

July 20, 1954

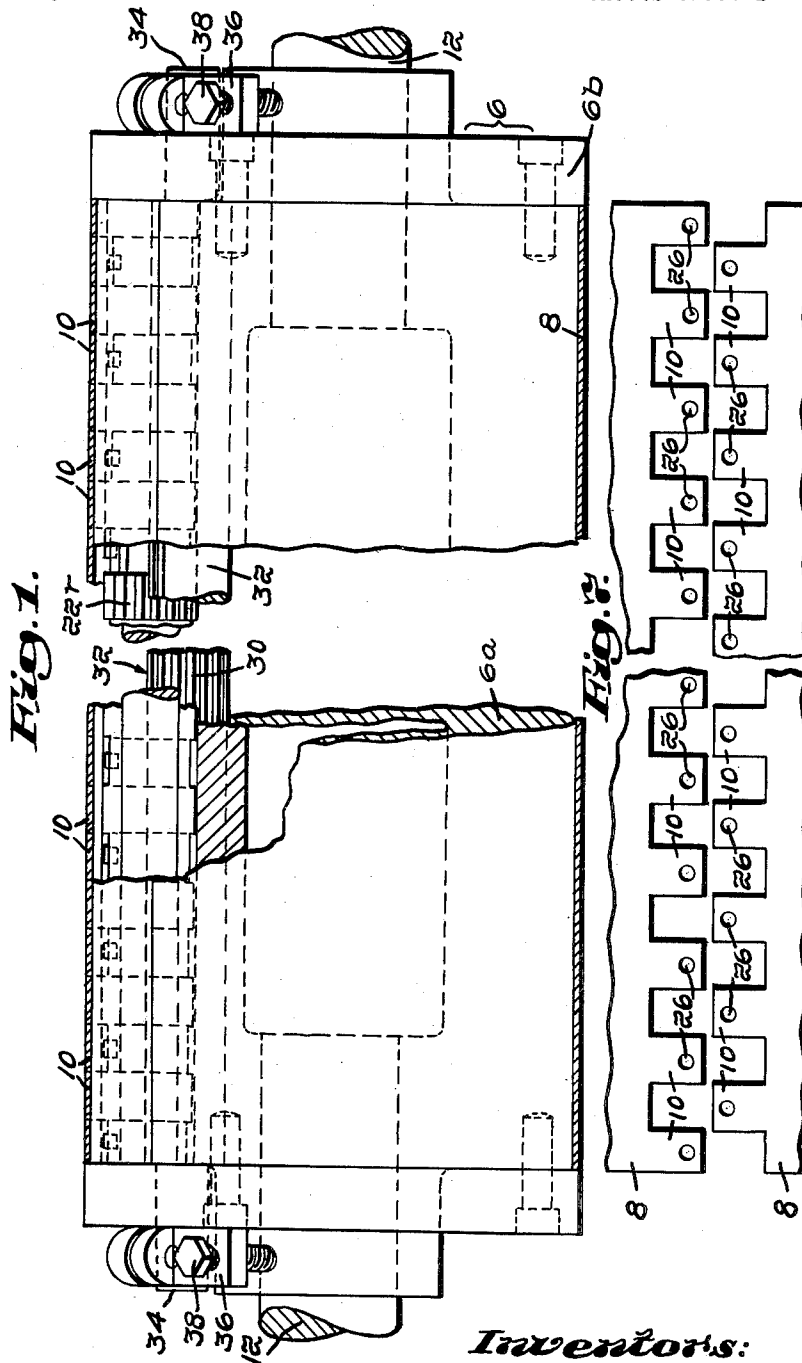
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2,684,029

