

July 15, 1941.

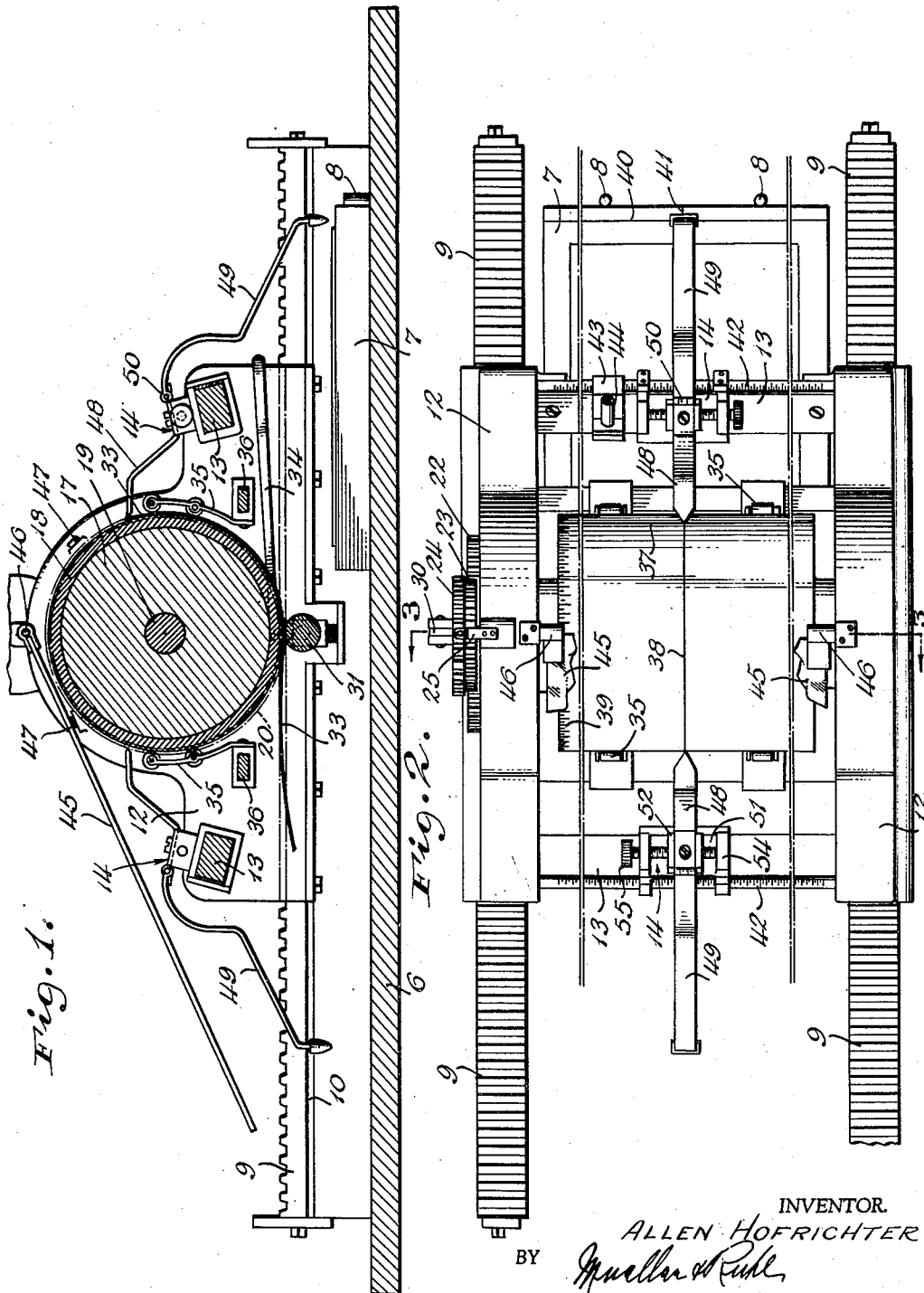
A. HOFRICHTER

2,249,245

REGISTERING APPARATUS FOR PRINTING FORMS

Filed Oct. 31, 1940

2 Sheets-Sheet 1



July 15, 1941.

