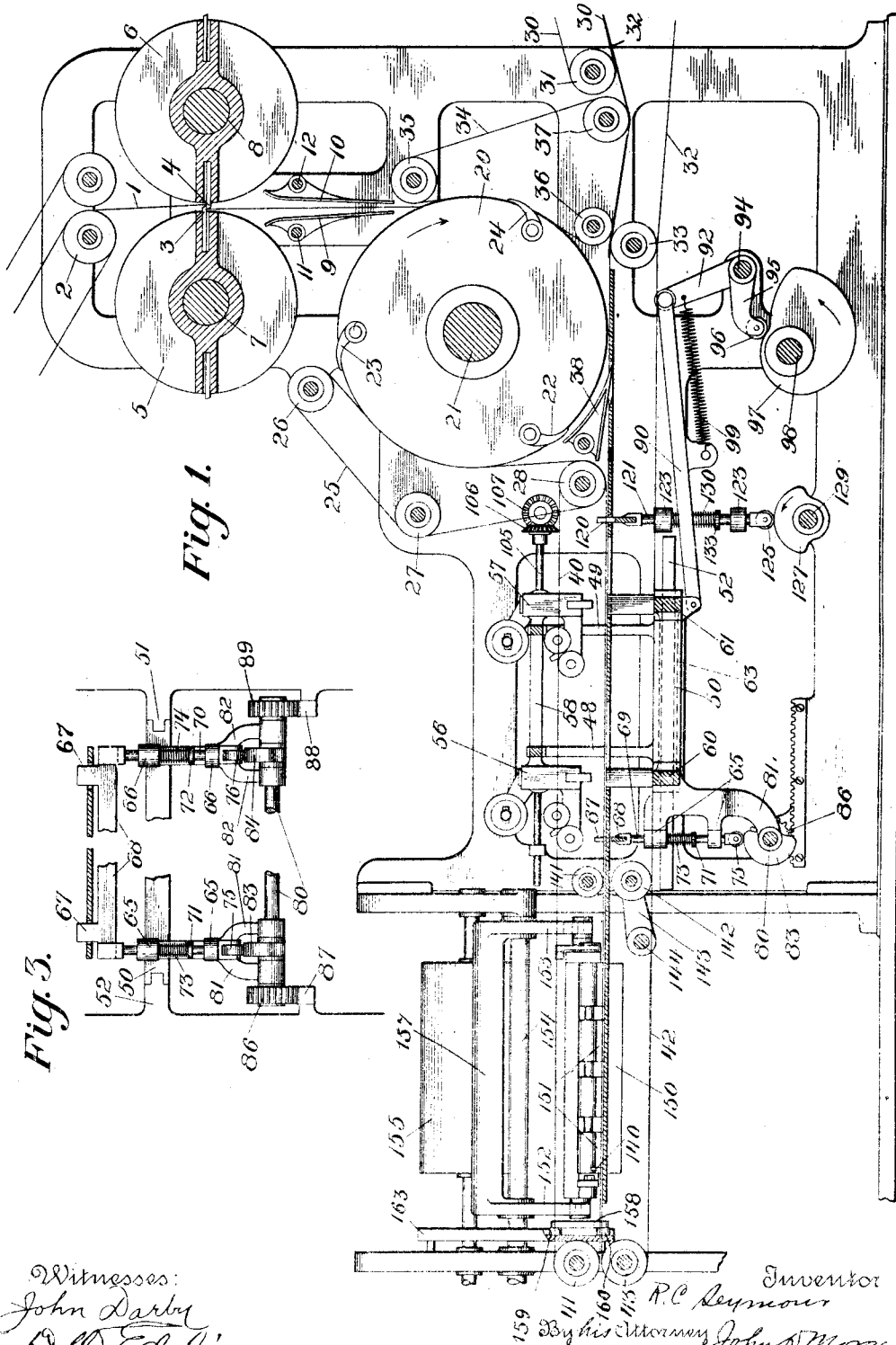


R. C. SEYMOUR.  
BOOK OR PAMPHLET BINDING MACHINE.  
APPLICATION FILED JUNE 15, 1910.

1,048,899.

Patented Dec. 31, 1912.

4 SHEETS—SHEET 1.



Witnesses:  
John Darby  
O.W. Edelin

Inventor  
R.C. Seymour  
By his Attorney John N. Morgan

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4 SHEETS-SHEET 2.