PLATE CYLINDER FOR PRINTING PRESSES

Filed May 19, 1953

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

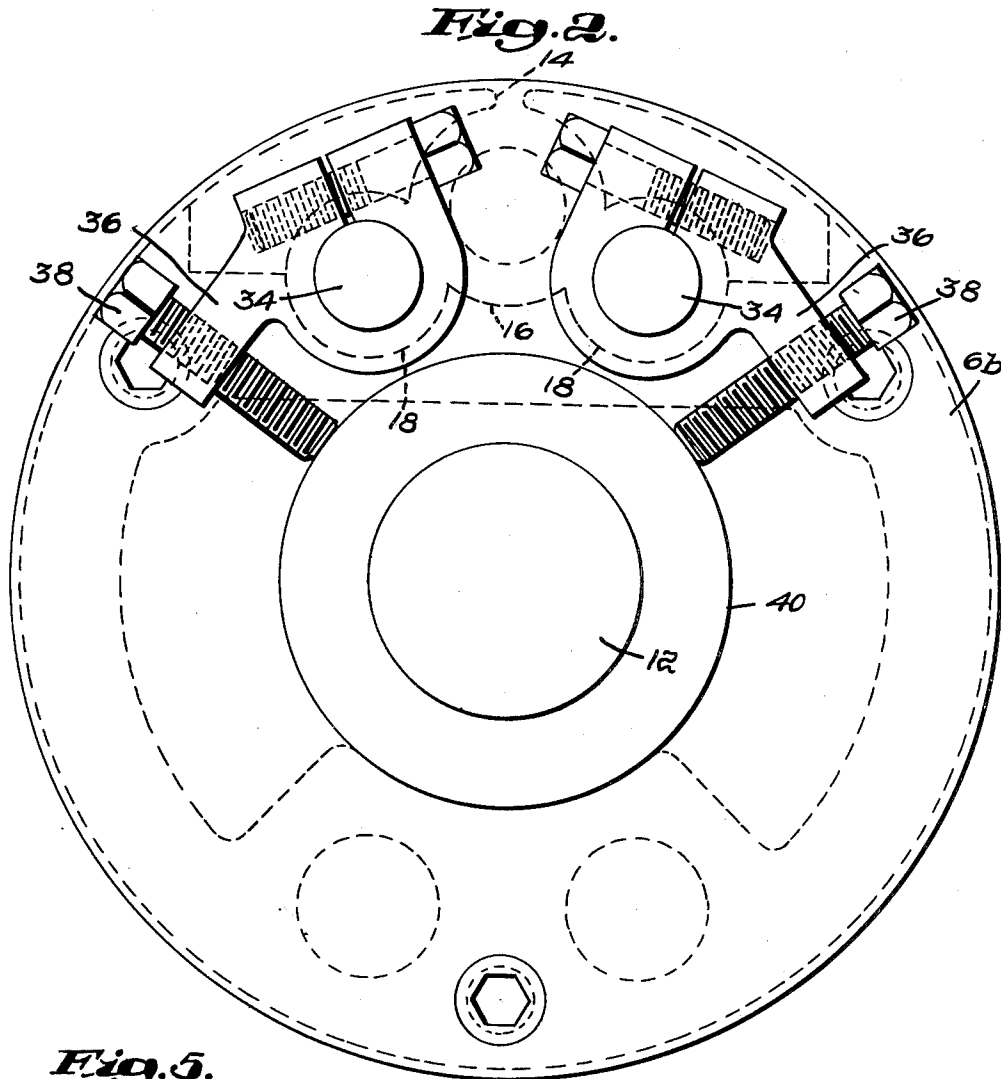


Fig. 5.

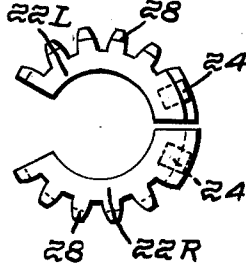
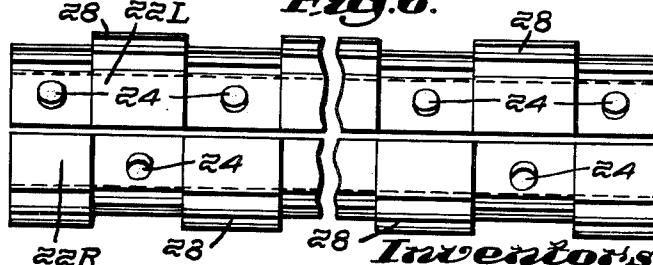


Fig. 6.