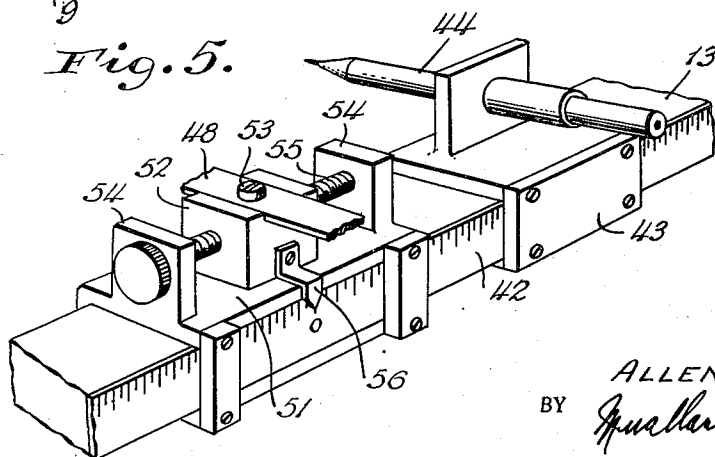
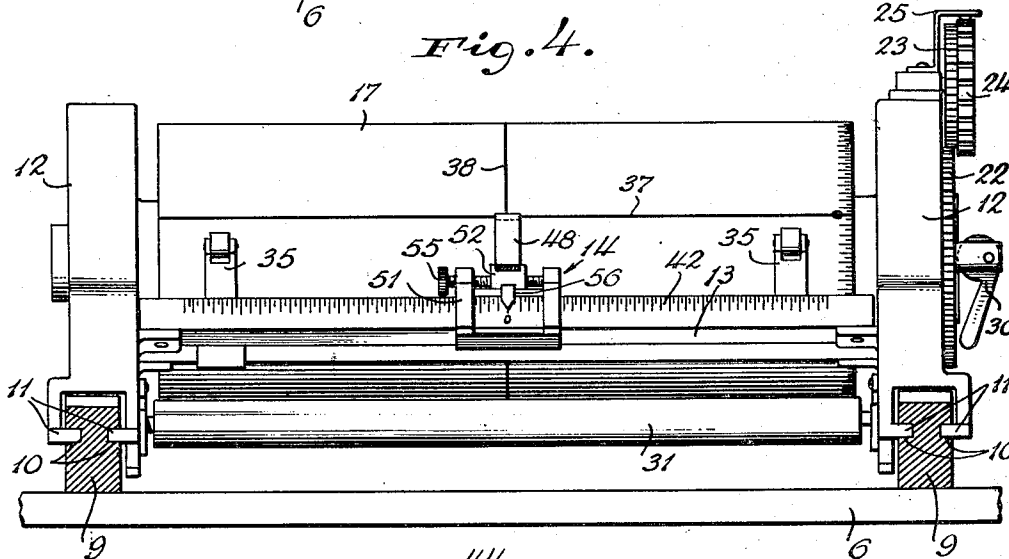
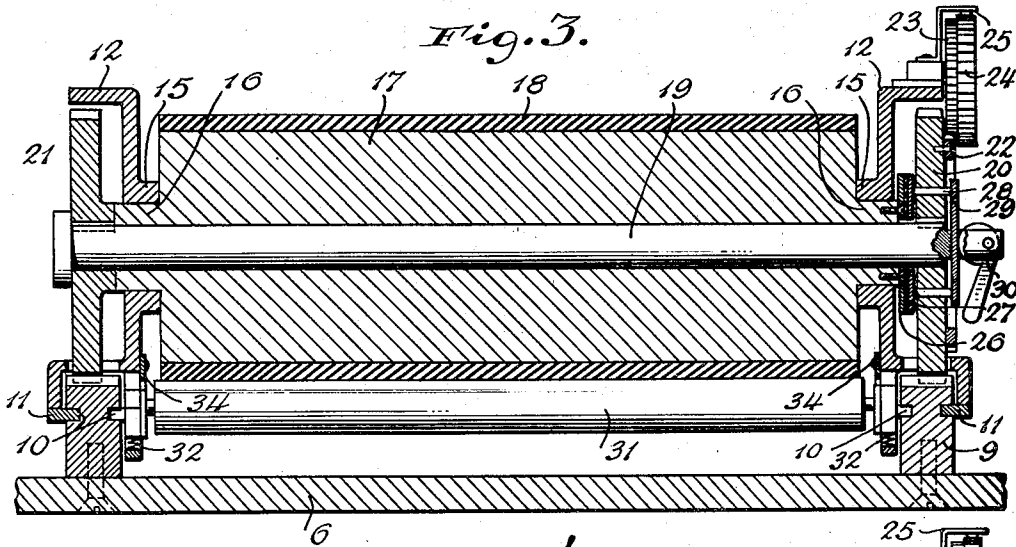
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2 Sheets-Sheet 2



