July 3, 1951 J. S. DANIELS 2,559,533

PRINTING PLATE POSITIONER

Filed Nov. 22, 1944 4 Sheets-Sheet 1

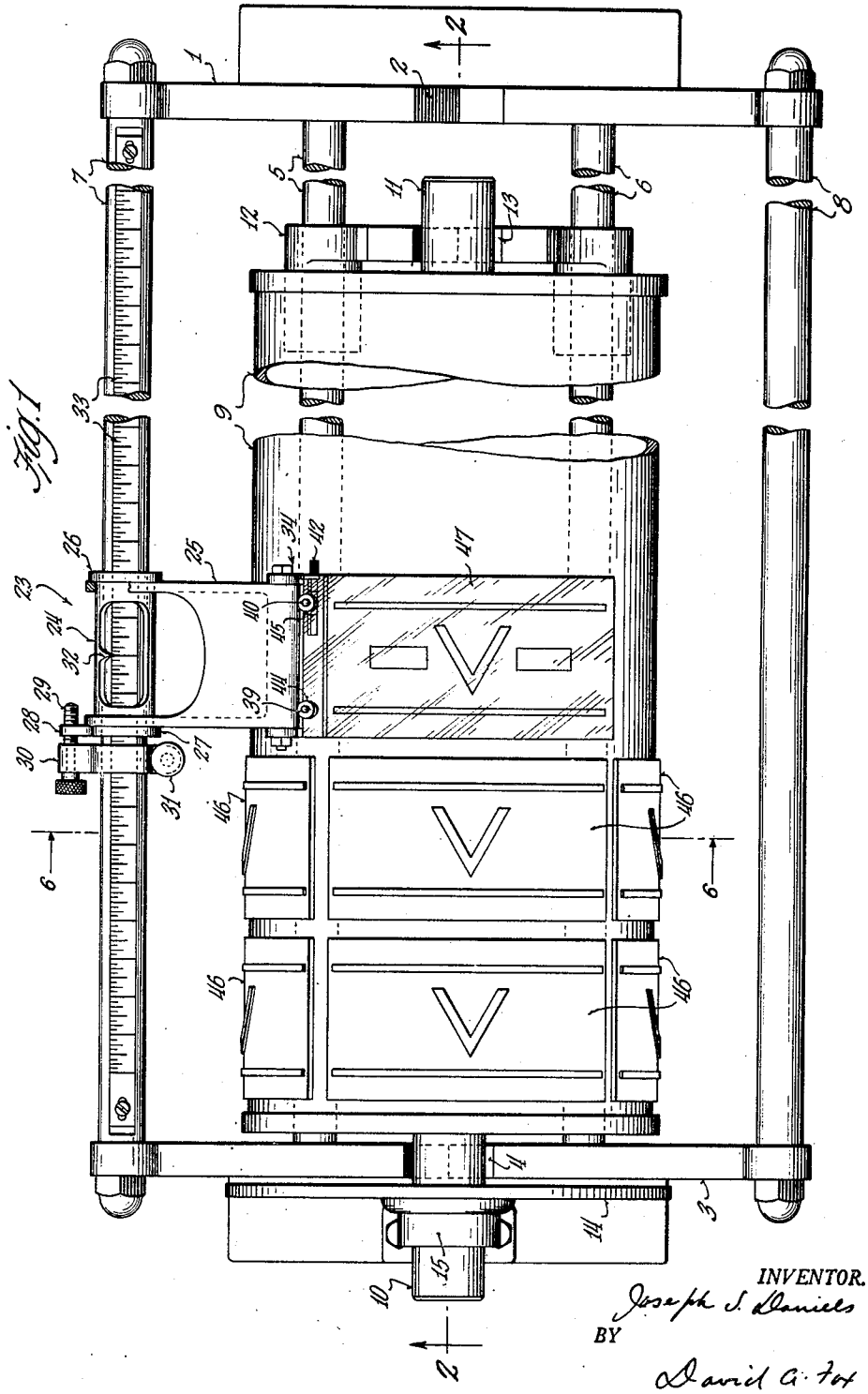


Fig. 1

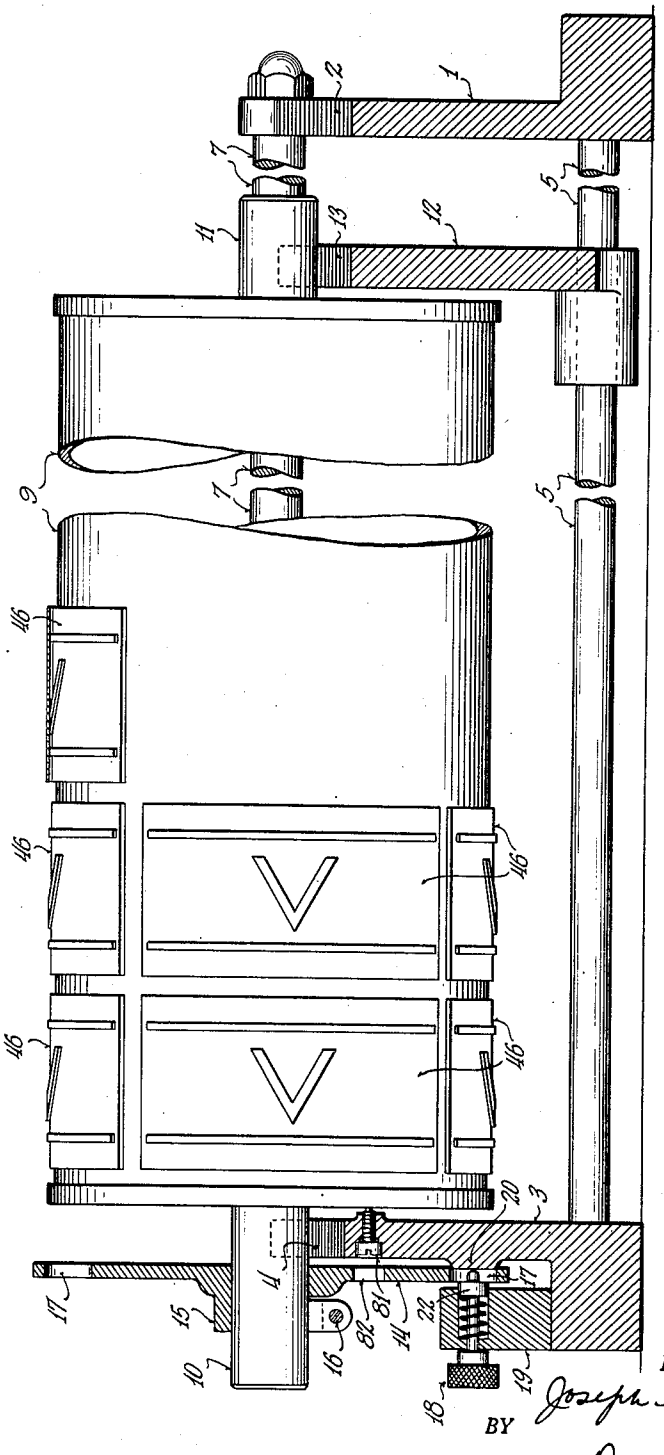
INVENTOR.
Joseph S. Daniels
BY
David A. Fox
ATTORNEY

July 3, 1951 J. S. DANIELS 2,559,533

PRINTING PLATE POSITIONER

Filed Nov. 22, 1944 4 Sheets-Sheet 2

Fig. 2




INVENTOR.
Joseph S. Daniels
BY
David A. Fox
ATTORNEY.