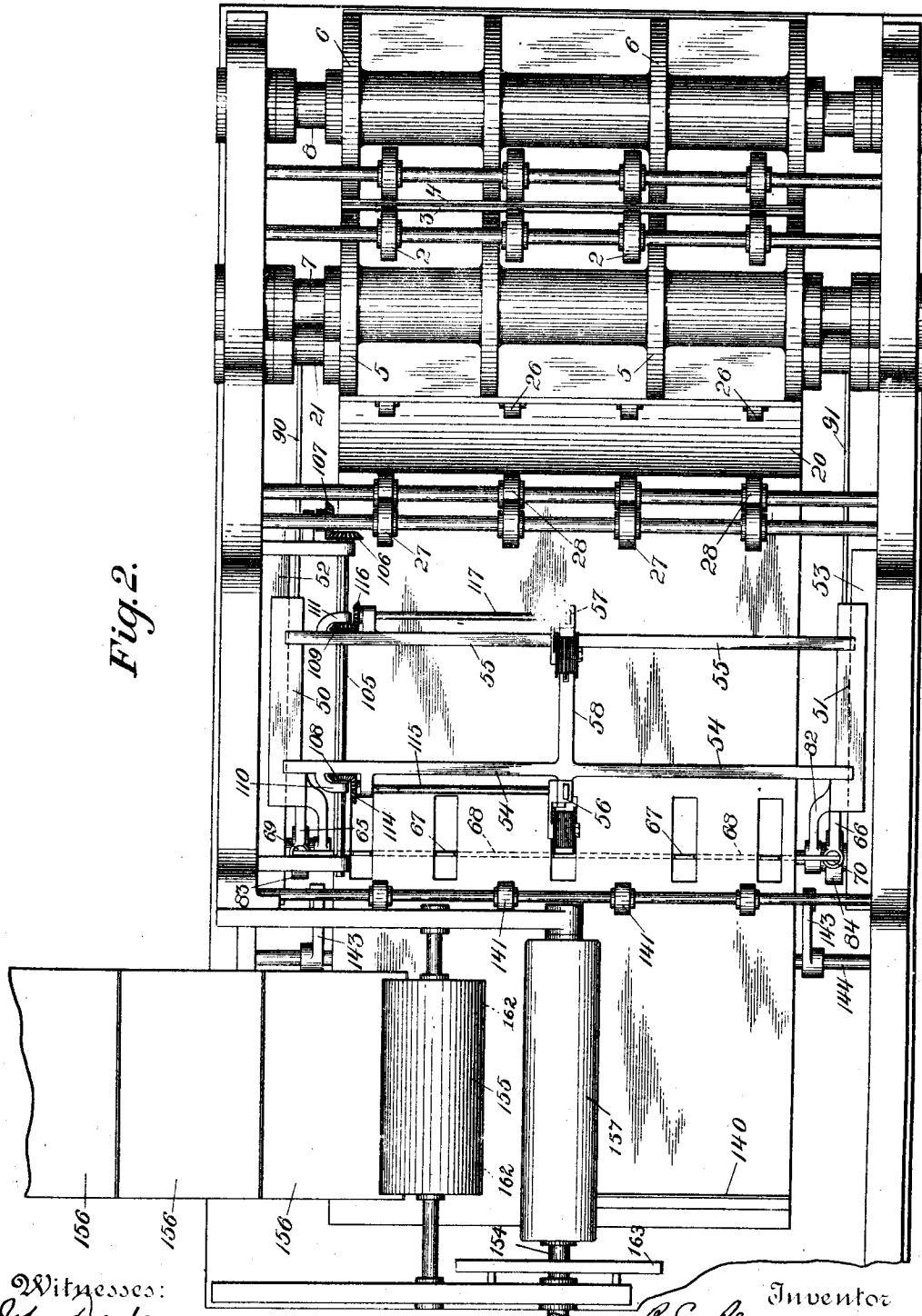


Fig. 2.

Witnesses:  
John Darby  
O. W. Edlin

Inventor  
R. C. Seymour  
By his Attorney John D. Morgan

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4 SHEETS—SHEET 3.

Fig. 5.

