June 6, 1944. A. J. CARPENTER, JR 2,350,585

PLATE CYLINDER CLAMPING MEANS FOR CYLINDER PRINTING PRESSES

Filed Aug. 20, 1942 3 Sheets-Sheet 1

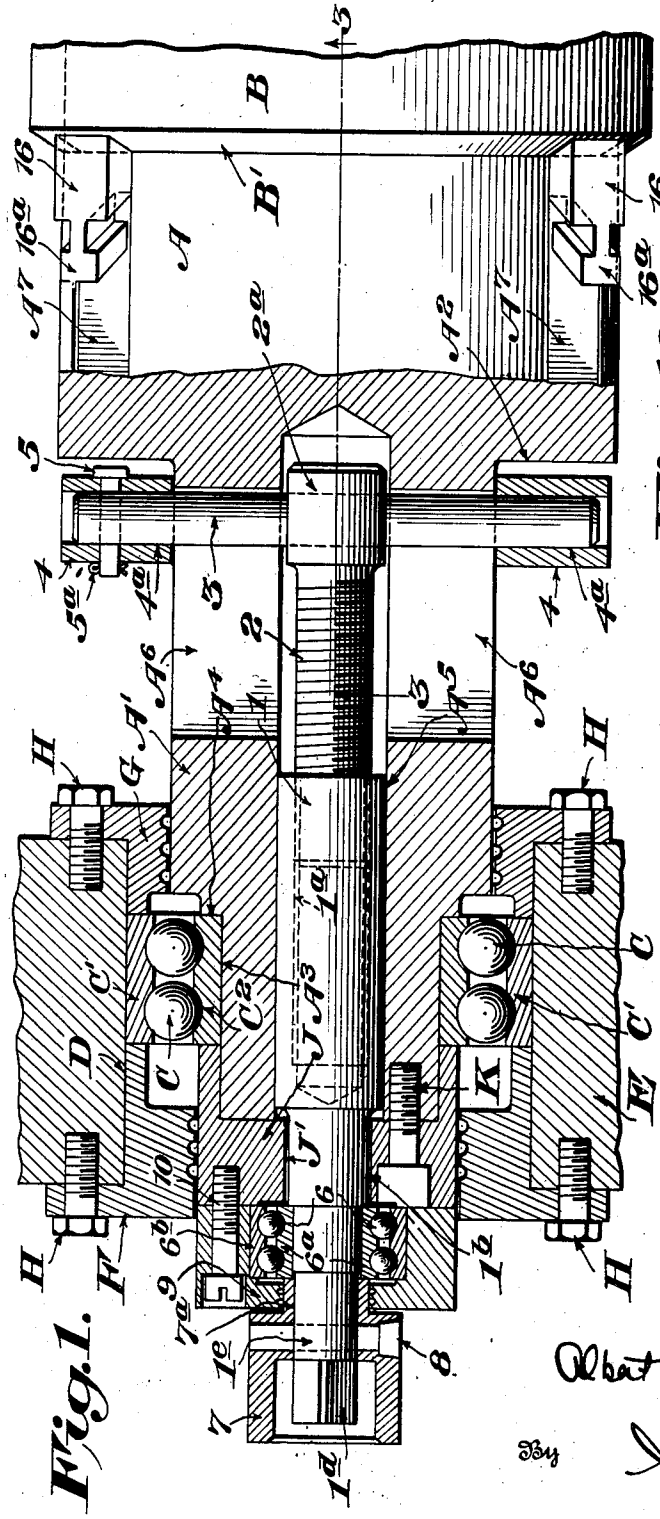


Fig. 1.

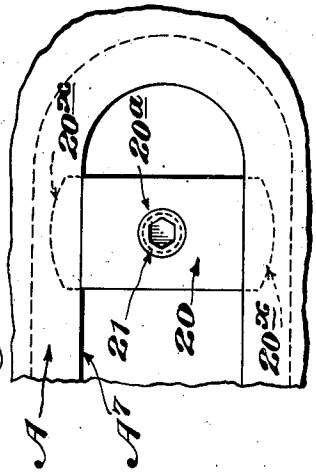


Fig. 10.

