May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 1

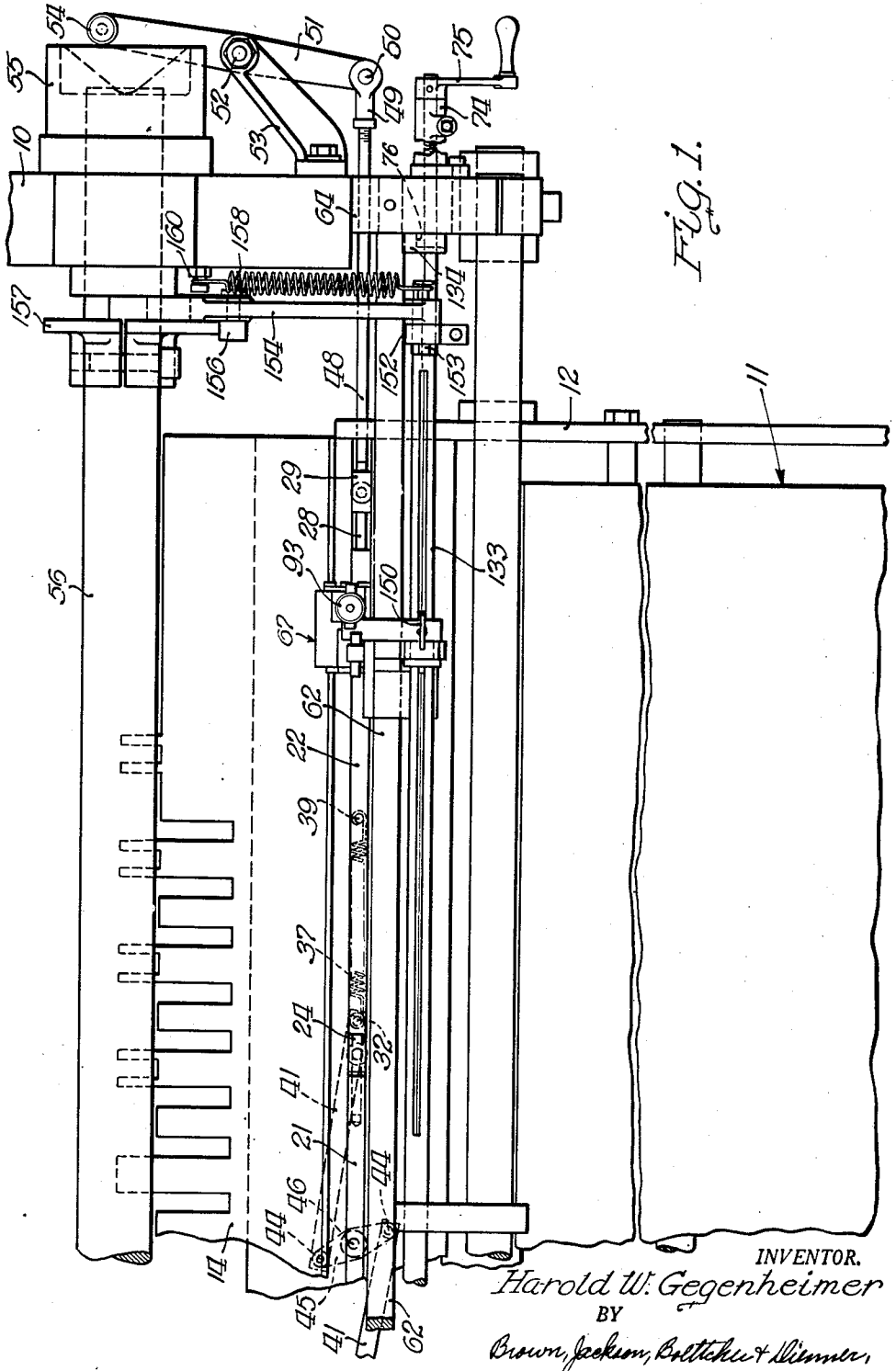


Fig. 1.

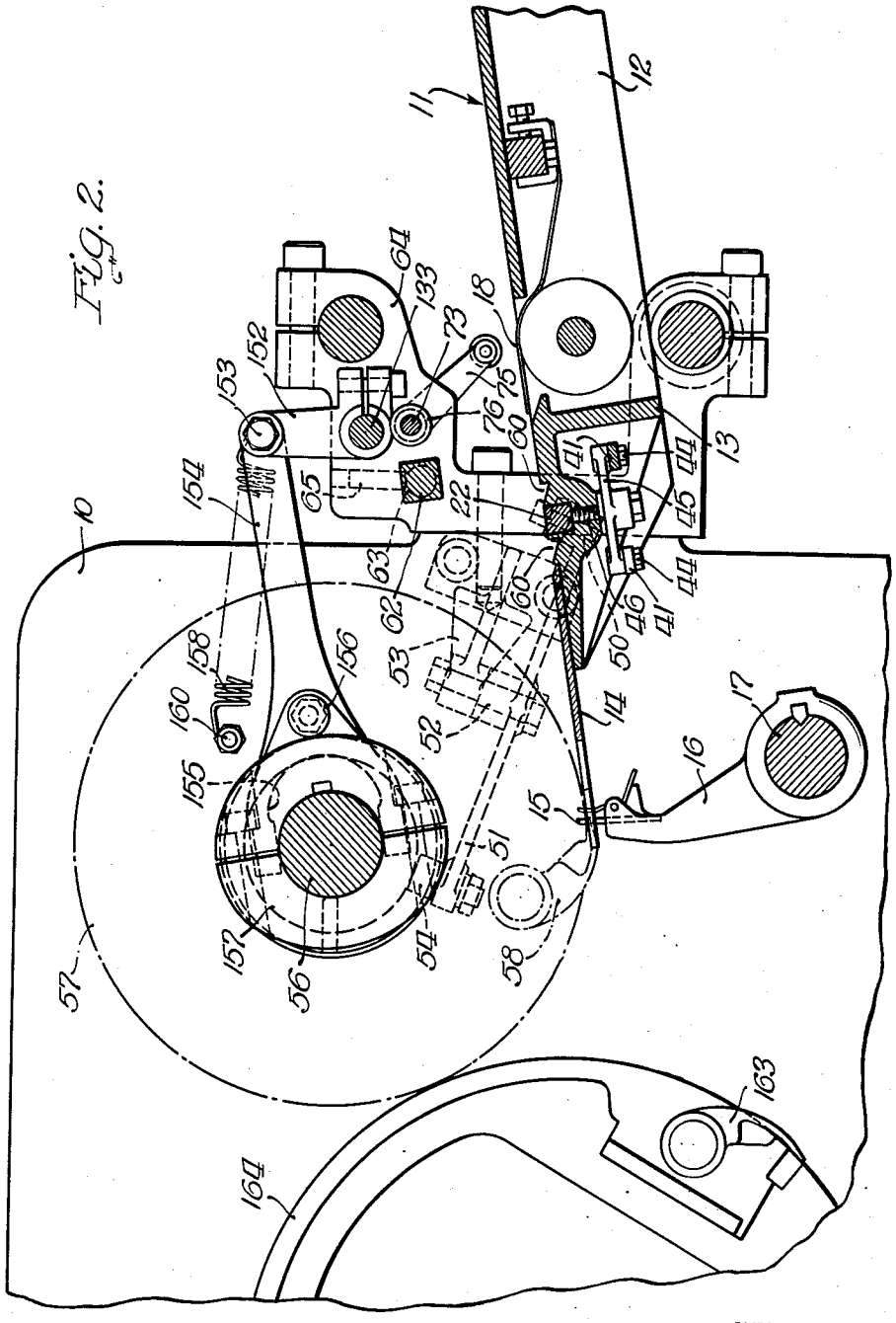
INVENTOR.
Harold W. Gegenheimer
BY
Brown, Jackson, Boettcher & Dienner,
Attys.

May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 2

Fig. 2.



INVENTOR.

Harold W. Gegenheimer

BY

Brown, Jackson, Boettcher & Dienner.

Attys.