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REGISTERING APPARATUS FOR
PRINTING FORMS

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20 Claims. (Cl. 33—184.5)

This invention relates to improvements in the art of printing and has particular reference to an apparatus for registering elements of printing forms in a chase preparatory to the actual printing operation.

An object of the invention is to provide an improved apparatus of simple and practical construction which will enable a compositor to set up in a chase, with extreme accuracy and within a minimum of time, the printing forms including types, cuts and the like, in accordance with the indicated positions thereof on the usual control or layout sheet supplied to the compositor.

Another and more specific object is to employ an indicating device in association with a chase and a control sheet, and to mount the latter on a rotatable cylinder supported on a movable carriage in such manner that said device may be used to indicate any point in a chase which corresponds to any definite or preselected point on said sheet, thereby to enable a compositor to accurately place a printing form in said chase in accordance with the indicated positions of various elements of said form on the control sheet.

The above and other objects will appear more clearly from the following detailed description when taken in connection with the accompanying drawings which illustrate a preferred embodiment of the inventive idea.

In the drawings:

Figure 1 is a vertical longitudinal section through an apparatus constructed in accordance with the invention.

Figure 2 is a top plan view, partly broken away.

Figure 3 is a transverse section through the apparatus taken substantially on the line 3—3 of Figure 2.

Figure 4 is an end elevation of the apparatus, partly in section, and

Figure 5 is a fragmentary perspective view of an indicating mechanism and associated elements forming part of the apparatus.

Referring more particularly to the accompanying drawings, the numeral 6 indicates a table or support sometimes referred to as a "stone" on which a printing chase 7 is adapted to be mounted and abutted against guide pins 8 when setting up therein printing forms which include type, cuts, illustrations and other material.

The apparatus of the present invention is affixed to the table 6 and comprises a pair of rack bars 9 disposed in parallel relation and on opposite sides of the space on the table 6 occupied

by the chase 7. As shown in Figures 3 and 4, the opposed faces of each of the rack bars 9 are provided with longitudinal grooves 10 which form trackways for the intumed flanges 11 of one of the side frames 12 constituting a part of a slidable carriage which is movable longitudinally back and forth along the rack bars 9. The two side frames 12 are connected at opposite ends thereof by two transverse guide bars 13 each of which slidably supports an indicator device, generally designated by the numeral 14, and the purpose of which will appear in the course of the description. These indicator devices are of identical construction and one is provided at each end of the apparatus so that a compositor can work from either or both of said ends depending upon the size of the chase 7 and its location upon the table 6.