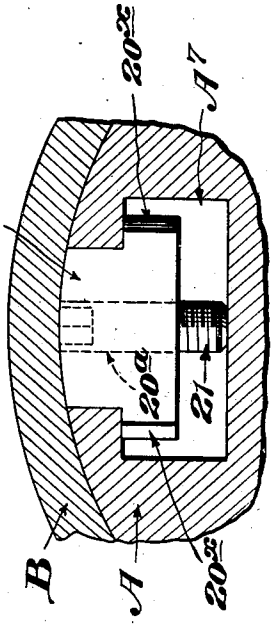


Fig. 9.

Inventor

Albert J. Carpenter, Jr.

By Bowden & Wood

Attorneys

June 6, 1944. A. J. CARPENTER, JR 2,350,585

PLATE CYLINDER CLAMPING MEANS FOR CYLINDER PRINTING PRESSES

Filed Aug. 20, 1942 3 Sheets-Sheet 2

Fig. 2.

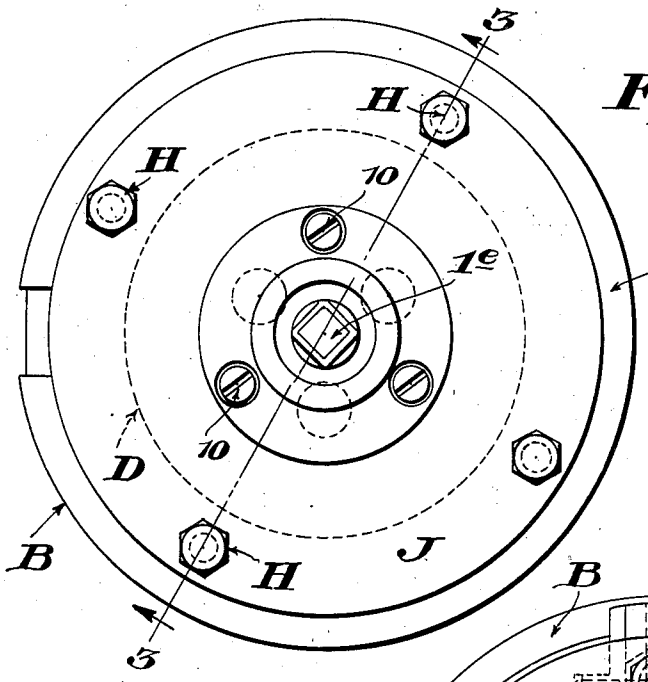


Fig. 4.

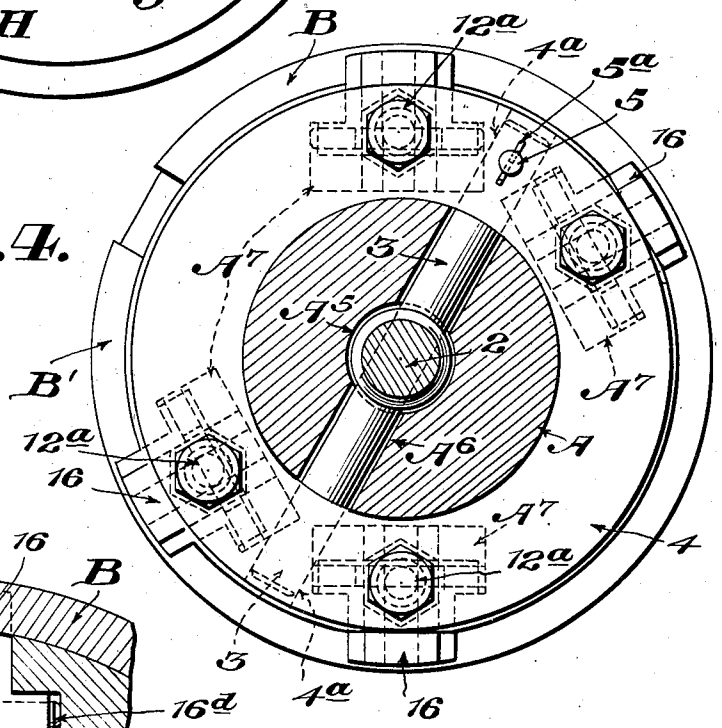
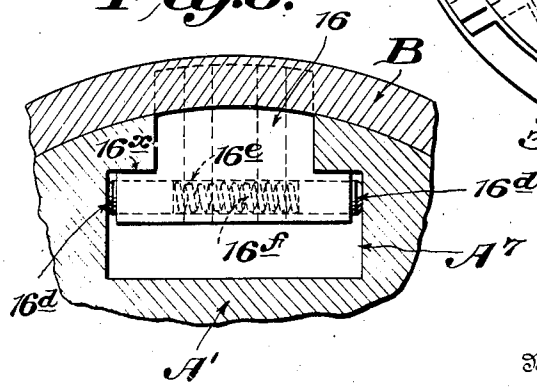