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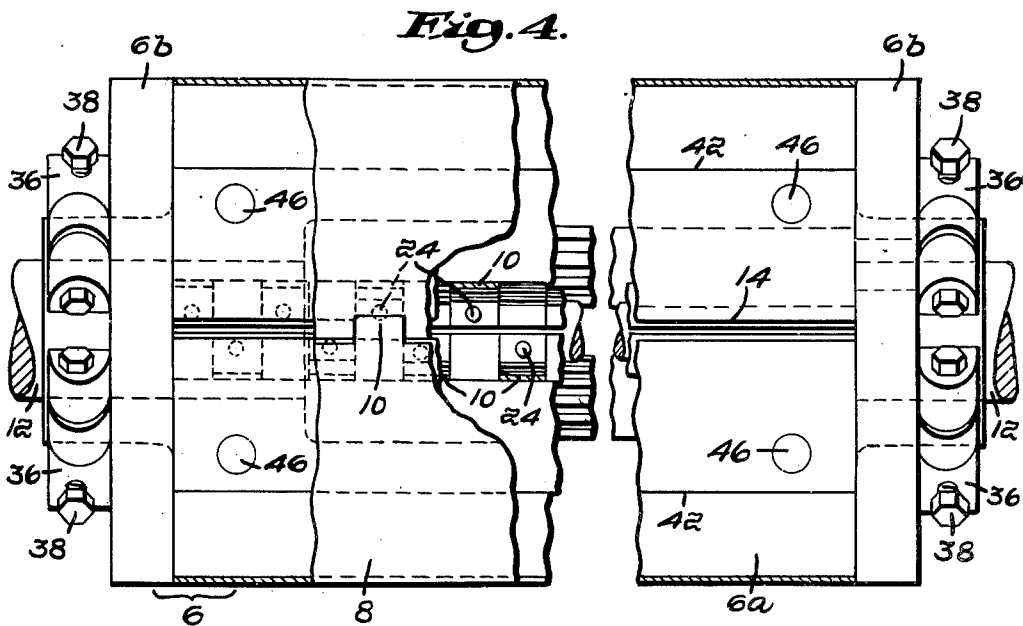
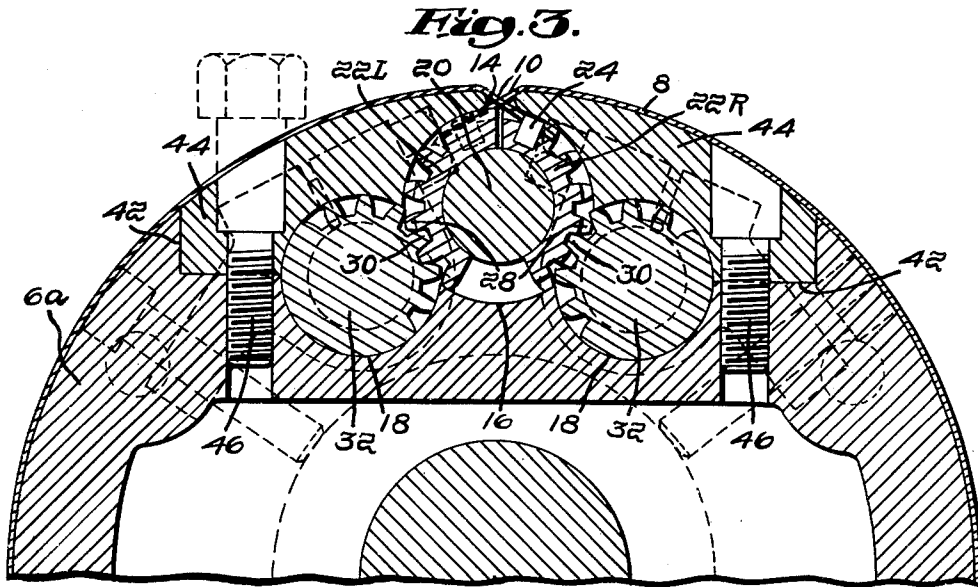
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PLATE CYLINDER FOR PRINTING PRESSES

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,684,029

PLATE CYLINDER FOR PRINTING PRESSES

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Application May 19, 1953, Serial No. 355,976

5 Claims (Cl. 101-415.1)

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This invention relates to printing cylinders and more particularly to the construction thereof providing for securing printing plates about their surfaces. The object of the invention is to provide a simple and efficient construction for clamping the adjacent ends of the plate or plates with which the cylinder is clothed and for tensioning them. In particular we provide a compact arrangement permitting the clamping to be effected with a minimum loss of space at the surface of the cylinder between the plate ends and without any sharp bending of the plates. From one point of view the construction may be considered as an improvement on that disclosed in Patent 2,109,152, February 22, 1938.

