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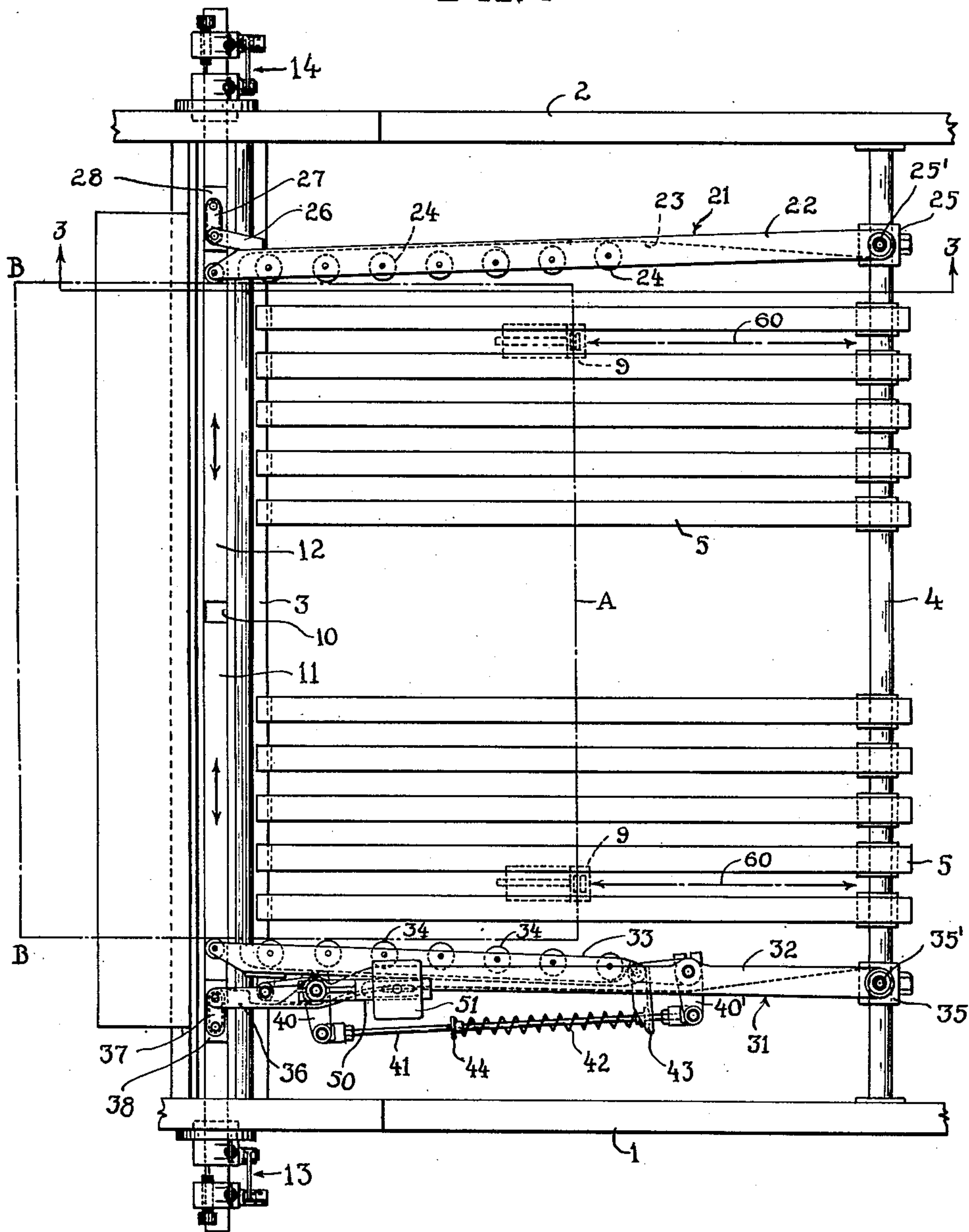
2,528,106