Fig. 8.



Inventor

Albert J. Carpenter, Jr.

By

Attorneys

June 6, 1944. A. J. CARPENTER, JR 2,350,585

PLATE CYLINDER CLAMPING MEANS FOR CYLINDER PRINTING PRESSES

Filed Aug. 20, 1942 3 Sheets-Sheet 3

Fig. 3.

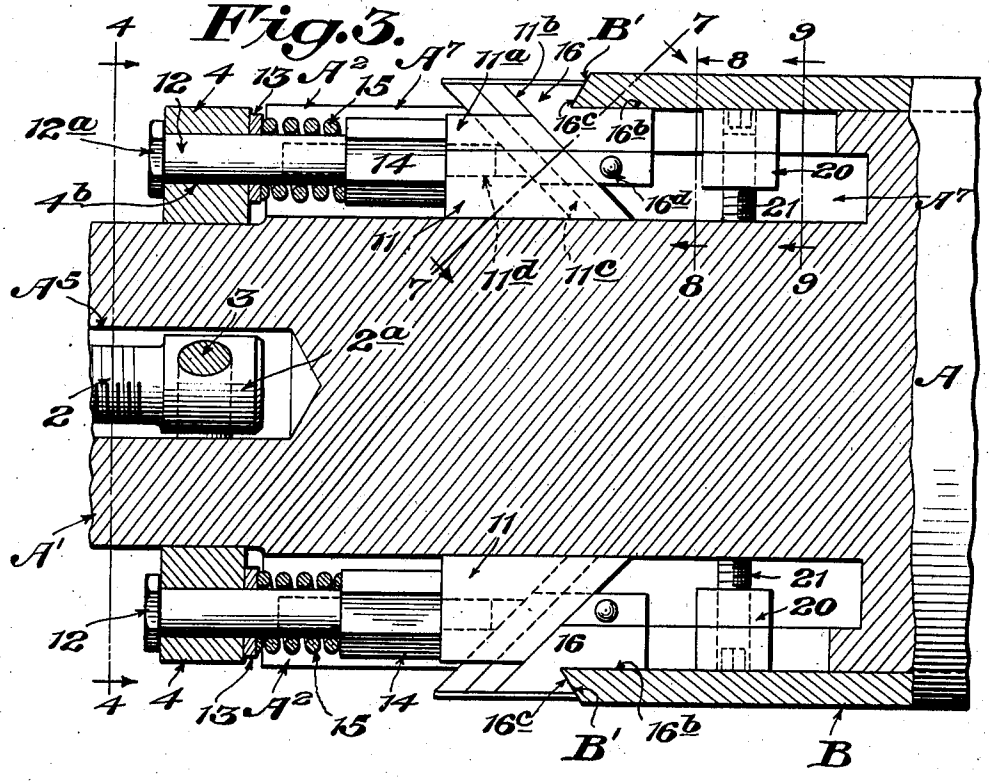


Fig. 5.