In the central enlarged portions of the frames 12, the same are provided with bearings 15 for receiving the trunnions 16 of a rotatable control sheet-supporting cylinder 17 having a covering 18 which may be of rubber or similar material. The cylinder 17 has a shaft 19 extending centrally therethrough and projecting beyond the ends of the trunnions 16 and said cylinder is capable of relative rotation on said shaft and also of unitary movement therewith when the shaft is rotated. At opposite ends of the shaft 19 the same has keyed thereon two gears 20 and 21 the pitch diameter of both of which is the same as the diameter of the cylinder 17 so that as the carriage is moved longitudinally by reason of the engagement of the gears 20, 21 with the teeth of the rack bars 9, the amount of peripheral movement of the cylinder, when it is coupled to the gears 20, 21, will equal the distance traversed by the carriage, the rotation of said cylinder being effected by reason of the engagement of said gears with the teeth of the rack bars 9. A movement of the carriage and cylinder in either direction may be accomplished by grasping either of the guide bars 13 or some portion of the frame so as to adjust the carriage to an approximate position. When desiring a more minute adjustment of the carriage and rotation of the cylinder, a vernier is employed consisting of intermeshing gears 22 and 23 mounted, respectively, on the outer face of the gear 20 and the top of the adjacent side of the frame 12. The gear 23 carries a knurled disk 24 for manipulation of the vernier adjustment and this disk may be engaged by a spring detent 25 to frictionally retain the same in adjusted positions. In order to connect the cylinder 17 to the gear 20 when unitary

rotation thereof with the shaft 19 is desired, a coupling or clutch device is provided consisting of two friction plates 26 and 27 carried, respectively, by the end of the cylinder 17 and said gear 20. The plate 27 has pins 28 extending therefrom and through the gear 20 and at the outer ends of said pins there is mounted a disk 29 adapted to be engaged by a cam 30 mounted upon the adjacent end of the shaft 19. By operating said cam, the disk 29 and the friction plate 27 are moved inwardly until the latter engages with the plate 26, thereby coupling the cylinder 17 and the gear 20. When said plates 26, 27 are separated by a reverse operation of the cam 30 the cylinder 17 will be free to rotate relatively to the carriage in which it is mounted.

Supported in the lower portions of the two side frames 12 is a pressure roller 31 yieldably held in engagement with the periphery of the cylinder 17 by springs 32. This roller is employed to aid in retaining a control or layout sheet 33 in engagement with the surface of the cylinder 17 after said sheet has been properly mounted thereon preparatory to setting up the printing forms in the chase 7. The roller 31 may be moved out of contact with the cylinder by the depression of cam levers 34 pivoted to the side frames and engaged with the extremities or trunnions of the roller 31. To further aid in retaining the control sheet 33 in proper position upon the cylinder 17, a pair of spring grippers 35 are mounted upon a bar 36 extending between the side frames 12 on each side of the cylinder 17.

For purposes which will appear in the course of the description, the surface of the cylinder 17 is provided longitudinally thereof with a paper guide line 37 and a peripheral center line 38, and is further provided at one end thereof with a scale 39. In association with the lines 37, 38 on the cylinder, the frame of the chase 7 is provided with a corresponding paper line 40 and center line 41. Also each guide bar 13 is provided on one face thereof with a scale 42. On one or both of the guide bars 13 there may be mounted a slide 43 carrying a marker or pencil 44 which may be employed to mark longitudinal and transverse lines on the control sheet or a press proof thereof when the same are mounted on the cylinder 17.

A transparent scanning plate 45 is hingedly connected at 46 to the side frames 12 directly above the cylinder 17 and this plate may be swung to either side of the apparatus and rested upon cushion abutments 47. This plate is supplied for the convenience of the compositor in determining on a press proof whether there is any overlap of printed matter on opposite sides of the sheet when both sides are printed. By placing a source of light beneath the plate, the compositor may readily compare opposite sides of the sheet to determine that the printed matter on said sides is properly placed.