SHEET REGISTERING MECHANISM

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3 Sheets-Sheet 1

FIG. 1



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SHEET REGISTERING MECHANISM

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3 Sheets-Sheet 2

FIG. 2

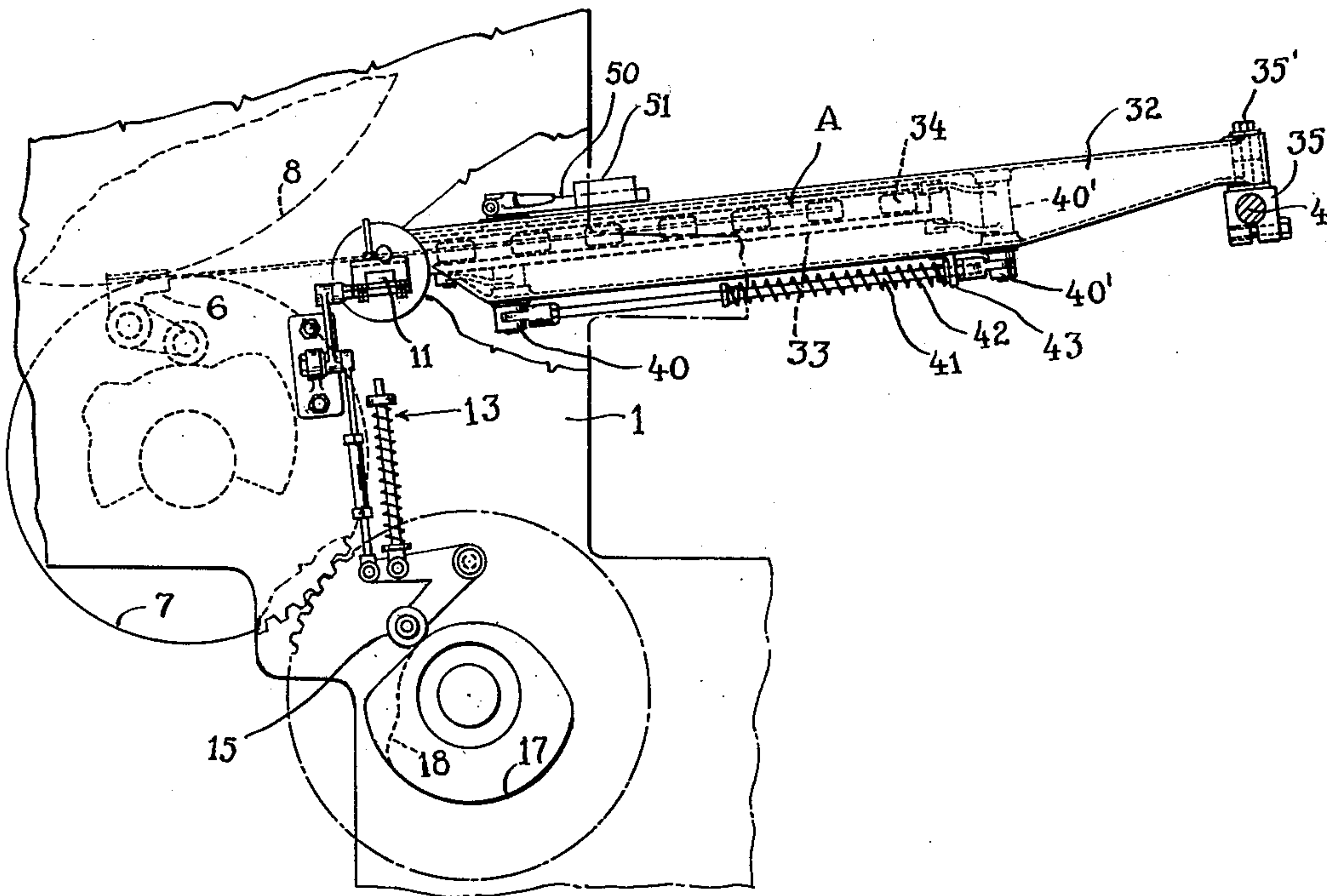
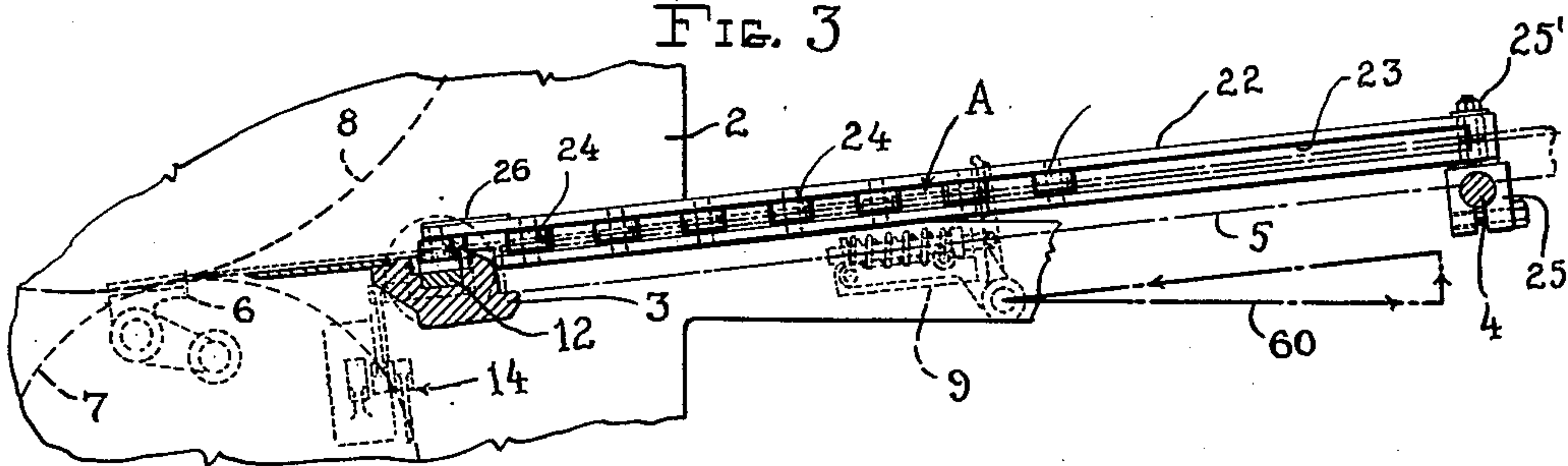