Our invention will be well understood by reference to the following description of the illustrative embodiment thereof shown by way of example in the accompanying drawings, wherein—

Fig. 1 is a side elevational view of the cylinder partly broken away;

Fig. 2 is an end elevation;

Fig. 3 is a partial transverse section;

Fig. 4 is a plan partly broken away;

Fig. 5 is an end view of certain elements;

Fig. 6 is a side view of the same as seen from the right of Fig. 5; and

Fig. 7 is a fragmentary plan view of the ap-
posed ends of the printing plate in separated
relation.

Referring to the drawing, we have there shown a cylinder 6 about which is secured a printing plate 8 and for convenience in the following description we may assume that a single plate covers substantially the entire periphery of the cylinder, its two ends being presented adjacent to each other and secured although, as will be obvious, more than one plate may be applied to the cylinders and the adjacent ends of two plates secured in the manner about to be described.

In the preferred form of the invention the ends of the plate 8 (see Fig. 7) are provided with projecting fingers 10 in alternating or staggered position at the two ends so that when the two ends are presented to each other the fingers on one end may pass into the spaces between those on the other end in interdigitated relation, and thus the ends of the main body of the plate may be brought into close proximity. The fingers may be deflected inwardly from the periphery of the cylinder to cross, as indicated in Fig. 3, slightly within the periphery of the cylinder and have their distal ends secured at the further side of the line of crossing to suitable tensioning means as hereinafter discussed.

The cylinder which is shown herein comprises a main body portion 6a, having at its ends the shaft extensions 12 and end plates 6b of slightly larger diameter than the body 6a and constituting

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ing bearers. One at least of the end plates 6b is readily removable for a reason which will appear, and both are herein shown as secured by screws.

The body portion 6a has a narrow slot 14 extending longitudinally thereof at one point of its circumference, the slot corresponding to a geometric "element" of the cylinder. This slot opens directly to a recess the radially outermost portion of which is closely adjacent the periphery of the cylinder. This recess might be described as comprising three intersecting bores of circular cross section and parallel to the axis of the cylinder, an outward and central bore 16, the center line of which is directly radially beneath the slot 14, and two inward lateral bores 18. Tangent circles about the centers of the bores correspond to gear pitch lines, as will appear.

In the outward bore 16, and received between the end plates 6b, is a shaft-like cylinder 20 which provides a bearing on which two segmental shells 22L and 22R rest and which may turn in the bore 16 about the cylinder 20. The shells are shown separately in Figs. 5 and 6. In cross section the general enveloping contour of each of these shells is that of a segment of a circular annulus less than 180° in extent. The inner surfaces are cylindrical and turn on the bearing member 20. They can thus turn independently about the same center line. The surfaces of the shells are grooved at intervals to receive the fingers 10 of the plate and in the grooves are projections 24 to take into openings 26 in the fingers, best seen in Fig. 7.

If the shells are turned in opposite directions 22L counterclockwise and 22R clockwise viewing Fig. 3, the projections move away from each other and draw on the ends of the plate 8. To effect this movement the other ends of the shells are provided in the spaces between the grooves with segmental series of gear teeth 28. Cooperating gear teeth 30 are cut on at least a portion of the periphery of two driving members 32 which are housed in the laterally inward bores 18. Preferably the teeth 30 cover only a portion of the periphery of these members and the remaining portion of the peripheries bear on the walls of the bores 18. The shells 22 and their bearing member 20 are supported and suspended by these lateral drivers 32.

To operate the drivers 32 one or preferably both ends thereof may have a central extension 34 through an end plate 6b to the exterior of the cylinder considered as a whole. An arm 36 secured thereto is traversed by a jack-screw 38 which may bear on one of the enlarged hub-like extensions 40 of the end plates 6b and provides for rocking the arm and turning member 32. The screw provides a micrometric adjustment and the gear connection transmits it to the segment

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22 which is thereby rotated in any necessary amount for producing the desired amount of tension.