May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 3

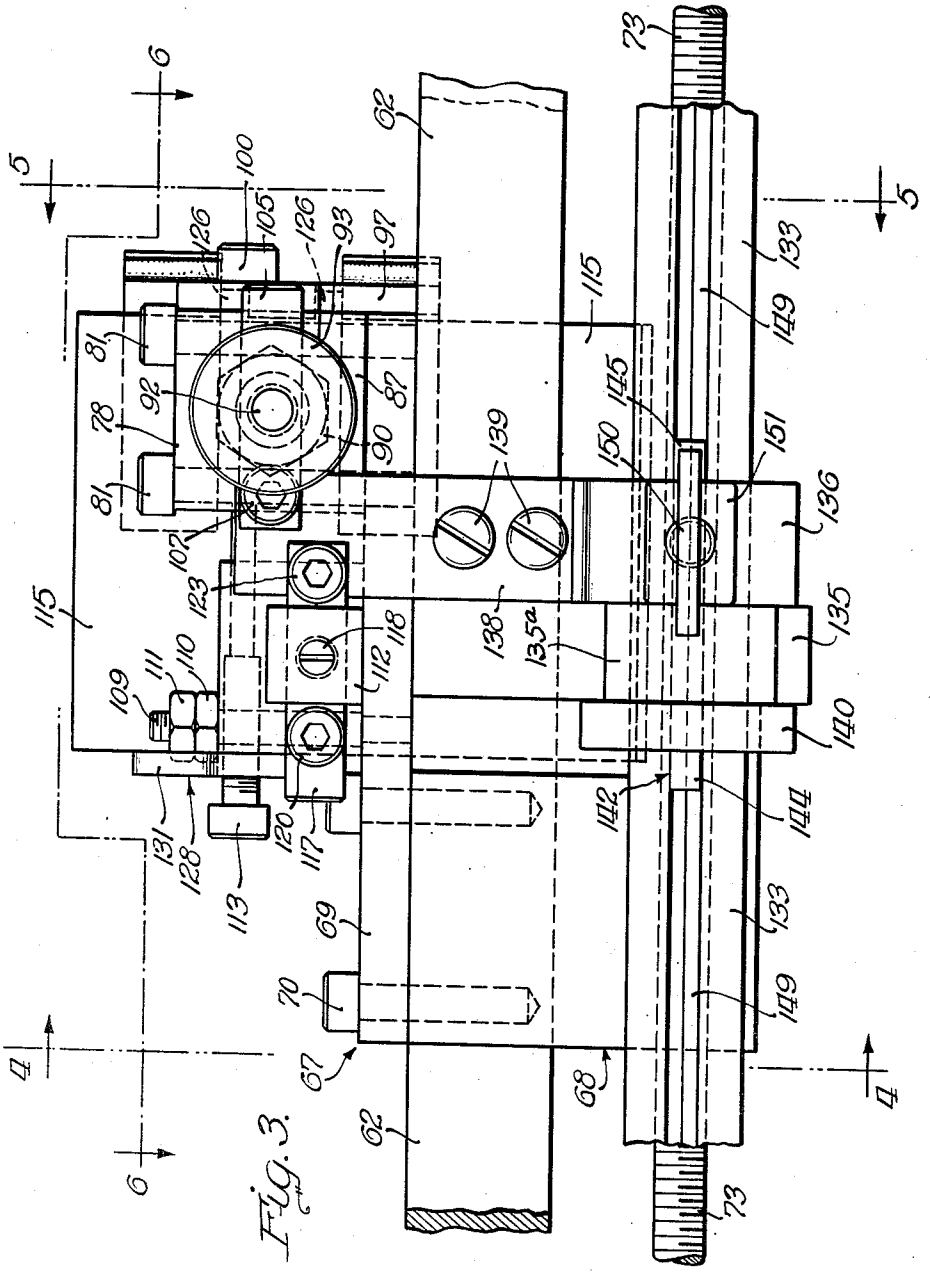


Fig. 3.

Inventor:
Harold W. Gegenheimer

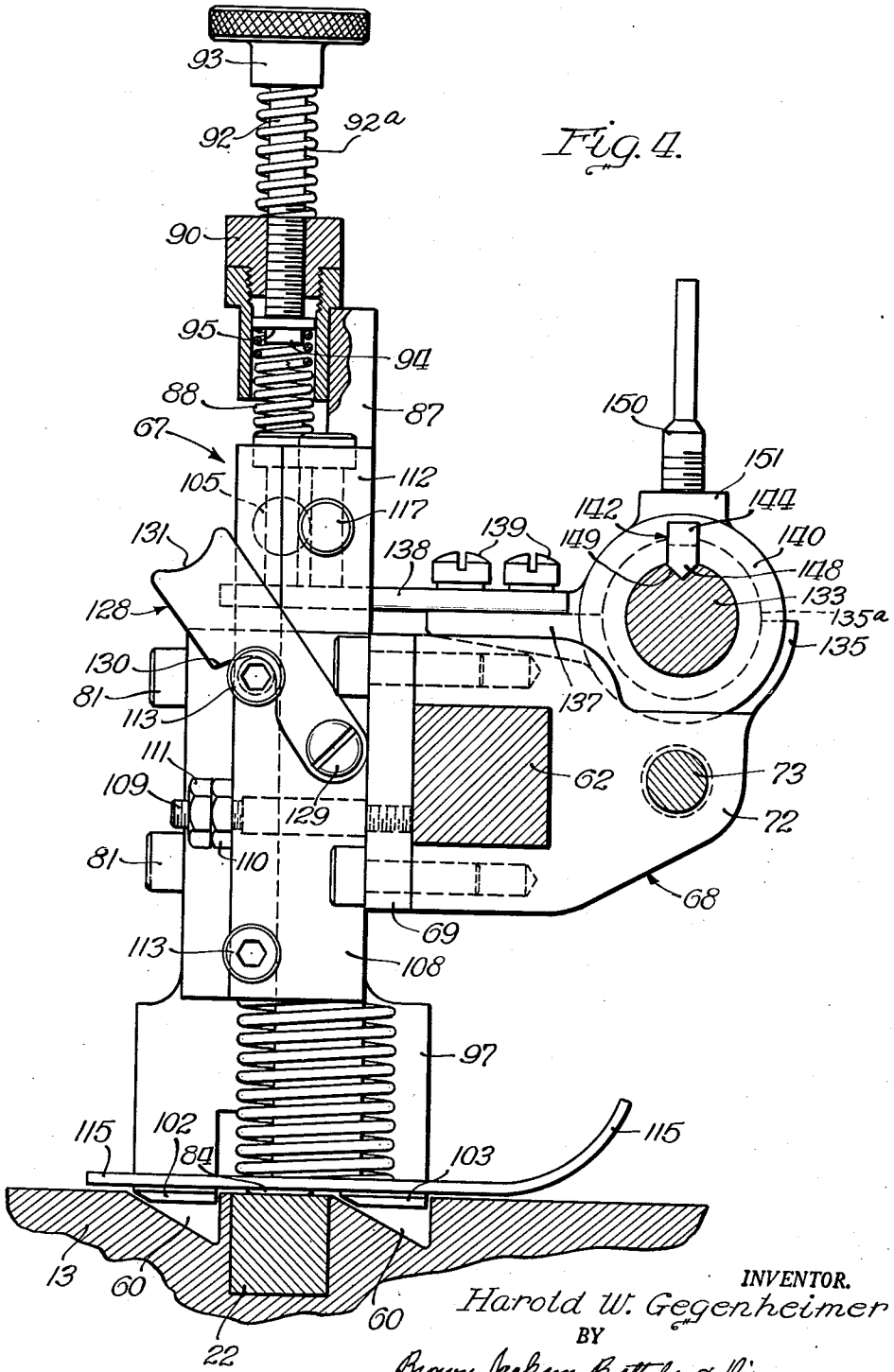
By:
Brown, Jackson, Boettcher & Dienner,
Attys.

May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 4

Fig. 4.