FIG. 3



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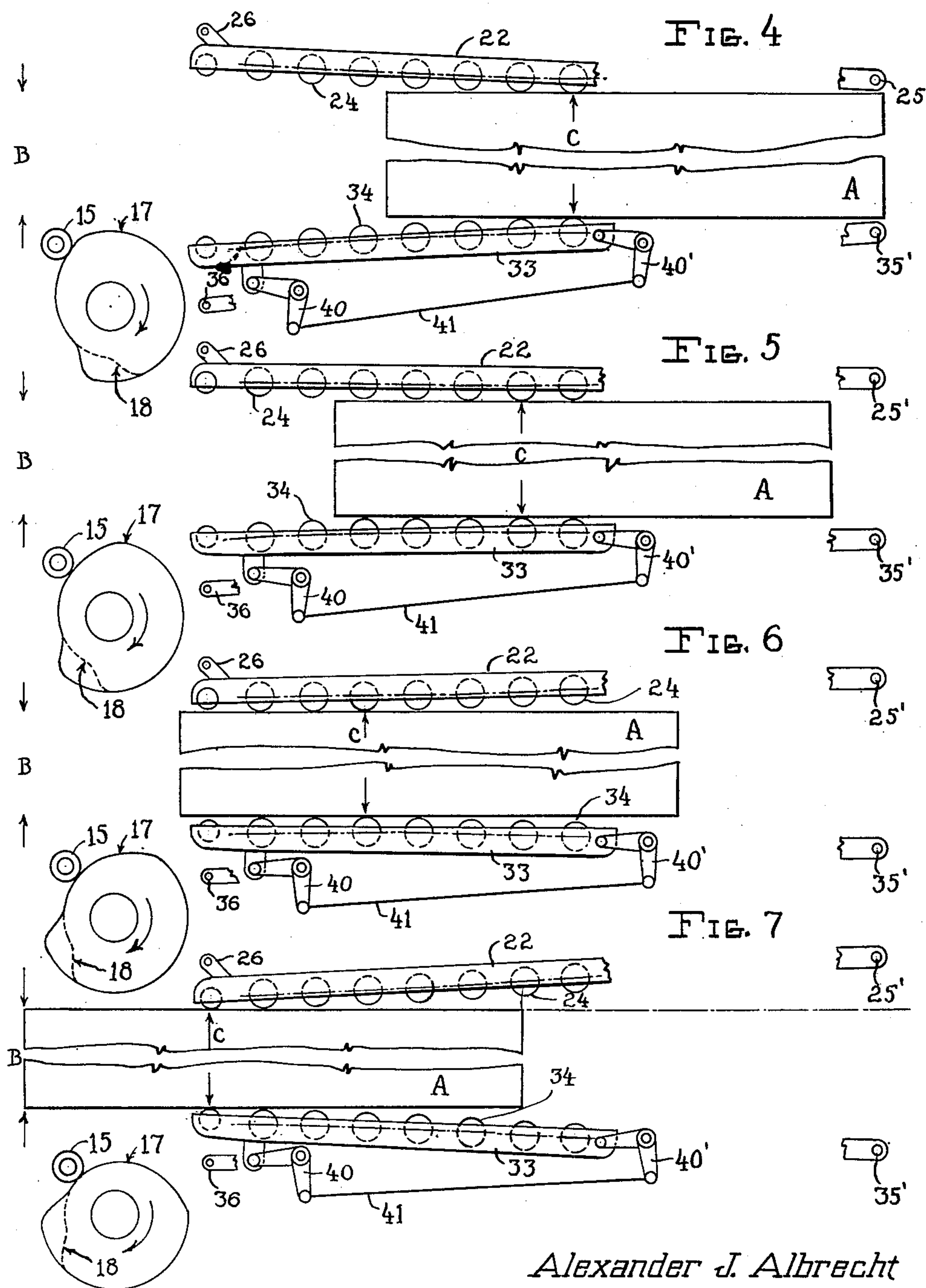
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SHEET REGISTERING MECHANISM

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3 Sheets-Sheet 3



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SHEET REGISTERING MECHANISM

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Application January 9, 1947, Serial No. 721,013

31 Claims. (Cl. 271—49)

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The present invention relates to sheet registering mechanisms. Such mechanisms are employed for presenting sheets of a variety of materials to machines of various types, wherever it is necessary to position the sheet in accurate registry. While usable for other purposes the mechanism of the invention is shown in a form suitable for registering sheets of metal, such as tin plate, for printing. The general object of the invention is to provide an improved side registering mechanism.

Due to slight variations in the size of sheets, nominally the same, and to the fact that the sheets sometimes are not quite square, a rigid guide for one side and a yieldable guide for the opposite side have been employed for guiding the sheet to a point where gripping mechanism takes hold to carry it through a printing unit, the guides then being withdrawn from contact with the sheet to avoid interference with registry of the sheet held by the gripping mechanism. Such a device is illustrated and described in Eckhard Patent No. 1,780,348, and the present invention constitutes an improvement thereon.