July 3, 1951 J. S. DANIELS 2,559,533

PRINTING PLATE POSITIONER

Filed Nov. 22, 1944 4 Sheets-Sheet 3

Fig. 3

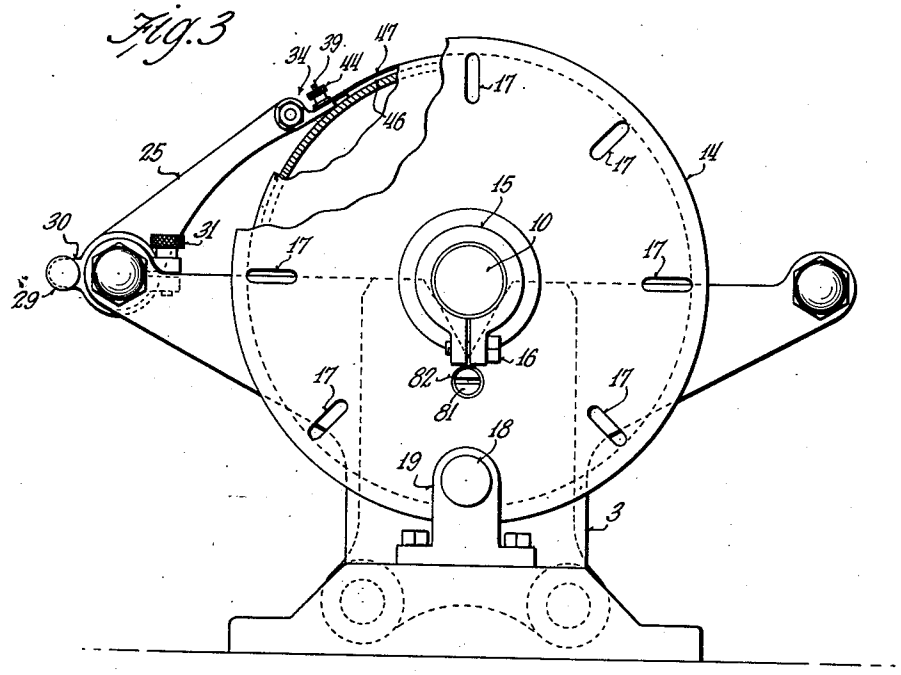



Fig. 4

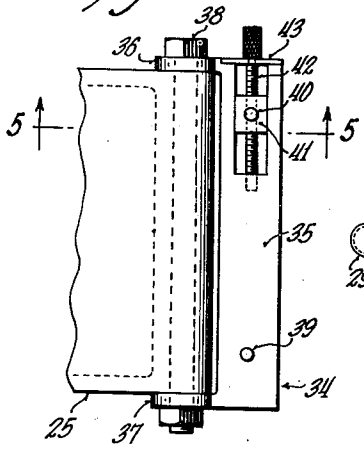



Fig. 6

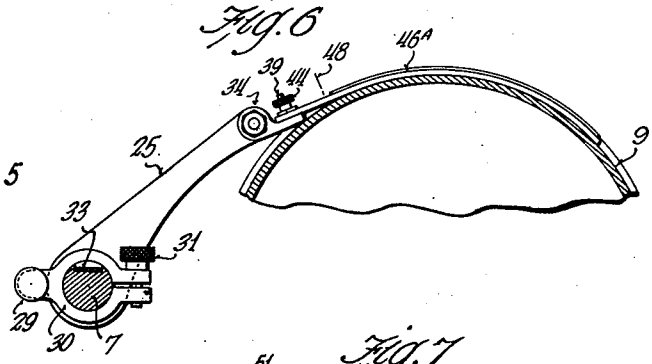



Fig. 5

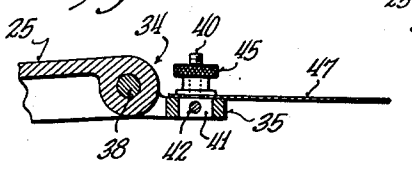
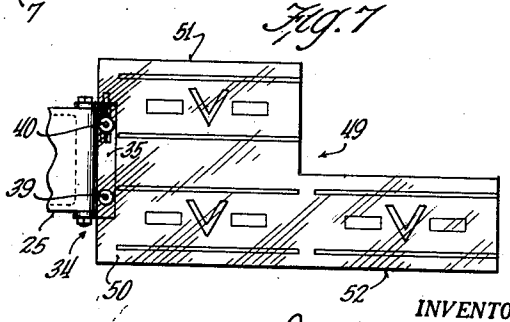



Fig. 7




INVENTOR.
Joseph S. Daniels
BY
David A. Fay
ATTORNEY.