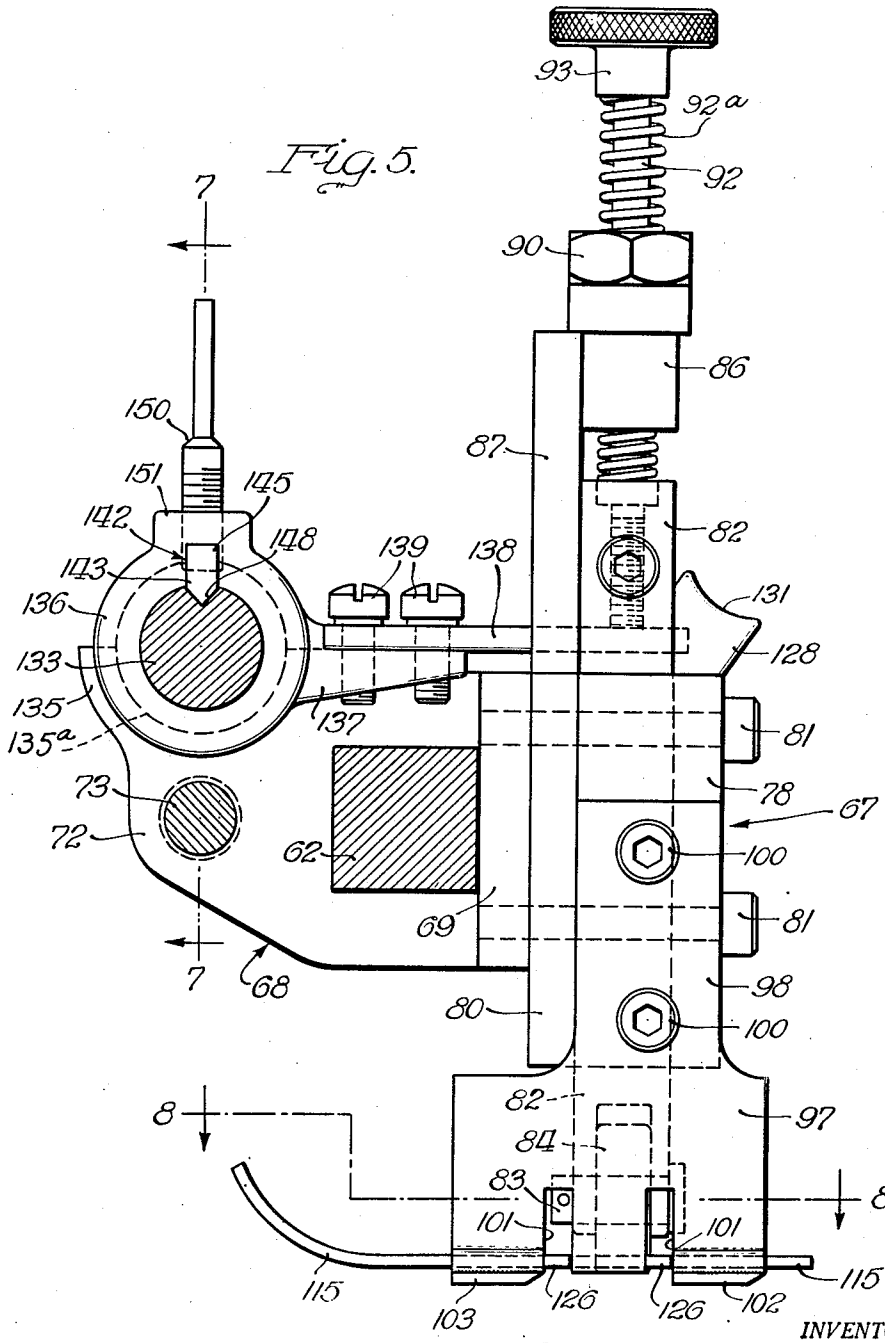
INVENTOR.
Harold W. Gegenheimer
BY
Brown, Jackson, Boettcher & Dimmer,
Attys.

May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 5

Fig. 5.



INVENTOR.
Harold W. Gegenheimer
BY
Brown, Jackson, Boettcher & Dienner,
Attys.

May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 6

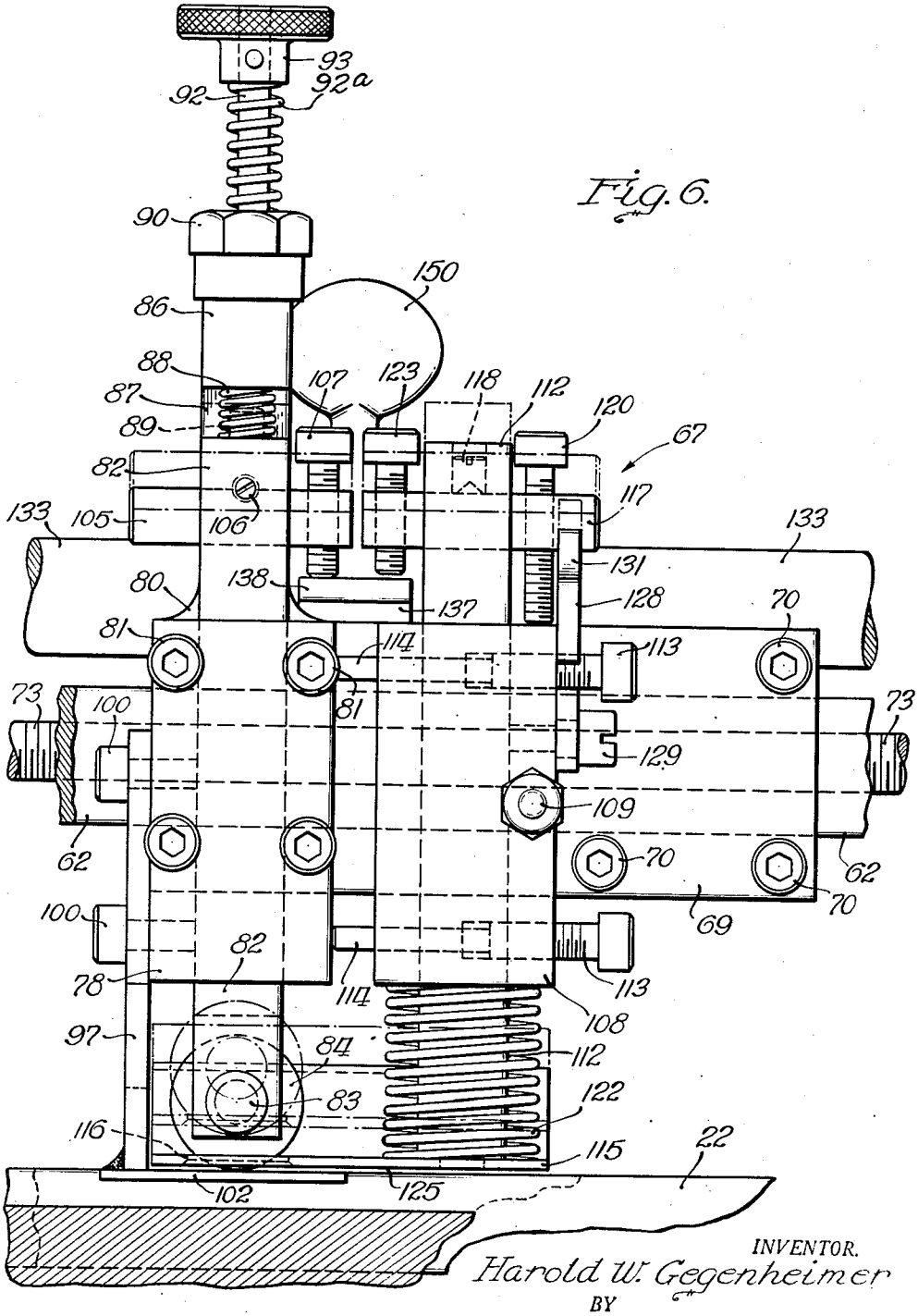


Fig. 6.

INVENTOR.
Harold W. Gegenheimer
BY
Brown, Jackson, Boettcher & Dinner.
Attys.