The present invention provides means for registering sheets as they are fed to the printing unit, registration being possible from either side edge of the sheet, regardless of irregularities in its size or shape, whereby the printing will be in exact register with reference to the side edge selected as well as the leading edge.

With these and other objects in view, as may appear from the accompanying specification, the invention consists in the method of operation, combinations of parts and features of construction which will be first described in connection with the accompanying drawing, and the method and features forming the invention will then be specifically pointed out in the claims.

In the drawings:

Figure 1 is a plan view of the sheet registering mechanism as applied over the feed table of a printing press;

Figure 2 is a side elevation of a portion of a press showing one element of the side registering mechanism mounted thereon;

Figure 3 is a section on the line 3—3 of Figure 1 showing the second element of the side registering mechanism; and

Figures 4 to 7 are schematic views illustrating the progressive steps of operation of the side registering mechanism.

Referring to the drawings, side frames 1 and 2 of a printing machine carry cross members or bars 3 and 4 for supporting the feed table, as

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well as the side guide mechanism of the invention. The feed table may be of any suitable construction, being shown for purposes of illustration as comprising a number of slats or plates 5 resting at one end on the cross member 3 and removably and adjustably attached at the opposite end to cross bar 4, allowing for adjustment in size of the table according to the width of the sheet to be printed. The printing machine illustrated is of the offset type usually employed for this type of work, but it is to be understood that the invention may be applied to any type of press or machine requiring registry of sheets presented thereto.

The sheets to be printed are delivered by suitable mechanism (not shown) to feed table 5 and are moved therealong toward the printing unit by pushers 9, which engage the rear edge of the sheet. These pushers 9 are shown diagrammatically, their construction and operating mechanism forming no part of the present invention. They may be of any suitable type, for example, such as shown and described in Eckhard Patent No. 1,888,659. A single set or plurality of sets of pushers may be employed, as convenient.

The pushers 9 deliver the sheet to grippers 6 carried by the impression cylinder 7, the latter cooperating with a blanket or printing cylinder 8, as is usual in offset presses of the type employed for such work. The grippers 6 engage the leading or forward edge of the sheet, holding it against the cylinder 7 during the printing operation. Longitudinal registry is obtained by the pushers 9 pressing the forward edge of the sheet against the grippers and associated stops carried by cylinder 7 until the grippers have firmly grasped the sheet, after which the pushers are retracted to a position where they may engage the succeeding sheet.

The cross member 3 carries, within a channel 10 formed therein, a pair of transversely slidable bars 11 and 12, each extending approximately half-way across the printing machine and having its outer end passing through one of the side frames 1 and 2. Cam operated mechanisms 13 and 14 are mounted on the frame members 1 and 2 respectively, mechanism 13 being adjustably attached to the slidable bar 11, while mechanism 14 is similarly attached to bar 12. These mechanisms 13 and 14 are provided for reciprocating the bars 11 and 12 in timed relation to the press operation, and are fully illustrated and described in the above-mentioned Patent No. 1,780,348. Each comprises a pivotally mounted

bellerank having one of its arms connected to the slidable bar 11 or 12, as the case may be, and the other arm connected through a link to a second bellerank carrying a cam roller 15. A cam wheel or member 17 is mounted on the shaft of the drive gear for the impression cylinder 7, on the left-hand side of the press, while a cam member 18 is mounted on the same shaft on the right-hand side of the press. The cam 17 is shown in full lines in Figures 2 and 4 to 7, and the cam 18 has the same configuration except as to the portion thereof shown in dotted lines. The cam rollers 15, forming part of the cam operated mechanisms 13 and 14, engage the surfaces of these cams 17 and 18 and as the latter rotate impart a reciprocatory motion to the bars 11 and 12, as more fully described hereinafter, and in the above-mentioned patent.

The side guide mechanism comprises right- and left-hand units 21 and 31. The right-hand unit comprises a bar 22 having a channel 23 formed therein for substantially its full length, in which are journaled a number of rollers 24. The bar 22 is pivotally attached at 25' to a supporting block 25, which is carried by the cross bar 4 and adjustable therealong. An extension 26 is formed on the opposite end of bar 22 and connects, through a link 27, to a block 28 which is attached, by bolts or other suitable means, to the reciprocable bar 12. Thus reciprocation of bar 12 will swing bar 22 about its pivot point 25' on block 25.