July 3, 1951 J. S. DANIELS 2,559,533

PRINTING PLATE POSITIONER

Filed Nov. 22, 1944 4 Sheets-Sheet 4

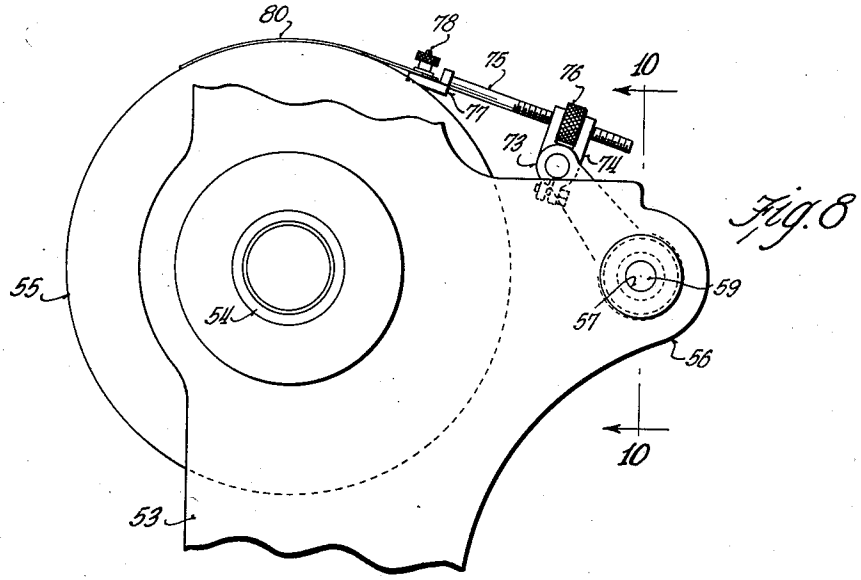
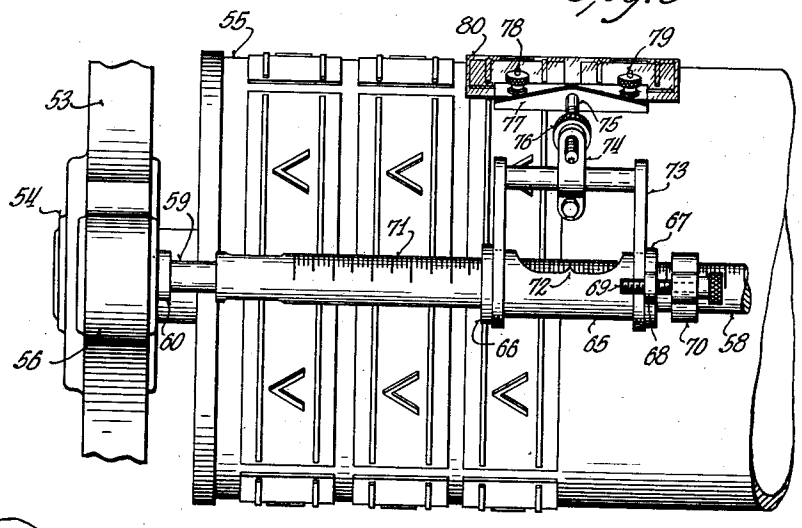



Fig. 8

Fig. 9



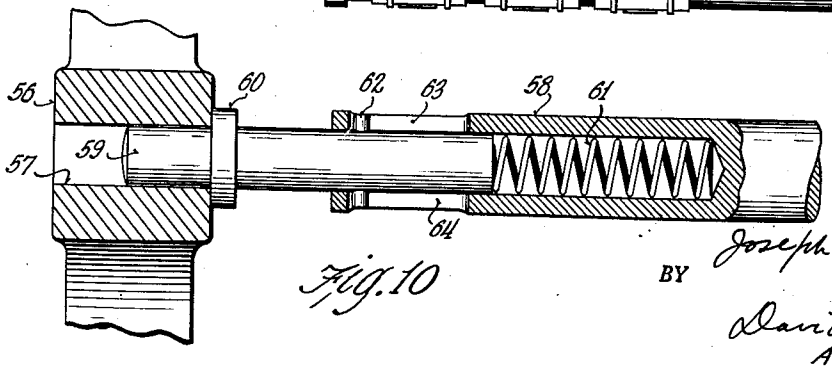




Fig. 10

INVENTOR.
Joseph S. Daniels
BY
David A. Fox
ATTORNEY.

Patented July 3, 1951

2,559,533

# UNITED STATES PATENT OFFICE

2,559,533

## PRINTING PLATE POSITIONER

Joseph S. Daniels, Rhinelander, Wis.

Application November 22, 1944, Serial No. 564,688

3 Claims. (Cl. 33—184.5)

1

This invention relates to plate positioning apparatus for guiding printing plates to a precise predetermined position on a printing press cylinder for attachment thereto, and it resides more specifically in means guided for movement to a desired predetermined position axially and circumferentially of a printing cylinder by which means a printing plate or facsimile thereof may be transported to a precise position on the surface of a printing cylinder, in which position a printing plate thus transported or guided by such means can be attached to the cylinder, said means being readily shiftable to any other predetermined position on the cylinder desired.

Heretofore, when setting up a cylinder printing press having a plurality of small cylindrical printing plates attached to each of the cylinders of the press, a large amount of time has been required to properly locate the plates with reference to one another upon a given cylinder, and with reference to the plates on other cylinders so that acceptable registry will result in the printing. In the case of rigid metallic printing plates, this operation is tedious and time consuming but nevertheless may be systematically approached and carried out, since successive small adjustments in position of the several plates can be easily made by reason of the nature of the various locking appliances used to secure the plates to the cylinders. A much more difficult problem is encountered in cases where a large number of somewhat non-rigid printing plates composed of rubber-like material and now widely used are to be adhesively attached to cylinders having smooth continuous surfaces. Once such a non-rigid plate has been adhesively attached to a cylinder, it must be completely lifted in order to make even a very small adjustment in position. As a result, a large amount of tedious and very skillful manipulation is required in order to properly set up a multiple color cylinder press with a large number of small non-rigid printing plates.

