 which is secured to the frame 15 and extends obliquely beneath the guide rail 34 with its free end bent out into a position to stand in the path of the rear portion of the pamphlets as they leave the last stitching machine. The single bearing face of the guide rail 34 which remains at this folding section of the apparatus is supported by a standard 15' and is twisted from the inclined position, as shown in Fig. 10, to a horizontal position, as shown in Fig. 11, so that the pamphlets are folded to a nearly horizontal position between the feed bar 50 and the folding rod 67. There is a guard plate 68 mounted on the frame and held in place by a brace 69, which is twisted to stand approximately at right angles to the single bearing surface of the guide rail 34 and at a short distance therefrom to keep the pamphlets in place on the guide rail during the folding operation.

A bracket 70 stands out from the frame 15 and rotatably supports a circular receptacle 71 having a central cylindrical upright portion 72 to form between it and the outer rim of the receptacle a circular receiver for the pamphlets which are discharged at the end of the guide rail 34. The receiver is caused to rotate by having a ratchet 73 formed on its bottom, which is engaged by a spring pawl 74 on a reciprocating rod 75, traveling in a guide 76 on the frame 15, said rod receiving motion from an eccentric on the drive shaft 16 by means of an eccentric strap or pitman 77. The reciprocations of the rod 75 cause the pawl 74 to turn the receiver in the direction of the arrow in Fig. 4. An arm 78 projects from the frame 15 and carries a pair of downwardly extending rigid pins 79 with loose sleeves 80 thereon bearing on the bottom of the receiver 71 in the path of the pamphlets, so that as the pamphlets are carried around in the receiver they engage the pins 79 or their sleeves 80 and are held thereby against further travel and are thus caused to accumulate so as to be convenient for removal.

A shaft 81 is journaled in an upright position on the frame 15 and carries at its lower end a slotted crank 82 to engage a pin on the reciprocating rod 75 so as to cause the shaft 81 to oscillate as the rod 75 reciprocates, and at the upper end of the shaft 81 is a hooked arm 83 which by the movements of said shaft is caused to swing in the path of the pamphlets as they are forced from the guide rail 34 by the last dog 51 and causes the pamphlets to fall in the same position each time.

The feed of the receiver is such that the pamphlets overlap each other as they are deposited therein, which facilitates their piling up in proper order for removal.

5 The operating shaft 16 is provided with a frictional brake 84 to quickly bring the machine to a standstill when the clutch 19 is released.

It will be noted that the positions of the dogs 51 vary with relation to the middle of the guide rail 34 on account of the necessity for their avoiding the stitching machines, the object being to have the dogs engage the pamphlets as near their middle portion as possible. It will also be noted that the feed bar 50 is bent so as to be higher at the portions which support the dogs that are nearer the middle of the guide rail, which is on account of the higher point of engagement of the dogs with the guide rail.

10 In operation the assembled sheets to form the pamphlets are placed upon the guide rail 34 at the conveyer portion of the apparatus by a number of attendants so that by the time the machine proper is reached each one of the fingers 33 of the conveyer chain carries one of the sets of sheets. As the fingers 33 turn upon the sprocket 39 to move downwardly out of engagement with the groups of assembled sheets, they force them along the guide rail 34 under the upturned end of the guard 57, where each in turn will be engaged by the first dog 51 as it is brought back to the beginning of its stroke and will be carried forward thereby during the next stroke of the feed bar, bringing the group of sheets into proper position to receive the staple from the first stitching machine. Just previous to the stitching operation, however, the rock shaft 54 is relieved of the support which it has had until this time by the engagement of the roller 60 with the upper surface of the rail 61, since said roller rides down the incline of the rail. The resulting movement of the rock shaft 54 causes the guard 57 to bear upon the group of sheets beneath it and hold it securely in place during the operation of the stitching machines which immediately follows. The pressure of the guard on the group of sheets is released as the roller 60 rides upon the track 61 at the beginning of the return stroke, and the second dog 51 is brought into engagement with the rear edge of the group of sheets which has just received its first staple. By the next stroke of the machine the partly formed pamphlet is moved by this dog to an intermediate position between the two stitching machines, and by the succeeding operation of the machine it is brought by means of the third dog into position beneath the second stitching machine to receive a second staple therefrom. The movement of the pamphlet caused by