The left-hand guide member 31 comprises a bar 32 pivotally attached at 35' to a supporting block 35 adjustably mounted upon cross bar 4. The opposite end 36 of bar 32 connects, through link 37, to block 38, which is attached by suitable bolts to reciprocating bar 11. A channel bar 33 has rollers 34 journaled within its channel for engaging the left edge of a sheet as it is fed over the feed table toward the printing unit. The bar 33 is yieldably coupled to the bar 32 in a manner now to be described, so as to accommodate the width of the sheet. Bellcranks 40 and 40' are pivotally mounted upon bar 32, channel bar 33 being carried by arms of the bellcranks 40 and 40'. The other arms of the bellcranks 40 and 40' are joined by a connecting rod 41, upon which spring 42 is mounted. Stop plate 43, mounted upon and extending outwardly from bar 32, has an opening therein through which connecting rod 41 passes. Spring 42 engages this plate 43 at one end and a stop washer 44 fixed to rod 41 at its other end, urging the bellcranks 40 and 40' in a clockwise direction and thus urging the bar 33 toward the center of the press and away from bar 32, though maintaining parallelism in its position with respect to bar 32 and permitting yielding of bar 33 to accommodate the width of the sheet. Arm 50 is mounted upon the pivotal axis of bellcrank 40 and is movable therewith. Weight 51, adjustably attached to arm 50, provides a counterweight for counterbalancing the inertia of bar 33.

In operation, sheet A is delivered to feed table 5, where the pushers 9 engage its rear edge to propel it toward the impression cylinder 7. The pushers 9 travel along the path indicated by broken-line arrows 60, being retracted after they have delivered the sheet to grippers 6. As sheet A advances toward the grippers, side guides 21 and 31 are gradually pivoted inwardly, the reciprocable bars 11 and 12 to which their ends 26 and 36 are attached being moved inwardly toward the center of the machine through action

of the cam rollers 15, cams 17 and 18, and their respective mechanisms 13 and 14. The pusher mechanisms and the cam-operated reciprocating mechanisms all being driven by the printing unit drive gearing, the inward pivoting movement of the guide members 21 and 31 is thus synchronized with the movement of the sheet toward the printing unit and with the rotation of the cylinders thereof, the ends of the guide members moving further toward the center of the press as the sheet advances nearer to the printing unit.

The centers of the sets of rollers 24 and 34 are arranged on slightly arcuate lines, so arranged that as units 21 and 31 are pivoted inwardly, the rollers engage the edges of the sheet consecutively, from right to left in the drawings, and always at a point approximately the same distance from the leading edge. Thus, no more than two rollers of a set engage the edge of the sheet at one time. Furthermore, the sets of rollers are arranged in axial symmetry, each roller of a set being opposed by its opposite member in the other set, and both engaging the edges of the sheet at the same instant.

Cams 17 and 18 are substantially alike, having the same slow fall conformation, whereby both arms 21 and 31 are pivoted inward simultaneously in timed relation to the forward movement of the sheet. However cam 17, operating spring-biased member 31, is formed with an earlier and more rapid rise, so that member 31 is retracted or pivoted away from engagement with sheet A a short time before the opposite guide member 21 is retracted. Thus the last roller (to the left in the figures) of member 21 provides the final registry for the sheet. Both guide members are retracted immediately after grippers 6 have engaged the sheet, so that irregularities in the size or shape of the sheet will not affect its register once it has been engaged by the grippers 6, as might result if members 21 and 31 continued to engage the sides of the sheet.

Figures 4 to 7 inclusive illustrate diagrammatically the progress of sheet A toward the gripper engaging point B, and the manner in which rollers 24 and 34 consecutively engage the edges of sheet A at point C, approximately a constant distance back of leading edge D. The arcuate formation of the rollers is somewhat exaggerated in these views to more clearly illustrate the construction and operation of the registering mechanism, the arc through their centers being very slight. The relative positions of cams 17 and 18 with respect to the cam rollers 15 are indicated alongside each of the diagrammatic figures.

As the sheet moves between the arms 21 and 31, it is moved slightly toward the arm 31, the yieldably mounted rollers 34 giving under the pressure exerted through the sheet by the inward movement of the opposing rigidly mounted registering rollers 24. Since the invention described is intended for use on relatively high speed machines, the speed of movement of the above-described parts will be high and a desirable jogging movement transversely of its movement toward the printing unit will be imparted to the sheet.

In the construction illustrated, provision is made for registering from the edge adjacent the arm 21 only. However, it is to be understood that by employing the spring-biased structure 31 on both sides of the press, the sheet may be registered from either edge, as desired, by simply silencing the spring-biasing mechanism of the member on the side from which registry is de-

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sired, providing a rigid structure on that side which would operate identically to member 21 illustrated, and leaving an opposing spring-biased member to cooperate therewith, as above described. When registering sheets at the side of the machine on which the arm 31 is carried, the cams 17 and 18 should be transposed, as it is necessary that the active spring-biased guide-member be retracted before the guide member having the silenced mechanism is withdrawn.

What is claimed is:

1. In a sheet registering mechanism, a plurality of guides along one side of the path of travel of a sheet to be registered, means for consecutively moving said guides transversely of said path of travel into engagement with the edge of the sheet, and yielding means for opposing transverse movement of the sheet and registering the same against said guides.

2. In a sheet registering mechanism, a plurality of guides disposed along each side of a sheet to be registered, means for consecutively moving said guides into engagement with the edge of the sheet, the guides on one side being yieldably mounted whereby the sheet is registered against the guides on the opposite side.