By means of this invention, however, printing plates of either rigid or non-rigid type may be brought to the surface of the printing cylinder in the precise position in which they are to be attached and, having been brought to such a position may be secured to the cylinder without need for further shifting to bring them to the final position in which they will be used for printing. This is accomplished by locating for movement in parallel relationship with the axis of the printing cylinder a guide-mounting which can be brought to any desired predetermined position axially of the printing cylinder. Movable upon this guide-

2

mounting is a member held in predetermined angular relation to the cylinder, the same being adapted to move to and from the cylinder surface and to carry a printing plate or facsimile thereof.

In this way, a plate to be attached can be guided to and secured in any predetermined position upon the cylinder.

This invention is herein described by reference to specific embodiments of its construction and use illustrated in the accompanying drawings forming a part hereof, the same being set forth by way of illustration and not of limitation.

In the drawings, Fig. 1 is a top plan view of one form of the apparatus of this invention;

Fig. 2 is a side view, in elevation and in section, of the apparatus shown in Fig. 1, viewed thru the plane 2—2 there indicated;

Fig. 3 is an end view in elevation, partly broken away, of the apparatus shown in Fig. 1;

Fig. 4 is a fragmentary detail top plan view of the plate and frisket holder of the apparatus shown in Fig. 1;

Fig. 5 is a fragmentary detail end view in elevation and in section of the plate and frisket holder shown in Fig. 4 viewed thru the plane 5—5 there indicated;

Fig. 6 is an end view in elevation and in section and in fragmentary form, viewed thru the plane 6—6 indicated in Fig. 1;

Fig. 7 is a detail view of a multiple frisket held in the plate and frisket holder;

Fig. 8 is an end view in elevation of another form of the apparatus of this invention adapted for mounting directly in a printing press without removal of the cylinder therefrom;

Fig. 9 is a fragmentary side view in elevation of the apparatus appearing in Fig. 8; and

Fig. 10 is a fragmentary side view in section of the guide-mounting rod of the apparatus shown in Fig. 8 viewed thru the plane 10—10 there indicated.

Referring now to the form of the apparatus of this invention illustated in Figs. 1 to 7 inclusive, it will be seen that an end stand 1 provided with a V bearing 2 is joined to a similar end stand 3 having a V bearing 4, by base rods 5 and 6 and side frame rods 7 and 8. A supporting framework is thus formed of very rigid parts of heavy section adapted to preserve their shape without distortion; such structure being intended to be mounted on a flat surface or table conveniently accessible to the operator. The end stands 1 and 3 are spaced from one another a distance slightly greater than the length of the longest printing cylinder which the apparatus is intended to serve. In

use, a printing cylinder 9, providing it is of maximum length, is placed upon and supported by the V bearings 2 and 4 which engage the end shafts 10 and 11 of the cylinder. However, to accommodate cylinders of shorter and variable length, as shown in the drawings, an intermediate movable end stand 12 having a V bearing 13 may be slidably mounted upon the base rods 5 and 6. In this way, support for a cylinder 9 of any length less than the maximum length may be readily provided.

Outside of the end stand 3 and adapted to be removably secured to the end shaft 10 of the cylinder 9 is an indexing disc 14 having an integrally formed, split clamping hub 15 regulated by a clamping screw 16. The indexing disc 14 is furnished with a plurality of radial indexing slots 17, the same being located to be engaged by a spring-pressed indexing pin 18 carried in a mounting bracket 19 secured to the end stand 3.

End stand 3 is further provided with an axial positioning boss 20 disposed opposite the locating pin 18, so as to engage the inside of the disc 14. Cylinder 9 may be thus brought to a predetermined axial position and there maintained by a collar 22 forming a part of the indexing pin 18 which engages the face of the disc 14 at the same time that the end of the pin 18 engages the interior sides of an indexing slot 17. When initially setting up the apparatus and before disc 14 is clamped to shaft 10, cylinder 9 may be positioned by bringing the end thereof into contact with the retractable locating screw 81. As soon as the disc 14 is clamped to the shaft 10, screw 81 may be backed out slightly by a screw driver inserted thru the opening 82 in the disc 14. In this way, cylinder 9 is freed for turning movement without binding. The disc 14 may be shifted to any one of the several predetermined angular positions represented by the indexing slots 17 and there held for the purposes hereafter to be described. It is contemplated that the disc 14 may have indexing slots 17 spaced to divide the circumference into any fractions thereof desired to facilitate the positioning of plates of different sizes.