the engagement therewith of the fourth dog 65 carries its rear portion under the folding rod 67 which completes the folding operation during the following forward movement produced by the fifth dog. As the pamphlets are pushed from the guide rail 34 by the last dog they drop into the receiver 71, being guided in doing so by the motion of the arm 83 and are carried around in the receiver until striking against the fingers 79 and the sleeves 80, where they pile up to be removed by hand.

By adjusting the connection between the pitman 46 and the crank 45 the length of movement of the feed bar may be varied so as to adapt the machine for different work, such as different sizes of pamphlets. The dogs 51 are made adjustable so as to vary the positions of rest of the pamphlets to enable them to receive staples at the desired places.

The terms "group of sheets" and "pamphlets" are used with the same meaning, the former term more properly applying to the unfinished product and the latter term to the finished product.

The sprocket 24 may be removed from shaft 25 and replaced with a sprocket of a different size, so as to alter the rate of supply of the groups of sheets by the conveyer and thereby adapt the machine for applying more or less staples to each pamphlet, the adjustment of the feeding mechanism being likewise altered to suit the requirements. For instance, if six staples are desired in each pamphlet, the conveyer is to operate at such a speed that it delivers a group of sheets at each third operation of the stitching machines and if eight staples are desired a group of sheets is delivered at each fourth operation of the stitching machines.

The spring 52 which presses on the first dog 51 is to straighten the cover on the groups of sheets as they are delivered from the conveyer, the dog in its backward movement pressing upon the cover and moving it with the sheets against the finger of the conveyer.

What I claim as my invention is:—

1. In a book stitching apparatus, a stitching machine, and a feeding mechanism for moving groups of assembled sheets successively into operative position with relation to the stitching machine to receive staples therefrom, said feeding mechanism comprising an inverted-V-shaped guide rail on which the groups of creased sheets are adapted to slide, and a plurality of reciprocating swinging dogs for riding on the guide rail and engaging the successive groups of sheets and moving them step-by-step in a course past the stitching machine.

2. In a book stitching apparatus, a stitching machine, and a feeding mechanism for moving groups of assembled sheets succes-

sively into operative position with relation to the stitching machine to receive staples therefrom, said feeding mechanism comprising an inverted-V-shaped guide rail on which the groups of creased sheets are adapted to slide, and a reciprocating feed bar having a plurality of dogs for riding on the guide rail and engaging the successive groups of sheets and moving them step-by-step in a course past the stitching machine.

3. In a book stitching apparatus, a frame, a stitching machine mounted on the frame, a drive shaft journaled therein, a guide mounted on the frame, a slide adapted to reciprocate in the guide, a crank on the drive shaft, a pitman on the slide adjustably connected with the crank for reciprocating the slide, a feed bar carried by the slide, an inverted-V-shaped guide rail on which groups of creased sheets are adapted to slide, and swinging dogs adjustably mounted on the feed bar and riding on the guide rail to engage and move the successive groups of sheets in a course past the stitching machine to receive staples therefrom.

4. In a book stitching apparatus, a stitching machine, a guide rail on which groups of assembled sheets are adapted to slide, means for feeding the groups of sheets intermittently along the guide rail to the stitching machine to receive staples therefrom, a rock shaft, arms carried by the rock shaft, rollers mounted on the arms for guiding the groups of sheets during their movements and bearing on them for holding them in position during the stitching operation.