May 22, 1951 H. W. GEGENHEIMER 2,553,758

PRINTING PRESS SIDE GUIDE

Filed Jan. 19, 1949 7 Sheets-Sheet 7

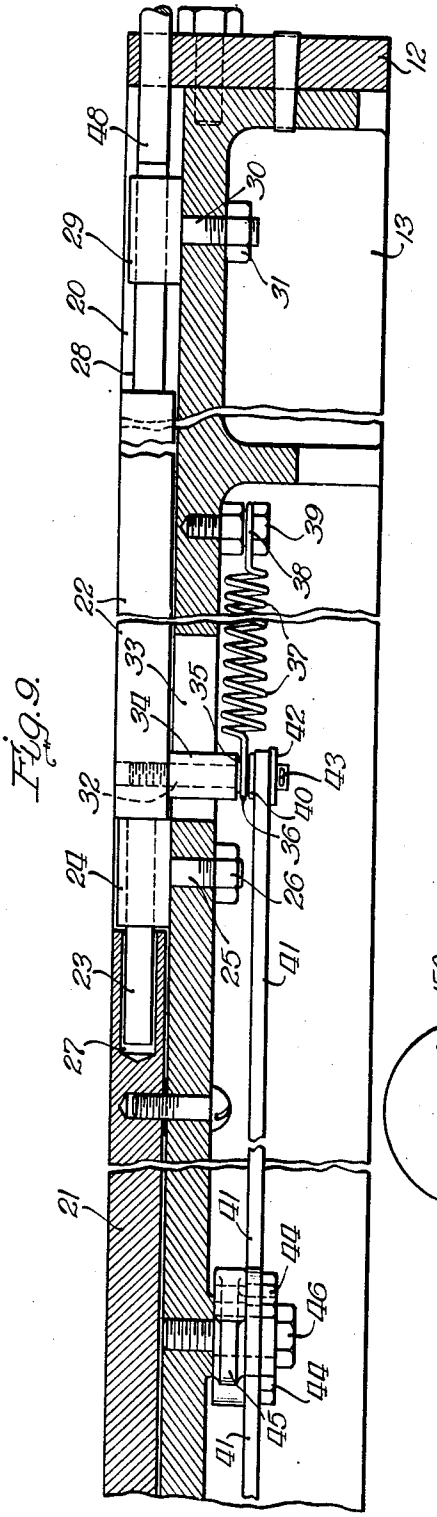


Fig. 9.

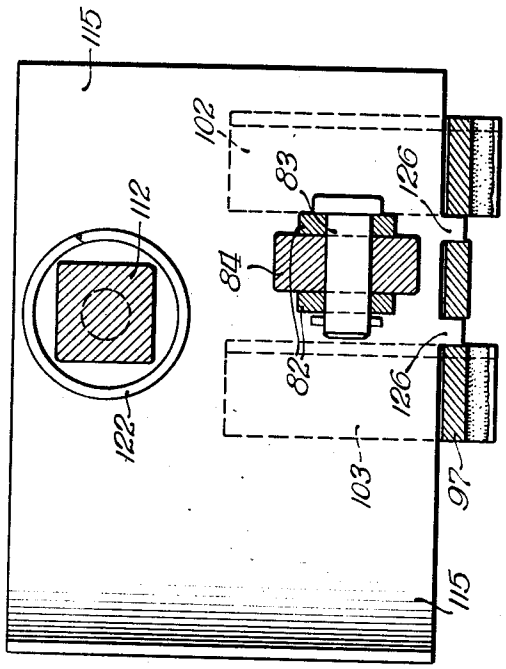


Fig. 8.

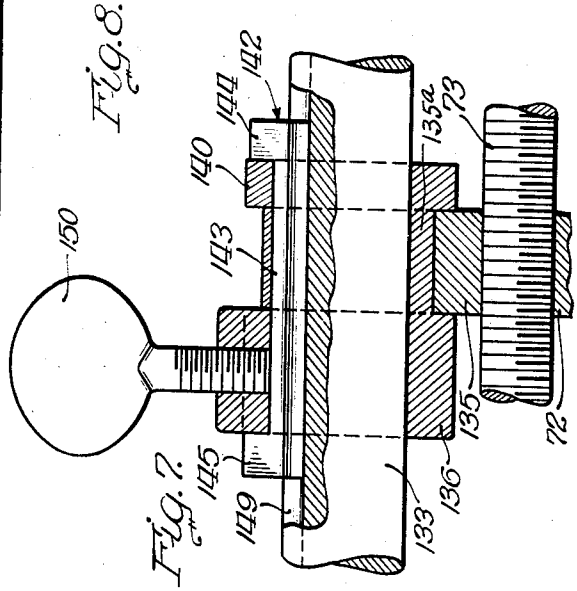


Fig. 7.

INVENTOR.
Harold W. Gegenheimer
BY
Brown, Jackson, Boettcher & Dinner,
Attys.

Patented May 22, 1951

2,553,758

UNITED STATES PATENT OFFICE

2,553,758

PRINTING PRESS SIDE GUIDE

Harold W. Gegenheimer, Mystic, Conn., assignor to Electric Boat Company, Groton, Conn., a corporation of New Jersey

Application January 19, 1949, Serial No. 71,715

14 Claims. (Cl. 271—59)

1

This invention relates to printing presses, and has to do with side guide means for positioning the sheets to be printed upon sidewise or laterally preparatory to their delivery to the cylinders of the press.

My invention is directed to side guide means of a character to assure accurate side register of the sheets. More particularly, I provide side guide means which positively grips the sheets and moves them into contact with a side guide stop member properly positioned to assure precise side register of the sheets. To that end I provide means whereby the sheets are gripped between cooperating gripper members, are moved while so gripped into contact with a side guide stop, and during such movement are guided in a manner effectively to prevent objectionable bulging or buckling of the sheet. More specifically, I provide a pull bar or member over which the sheets successively pass, a gripper member overlying the pull member movable downward toward the latter for positively gripping a sheet between the two and movable upward to sheet releasing position, and means for operating the pull member and the gripper member in timed relation such that the sheet is gripped and while gripped moved into contact with the side guide stop member, and is then released for delivery to the press cylinders. I also provide a sheet guide plate or member overlying the pull member movable downward to a guiding position, in which it cooperates with the pull member to guide the sheet in a manner effectively to prevent objectionable bulging or buckling thereof during its movement into contact with the side guide stop member, the sheet guide member being moved upward to a nonguiding position upon release of the sheet and in properly timed relation to the operation of the pull member and the gripper member. The side guide means of my invention is of comparatively simply and inexpensive construction and operation, is mounted for adjustment transversely of the press with expedition and facility, as conditions may require, and may readily be adjusted with precision to assure precision in side register of the sheets. Further objects and advantages of my invention will appear from the detail description.

In the drawings:

Figure 1 is a fragmentary plan view of the sheet feed table and associated parts of a printing press provided with side guide means embodying my invention, this view being semi-diagrammatic with certain parts broken away and certain other parts omitted for clearness of illustration;

2

Figure 2 is a fragmentary lengthwise vertical sectional view of the front portion of the press of Figure 1, looking toward the right side of the press as viewed from in back or the direction of travel of the sheets to the cylinders, certain parts being omitted for clearness of illustration, the transfer cylinder being indicated in broken lines and the impression cylinder being shown fragmentarily in end view;

Figure 3 is a plan view, on an enlarged scale, of the side guide assembly of my invention and the mounting and adjusting means therefor, certain parts being broken away and some thereof being shown in section;

Figure 4 is a sectional view taken substantially on line 4—4 of Figure 3 but also showing the pull-bar in section and the sheet support fragmentarily and in section;

Figure 5 is a sectional view taken substantially on line 5—5 of Figure 3;

Figure 6 is a front view, taken substantially on line 6—6 of Figure 3, of the side guide assembly and associated parts of the latter figure, this view also showing the sheet support fragmentarily and in section and the pull bar fragmentarily and in elevation, certain other parts being broken away and shown in section;

Figure 7 is a sectional view taken substantially on line 7—7 of Figure 5, certain parts being shown in elevation with certain thereof broken away and shown in section;

Figure 8 is a sectional view taken substantially on line 8—8 of Figure 5, certain of the parts being shown in plan; and

Figure 9 is a fragmentary lengthwise vertical sectional view of the sheet support and associated parts, certain parts being shown in elevation and certain parts being broken away.

I have illustrated the side guide means of my invention, by way of example, as applied to an offset printing press which is, in general, of known construction and operation and need be described but briefly, except as to those features having to do particularly with my instant invention. The press comprises suitable side frames, one of which is shown and indicated by the reference number 10, between which is supported a feed table 11 having forwardly extending side rails, one of which is shown and indicated by the reference number 12. The side frames 10 are secured to and extend upward from a suitable foundation (not shown) as is known.

A sheet support 13, which may be of suitably formed casting, is suitably mounted on the rails 12, at the forward ends thereof, and extends therebetween transversely of the feed table 11.