3. In a sheet registering mechanism, a first set of guides disposed along one side of the path of travel of a sheet to be registered, a second set of guides disposed along the other side of the sheet, means for consecutively moving the opposite guides of each set into engagement with the edges of the moving sheet, the guides of one set being yieldably mounted whereby the sheet is registered against the guides of the opposite set.

4. In a sheet registering mechanism, the combination with a feed table of a set of guides disposed along one edge of the feed table, a second set of guides disposed along the opposite edge of the feed table, means for moving the guides of said first set transversely and consecutively into engagement with a sheet to be registered, yielding means for moving the guides of the second set transversely and consecutively into engagement with the sheet for registering the same against the guides of the first set, and means for maintaining parallelism in movement of the guides of said second set during yielding movement thereof.

5. In a sheet registering mechanism, the combination with a feed table of unyielding means for registering one edge of a sheet, a member embodying means for engaging the opposite edge of the sheet at a plurality of points spaced along the feed table, yieldable means for urging said sheet engaging means toward said registering means to register the sheet thereagainst, and means for maintaining parallelism in movement of said sheet engaging means during yielding movement thereof.

6. In a sheet registering mechanism, the combination with a feed table of a member embodying unyielding registering means for engaging one edge of a sheet at a plurality of points spaced along the feed table, a second member embodying yieldable means for engaging the other edge of the sheet at opposite points spaced along the other side of the feed table for urging the sheet against said registering means, and means for maintaining parallelism in movement of said yieldable means during yielding movement thereof.

7. In a sheet registering mechanism, a plurality of guides grouped along each side of the

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path of travel of a sheet to be registered, the guides of each group being arranged in arcuate alignment with respect to the path of travel and in axial symmetry with the opposing group, means for consecutively moving the individual guides of each group inwardly against the sheet as it advances therebetween, the guides of one group being yieldably mounted whereby the sheet is registered against the guides of the opposing group.

8. In a sheet registering mechanism, a plurality of guides disposed along each side of the path of travel of a sheet to be registered, means for consecutively moving said guides into engagement with the edges of the moving sheet, movement of said guides being synchronized with the travel of the sheet to engage the edge of the sheet a predetermined distance behind its leading edge, the guides on one side being yieldably mounted for urging the opposite edge of the sheet against the opposing guides for registration.

9. In a sheet registering mechanism, a plurality of guides disposed along each side of the path of travel of a sheet to be registered, means for consecutively moving said guides into engagement with the edges of the moving sheet, movement of said guides being synchronized with the travel of the sheet to engage the edge of the sheet a predetermined distance behind its leading edge, the guides on one side being yieldably mounted for urging the opposite edge of the sheet against the opposing guides for registration, and means for retracting the guides from engagement with the sheet when the sheet has been laterally registered.

10. In a sheet registering mechanism, guide arms between which a sheet to be registered travels, arcuately aligned sheet engaging members carried thereby, means for pivoting said guide arms inwardly toward the sheet as it moves therebetween to effect consecutive engagement of said sheet engaging members with the edge of the moving sheet, the sheet engaging members carried by one of said arms being yieldably mounted whereby the sheet will be registered against the sheet engaging members carried by the opposite arm.

11. In a sheet registering mechanism, a pair of aligned guide arms between which a sheet to be registered travels, sheet engaging members carried by each of said arms in arcuate alignment with the path of travel of the sheet, the individual sheet engaging members carried by one arm in axial symmetry with those carried by the opposite arm, means for pivoting said arms inwardly in timed relation to the travel of the sheet therebetween to effect consecutive engagement of the sheet engaging members with the edge of the moving sheet, the sheet engaging members carried by one arm being yieldably supported thereby so that the sheet will be registered against the opposing sheet engaging members.

12. In a sheet registering mechanism including sheet receiving means, the combination of a set of guides disposed along each side of the path of travel of a sheet to be registered, means for consecutively moving the guides of each set into engagement with the edges of the moving sheet, means for synchronizing movement of said guides with the travel of the sheet whereby each consecutive guide will engage the sheet edge at approximately the same point, the guides of one set being yieldably mounted whereby the opposite edge of the sheet will be registered against

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the opposing set of guides, and means for retracting the sets of guides from engagement with the sheet upon delivery thereof to the sheet receiving mechanism to permit alignment of the front end of the sheet against the said stop means.

13. In a sheet registering mechanism including sheet receiving means, the combination of a set of guides disposed along each side of the path of travel of a sheet to be registered, means for consecutively moving the guides of each set into engagement with the edges of the moving sheet, means for synchronizing movement of said guides with the travel of the sheet whereby each consecutive guide will engage the sheet edge at approximately the same point, the guides of one set being yieldably mounted whereby the opposite edge of the sheet will be registered against the opposing set of guides, and means for retracting the sets of guides from engagement with the sheet upon delivery thereof to the sheet receiving mechanism to permit alignment of the front end of the sheet against the said stop means, the set of yieldably mounted guides being retracted in advance of retraction of the opposing set.