Each indicator device 14 comprises two indicators 48 and 49 hingedly connected at 50 to enable the latter indicator to be swung upwardly from a position contiguous to the chase 7 when said indicator is not in use. The indicator 48 is arranged during the operation of the apparatus so that its free extremity is disposed adjacent the control sheet 33 on the cylinder 17. The support for this indicator device comprises a slide 51 mounted for longitudinal movement on the guide bar 13 and carrying a follower block 52 grooved in its upper surface to receive a part of the indicator 48 which is secured in said groove

by the screw 53. At the ends of the slide 51, the same is provided with bearings 54 in which is threaded a finely pitched screw 55 which provides a vernier for minute adjustments of the block 52, and consequently the indicators 48, 49 after the slide 51 has been adjusted to an approximate desired position. The block 52 also carries a pointer 56 associated with the scale 42 for a purpose which will later appear.

In practice, when a compositor is furnished with a control sheet 33 on which the usual markings for a layout appear, the sheet is first mounted upon the cylinder 17 in a position such as shown in Figure 1. In accomplishing this, the cylinder 17 is first uncoupled from the gear 20 by manipulation of the cam 30 so as to enable the cylinder to freely rotate relative to the carriage 12. The paper and center lines of the control sheet are then aligned with the corresponding lines 37, 38 on the cylinder and engaged beneath the grippers 35, and between the cylinder and the pressure roller 31. Then, after the chase 7 has been placed upon the table 6, the indicator device 14 is moved along the bar 13 and the cylinder 17 is rotated until the free extremity of the pointer 48 is positioned at the intersection of the paper and center lines, as indicated in Figure 2. The carriage, including the frames 12, is then moved along the rack bars 9, without rotating the cylinder 17, until the lower extremity of the indicator 49 is positioned directly above the point where the paper and center lines 40, 41 on the chase 7 would intersect. The cylinder 17 is then coupled to the gear 20 by actuating the cam 30 to engage the two friction plates 26, 27 so that any consequent movement of the carriage will result in a corresponding rotation of the cylinder 17 and due to the fact that the diameters of said cylinder and the gears 20, 21 are the same, the amount of peripheral movement of the cylinder will be equal to the linear movement of the carriage. The compositor may now proceed to set up a printing form in the chase 7 in accordance with the layout on the control sheet 33. In the course of accomplishing this, it is desired to accurately locate in the chase various elements of the form and specific points thereof, in accordance with the positions of such elements and points on said control sheet. Thus, to determine in the chase the location of a definite preselected point on the control sheet, the carriage is moved longitudinally, with the resulting rotation of the cylinder 17, and the indicator device 14 is adjusted along the bar 13 until the indicator 48 is aligned with the preselected point on the control sheet. As these movements of the carriage, cylinder and indicator device are effected, the indicator 49 will move over the chase 7 and when the desired position of the indicator 48 is attained, the point in the chase 7 corresponding to the then selected point on the control sheet will be indicated by the indicator 49. Following this procedure, the compositor may accurately, and with rapidity, set up in the chase the various elements of the printing form as indicated on the control sheet and as the set up is made in the chase it is locked in position through the various instrumentalities customarily used for this purpose. If the chase 7 happens to be a particularly long one, the compositor may first work at one end of the apparatus and then at the other where he may employ the indicator device 14 on the opposite side of the cylinder 17.