A support plate 14 is secured to and extends forwardly from the sheet support 13, this plate 14 being appropriately slotted at its forward end to accommodate front guide stops 15, one of which is shown in Figure 2, carried by arms 16 keyed on a rockably mounted shaft 17 operated in a suitable manner in proper timed relation to the operation of the press. The sheets to be printed upon are delivered from a stack forwardly over the table 11 and pass successively over the sheet support 13 and the plate 14 into contact with the front guide stops 15, which provide for front register of the sheet prior to delivery thereof to the press cylinders. Slow down means 18, of suitable type, is provided adjacent the rear of support 13, for reducing or slowing down the speed of travel of the sheet sufficiently to guard against rebound thereof from the front guide stops 15 when it contacts the latter. After the sheet has been moved into contact with the front guide stops 15, which provide for front register, it is moved into contact with a stop member of side guide means, providing for side register, and my invention is directed to the side guide means and the means for moving the sheet into contact with the stop member of such means.

Referring to Figures 1, 2 and 9, the sheet support 13 is provided with an upwardly opening lengthwise groove 20 of rectangular cross section. A spacer block 21 of appropriate length is secured in groove 20 at the central area thereof. A pull bar 22, of rectangular cross section for the major portion of its length, fits in groove 20 at each side of the block 21. The bar 22 is provided, at its inner end, with a reduced cylindrical stud 23 of substantial length slidable through a guide sleeve 24 mounted in groove 20 adjacent block 21, and secured to member 13 by means of a screw stud 25 depending from sleeve 24, and a nut 26 screwing on stud 25. Stud 23 also extends into a suitable bore 27 in the adjacent end of block 21. The bar 22 is provided at its outer end with a reduced cylindrical stud 28 of substantial length slidable through a guide sleeve 29 mounted in groove 20 and secured to sheet support 13 by stud 30 and nut 31 screwing thereon. It will be clear, from what has been said, that there are two pull bars 22, one at each side of the spacer block 21, and that these pull bars are mounted for reciprocation in the groove 20 of the sheet support 13.

A pin 32 is secured in pull bar 22 and extends therefrom downward through a lengthwise slot 33 in support 13. A spacer sleeve 34 is disposed about pin 32 and extends downward through slot 33, with its lower end resting upon a washer 35 which seats upon a hook element 36 formed at one end of a tension spring 37 and engaging about pin 32. The other or outer end of tension spring 37 is anchored to sheet support 13, by means of a terminal hook element 38 engaging about the grooved head of a screw stud 39 threaded into support 13. The hook element 36 of spring 37 rests upon a lower washer 40 disposed about pin 32, this lower washer 40 seating upon the upper face of a link 41 through which pin 32 passes, the lower face of link 41 seating on a lower washer 42 disposed about pin 32 and restrained against downward movement by a cotter pin secured through pin 32 adjacent the lower end thereof. The inner end of link 41 is pivoted, at 44, to one end of a two armed lever 45 pivoted, at its mid-length, on a shouldered cap screw 46 threaded into sheet support 13 from the under side and at the mid-length thereof. A similar link 41 is pivoted to the other end of lever 45 and has its outer end connected to the other pull bar 22 in the manner just above described, as will be understood.

A push rod 48 is slidably mounted through the side rail 12 of the feeder table 11, at the right hand side thereof as viewed from the back of the press, that is, the direction in which the sheets are delivered over the table 11 to the front guide stops 15. The rod 48 is coaxial with stud 28 and has its inner end in contact with the outer end of that stud. A clevis 49 is adjustably secured on the outer end of rod 48 and is pivoted, at 50, to the rearward end of a lever 51 (Figure 1) pivoted, at about its mid-length, at 52, on a bracket 53 bolted to side frame 10. At its forward end the lever 51 is provided with a roller 54 which contacts a suitably shaped cam 55 secured on the end of a transfer cylinder shaft 56 extending between and rotatably mounted on the side frames of the press. The shaft 56 has secured thereon a transfer cylinder 57 of suitable type provided with sheet grippers 58, operated in proper timed relation to the rotation of the cylinder 57. The transfer cylinder 57 and the sheet grippers 58 thereof are indicated in dot and dash lines in Figure 2 and need not be described here in greater detail. It is sufficient, for present purposes, to note that the shaft 56 is driven at appropriate speed in the operation of the press, and that this shaft carries a transfer cylinder provided with sheet grippers which are operated in proper timed relation to the operation of the press.

It will be understood, from what has been said, that the tension spring 37 urges the pull bar 22 outward so as to maintain the outer end of stud 28 thereof in contact with the inner end of push rod 48. In the rotation of shaft 56, the cam 55 moves the forward end of lever 51 outward, thereby forcing the push rod 48 inward, and the tension spring 37 forces the pull bar 22 and the push rod 48 outward, as permitted by cam 55, appropriately formed to that end. Accordingly, when the press is in operation and the shaft 56 is rotated, the pull bar 22 is reciprocated lengthwise of the sheet support 13 and in proper timed relation to the operation of the press. As is shown more clearly in Figures 2 and 4, the sheet support 13 is provided, adjacent each side of groove 20 thereof, with a substantially V-shaped recess 60 paralleling pull bar 22, for a purpose to be described more fully presently. The upper face of pull bar 22 is flush with the adjacent areas of the upper face of sheet support 13, and the sheet support plate 14 is set downward in the forward portion of sheet support 13 with its upper face flush with the area of support 13 disposed rearward of plate 14; in order that the sheets may readily pass from the table 11 forward over support 13 and plate 14 into contact with the front guide stops 15, as previously described.

A mounting bar 62 is disposed above the sheet support 13 parallel therewith. This bar 62 is of rectangular-substantially square-cross section and is provided at each end with a reduced cylindrical stud, one of which is indicated by the reference number 63. The stud 63 fits into a corresponding bore in a bracket 64 bolted to side frame 10 of the press, it being understood that there is a bracket 64 bolted to each of the press side frames. A set screw 65 is threaded in bracket 64 and engages the stud 63, effective for locking bar 62 against turning movement about its axis. The mounting bar 62 supports a side guide stop assembly 67 (Figures 4, 5 and 6) slidable thereon. The assembly 67 comprises a carriage 68 of approxi-

mately rectangular shape in plan, provided with a lengthwise slot opening through its forward face and conforming to and snugly receiving the mounting bar 62. A rectangular plate 69, of substantial thickness, is suitably secured, conveniently by socket headed screws 70 (Figures 4 and 6), to the front of carriage 68 and extends therefrom a substantial distance along the mounting bar 62. The carriage 68 is thus mounted on bar 62 for sliding movement lengthwise thereof.

Carriage 68 is provided with a rearward extension 72 which is suitably bored and tapped for reception of an adjusting screw shaft 73 threaded therethrough. The shaft 73 is rotatably mounted through bracket 64 (Figures 1 and 2) and extends outward therebeyond through an elongated split sleeve 74 bolted to the outer side of bracket 64, shaft 73 being also journalled in sleeve 74. A crank handle 75 is secured on the outer end of shaft 73 in contact with the outer end of sleeve 74, restraining shaft 73 against inward movement lengthwise. The collar 76 fixed on shaft 73 at the inner side of bracket 64 restrains that shaft against outward movement lengthwise. It will be seen that by rotating shaft 73 in appropriate direction, the carriage 68 may be adjusted in either direction and to desired extent along the mounting bar 62. By contacting the sleeve 74 about shaft 73, that shaft may be locked against rotation assuring that the carriage 68 will remain in the position to which it has been adjusted. It will be understood that there are two side guide stop assemblies 67, one at each side of the press, which are similarly mounted on the mounting bar 62, each of such assemblies being adjusted by means of its associated screw shaft 73.

A block 78 of rectangular cross section and of materially greater height than width, is disposed at the front of the outer portion of plate 69. This block 78 is provided therein with a vertically extending groove of rectangular cross section opening through the outer face of the block and closed by a plate 80 which, with the block 78, is secured to plate 69 by socket headed screws 81 passing through block 78 and plate 80 and threading into plate 69. A plunger 82, of rectangular cross section, is slidable in block 78 for vertical reciprocation. The lower end of plunger 82 is slotted and has rotatably mounted therein, on a headed pin 83, a gripper roller 84. The roller 84 overlies the pull bar 22 and cooperates therewith for gripping therebetween a sheet, as will be explained more fully later, it being noted that roller 84 rotates about an axis extending transversely of pull bar 22.