14. In a sheet registering mechanism including sheet receiving means, the combination of a set of guides on each side of the path of travel of the sheet, means for consecutively moving the guides of each set into engagement with the edges of the moving sheet, the guides of one set being yieldably mounted whereby the sheet is laterally registered against the guides of the opposing set, stop means associated with the gripping mechanism against which the sheet is longitudinally registered by the delivery mechanism, and means for retracting the sets of guides from engagement with the sheet after the gripping mechanism has received the sheet.

15. In a sheet registering mechanism including sheet receiving means, the combination of a pair of guide arms on opposite sides of the path of travel of the sheet, sets of sheet engaging members carried by each of said arms, means for gradually pivoting said arms toward each other in timed relation to the forward movement of the sheet therebetween whereby the guide members carried thereby will consecutively engage the edges of the moving sheet, the set of sheet engaging members carried by one of the arms being yieldably supported thereby so that the sheet will be laterally registered against the opposing set of sheet engaging members carried by the opposite guide arm.

16. In a sheet registering mechanism including sheet receiving means, the combination of a pair of guide arms on opposite sides of the path of travel of the sheet, a set of sheet engaging members carried by each of said arms in arcuate alignment, means for gradually pivoting said arms toward each other in timed relation to the forward movement of the sheet therebetween for effecting consecutive engagement of the sheet engaging members of each set with the adjacent edge of the moving sheet, the set of sheet engaging members carried by one of said arms being yieldably supported thereby so that the sheet will be laterally registered against the opposite sheet engaging members.

17. In a sheet registering mechanism including sheet receiving means, the combination of a pair of guide arms on opposite sides of the path of travel of the sheet, sheet engaging members carried by each of said arms in arcuate alignment, means for gradually pivoting said arms toward each other in timed relation to the travel of the

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sheet therebetween for effecting consecutive engagement of the sheet engaging members with the adjacent edge of the moving sheet, the sheet engaging members carried by one of said arms being yieldably supported thereby so that the sheet will be laterally registered against the opposite sheet engaging members, and stop means associated with the gripping mechanism against which the leading edge of the sheet is urged by the delivery means for longitudinal register.

18. In a sheet registering mechanism including sheet receiving means, the combination of a pair of guide arms on opposite sides of the path of travel of the sheet, sheet engaging members carried by each of said arms in arcuate alignment, means for gradually pivoting said arms toward each other in timed relation to the travel of the sheet therebetween for effecting consecutive engagement of the sheet engaging members with the adjacent edge of the moving sheet, the sheet engaging members carried by one of said arms being yieldably supported thereby so that the sheet will be laterally registered against the opposite sheet engaging members, stop means associated with the gripping mechanism against which the leading edge of the sheet is urged by the delivery means for longitudinal register, and means for retracting said arms to release engagement of the sheet engaging members with the sheet after it is received by the gripping mechanism.

19. In a sheet registering mechanism including sheet receiving means, the combination of a pair of guide arms on opposite sides of the path of travel of the sheet, sheet engaging members carried by each of said arms in arcuate alignment, means for gradually pivoting said arms toward each other in timed relation to the travel of the sheet therebetween for effecting consecutive engagement of the sheet engaging members with the adjacent edge of the moving sheet, the sheet engaging members carried by one of said arms being yieldably supported thereby so that the sheet will be laterally registered against the opposite sheet engaging members, stop means associated with the gripping mechanism against which the leading edge of the sheet is urged by the delivery means for longitudinal register, and means for retracting said arms to release engagement of the sheet engaging members with the sheet after it is received by the gripping mechanism, the arm carrying the yieldably supported sheet engaging members being retracted in advance of the opposite arm.

20. In a printing machine including a printing unit, means for delivering a sheet thereto, and gripping mechanism associated therewith for receiving the sheet, the combination therewith of a sheet registering mechanism comprising, a pair of arms on opposite sides of the path of travel of the sheet, guides carried by each of said arms, means for gradually pivoting said arms toward each other in timed relation to the travel of the sheet therebetween whereby the guides carried thereby will consecutively engage the edges of the moving sheet, the guides carried by one of the arms being yieldably supported thereby so that the sheet will be laterally registered against the opposing guides carried by the opposite arm, stop means associated with the said gripping mechanism for longitudinally registering the sheet as it is delivered to the gripping mechanism by the delivery mechanism, and means for retracting the arms to release engagement of the

guides with the edges of the sheet after it is received by the gripping mechanism.

21. In a printing machine including a printing unit, means for delivering a sheet thereto, and gripping mechanism associated therewith for receiving the sheet, the combination therewith of a sheet registering mechanism comprising, a pair of arms on opposite sides of the path of travel of the sheet, guides carried by each of said arms, means for gradually pivoting said arms toward each other in timed relation to the travel of the sheet therebetween whereby the guides will consecutively engage the edges of the moving sheet, the guides carried by one of the arms being yieldably supported thereby so that the sheet will be laterally registered against the opposing guides carried by the opposite arm, stop means associated with the said gripping mechanism for longitudinally registering the sheet as it is delivered to the gripping mechanism by the delivery mechanism, and means for retracting the arms to release engagement of the guides with the edges of the sheet after it is received by the gripping mechanism, said arm carrying the yieldably supported guides being retracted in advance of the opposite arm.