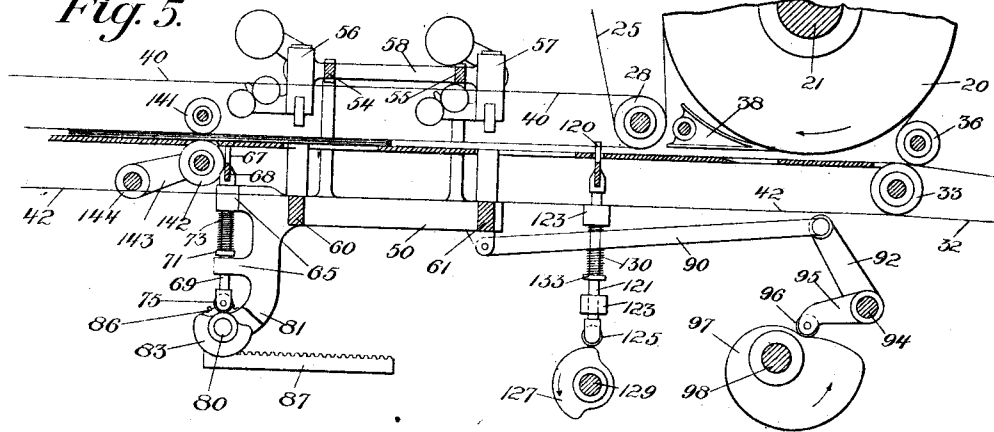


Fig. 4.

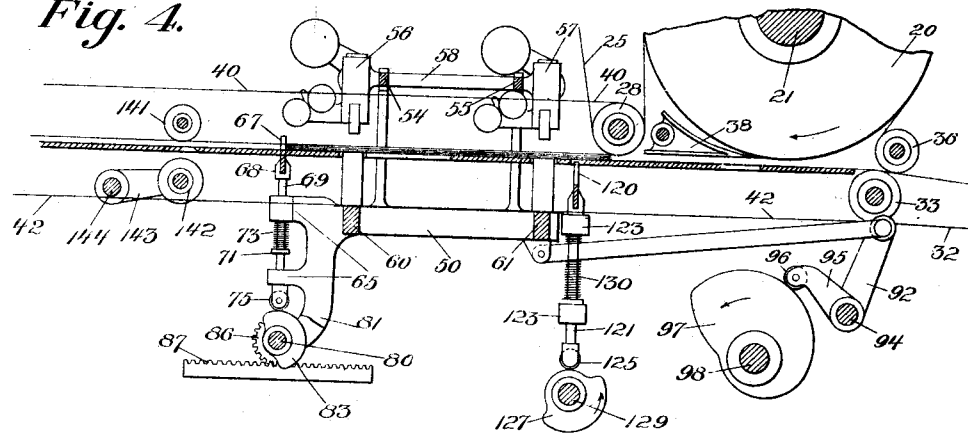
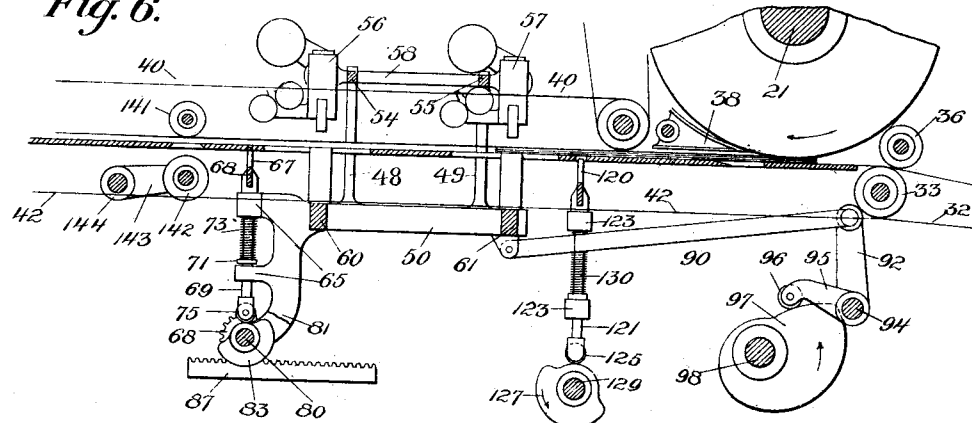


Fig. 6.