Slidably mounted upon the rod 7 is an axially-movable guide-mounting 23 formed of a sleeve member 24 having end collars 26 and 27. A swinging arm 25 is rotatably mounted upon the sleeve 24 and held in place by end collars 26 and 27. The end collar 27 has integrally formed therewith an ear 28 having a threaded hole therein engaged by a fine adjusting screw 29. The fine adjusting screw 29 is rotatably held against end-wise movement within a clamping bracket 30. A clamping screw 31 mounted in said bracket 30 may be operated to rigidly clamp the same to the rod 7 in any position as more clearly appears in Fig. 6. In this way the arm 25 may be freely swung in a vertical plane at any time while the guide-mounting 23 may be moved end-wise of the rod 7 only when the clamping screw 31 is released or when the adjusting screw 29 is turned.

Sleeve 24 is provided with an indicating pointer 32 correlated with a divided scale 33 rigidly attached in a milled slot in the upper face of rod 7. Thus with the clamping screw 31 released, the guide-mounting 23 may be moved until the pointer 32 registers with any mark on the scale 33 which is desired. Clamping screw 31 may then be clamped and the final adjustment to the exact position desired may be made by turning the fine adjusting screw 29. If desired, the pointer 32 may be supplemented by a vernier scale to assist the eye in bringing the apparatus to the precise adjusted position which is being sought.



Secured to the outer end of the arm 25 is an adjustable plate and frisket holder 34. The holder 34 comprises a cross member 35 and mounting ears 36 and 37 which are frictionally held against rotation in the end of the arm 25 by a clamping bolt 38. Projecting upwardly from the cross member 35 near one end is a stationary threaded mounting pin 39 while at the opposite end of cross member 35 an upwardly extending, longitudinally-adjustable mounting pin 40 carried upon a slide block 41 is provided. The slide block 41 is transversely bored and threaded to accommodate an adjusting screw 42 rotatably held in an end-plate 43 secured to the end of the cross member 35. The spacing between the mounting pins 39 and 40 is thus capable of adjustment by simple rotation of the screw 42. Knurled units 44 and 45 are provided for the mounting pins 39 and 40 respectively.

In the drawings the cylinder 9 is shown provided with a smooth, continuous surface of the type employed where adhesively-attached non-rigid printing plates are to be used. One manner of use of the apparatus of this invention in connection with printing plates of this type is to secure to the mounting pins 39 and 40 a frisket 47 in the form of a facsimile of the printing face of the plate 46 set forth upon a sheet of transparent cellulosic sheet material. The frisket 47 having been thus secured to the arm 25, a plate 46 is manually held in registry therewith while the arm 25 is in raised position. The operator then carefully lowers the arm 25 while maintaining said registry until the plate 46 comes in contact with the cylinder 9. If the plate 46 in accordance with customary printing technic is furnished on its rear surface with pressure-sensitive adhesive material, the plate 46 is thus guided to and secured upon the surface of the roller 9 in the particular position determined by longitudinal position of the reference point 32 and the circumferential position of the indexing disc 14. One such plate 46 having been thus attached to the cylinder 9, other plates 46 may then be attached in predetermined position with respect to said first plate.

Another manner of use of the apparatus of this invention is illustrated in Fig. 6. Here a plate to be attached to the cylinder 9 and designated by the numeral 46A is provided with a rejectable portion beyond the intended printable area thereof, which rejectable portion is perforated in precise relationship to the type face appearing thereon so as to be received upon the pins 39 and 40. With the arm 25 in raised position, a plate 46A is then carefully lowered until brought into contact with the cylinder 9 and by reason of the pressure-sensitive adhesive is secured thereto. As soon as the attachment of the plate 46A has been thus made, it may be severed by a sharp knife applied as indicated by the broken line carrying the numeral 48. In this way the printing plate 46A is precisely positioned at the time of its attachment to the cylinder 9 without necessity for the operator maintaining registry between the plate and a frisket such as 47.

Rigid metallic printing plates may also be guided in like manner to the surface of a printing cylinder provided with the usual grooves and locking devices by employing either direct attachment to the arm 25 or by the use of a transparent frisket. The plate having been thus transferred to the cylinder, the same may be

locked in place by the customary locking devices in the usual manner. Where direct attachment to the arm 25 is resorted to an adhesively-attached rubber or rubber-like margin strip carried by the pins 39 and 40 and readily separable from the plate itself is preferably employed, but other suitable means of attachment to the arm 25 may be resorted to.