The upper end of plunger 82 underlies a cylindrical boss or sleeve 86 suitably secured to the upper end portion of a reduced upwardly extending projection or neck 87 of plate 80. The boss 86 is bored for reception of the upper portion of a compression spring 88, the lower end portion of which seats upon the upper end of plunger 82, about a reduced stud 89 extending upward therefrom. A cap nut 90 threads on the upper end of boss 86 and is suitably bored and tapped for reception of an adjusting screw 92 threading therethrough and provided, at its upper end, with a knurled head or knob 93 suitably secured thereon. The lower end portion of screw 92 is reduced in diameter to provide a stud 94 which extends into the upper end of compression spring 88, and a shoulder 95 which seats against the upper end of that spring. It will be clear that by turning the screw 92 in appropriate direction, the spring 88 may be stressed to varying extent

thereby adjusting the pressure exerted by the roller upon a sheet gripped between that roller and the pull bar 22. A compression spring 92a, disposed about screw 92 and confined between cap nut 90 and knob 93, serves to lock the screw 92 against casual rotation.

A guide stop member or plate 97, provided with a reduced upwardly extending neck 98 (Figure 5), is suitably secured, conveniently by means of socket headed screws 100, to the outer side of block 78 and extends downward a substantial distance therebelow. The plate 97 is provided with two spaced vertical slots 101 extending from its lower edge, and has secured thereto, by welding or otherwise, adjacent the front and the back thereof, two fingers 102 and 103, respectively. The lower edge of the side guide stop plate 97 is flush with the upper surface of pull rod 22 and the adjacent areas of sheet support 13 (Figure 4) and the fingers 102 and 103 extend lengthwise of pull bar 22 and are disposed in the recesses 60 at opposite sides thereof, with their upper faces flush with the upper face of bar 22. The fingers 102 and 103, constituting elements of the side guide stop plate 97, thus straddle the pull bar 22 with their upper faces flush with the upper face of that bar so as to present no interference to ready passage of sheets over the bar to the front guide stops 15. A pin 105 extends through plunger 82 a short distance below the upper end thereof and is secured therein by a set screw 106. The pin 105 projects inward beyond plunger 82 and receives a vertically disposed screw 107 threading therethrough, for a purpose which will be explained later.

A second block 108, similar to block 78 and spaced inwardly therefrom along plate 69, is pivoted on the plate 69 by a shouldered stud 109 passing therethrough and screwing into plate 69, this stud receiving on its outer end a securing nut 110 and a jam nut 111. The plate 108 is provided with a rearwardly opening lengthwise groove of rectangular cross section, closed at its rear by plate 69, this groove receiving a plunger 112 of rectangular cross section slidable therein for vertical reciprocation. Two adjusting screws 113 pass through the forward portion of block 108, adjacent the upper and the lower ends thereof, each of these screws being provided with a reduced unthreaded shank 114 which bears against the inner side of block 78. The screws 113 provide means whereby the block 108, and with it the plunger 112, may be adjusted, and secured in adjustment, about the stud 109 for accurately positioning the plunger 112 and parts carried thereby relative to the pull bar 22. A sheet guide plate 115, of generally rectangular shape in plan, is secured to the lower end of plunger 112, in overlying relation to the pull bar 22 and the adjacent areas of the sheet support 13. The rearward portion of plate 115 is curved upward, as shown in Figures 4 to 6, inclusive, to facilitate entry therebeneath of a sheet passing forward to the front guide stops. The plate 115 extends from plunger 112 outward along pull bar 22 in underlying relation to roller 84, with its outer end in close proximity to the side guide stop plate 97. Plate 115 is provided with a rectangular opening 116 therethrough, through which the lower portion of roller 84 extends (Figure 6). A pin 117 is secured through plunger 112, adjacent the upper end thereof, by means of a set screw 118, and projects beyond the opposite sides of plunger 112. A vertically disposed screw 120 is threaded

through the inner portion of pin 117 and contacts the upper end of block 108. This screw 120 provides adjustable means for limiting downward movement of plunger 112 under the influence of a compression spring 122, disposed about the lower portion of plunger 112 and confined between plate 115 and the lower end of block 108. A screw 123, also vertically disposed, is threaded through the outer end portion of pin 117, for a purpose to be described later. When the plunger 112 is in its lowered position shown in Figure 6, plate 115 defines, with pull bar 22 and the adjacent areas of the sheet support 13, a guide slot 125 for the side portion of a sheet, this guide slot extending from the side guide stop plate 97 and serving to prevent objectionable bulging or buckling of a sheet gripped between pull bar 22 and roller 84 and moved outward into contact with the stop plate 97; as will be explained more fully presently. The plate 115 is provided, at its outer side edge, with two tabs 126 (Figures 5 and 8) extending into the vertical slots 101 of the stop plate 97. These tabs 126 are effective to prevent passage of the edge portion of a sheet between the outer edge of plate 115 and the stop plate 97, with resultant tearing or injury to the sheet, such as might otherwise occur under unfavorable conditions. It will be noted that the length of the slot 116 is materially less than the diameter of the roller 84. In practice, but one side guide assembly 67 is used when printing on one side of the sheets, the side guide assembly at the other side of the press being used when printing on the other side of the sheets, in the interest of accurate register, as is understood. It may be desirable to hold the gripper roller 84 and the guide plate 115 of the assembly not in use in a raised inoperative position at a sufficient height to guard against likelihood of interference with sheets passing to the front guide stops. To that end, I provide a holding pawl 128 pivoted at its lower end on a shouldered screw 129 threaded into block 108 at the inner side thereof. This pawl 128 is provided, at its forward edge, with a recess 130 for reception of the upper adjusting screw 113, when pawl 128 is in its normal forward inoperative position. The upper end of pawl 128 is provided with an arcuate recess 131 for reception of the inner end portion of pin 117. By grasping pin 117 the plunger 112 may be raised and may then be held in raised position by swinging the pawl 128 rearward into substantially vertical position with pin 117 seating in recess 131. In moving the plunger 112 upward, plate 115 picks up the roller 84 and moves the latter and the plunger 82 upward, the plate 115 and roller 84 being then both held in raised inoperative position. The parts then occupy the positions indicated by dot and dash lines in Figure 6. Obviously, if desired, the side guide assembly may be moved outward, by its adjusting means, a sufficient distance such as to assure that it will not interfere with the sheets passing forward over the feed table, though in many instances that is not necessary and raising of the plate 115 to its inoperative position, which entails little delay, will suffice.

An operating shaft 133 is disposed above the rearward extension 72 of carriage 68, parallel with mounting bar 62, and is rockably mounted at its end portions in the brackets 64. A stop collar 134 is secured upon shaft 133 adjacent each end thereof and at the inner face of bracket 64, the two stop collars 134 restraining shaft 133 against endwise movement. The rearward extension 72 of carriage 68 is provided with an upwardly opening fork 135 extending about the lower portion of shaft 133 in spaced relation thereto. A collar 136, provided with a forwardly extending arm 137 integral therewith, fits about the operating shaft 133 at the outer side of fork 135. An arm 138 is suitably secured to arm 137, conveniently by means of screws 139, and extends forwardly therefrom in underlying relation to the screws 107 and 123, as shown more clearly in Figures 5 and 6. These screws 107 and 123 are so adjusted that the screw 123 normally is spaced above arm 138 a slightly greater distance than the screw 107, for a purpose which will appear presently. A second collar 140 fits about shaft 133 at the inner side of fork 135. A spacer collar 135a, shown more clearly in Figure 7, is disposed about shaft 133, between collars 136 and 140 and in the fork 135. The collars 135a, 136 and 140 preferably are formed together as a unit, and are slotted for reception of a key 142, extending therethrough. This key 142 is of elongated U-shape in elevation and is disposed with its bight portion 143 extending through the collars 136, 135a and 140 and with its arms 144 and 145 in contact with the collars 140 and 136, respectively. It will be seen that the fork 135 fits snugly between the collars 136 and 140 so that the collar 136 moves with the carriage 68 as a unit in the adjustment of the carriage in either direction by means of the adjusting screw shaft 73.

The bight element 143 of key 142 is formed at its lower portion to provide a downwardly directed V-shaped element 148 which engages into a corresponding keyway 149 in shaft 133 extending lengthwise thereof (Figures 1 and 4 to 7, inclusive). A thumb screw 150 threads through a boss 151 at the upper portion of collar 136 and bears upon the upper face of the bight element 143 of key 142. By turning the screw 150 tightly against key 142, collar 136 is locked to shaft 133 thereby guarding against any slight looseness or play of parts. Locking of the collar 136 to shaft 133 also serves to lock the carriage 68 against movement lengthwise of its mounting bar 62, thereby supplementing the action of the adjusting screw shaft 73 for locking the carriage in adjustment.