Witnesses:  
John Darby  
O. W. Edlin

Ralph C. Seymour Inventor  
By his Attorney John D. Morgan

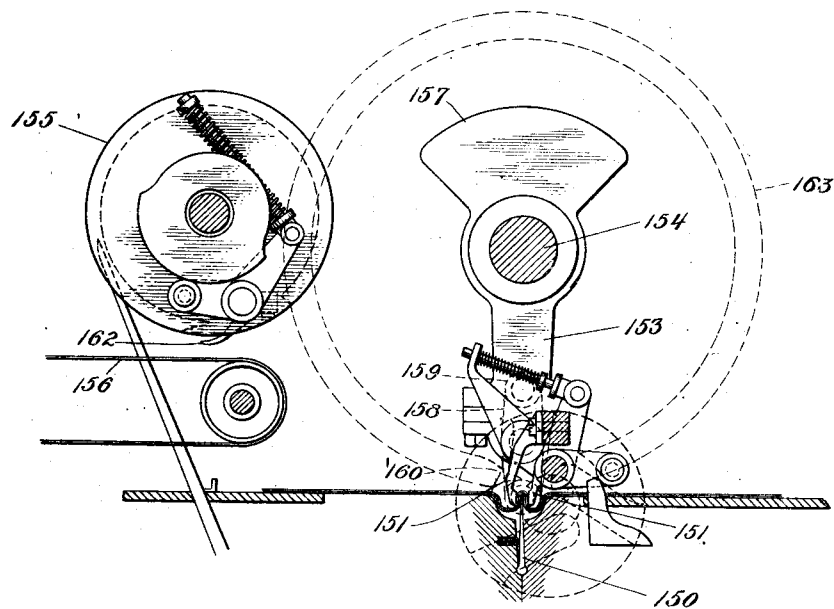
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4 SHEETS—SHEET 4.

*Fig. 7.*



Witnesses:  
*John Darby*  
*Ross Menck*

*R. C. Seymour* Inventor  
By *John D. Morgan* His Attorney

# UNITED STATES PATENT OFFICE.

RALPH C. SEYMOUR, OF LARCHMONT, NEW YORK, ASSIGNOR TO GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## BOOK OR PAMPHLET BINDING MACHINE.

1,048,899.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed June 15, 1910. Serial No. 567,102.

### *To all whom it may concern:*

Be it known that I, RALPH C. SEYMOUR, a citizen of the United States, and a resident of Larchmont, in the county of Westchester and State of New York, have invented new and useful Improvements in Book or Pamphlet Binding Machines, of which the following is a specification.

The invention relates to machines for making magazines and pamphlets, and more especially to machines for stitching and folding such magazines and pamphlets, although in certain features of the invention may be useful in other regards.

15 Objects of the invention are to provide novel mechanisms to receive associated sheets and to register them with respect to each other with great rapidity and accuracy, and also to do this while they are traveling through the machine; to accomplish these objects with sheets fed or associated from a plurality of sources of supply; to effect these objects with sheets traveling along a straight path, or a substantially straight path, as distinguished from sheets carried around on the surface of cylinders; to provide for the accurate registration of associated sheets while traveling through the machine and to bring them at the same time into stationary

20 and registered relation with the stitching devices; to provide for a high speed in such mechanisms in connection with accurate work, through imparting a movement to the stitching mechanism; to slow down the sheets as they travel along a pathway to register them, to move the stitchers at the same reduced speed, and to stitch them while so registered; to impart a quick return movement to the stitchers in order to speed up the machine. These and other objects of the invention will in part be obvious, and will in part more fully appear herein.

The invention consists in the novel parts, devices, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and forming a part hereof, illustrate one embodiment of the invention, the same serving in connection with the description

herein to explain the principles of the invention.

Of the drawings:—Figure 1 is a side elevation of a machine constructed in accordance with the principles of the invention; 55 Fig. 2 is a top plan view corresponding to Fig. 1; Fig. 3 is a fragmentary elevation of the actuating means for the registering stops; Fig. 4 is a view, partly diagrammatic, showing the sheets striking the registering stop just prior to stitching; Fig. 5 shows the sheets being released just after stitching; Fig. 6 shows the carriage carrying the stitcher and the registering device during the quick return movement; and Fig. 7 is 65 a central section through the folder looking to the right as shown in Fig. 1.

Referring to the accompanying drawings, illustrating by way of example one embodiment of the invention, a suitable source of 70 sheet supply is provided. There is shown herein a web of paper 1, running in from a printing press or other suitable machine, over a roller 2. Said web runs between rotary cutters 3 and 4 carried upon a series of 75 disks 5 and 6 fixed to the shafts 7 and 8. The end of the web runs down through a throat formed by a series of fingers 9 and an opposed series of fingers 10 mounted, respectively, upon rods 11 and 12 carried by 80 the machine frame. The sheets cut from the web may be associated if desired, and there is shown herein a three way collecting cylinder 20 rotating on its shaft 21 in the machine frame. Said cylinder is provided 85 with three series of sheet-taking grippers 22, 23 and 24, respectively. When the sheets are fed in one, two, three, four order they will be collected and associated by the cylinder in a well known manner. Tapes 25 90 are shown running over rolls 26 and over rolls 27, and rolls 28, to keep the sheets in position upon the cylinder 20.