22. In a printing machine including a printing unit, means for delivering a sheet thereto, and gripping mechanism associated therewith for receiving the sheet, the combination therewith of sheet registering mechanism comprising pivotally mounted arms on each side of the path of travel of the sheet, sheet engaging rollers carried by each of said arms in arcuate alignment, means for gradually pivoting the arms toward each other in timed relation to the travel of the sheet for effecting consecutive engagement of the rollers with the adjacent edge of the moving sheet, the rollers carried by one of said arms being yieldably mounted thereon for urging the sheet against the rollers carried by the opposite arm for lateral registration, stop means associated with the gripping mechanism against which the leading edge of the sheet is urged by the delivery mechanism for longitudinal registration, means retracting said arms from said sheet after it is seized by the gripping mechanism, the arm carrying the yieldably mounted rollers being retracted in advance of the opposite arm.

23. Sheet registering mechanism comprising a pivotally mounted arm on one side of the path of travel of a sheet, arcuately aligned rollers carried thereby for engaging the adjacent edge of the moving sheet, a second pivotally mounted arm on the opposite side of the path of travel of the sheet, arcuately aligned rollers yieldably carried thereby for engaging the adjacent edge of the moving sheet and urging it toward the opposite arm, and means for gradually pivoting said arms toward each other in timed relation to the travel of the sheet whereby the rollers will engage the edges of the sheet consecutively at a point a predetermined distance behind its leading edge.

24. Sheet registering mechanism comprising a first pivotally mounted arm on one side of the path of travel of a sheet, arcuately aligned rollers carried thereby for engaging the adjacent edge of the sheet, a second pivotally mounted arm on the opposite side of the path of travel of the sheet, arcuately aligned rollers yieldably carried thereby for engaging the adjacent edge of the moving sheet and urging it toward said rollers of said first arm for lateral registration, means for pivoting both said arms inwardly in

timed relation to the travel of the sheet whereby the rollers will engage the edges of the sheet consecutively at a point a predetermined distance behind its leading edge, and means for retracting said arms to disengage said rollers from the edges of the sheet, said second arm being retracted in advance of the first-named arm.

25. In a sheet registering mechanism, a series of spaced lateral guides for engaging the edge of a sheet to register the same, sheet feeding means for moving a sheet along the series of guides, means synchronized with said feeding means for moving said guides consecutively into engagement with the edge of the sheet whereby the sheet is registered by the last guide of said series.

26. In a sheet registering mechanism, a series of spaced lateral guides for engaging the edge of a sheet to register the same, sheet feeding means for moving a sheet along the series of guides, means synchronized with said feeding means for moving said guides consecutively into engagement with the edge of the sheet whereby the sheet is registered by the last guide of said series, and yieldable means for urging the sheet laterally against said guides.

27. In a sheet registering mechanism, a series of spaced lateral guides for engaging the edge of a sheet to register the same, sheet feeding means for moving a sheet along the series of guides, means synchronized with said feeding means for moving said guides consecutively into engagement with the edge of the sheet and at substantially the same point thereof whereby the sheet is registered by the last guide of said series, and yieldable means for urging the sheet laterally against said guides.

28. In a sheet registering mechanism, means for registering one edge of a sheet, a member for engaging the opposite edge of the sheet to urge the same against the first said means for registration, yielding means for urging said member in sheet engaging direction, a movable support for said member and yielding means, means for moving said support in timed relation to the movement of the sheet to be registered, and a counterweight system carried by said support and connected to said member for balancing inertia thereof, whereby reaction upon said yielding means due to movement of said support is substantially eliminated.

29. In a sheet registering mechanism, means for registering one edge of a sheet, a movable support, a sheet engaging member pivotally mounted on said support, yielding means for urging said pivotally mounted member in the sheet engaging direction for pressing the sheet against the said registering means for registration, a counterweight connected to said member for balancing inertia of the same about its pivot point, means for moving said support toward and away from the first said means in timed relation to the passage of a sheet.

30. In a sheet registering mechanism, movable means for registering one edge of a sheet, a movable support, a sheet engaging member pivotally mounted thereon, yielding means for urging said pivotally mounted member into engagement with the opposite edge of the sheet for urging the same against said movable registering means for registration, means for moving said registering means and said movable support toward and away from the sheet in timed relation to the passage of the sheet therebetween,

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and a counterweight connected to said pivotally mounted member for balancing inertia of the same about its pivot point.

31. In a sheet registering mechanism, means for registering one edge of a sheet, a member for engaging the opposite edge of the sheet to urge the same against the first said means for registration, yielding means for urging said member in sheet engaging direction, means for moving said member and yielding means toward said registering means in timed relation to travel of the sheet, and a counterweight system connected to said member for balancing inertia of said member, whereby reaction upon said yield-

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ing means due to movement of said member and yielding means is substantially eliminated.

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