5. In a book stitching apparatus, a stitching machine, a guide rail on which groups of assembled sheets are adapted to slide, means for intermittently feeding the groups of sheets along the guide rail to the stitching machine to receive staples therefrom, a rock shaft, and arms adjustably mounted on the rock shaft and having rollers to bear upon the groups of sheets for guiding them in their movements and holding them in position during the stitching operation.

6. In a book stitching apparatus, a stitching machine, a guide rail on which groups of assembled sheets are adapted to slide, means for feeding the groups of assembled sheets intermittently along the guide rail to the stitching machine to receive staples therefrom, a rock shaft, arms carried by the rock shaft, rollers mounted on the arms for guiding the groups of sheets during their movements and bearing on them for holding them in position during the stitching operation, and a guard also bearing on the groups of sheets and capable of independent movement away from the guide rail.

7. In a book stitching apparatus, a stitching machine, a guide rail on which groups

of assembled sheets are adapted to slide, means for intermittently feeding the groups of sheets along the guide rail to the stitching machine to receive staples therefrom, a rock shaft, arms carried by the rock shaft, rollers mounted on the arms for guiding groups of sheets during their movements and bearing on them for holding them in position during the stitching operation, a guard also mounted on the rock shaft and independently movable thereon, and a roller carried by the guard and bearing on the groups of sheets.

8. In a book stitching apparatus, a stitching machine, a guide rail on which groups of assembled sheets are adapted to slide, means for intermittently feeding the groups of sheets along the guide rail to the stitching machine to receive staples therefrom, a rock shaft, arms adjustably mounted thereon and having rollers to guide the groups of sheets during their movements and for holding them in position during the operation of the stitching machine, a guard loosely mounted on the rock shaft and also having a roller bearing on the groups of sheets for the same purpose as the before mentioned rollers, and an adjustable stop between the guard and the rock shaft.

9. In a book stitching apparatus, a stitching machine, a guide rail on which groups of assembled sheets are adapted to slide, means for intermittently feeding the groups of sheets along the guide rail to the stitching machine to receive staples therefrom, a rock shaft, arms adjustably mounted thereon and having rollers to guide the groups of sheets during their movements and for holding them in position during the operation of the stitching machine, a guard loosely mounted on the rock shaft and also having a roller bearing on the groups of sheets for the same purpose as the before mentioned rollers, an adjustable stop between the guard and the rock shaft, and an adjustable counter-weight on the rock shaft for determining the degree of pressure of the rollers and the guard against the groups of sheets.

10. In a book stitching apparatus, a stitching machine, a guide rail on which groups of assembled sheets are adapted to slide, a feeding mechanism for intermittently moving the groups of sheets along the guide rail, a rock shaft, arms on the rock shaft carrying rollers for bearing upon the groups of sheets to guide them during their movements and hold them in position during the stitching operation, a cam track carried by the feeding mechanism, and an arm on the rock shaft having a roller to ride on the track and cause the other rollers to move nearer to or farther from the guide rail as said roller rides upon the cam of the track.

11. In a book stitching apparatus, a stitching machine, a guide rail on which

groups of assembled sheets are adapted to slide, a feeding mechanism for intermittently moving the groups of sheets along the guide rail, a rock shaft, arms on the rock shaft carrying rollers for bearing upon the groups of sheets to guide them during their movements and hold them in position during the stitching operation, a cam track carried by the feeding mechanism, an arm on the rock shaft having a roller to ride on the cam track and cause the other rollers to move nearer to or farther from the guide rail as said roller rides upon the cam of the track, and an adjustable counter-weight on the rock shaft for determining the degree of pressure of the rollers on the groups of sheets.