There are times during the course of setting up a printing form, or after the form has been completely set up, when it is desirable to check the positions of various elements in the chase. It is for this purpose that the scales 39 and 42 are provided. These scales may be employed in various ways; for example, if the control sheet should indicate thereon, as is frequently the case, that a space of definite width across the chase is to remain blank, the compositor may, by moving the slide 51 and its pointer 56 to the left or right a distance along the scale equal to that designated on the control sheet, and then note on said chase, by means of the indicator 49, the boundaries of said space. Similarly, if a space is to be left along the length of the chase, the cylinder 17 may be rotated the required amount indicated on the control sheet with the scale 39 as a guide, and the carriage will be moved longitudinally of the chase so that the indicator 49 will define the limits of said space on the chase. The scales 39 and 42 may also be employed, after a printing form has been locked in the chase, to ascertain whether any discrepancy or shifting in the position of said form has occurred in the locking-up process. For instance, if it is desired to check the position of a form crosswise of the chase, the slider 51 is shifted until the indicator 48 registers with a point on the control sheet corresponding with a similar point of the form in the chase. If the latter point is off-set laterally from the indicator 49, note is made of the position of the pointer 56 along the scale 42, and said indicator 49 is then moved, by an adjustment of the slider 51, to the actual position of said point in the chase. In so doing, the pointer 56 is also moved along the scale and when said actual position is reached, note is again made of the scale reading and the distance between the two readings made indicates the amount of discrepancy in the position of the printing form. The compositor can then proceed to shift the printing form the required amount to properly position the same. A like procedure may be followed with respect to the scale on the cylinder when shifting of a form lengthwise of the chase becomes necessary. The scales 39 and 42 may also be used for an arithmetic calculation for locking up multiple units of the same dimensions.

It will be apparent that the present apparatus may be utilized for multi-colored work and when so employed the original control sheet may be used throughout the operation, or preferably, a press copy of the first color may be used and this first copy then substituted for the control on the cylinder.

What is claimed is:

1. A registering apparatus for printing forms comprising a cylinder for carrying a control sheet, means to support said cylinder for movements relative to a printing chase, means to so move said cylinder, and indicating members movable with said supporting means and relative to said cylinder for indicating a point on said chase corresponding to a preselected point on said control sheet.

2. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder supported in said carriage and adapted to support a control sheet thereon, means to rotate said cylinder, and two indicators mounted for unitary movement on said carriage, one of said indicators arranged ad-

jacent said control sheet and the other contiguous to said chase.

3. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is mounted, said cylinder being supported in and movable with said carriage and also having rotary movements relative thereto, means to effect said rotary movements of the cylinder, and indicating members movable with said carriage and relative to said cylinder for indicating a point on said chase corresponding to a preselected point on said control sheet.

4. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is mounted, said cylinder being supported in and movable with said carriage and also having rotary movements relative thereto, means to effect said rotary movements of the cylinder, and two indicators supported by and movable with said carriage and relative to said cylinder, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase.

5. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is mounted, said cylinder being supported in and movable with said carriage and also having rotary movements relative thereto, means to effect said rotary movements of the cylinder, a guide bar mounted in said carriage, a slide on said bar movable longitudinally of said cylinder, and indicating means carried by said slide and including two pointers, one adjacent said control sheet and the other contiguous to said chase.

6. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is mounted, said cylinder being supported in and movable with said carriage and also having rotary movements relative thereto, means to so rotate said cylinder, a guide bar mounted in said carriage, a slide on said bar movable longitudinally of said cylinder, indicating means carried by said slide and including two pointers, one adjacent said control sheet and the other contiguous to said chase, and a vernier adjustment for said indicating means mounted on said slide.

7. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder supported in and movable with said carriage and adapted to support a control sheet thereon, two indicators mounted for unitary movement on said carriage, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase, and a vernier adjustment for said indicators.

8. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is adapted to be mounted, said cylinder being supported in and movable with said carriage and also having rotary movement relative thereto, mechanism for coupling said cylinder to said carriage so that the cylinder will only rotate when said carriage is moved linearly, means to so rotate said cylinder, and indicating members movable with said carriage and relative to said cylinder for indicating a point on

said chase corresponding to a preselected point on said control sheet.

9. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is adapted to be mounted, said cylinder being supported in and movable with said carriage and also having rotary movement relative thereto, mechanism for coupling said cylinder to said carriage so that the cylinder will only rotate when said carriage is moved linearly, means to so rotate said cylinder, and two indicators mounted for unitary movements on said carriage, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase.

10. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is adapted to be mounted, said cylinder being supported in and movable with said carriage and also having rotary movement relative thereto, mechanism for coupling said cylinder to said carriage so that the cylinder will only rotate when said carriage is moved linearly, means to so rotate said cylinder, and two indicators supported by and movable with said carriage and relative to said cylinder, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase.

11. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is adapted to be mounted, said cylinder being supported in and movable with said carriage and also having rotary movement relative thereto, mechanism for coupling said cylinder to said carriage so that the cylinder will only rotate when said carriage is moved linearly, means to so rotate said cylinder, a guide bar mounted in said carriage, a slide on said bar movable longitudinally of said cylinder, and indicating means carried by said slide and including two pointers, one adjacent said control sheet and the other contiguous to said chase.

12. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted to support a control sheet, transmission means for rotating said cylinder including gears connected to the latter and engaged with said rack bars, and indicating members movable with said carriage and relative to said cylinder for indicating a point on said chase corresponding to a preselected point on said control sheet.

13. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted to support a control sheet, transmission means for rotating said cylinder including gears connected to the latter and engaged with said rack bars, and two indicators supported by and movable with said carriage and relative to said cylinder, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase.

14. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted

to support a control sheet, gearing connected to said cylinder and engaged with said rack bars for imparting a peripheral movement to said cylinder equal to a linear movement of said carriage, and indicating members movable with said carriage and relative to said cylinder for indicating a point on said chase corresponding to a preselected point on said control sheet.

15. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted to support a control sheet, gearing connected to said cylinder and engaged with said rack bars for imparting a peripheral movement to said cylinder equal to a linear movement of said carriage, and two indicators supported by and movable with said carriage and relative to said cylinder, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase.

16. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted to support a control sheet, gearing connected to said cylinder and engaged with said rack bars for imparting a peripheral movement to said cylinder equal to a linear movement of said carriage, means to disconnect said cylinder from said gearing whereby the cylinder may be rotated independently of the linear movement of said carriage, and indicating members movable with said carriage and relative to said cylinder for indicating a point on said chase corresponding to a preselected point on said control sheet.

17. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted to support a control sheet, gearing connected to said cylinder and engaged with said rack bars for imparting a peripheral movement to said cylinder equal to a linear movement of said carriage, means to disconnect said cylinder from said gearing whereby the cylinder may be rotated independently of the linear movement of said carriage, and two indicators supported by and movable with said carriage and relative to said cylinder, one of said indicators arranged adjacent said control sheet and the other contiguous to said chase.

18. A registering apparatus for printing forms comprising rack bars arranged on opposite sides of a printing chase, a carriage supported for longitudinal movements relative to said rack bars, a cylinder journaled in said carriage and adapted to support a control sheet, transmission means for rotating said cylinder including gears connected to the latter and engaged with said rack bars, said gears being of a pitch diameter equal to the diameter of said cylinder, and indicating members movable with said carriage and relative to said cylinder for indicating a point on said chase corresponding to a preselected point on said control sheet.

19. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is adapted to be mounted, said cylinder being supported in said carriage for rotary movements relative thereto and unitary lin-

ear movements therewith, a guide bar mounted in said carriage, a slide on said bar movable longitudinally of said cylinder, indicating means carried by said slide and including two pointers, one adjacent said control sheet and the other contiguous to said chase, another pointer on said slide, and a scale on said guide bar along which said other pointer moves.

20. A registering apparatus for printing forms comprising a carriage having linear movements relative to a printing chase, a cylinder on which a control sheet is adapted to be mounted, said cylinder being supported in said carriage for ro-

tary movements relative thereto and unitary linear movements therewith, a guide bar mounted in said carriage, a slide on said bar movable longitudinally of said cylinder, indicating means carried by said slide and including two pointers, one adjacent said control sheet and the other contiguous to said chase, a vernier adjustment for said indicating means mounted on said slide, a pointer controlled by said vernier adjustment, and a scale on said guide bar along which the latter pointer moves.

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