To facilitate ready and rapid location of the positioning means of the apparatus above described in a somewhat different manner, a multiple transparent facsimile or frisket of the type faces of a plurality of properly spaced plates such as is shown in Fig. 7 may be emloyed. In Fig. 7 a frisket 49 is shown secured to the pins 39 and 40 and thus carried upon the arm 25. The frisket 49 carries the facsimiles of three separate printing plates; that is to say, a reference facsimile 50 flanked longitudinallly by a properly-spaced facsimile 51 and flanked circumferentially by a properly-spaced facsimile 52. With such an arrangement and with an original or datum printing plate initially applied at one end of the cylinder 9, all of the remaining plates to be attached may be located with reference thereto without dependence upon the indexing plate 14 or the measuring scale 33, since both longitudinal and circumferential locating measuring means are embodied within the frisket 49 itself. Thus an operator having applied a datum plate, may register one of the facsimiles of frisket 49 therewith by loosening clamping screw 16 to permit rotation of the cylinder 9 to appropriate angular position and by loosening clamping screw 31, to permit movement of the arm 25 to appropriate longitudinal position. The completely defined location having been thus secured, screws 16 and 31 are tightened and a new plate, held in registry with an appropriate facsimile of frisket 49 is then applied to the cylinder 9. This process can be repeated until the cylinder 9 is filled both circumferentially and longitudinally.

Another application of the multiple frisket 49, is its use for the replacement of a plate which may have been removed from the cylinder 9 for any cause. In this case, facsimiles on the frisket 49 are brought into registry with plates on the cylinder 9 adjacent the space occupied by the removed plate with one facsimile of said frisket 49 overlying said space. The arm 25 is then lifted and the new replacement plate while held in registry with that facsimile which overlays the vacated surface is then applied to the cylinder 9. Other variations in the use of the longitudinal and angular measuring means will of course occur to an operator having such means at his disposal for use.

At times it is inconvenient to remove printing cylinders bodily from a press for the purpose of attaching plates, and where this is the case, relative angular and axial measurement and location between a plate about to be applied and a cylinder located in a press may be accomplished by the form of the apparatus of this invention illustrated in Figs. 8, 9 and 10. In Figs. 8 and 9 a fragment of a press stand 53, having a bearing 54 for rotatable mounting of a cylinder 55 is shown. Formed in or attached rigidly to the press stand 53 is a positioning support 56 having a socket 57. On the opposite side of the press but not shown is a similar stand and bearing for support of the opposite end of the cylinder 55 and this stand also has a support and socket corresponding to support 56 and socket 57.

Received within the socket 57 in the press



stand 53, which is shown, is a telescoping spud end 59 of a longitudinal locating rod 58. A non-telescoping opposite end of rod 58, not shown, is received in the corresponding socket in the opposite press stand. The locating rod 58 is thus mounted and held in a position parallel to the axis of the cylinder 55. The spud 59 has an integrally formed shoulder 60 in butting engagement with the side of press stand 53 while its inner end is urged outwardly by a spring 61 received within a bore in the end of rod 58. A keeper pin 62 traversing the spud 59 is accommodated in slots 63 and 64 formed in the rod 58 thus permitting the spud 59 to be withdrawn so that the rod 58 and appurtenances can be removed from the press when not in use.

Slidingly carried upon the rod 58, is a guide-mounting sleeve 65, having end retaining collars 66 and 67. Collar 67 (in a manner corresponding to part 27 above described) is provided with an ear 68 which threadingly receives a fine adjusting screw 69. The screw 69 is in turn rotatably held against end-wise movement in a clamping ring 70 adapted to be clamped to and released from the rod 58 by means not shown. Rod 58 also is provided with graduation marks 71 in position referable to an indicating pointer 72 formed in an aperture in the guide-mounting sleeve 65. Rotatably carried by the sleeve 65 for swinging movement in a vertical plane is a bifurcated arm 73 which is held against end-wise movement with respect to sleeve 65 by the collars 66 and 67.

Attached to the swinging arm 73 near the center of the cross member thereof is an adjustable clamp 74 having an upwardly-facing slot. The sides of the clamp 74 facing the upwardly-facing slot are drilled transversely to provide openings in alinement with one another within which a threaded rod 75 is received. Mounted upon the threaded rod 75 in threaded engagement therewith is a knurled nut 76 closely fitting within the slot in the clamp 74. Mounted upon the outer end of the rod 75 is a plate bearer 77 having mounting pins 78 and 79.

The plate bearer 77 is thus carried upon the swinging arm 73 and is therefore adapted to function to hold a frisket or a plate in the manner described above in connection with the arm 25. With the form of apparatus here described, however, adjustment of the clamp 74 and the nut 76 permits a limited circumferential adjustment to be made in a frisket 80 or a plate which may be carried by the bearer 77. This circumferential adjustment is of special utility where the cylinder 55 remains in the press, since it is convenient to rely upon the gearing of the press as an indexing means for the angular positioning of the cylinder 55 and such existing gearing may not correlate exactly with the angular locations of plates to be attached. As in the case of the apparatus described and shown in Figs. 1 to 7 inclusive, a multiple frisket 80 shown in Fig. 9 may be conveniently employed or the plates may be directly attached to the bearer 77 and conveyed to the cylinder 55 without the use of a frisket.