An additional source of sheet supply may also be provided, which may be used to feed 95 in additional sheets, or an insert, or a cover. Said sheet feeding means may be of any convenient or approved form, so far as concerns many features of the invention. Said sheets are shown herein as being conveyed between 100

a series of tapes 30, running over rolls 31, and a series of tapes 32 running over rolls 33 in cooperation with the tapes 30 to convey a sheet or sheets therebetween. An additional series of tapes 34 is shown running over a series of rolls 35, and over another series of rolls 36 and another series of rolls 37. This series of tapes acts both on the sheets on the cylinder 20, and the sheets fed in from the other source of supply just described. A suitable stripper 38 may be provided to insure the collected sheets leaving the cylinder 20 at the proper time. The associated sheets are then fed along a pathway by suitable means, such as a series of tapes 40, shown running over certain of the rolls 28 and over a series of rolls 41, and an opposed series of tapes 42, running over the rolls 33 and over the rolls 43.

In accordance with one feature of the invention means are provided for registering the sheets with each other and with the stitching mechanism for stitching while they are traveling toward the folding mechanism. The embodied form of such means comprises a carriage having side frames 50 and 51, said frames being channeled to work on guides 52 and 53 carried on the machine frame. The stitchers are carried upon this frame. Supported on the side frames 50 and 51, by means of the upright supports 48 and 49, and extending across between them are rods 54 and 55. Mounted upon the rod 54 is a stitcher 53, and a similar stitcher 57 is mounted upon the rod 55. A longitudinal frame piece or brace 58 connects the rods 54 and 55 at the place where the stitchers are mounted. Suitable cross rods 60 and 61 also extend across between the frame pieces 50 and 51 below the path of travel of the sheets to carry the anvils and other lower mechanisms of the stitchers. The cross or longitudinal frame member 63 is also shown extending centrally from the cross rod 60 to the cross rod 61.

The registering stop or gage for the sheets, which positions them for stitching is mounted upon and travels with the stitcher carriage. Said mechanism comprises arms 65 and 66 extending from the side frame pieces 50 and 51. A series of fingers 67 extend upwardly from a support 68 lying across the path of the sheets. At each end of the support 68 are two downwardly extending rods 69 and 70 working in apertures in the supporting arms 65 and 66. Carried upon the said rods 69 and 70, respectively, are collars 71 and 72, and springs 73 and 74 are coiled about said rods between the lower surfaces of the arms 65 and 66, respectively, and said collars 71 and 72. The rods 69 and 70 are provided at their lower ends with each a cam roll 75 and 76. A cam shaft 80 is shown carried in a pair of arms 81 and 82, which arms are fixed to the side frames 50

and 51 of the stitcher carriage. The cam shaft 80 has a pair of cams 83 and 84 cooperating, respectively, with the cam rolls upon the rods 69 and 70. Upon the ends of the cam shaft 80 are pinions 86 and 89, and on the frame of the machine near one end of the path of travel of the stitcher carriage are provided stationary racks 87 and 88. When the pinions 86 and 89 engage the racks 87 and 88 in traveling in one direction, (to the left in Fig. 4) the cam shaft 80 will be rotated, and the registering stop fingers 67 will drop down permitting the stitched sheets to be fed forward to the folding devices. When the stitcher carriage travels in the opposite direction the pinion will be rotated in the opposite direction, and the cams will move the registering stops back into and hold them in operative position, ready to receive the next bundle of sheets fed along by the tapes 40 and 42.

Suitable means are provided for reciprocating the stitcher carriage to and fro. In accordance with one feature of the invention, the carriage moves a little more slowly than the speed of the sheets as they are carried along by the tapes 40 and 42. This insures the sheets being driven fairly and squarely up to the registering stops just prior to the operation of the stitchers, and being stitched while so registered, and all this is accomplished with an almost unappreciable slowing down of the movement of the sheets between the collecting devices and the folding mechanism. The action of the tapes 40 and 42 at the same time insures against rebound of the sheets from the stop. In the embodied form of such means pivoted links 90 are shown connecting each of the side frames 50 and 51 of the stitcher carriage with lever arms 92 carried at either side upon a shaft 94, which shaft is journaled in the machine frame. Fixed to the shaft 94 is an arm 95 provided with a cam roll 96, cooperating with a cam 97 upon a cam shaft 98, journaled in the machine frame. Springs 99 are shown acting on the arms 92 to hold the arm 95 to its cam. The cam 97 is shaped to give the requisite movement to the stitcher carriage as just described.