Referring to Figures 1 and 2, an arm 152 is secured on the operating shaft 133 a short distance inward from the bracket 64. This arm 152 extends upward from shaft 133 and is pivoted at its upper end, at 153, to the rearward end of the link 154 provided at its forward end with a fork 155 straddling shaft 56. A roller 156 is mounted on link 154 and contacts a split cam 157 secured on shaft 56. The link 154 is urged forward by a tension spring 158 anchored at its rearward end to the pivot 153 and at its forward end to side frame 10 of the press, at 160. As shown in Figure 2, the cam 157 has a high dwell and a low dwell, the former effective for moving the link 154 rearward and the latter permitting forward movement of link 154 under the influence of the tension spring 158. It will be clear, from what has been said, that when the shaft 56 is rotated, in the operation of the press, the operating shaft 133 is oscillated about its axis thereby oscillating the arm 138.

In the operation of the press, the sheets to be printed upon are delivered successively over the feeder table 11 to the front guide stops 15. Immediately after a sheet contacts the front

guide stops 15, the arm 138 is moved downward so as to move the sheet guide plate 115 to its guiding position shown in Figure 6, and move the sheet gripper roller 84 to its operative position, the sheet being then gripped between the roller 84 and the pull bar 22. Immediately thereafter, the pull bar 22 is moved outward by tension spring 37, as permitted by passage of the low area or dwell of cam 55 in contact with roller 54. This outward movement of the pull bar 22 serves to move the sheet, while positively gripped between that bar and the roller 84, outward into contact with the side guide stop plate 97 properly adjusted for that purpose. During such outward movement the side portion of the sheet is within the guide slot 125 and is effectively restrained by the guide plate 115 and bar 22 against bulging or buckling, thereby assuring accuracy of operation. The tabs 126 of the guide plate 115 guard against entry of the edge of the sheet between plate 115 and the stop plate 97 and, in cooperation with the guide means, assure accuracy in positioning of the sheet in contact with the side guide stop. In that manner, I assure accurate side register of the sheet. When the sheet has been moved into contact with the side guide stop plate 97, the high dwell of cam 157 contacts the roller 156, thereby turning the operating shaft 133 in clockwise direction as viewed in Figure 4. That swings the arm 138 upward. In its upward movement arm 138 first contacts screw 107 thereby raising the sheet gripper roller 84 to sheet releasing position, in which the lowermost point of roller 84 is disposed a slight distance above the under face of plate 115. The arm 138 then contacts the screw 123 there-by raising the sheet guide plate 115 to non-guiding position while continuing to raise the roller 84, with the latter remaining in its raised position relative to plate 115. Accordingly, when the roller 84 and the plate 115 are in their fully raised positions, roller 84 does not project below plate 115. That is of importance in that it eliminates possibility of interference by roller 84 with a succeeding sheet entering and passing through the side guide stop assembly 67. Upon release of the sheet it is delivered to the cylinders of the press, as will be explained more fully presently, and a succeeding sheet is advanced over the feeder table and the support 13 and associated parts to the front guide stops 15. The operating shaft 133 is then rocked or turned a short distance in counter-clockwise direction, as viewed in Figure 4, thereby lowering the sheet guide plate 115 to guiding position and lowering the roller 84 into sheet gripping position, in the order stated. The side register operation above described is then repeated.

As previously noted, there are two sheet pull bars 22, one adjacent each side of the press, and these two bars are connected together through the links 41 and the lever 45. It will be clear that each of the bars 22 will partake of the movements of the other thereof. Accordingly, but one push rod 48 and associated parts for imparting inward movement to the pull bars 22 and controlling outward movement thereof is required. Conveniently, the push rod 48 and its associated operating means are positioned at the same side of the press as the means for oscillating the operating shaft 133.

As soon as side register of the sheet has been completed, the front guide stops 15 are swung forward and downward out of the path of travel of the sheet to the cylinders, in a suitable known

manner. At the same time, the grippers 58 of the transfer cylinder 57 grip the forward edge of the sheet and move it forward into position to be delivered to grippers 163 of an impression cylinder 164, about which the sheet is disposed while it receives the impression from the blanket cylinder (not shown).

It will be understood that changes in detail may be resorted to without departing from the field and scope of my invention, and I intend to include all such variations, as fall within the appended claims, in this application in which the preferred form only of my invention has been disclosed.

I claim:

1. In side guide means for printing presses, a sheet support, a pull bar mounted on said support for reciprocation lengthwise thereof, a sheet guide plate overlying said support and said bar movable to an upper non-guiding position and a lower guiding position relative to said bar, said sheet guide plate having a slot therein overlying said bar, a side guide stop plate, a gripper roller extending through said slot and rotatable about an axis extending transversely of said bar, said roller being movable independently of said guide plate to an upper sheet releasing position and a lower sheet gripping position effective with said bar for gripping a sheet therebetween, and means for operating said bar and said sheet guide plate and roller in timed relation effective for gripping and guiding a sheet and moving it into contact with said side guide stop plate and then releasing it.

2. In side guide means for printing presses, a sheet support, a pull bar mounted on said support for reciprocation lengthwise thereof, a sheet guide plate overlying said support and said bar movable to an upper nonguiding position and a lower guiding position relative to said bar, said sheet guide plate having a slot therein overlying said bar, a side guide stop plate, a gripper roller of greater diameter than the length of said slot extending therethrough and rotatable about an axis extending transversely of said bar, said roller being movable independently of said guide plate to an upper sheet releasing position and a lower sheet gripping position effective with said bar for gripping a sheet therebetween, means for operating said bar and said sheet guide plate and roller in timed relation effective for gripping and guiding a sheet and moving it into contact with said side guide stop plate and then releasing it, said sheet guide plate being movable to a second upper position above its said nonguiding position and in its upward movement to said second upper position contacting said roller thereby raising the latter to a position above its said sheet releasing position, and means for optionally holding said sheet guide plate in its said second upper position.

3. In side guide means for printing presses, a sheet support, a pull bar mounted on said support for reciprocation lengthwise thereof, a side guide stop assembly comprising a carriage mounted above said bar for adjustment lengthwise thereof, a plunger mounted on said carriage for vertical reciprocation yieldingly urged downward, a sheet gripper member carried by said plunger overlying said bar cooperating therewith for gripping therebetween a sheet when said plunger is in lowered position, a side guide stop plate carried by said assembly at the outer side thereof, a second plunger mounted on said carriage for vertical reciprocation

yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger extending inward from said side guide stop plate and overlying said support and bar defining therewith a guide slot for the side portion of a sheet, when said second plunger is in lowered position, said plungers being operable independently of each other, means for operating said bar, and means for first raising said first plunger a predetermined distance and thereafter raising both of said plungers and for lowering both of said plungers a predetermined distance and thereafter lowering said first plunger a further distance effective to position said gripper member in cooperating sheet gripping relation to said bar.

4. In side guide means for printing presses, a sheet support, a pull bar mounted on said support for reciprocation lengthwise thereof, a side guide stop assembly comprising a carriage mounted above said bar for adjustment lengthwise thereof, a plunger mounted on said carriage for vertical reciprocation yieldingly urged downward, a sheet gripper member carried by said plunger overlying said bar cooperating therewith for gripping therebetween a sheet when said plunger is in lowered position, a side guide stop plate carried by said assembly at the outer side thereof, a second plunger mounted on said carriage for vertical reciprocation yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger extending inward from said side stop plate and overlying said support and bar defining therewith a guide slot for the side portion of a sheet, when said second plunger is in lowered position, a rockably mounted operating shaft overlying said carriage parallel with said bar, operating members respectively secured to said plungers, an operating arm keyed to said shaft underlying said operating members for raising said plungers in the upward movement of said arm, said operating members being adjustable independently of each other relative to said arm for raising and lowering thereby of said plungers in predetermined sequence and through different distances, and means for operating said bar and oscillating said shaft in timed relation.