The body portion 6a of the cylinder may for convenience of manufacture be formed of three portions. One, in the case of a printing cylinder having take-up means at only one point of its periphery, is of generally cylindrical contour interrupted by a channel 42, the bottom of which is shaped to define inner portions of the three bores, as is apparent from Fig. 3. Removable elements 44 are fitted into the channel and have overhanging portions which cooperate with said bottom to define the rest of the bores, and the extremities of the overhanging portions are slightly spaced from each other to define the entrance slot 14. Their exterior surfaces continue and complete the cylindrical contour. These members 44 may be secured in position by means of the screws 46 which, after they have been driven in, may be cut off at the cylindrical surface as indicated by the showing of parts of them in dotted lines at the left of Fig. 3, after which the entire cylinder is turned or ground to its final size and finish. If one of the end plates 6b is removed the bearing 20 and the shells 22 which rest thereon and the two drivers 13 may be withdrawn longitudinally of the cylinder for any desired purpose, and may be replaced in a similar manner.

While it is of course not literally true that the pitch line of the shells 22 is internally tangent to the periphery of the cylinder at the location of the slot 14, it approximates such a construction, having in mind that the portions of the elements 44 at either side of the slot must have sufficient rigidity to prevent them from being distorted in use. The projections 24, when in the position where they most nearly approach one another, are very close to such a point of internal tangency or, to put it in another way, they are very close to the slot. The fingers 10 may thus be very short and are easily engaged over the projections. The slot 14 for the same reason can be very narrow and practically the full circumference of the cylinder may be utilized for printing without the necessity of providing any but the narrowest of margins.

While they are not limited to such use the cylinder shown has been found particularly adaptable to use in connection with magnesium plates printing by the dry offset process. Such plates cannot be bent cold and if they are heated to permit bending they are likely to be distorted. A slight deflection provided at the fingers 10 is however possible without such heat.

We are aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and we therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claims to indicate those principles of the invention exemplified by the particular embodiment described and which we desire to secure by Letters Patent.

We claim:

1. A printing press cylinder providing means for clamping thereto intersecting plate ends having series of interdigitated fingers, the cylinder having a narrow longitudinal slot along its periphery opening to an internal recess closely ad-

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jacent its periphery, a cylindrical bearing member in said recess, segmental shells supported on said bearing member having at their adjacent ends means for engaging the plate fingers and beyond said means having gear teeth, cylinders laterally disposed in the recess having teeth cooperating with those on the shells and means accessible from the exterior of the press cylinder for adjustably rotating the lateral cylinders.

2. A printing press cylinder providing means for clamping thereto intersecting plate ends having series of interdigitated fingers, the cylinder having a narrow longitudinal slot along its periphery opening to an internal recess closely adjacent its periphery, devices received in said recess arranged for independent movement about a common center line in the radial plane of the slot, said devices having means at their adjacent ends for engaging the plate fingers and means accessible at the exterior of the cylinder for rotating the members to separate said means.

3. A printing press cylinder providing means for clamping thereto intersecting plate ends having series of interdigitated fingers, the cylinder having a narrow longitudinal slot along its periphery opening to an internal recess closely adjacent its periphery, devices received in said recess arranged for independent movement about a common center line in the radial plane of the slot, said devices having means at their adjacent ends for engaging the plate fingers and means accessible at the exterior of the cylinder for rotating the members to separate said means, said means comprising a gear connection and screw-operated means for turning the driving element thereof.

4. A printing press cylinder providing means for clamping thereto intersecting plate ends having series of interdigitated fingers, the cylinder comprising a main body having a narrow longitudinal slot, and a circular bore extending from end to end of the body closely adjacent the periphery thereof to which the slot opens radially, end plates closing the end of the bore, a cylindrical bearing member and segmental shells fitted on the same disposed between said end plates in the recess, means on the adjacent ends of the shells for engaging said fingers and means accessible from the exterior of the press cylinder for independently adjustably rotating said shells about the center line of the bore.

5. A printing press cylinder providing means for clamping thereto intersecting plate ends having series of interdigitated fingers, the cylinder comprising a main body having a narrow longitudinal slot and a recess beneath the slot formed by three intersecting circular bores extending from end to end of the body and defining cooperating pitch circles, a central and outward bore closely adjacent the periphery of the cylinder to which the slot opens radially, and lateral more inward bores, end plates closing the bores, toothed segmental members in the outward bore confined between said end plates, moving independently along one of the pitch circles and having means for engaging the fingers and toothed members rotatably received in the inward bores having teeth meshing with those of the segmental members, said latter members having parts extending through at least one of the end plates whereby they may be adjustably rotated from the exterior of the cylinder.

No references cited.