Suitable devices for operating the stitchers as they travel are provided, and in the embodied form thereof, a shaft 105 is arranged longitudinally above the path of travel of the sheets, said shaft being driven by miter gears 106 and 107, driven from a suitable source of power. Beveled gears 108 and 109 are splined on the shaft 105, and are held respectively by yokes 110 and 111 carried by the cross rods 54 and 55 of the stitcher carriage. Meshing with the gear 108 is shown a beveled gear 114 carried by a shaft 115 which operates the stitcher 56. A similar gear 116 and shaft 117 con-

nects the gear 109 to the stitcher 57. The anvils for the stitchers may be operated by a similar gear mechanism, or by suitable cams.

5 If desired a gate or stop may be provided between the sources of sheet supply and the stitcher mechanism to insure the admission of the sheets at the proper moment to the stitcher mechanism. A form of such means  
10 is shown herein as comprising a series of fingers 120 connected together and mounted to slide vertically in the machine frame. Said fingers are arranged across the path of travel of the sheets and are located just  
15 forward of the end of the path of travel of the stitcher carriage. Connected to the fingers 120, at either side are downwardly extending rods 121, working in apertured lugs 123 on the machine frame, and each  
20 rod 121 is provided with a cam roll 125. These cam rolls cooperate respectively with cams 127 upon the cam shaft 129 journaled in the machine frame. A coiled spring 130 is shown acting between the lug 123 and a  
25 collar 133 on each rod 121 to hold it to its cam.

A suitable stop 140 is shown for bringing the sheets to rest in position for folding. Suitable devices are also provided for insur-  
30 ing the quick feeding forward or speeding up to the folding position of the stitched sheets from the stitchers, as soon as they are released by the stop 67. Thus the arrival and registry of the stitched sheets in fold-  
35 ing position is insured and the product or output of the machine increased. The embodied form thereof comprises a series of driven rolls 141 located above the path of travel of the sheet bundle and closely con-  
40 tiguous to the end of the travel of the stitcher carriage toward the folding mechanism. Cooperating therewith is a series of movable rollers 142 carried by arms 143, fixed to a shaft 144. The shaft 144 is actu-  
45 ated by a suitable mechanism to drop and to raise the rollers 142 at the proper times, such mechanism not being shown herein, being old and well known. The movable roller could, if desired, be located above and  
50 of the sheets and the stationary roller below the path of travel of the sheets.

The particular form of folding mechanism shown herein is claimed and described in my co-pending application Serial No. 55 569948. It consists generally of a folding blade 150, arranged longitudinally of the path of travel of the sheets, and just beneath their position as they are brought to rest by the stop 140.

60 The shaft 154 is journaled in the machine frame. Fixed to said shaft are arms 152 and 153. A pair of folding jaws 151 are carried by said arms and rotate therewith about said shaft 154. A counterbalance  
65 157 is carried on the opposite side of shaft

154 from said arms and folding jaws. Said folding jaws 151 have connected thereto at one end the double armed lever 158, having cam rolls 159 and 160 running in a cam groove 163 (broken away in part in Fig. 1 to show cam rolls), carried on the machine  
70 frame. By this construction, the jaws are caused to rotate relatively to said arms 152 and 153, and to fold the sheets over the blade 150 and carry away the folded sheets.  
75 The folding jaws are pointed tangentially as they pass the delivery cylinder 155 and grippers 162, which may be of usual form, upon said cylinder take the folded sheets by their folded edge from the folding jaws,  
80 and in turn drop said sheets upon the intermittently moving delivery device 156.

The manner of operation of the herein described mechanism is substantially as follows: One or more webs may be fed in between  
85 the rollers 2, and are taken by the grippers on the collecting cylinder 20 and associated. The cutters 3 and 4 cut off the sheets as they are taken by the grippers. Another sheet or sheets may be fed in between the tapes  
90 31 and 32, the sheets from this source and from off the cylinder 20 being forwarded together, the stripper 38 being actuated to strip the sheets off from the cylinder 20 at the proper time. If the stop 120 be used,  
95 the sheets may be allowed to run up against this stop, and be released at the proper time to move forward to the stitchers. The sheets are impelled forward along their path of travel by the tapes 40 and 42, and  
100 they are supplied so as to be fed forward and to be almost in contact with the stop 67 just as the gripper carriage is beginning its movement toward the left in Fig. 6. At  
105 this time the registering stop 67 is up in position, and owing to the slightly faster rate of travel of the bundle of sheets, it contacts with the registering stops 67, as shown in Fig. 4. While the speed of the  
110 sheets has been diminished but little, they are at rest relatively to the stitchers, which are now operated to stitch the sheets together when they are thus accurately reg-  
115 istered with reference to each other and accurately positioned with reference to the stitchers. Just about this time the stitcher carriage has reached the end of its travel toward the left and the registering stops 67 have dropped down, the sheets being free to move forward under the drive of the  
120 tapes 40 and 42. To insure a quick and clean folding of the bundle of sheets, however, the rollers 141 and 142 engage them at this time and give them a positive forward drive at the proper speed. These rollers  
125 are arranged to engage the sheets close to the stop 67 and just as they are released from the stitcher carriage. The sheets are then carried forward against the stop 140, which is adjustable for the particular size 130