In the making up of plates to be directly attached to a cylinder without the employment of either a single or a multiple frisket, the location of the perforations to be engaged by the pins 39 and 40 or 78 and 79 can be indicated by the usual registering marks placed upon the plates during the process of their formation. Precision punching apparatus may then be em-

ployed to perforate the plate at the exact locations of the registering marks. In this way, registration of the printing faces of one cylinder with the next may be secured with an accuracy determined only by the precision with which such registering perforations are placed upon the plates and the care with which measurements easily made with the apparatus of this invention are executed by the operator.

I claim:

1. In an apparatus for guiding printing plates to a predetermined position on the surface of a printing press plate cylinder the combination comprising a longitudinal supporting rod positioned lengthwise of said cylinder, a guide mounting sleeve slidable on said rod, means for securing said sleeve to said rod in predetermined position, measuring means including a divided scale and a pointer secured to said sleeve and rod and referable to one another, a swingable guiding arm mounted on said sleeve to swing thereabout, shoulders on said sleeve cooperatively engaging said swingable arm and adapted to hold said swingable arm against endwise displacement with respect to said sleeve, said sleeve being interposed between said swingable arm and said supporting rod precluding wearing contact therebetween, said guiding arm having a free end movable to and from the surface of said cylinder, a cross member pivotally secured to and frictionally held on the free end of said guiding arm swingable with respect thereto about an axis parallel to the swinging axis of said guiding arm, attachment pins mounted on said cross member adapted to pass through openings provided therefor in a printing plate and clamping nuts threadingly engaging said pins.

2. In an apparatus for guiding an object to a predetermined position on the surface of a printing press plate cylinder the combination comprising a longitudinal supporting rod positioned lengthwise of said cylinder, a guide mounting sleeve slidable on said rod, means for securing said sleeve to said rod in predetermined position, a swingable guiding arm mounted on said sleeve to swing thereabout, shoulders on said sleeve cooperatively engaging said swingable arm and adapted to hold said swingable arm with respect to said sleeve, said sleeve being interposed between said swingable arm and said supporting rod precluding wearing contact therebetween, said swingable arm having a free end movable to and from the surface of said cylinder, a cross member pivotally secured to and frictionally held on the end of said swingable arm swingable about an axis parallel to the swinging axis of said swinging arm, and clamping members mounted on said cross member adapted to clamp and rigidly hold an object to be guided to the surface of said printing press plate cylinder.

3. An apparatus in accordance with claim 2 wherein the clamping means on the cross member comprise a stationary threaded locating pin projecting from said cross member near one end thereof, a clamping nut in threaded engagement therewith, a longitudinal guide-way on the opposite end of said cross member, a sliding block slidable in said guide-way, a screw in rotatable engagement with said cross member and in threaded engagement with said sliding block adapted upon turning to adjustably position said sliding block longitudinally with respect to said cross member, a second threaded locating pin secured to said sliding block to move therewith, and a second clamping nut threadingly engaging said second locating pin.

JOSEPH S. DANIELS.

**REFERENCES CITED**

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

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 1,070,669 | Cundall | Aug. 19, 1913 |
| 1,139,984 | Leethem | May 18, 1915 |
| 1,251,516 | Hardesty | Jan. 1, 1918 |
| 1,555,105 | Dausmann | Sept. 29, 1925 |
| 1,583,825 | Davis | May 11, 1926 |
| 1,662,830 | Lund | Mar. 20, 1928 |
| 1,668,592 | Huebner | May 8, 1928 |
| 1,786,325 | Young | Dec. 23, 1930 |
| 1,832,255 | Springstead | Nov. 17, 1932 |
| 1,911,442 | Earl | May 30, 1933 |
| 1,965,216 | Brown | July 3, 1934 |
| 2,091,280 | Huebner | Aug. 31, 1937 |
| 2,095,542 | Claybourn | Oct. 12, 1937 |
| 2,104,553 | Claybourn | Jan. 4, 1938 |
| 2,131,323 | Huebner | Sept. 27, 1938 |
| 2,231,187 | Hawley | Feb. 11, 1941 |
| 2,249,245 | Hoffrichter | July 15, 1941 |
| 2,417,496 | Huebner | Mar. 18, 1947 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 354,375 | Great Britain | Aug. 10, 1931 |