5. In side guide means for printing presses, a sheet support, a pull bar mounted on said support for reciprocation lengthwise thereof, a mounting bar above and parallel with said pull bar, a carriage slidable on said mounting bar, a plunger mounted on said carriage for vertical reciprocation yieldingly urged downward, a side guide stop plate mounted on said carriage at the outer side thereof, a second plunger mounted on said carriage inward of said first plunger for vertical reciprocation yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger extending inward from said side guide stop plate and overlying said support and bar defining therewith a guide slot for the side portion of a sheet, when said second plunger is in lowered position, said guide plate having a slot therein overlying said pull bar, a sheet gripper roller extending downward through said slot and mounted on the lower end of said first plunger for rotation about an axis extending transversely of said pull bar, a rockably mounted operating shaft parallel with said mounting bar, cooperating members carried by said shaft and plungers for first raising said first plunger a predetermined distance and thereafter raising both plungers and for lowering both plungers a predetermined distance and thereafter lowering said first plunger a further distance effective for positioning said roller in cooperating sheet gripping relation to said pull bar responsive to oscillatory movement of said shaft, and means for operating said pull bar and said shaft in timed relation.

6. In side guide means for printing presses, a side guide stop member, a pull member movable toward said stop member, a sheet gripper member overlying said pull member movable downward into cooperating relation thereto effective therewith for gripping a sheet therebetween and upward to a sheet releasing position, a sheet guide member overlying said pull member movable downward into cooperating relation thereto defining therewith a guide slot extending inward from said stop member and upward into a nonguiding position, means for operating said pull member, and means for raising said gripper member a predetermined distance independently of said guide member and thereafter raising said guide member and gripper member together and for lowering said gripper member and guide member together a predetermined distance and thereafter lowering said gripper member a further distance effective for positioning it in cooperating sheet gripping relation to said pull member.

7. In side guide means for printing presses, a side guide stop member, a reciprocatory pull bar, a first slidably mounted plunger yieldingly urged downward, a sheet gripper member carried by said plunger at the lower end thereof overlying said bar and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second slidably mounted plunger yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said gripper member extending downward beyond said plate when both of said plungers are lowered, said plungers being operable one independently of the other, means for reciprocating said bar, and means for first raising said first plunger a predetermined distance such that said gripper member clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said gripper member in cooperating sheet gripping relation to said bar.

8. In side guide means for printing presses, a side guide stop member, a reciprocatory pull bar, a first slidably mounted plunger yieldingly urged downward, a sheet gripper roller carried by said plunger at the lower end thereof overlying said bar rotatable about an axis extending transversely thereof and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second slidably mounted plunger yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said plate having an opening accommodating said roller and the latter extend-

ing through said opening downward beyond said plate when both of said plungers are lowered, said plungers being operable one independently of the other, means for reciprocating said bar, and means for first raising said first plunger a predetermined distance such that said roller clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said roller in cooperating sheet gripping relation to said bar.

9. In a side guide means for printing presses, a side guide stop member, a reciprocatory pull bar, a first slidably mounted plunger yieldingly urged downward, a sheet gripper roller carried by said plunger at the lower end thereof overlying said bar rotatable about an axis extending transversely thereof and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second slidably mounted plunger yieldingly urged downward, means adjustably limiting downward movement of said second plunger, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said plate having an opening accommodating said roller and the latter extending through said opening downward beyond said plate when both of said plungers are lowered, said plungers being operable one independently of the other, means for reciprocating said bar, and means for first raising said first plunger a predetermined distance such that said roller clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said roller in cooperating sheet gripping relation to said bar.

10. In side guide means for printing presses, a side guide stop member, a reciprocatory pull bar, a first slidably mounted plunger yieldingly urged downward, a sheet gripper member carried by said plunger at the lower end thereof overlying said bar and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second slidably mounted plunger yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said gripper member extending downward beyond said plate when both of said plungers are lowered, said plungers being operable one independently of the other, means for reciprocating said bar, an oscillatory operating arm, means for oscillating said arm, and adjustable abutment members respectively carried by said plungers and overlying said arm effective in cooperation therewith for first raising said first plunger a predetermined distance such that said roller clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said roller in cooperating sheet gripping relation to said bar.

11. In side guide means for printing presses, a side guide stop member, a reciprocatory pull bar, a first slidably mounted plunger yieldingly urged downward, a sheet gripper member carried by said plunger at the lower end thereof overlying said bar and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second slidably mounted plunger yieldingly urged downward and having limited downward movement, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said gripper member extending downward beyond said plate when both of said plungers are lowered, said plungers being operable one independently of the other, means for reciprocating said bar, an oscillatory operating arm, means for oscillating said arm, pins respectively secured to the upper ends of said plungers projecting from the inner sides thereof with their inner ends adjacent each other, and adjustable abutment members threaded through the inner ends of said pins and overlying said arm effective in cooperation therewith for first raising said first plunger a predetermined distance such that said roller clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said roller in cooperating sheet gripping relation to said bar.

12. In side guide means for printing presses, a side guide stop member, a reciprocatory pull bar, a mounting block structure, a first plunger slidably mounted in said structure and yieldingly urged downward, a sheet gripper member carried by said plunger at the lower end thereof overlying said bar and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second plunger slidably mounted in said structure and yieldingly urged downward, a pin secured to said second plunger projecting beyond one side thereof above said block structure, an abutment member threaded through said pin cooperating with said block structure for adjustably limiting downward movement of said second plunger, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said gripper member extending downward beyond said plate when both of said plungers are lowered, said plungers being operable one independently of the other, means for reciprocating said bar, and means for first raising said first plunger a predetermined distance such that said gripper member clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said gripper member in cooperating sheet gripping relation to said bar.

13. In side guide means for printing presses, a side guide stop member, a reciprocating pull bar, a mounting block structure, a first plunger slidably mounted in said structure and yieldingly urged downward, a sheet gripper roller carried by said plunger at the lower end thereof overly-

ing said bar rotatable about an axis extending transversely thereof and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second plunger slidably mounted in said structure and yieldingly urged downward, pins respectively secured to said plungers projecting beyond the sides thereof above said block structure, an abutment member threaded through the outer end of the pin of said second plunger cooperating with said block structure for limiting downward movement of said second plunger, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said guide plate having a slot therein of less length than the diameter of said roller and the latter extending through said slot below said plate when both of said plungers are lowered, said first plunger being movable upward to a sheet releasing position and to a second position thereabove and said second plunger being movable upward to a non-guiding position and to a second position thereabove, said plate in the movement of said second plunger to its said second raised position picking up said gripper roller and thereby raising it and said first plunger to its said second raised position, means cooperating with the outer end of the pin of said second plunger for optionally holding the latter raised in its said second position and thereby holding said first plunger raised in its said second position, means for reciprocating said bar, an oscillatory operating arm, means for oscillating said arm, and adjustable abutment members threaded through the inner ends of said pins and overlying said arm effective in cooperation therewith for first raising said first plunger a predetermined distance such that said roller clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said roller in cooperating sheet gripping relation to said bar.

14. In side guide means for printing presses, a side guide stop member, a reciprocating pull bar, a mounting block structure, a first plunger slidably mounted in said structure and yieldingly urged downward, a sheet gripper roller carried by said plunger at the lower end thereof overlying said bar rotatable about an axis extending transversely thereof and disposed in cooperating sheet gripping relation thereto when said plunger is lowered, a second plunger slidably mounted in said structure and yieldingly urged downward, a pin secured to said second plunger projecting beyond one side thereof above said block structure, an abutment member threaded through said pin cooperating with said block structure for adjustably limiting downward movement of said second plunger, a sheet guide plate carried by said second plunger at the lower end thereof overlying and spaced above said bar defining therewith a sheet guide slot, when said second plunger is lowered, said guide plate having a slot therein of less length than the diameter of said roller and the latter extending through said slot below said plate when both of said plungers are lowered, said first plunger being movable upward to a sheet releasing position and to a second position thereabove and said second plunger being movable upward to a non-guiding position and to a second position thereabove, said plate in the movement of said second plunger to its said second raised position picking up said gripper roller and thereby raising it and said first plunger to its said second raised position, means cooperating with said pin for optionally holding said second plunger raised in its said second position and thereby holding said first plunger in its said second position, means for reciprocating said bar, and means for first raising said first plunger a predetermined distance such that said roller clears the underface of said plate and thereafter raising both plungers together a further distance and for lowering both plungers to the limit of downward movement of said second plunger and thereafter lowering said first plunger a further distance effective for disposing said roller in cooperating sheet gripping relation to said bar.

HAROLD W. GEGENHEIMER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
936,027	Parker	Oct. 5, 1909
1,404,376	Christophel et al.	Jan. 24, 1922
1,988,791	Harrold	Jan. 22, 1935
2,182,023	Harrold	Dec. 5, 1939