12. In a book stitching apparatus, a stitching machine, an inverted-V-shaped guide rail on which groups of assembled sheets are adapted to slide, feeding mechanism for intermittently moving the group of sheets along the guide rail, a rock shaft carrying grooved rollers for bearing upon the groups of sheets to guide them during their movements and hold them in position during the stitching operation, a cam track carried by the feeding mechanism, an arm on the rock shaft having a roller to ride on the track and cause the grooved rollers to move nearer to or farther from the guide rail as said roller rides upon the cam of the track, a guard plate V-shaped in cross-section loosely mounted on the rock shaft and having a grooved roller for bearing on the groups of sheets in the same manner as the other grooved rollers, an adjustable stop between the guard plate and the rock shaft, and an adjustable counter-weight on the rock shaft for determining the degree of pressure of the rollers on the groups of sheets.

13. In a book stitching apparatus, a stitching machine, mechanism for feeding groups of assembled sheets to the stitching machine to be stitched thereby, and means for conveying the groups of assembled sheets to the feeding mechanism, comprising suitable standards, a rod mounted on the standards and forming a conveyer frame therewith, an inverted-V-shaped guide rail supported on the rod, guide rods extending parallel with the guide rail at a slight distance therefrom and in the plane of the bearing faces thereof so as to form slots therebetween, sprockets mounted on the conveyer frame, a conveyer chain passing around the sprockets, fingers projecting from the conveyer chain and adapted to engage groups of sheets on the guide rail and move them along the guide rail to the feeding mechanism, guide strips for supporting the conveyer chain during its horizontal travel and causing the fingers of the conveyer chain to project through one of the

slots between the guide rail and the guide rods, and means for driving the conveyer chain.

14. In a book stitching apparatus, a stitching machine, mechanism for feeding groups of sheets to the stitching machine to be stitched thereby and for discharging them from the stitching machine, a rotary receiver into which the books are discharged, a stationary arm having depending pins in the path of the books, and sleeves loosely mounted on the pins and bearing on the receiver to bunch the books for removal.

15. In a book stitching apparatus, a stitching machine, mechanism for feeding groups of sheets to the stitching machine to be stitched thereby, a rotary receiver into which the books are discharged, a stop in the path of the books to bunch them for removal, a ratchet carried by the receiver, a reciprocating rod carrying a pawl for turning the ratchet, a shaft having a crank connected with the reciprocating rod, and an arm on the shaft adapted to swing in the path of the books as they are discharged into the receiver for causing them to fall uniformly into the receiver.

16. A machine having in combination constantly moving mechanism for delivering individual packs of signatures in succession, stitching mechanism mounted in fixed position, and mechanism engaging the edge of the packs for transferring the individual packs of signatures in succession from the delivery mechanism into register with the stitching mechanism.

17. A signature gathering machine having in combination a collecting table, constantly traveling feeding fingers for advancing the signatures along the table, stitching mechanism, and intermittently operating mechanism for transferring the packs of signatures in succession from the delivery mechanism into register with the stitching mechanism.

18. In a signature gathering machine the combination of a collecting table, traveling fingers for advancing the signatures along the table, stitching mechanism, a supporting table below said mechanism, a frame mounted to reciprocate above the path of the signatures, and vertically movable feeding fingers on the frame for engaging and feeding the packs of signatures from the collecting fingers to the stitching mechanism.

19. A signature gathering machine, having, in combination, means for delivering packs of signatures in succession, a stitching mechanism, a supporting table below the stitching mechanism, a reciprocating feeding frame above the supporting table, and vertically movable feeding fingers carried by said frame for advancing the packs of signatures from the delivery mechanism to the stitching mechanism.

20. A signature gathering machine, hav-

ing, in combination, a stitching mechanism, a supporting table below the stitching mechanism, a reciprocating feeding frame above the supporting table, feeding fingers pivoted upon said frame and provided with inclined surfaces for engaging the stacks of signatures and raising the fingers on the return stroke of the feeding frame, and means for advancing stacks of signatures into position

to be operated upon by the stitching mechanism. 10

In testimony whereof, I affix my signature, in presence of two witnesses.

MARTIN CHRISTENSEN.

Witnesses:

NELS CHRISTENSEN,
JACOB ANDERSON.