of book or pamphlet being operated on, and are folded and carried away by the folding jaws 151, the edges of the book now slipping out laterally from beneath the tapes 40 and 42. The stop in conjunction with these tapes has positioned the book accurately so that the folding jaws will fold it along the line of the stitchers. The folded book or pamphlet is then delivered to the delivery cylinder 155 and deposited upon the carrier 156. In the meantime the stop 120 has been restored to control the next supply of sheets, and the stop 67 has again been raised to registering position, the stitcher carriage traveling backwardly toward the right, as shown in Fig. 6, its movement being again reversed toward the left just before the bundle of sheets has reached the registering stops 67.

The invention, in its broader aspects, is not limited to the particular constructions shown, nor to any particular constructions by which it has been or may be carried into effect, as many changes may be made in the construction without departing from the main principles of the invention and without sacrificing its chief advantages.

What I do claim as my invention and desire to secure by Letters Patent, is:—

1. A folding and binding machine including in combination a source of sheet supply, a folding mechanism, means for progressing a bundle of sheets from said source to said folding means and stitching means traveling along said path in a definite relation to each bundle of sheets to stitch the sheets together.
2. A folding and binding machine including in combination a source of sheet supply, a folding mechanism, means for progressing a bundle of sheets from said source to said folding means, and stitching means reciprocating along said path in a definite relation to each bundle of sheets to stitch the sheets together.
3. A binding machine including in combination a series of tapes for progressing sheets along a path, a stitcher mechanism traveling along a portion of said path at a slower speed than said tapes, a stop traveling with said stitcher mechanism and movable into and out of said path, and speeding-up rolls to act on the sheets as they leave the stitcher mechanism, and folding means beyond the speeding up rolls.
4. A book or pamphlet making machine including in combination a reciprocating stitching mechanism, means for reciprocating said stitching mechanism at different velocities in the two directions, means for progressing sheets along the path of travel of said stitching mechanism in the direction of the slower travel of, and at greater speed than, said stitching mechanism, and means for retarding the speed of the sheets to that of the stitcher mechanism, and folding

means in the path of travel of the sheets beyond said stitching mechanism for folding said stitched sheets.

5. A sheet handling machine including in combination means for progressing the sheets through the machine, means for retarding the sheets, means for stitching the retarded sheets, means for accelerating the speed of said sheets as they travel between the stitcher and folder when said retarding means cease to act on the sheets, and means located along the path of travel of said sheets beyond said stitching means for folding said sheets.

6. A sheet handling machine including in combination means for progressing the sheets through the machine, means for retarding the sheets, means for operating upon the retarded sheets, and means for accelerating said sheets when said retarding means cease to act upon them and leave them to be acted upon by said progressing means, and means located along the path of travel of said sheets beyond said stitching means for folding said sheets.

7. A binding and folding machine including in combination means for progressing associated sheets to a folder, a stitcher traveling in the same direction as the sheets progressed thereby, but at a slower speed, a registering stop traveling with the stitcher, whereby said progressing means bring the sheets into contact with the stop to register and stop them relatively to the traveling stitcher without stopping the progress of the sheets, and means for folding the progressed and stitched sheets.

8. A binding and folding machine including in combination means for progressing associated sheets to a folder, traveling binding means, both said means traveling in the same direction, said progressing means traveling at a greater speed than said binding means, means for registering the progressing sheets and bringing them to rest relatively to the traveling binding means, and means for folding the progressed and bound sheets.

9. A binding and folding machine including in combination means for progressing sheets along a path to folding means, a carriage traveling along said path, stitching means and sheet registering means on said carriage, means for causing the registering means to register and hold at rest relatively to said stitching means the sheets traveling along said path while being stitched by said stitching means, and means for folding the progressed and stitched sheets.

10. A binding and folding machine including in combination means for progressing sheets along a path to folding means, a carriage reciprocating along said path, stitching means and sheet registering means on said carriage, means for causing the reg-

istering means to register and hold at rest relatively to said stitching means the sheets reciprocating along said path while being stitched by said stitching means, and means for folding the stitched sheets.

11. A binding and folding machine including in combination a traveling carriage and stitchers mounted thereon, sheet progressing means for progressing associated sheets along the path of travel of said carriage to folding means, means for bringing the progressing sheets to rest relatively to said traveling carriage, means for operating the stitchers while the sheets are at rest relatively to said carriage, and means for folding the progressed and stitched sheets.

12. A binding and folding machine including in combination a reciprocating carriage, a plurality of stitchers upon said carriage, means for progressing sheets in the direction of movement of said carriage and past said carriage to folding means, means for positioning the progressing sheets relatively to the stitchers and limiting their speed to that of the stitchers while being stitched, and means for folding the progressed and stitched sheets.

13. A binding and folding machine including in combination a source of sheet supply, folding mechanism, tapes for progressing a bundle of sheets from said source of supply to said folding mechanism, a stitching device traveling along a portion of the path of said tapes, and means for causing the sheets to travel at the same speed as the stitching device while being stitched.

14. A binding and folding machine including in combination a source of sheet supply, folding mechanism, tapes for progressing a bundle of sheets from said source of supply to said folding mechanism, a stitching device traveling along a portion of the path of said tapes at slower speed than the tapes, and means for retarding the sheets to travel at the same speed as the stitching device while being stitched.

15. A binding and folding machine including in combination means for progressing sheets along a path to folding means, a stitcher mechanism traveling along said path, a sheet stop traveling with said stitcher mechanism movable into and out of said path of travel of the sheets, and means for folding the stitched sheets.

16. A binding and folding machine including in combination tapes for conveying sheets along a path to folding means, a stitcher mechanism traveling along a portion of said path, a stop mounted on said stitcher mechanism and movable into and out of the path of the sheets conveyed by the tapes, and means for folding the stitched sheets.

17. A binding and folding machine including in combination tapes for conveying

sheets along a path to folding means, a stitcher mechanism traveling along a portion of said path at a slower speed than said tapes, a stop mounted on said stitcher mechanism and movable into and out of the path of the sheets conveyed by the tapes, and means for folding the stitched sheets.

18. A binding and folding machine including in combination means for progressing sheets along a path to folding means, a stitcher carriage traveling to and fro along a portion of said path, said progressing means having a greater speed than said stitcher carriage, a stop on said stitcher carriage which is projected into the pathway of the progressing sheets near the beginning of the movement of said carriage in the direction of travel of the progressing means and withdrawn near the end of said movement, and means for folding the stitched sheets.

19. A book or pamphlet making machine including in combination a reciprocating stitching mechanism, means for reciprocating said stitching mechanism at different velocities in the two directions, means for progressing sheets to a folding means along the path of travel of said stitching mechanism in the direction of the slower travel of, and at greater speed than, said stitching mechanism, means for retarding the speed of the sheets to that of the stitcher mechanism, and means for folding the stitched sheets.

20. A sheet handling machine including in combination means for progressing the sheets through the machine to folding means, reciprocating means for retarding the sheets, means for operating upon the sheets while so retarded, means located along the path of travel of said sheets beyond said stitching means for accelerating said sheets when said retarding means cease to act upon the sheets, and means for folding the stitched sheets.

21. In a machine for operating upon sheets and in combination means for progressing sheets to folding means, means for operating upon the sheets traveling in the same direction but at a slower speed than the sheets, a stop traveling with said operating means for engaging the sheets whereby they travel at the same speed as said operating means, means for causing said operating means to operate upon the sheets when traveling at said slower speed, and means for folding said sheets progressed and stitched.

22. In a machine for operating upon sheets and in combination means for progressing sheets to folding means, means for operating upon the sheets traveling in the same direction but at a slower speed than the sheets, a stop traveling with said operating means for engaging sheets whereby they travel at the same speed as said op-

erating means, means for causing said operating means to operate upon the sheets when traveling at said slower speed, means for releasing the sheets from said stop, and  
5 means for folding said sheets progressed and stitched.

In testimony whereof, I have signed my

name to this specification, in the presence of two subscribing witnesses.

RALPH C. SEYMOUR.

Witnesses:

JOHN D. MORGAN,  
ROSE MENK.