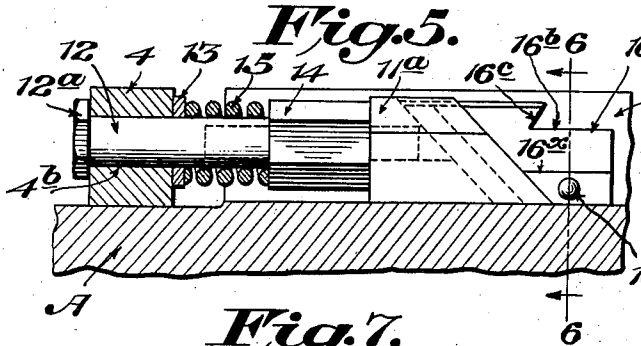


Fig. 6.

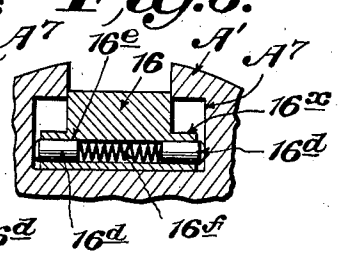
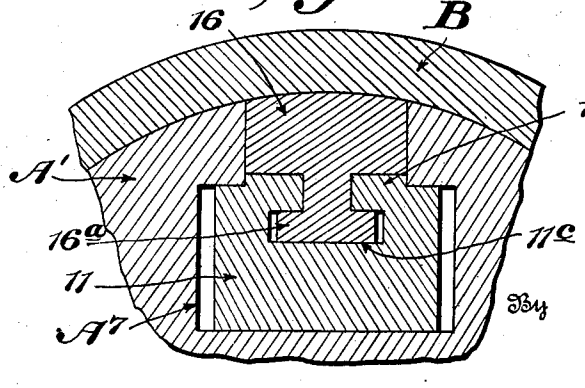


Fig. 7.



Inventor

Albert J. Carpenter, Jr.

By Alexander Darrell

Attorneys

Patented June 6, 1944 2,350,585

UNITED STATES PATENT OFFICE

2,350,585

PLATE CYLINDER CLAMPING MEANS FOR CYLINDER PRINTING PRESSES

Albert James Carpenter, Jr., Battle Creek, Mich., assignor to The Duplex Printing Press Company, Battle Creek, Mich., a corporation of Michigan

Application August 20, 1942, Serial No. 455,493

17 Claims. (Cl. 101—378)

This invention is a novel stereotype plate clamping means for the plate cylinders of cylinder printing presses adapted to hold thereon in a positive manner printing plates of arcuate length sufficient to extend more than half way around the plate cylinder. Such stereotype plates must be entered on and removed from the plate cylinders by slipping same over an end thereof, and therefore necessarily require the use of clamps which can be retracted below the plate supporting surfaces of the plate cylinder.

One object of the invention is to provide a novel and efficient clamping means applicable to a reduced end of the plate cylinder and including a plurality of retractible plate clips mounted in slots in the plate supporting surface of the cylinder, said clips being simultaneously operable by a single element to retract all the clips from plate engaging position into retracted position within the slots of the cylinder, and vice versa, said single means comprising a jack screw mounted in the reduced journal of the plate cylinder and projecting beyond the end thereof, the jack screw being held against axial movement in said journal and operating a ring slidably mounted on the reduced end of the plate cylinder, whereby when a wrench is applied to the jack screw, the jack screw will be rotated and the ring will be moved axially of the cylinder, the ring simultaneously actuating all of the clip actuators of the plate clips, which latter clamp the stereotype plate to the plate cylinder at the reduced end thereof. My invention thus provides a single wrench lock-up having a range of motion and sturdiness of parts not found in other lock-up mechanisms; and also provides a single point lock-up positioned at the end of the plate cylinder journal, the actuating jack screw being housed within the plate cylinder journal and moving the entire clip assembly, giving a range of motion thereto limited only by the length of the jack screw.

Another object of the invention is to provide a series of plate clip assemblies operable by a single movable ring in such manner as to permit clamping any length of stereotype plate on the cylinder within the range of ring motion, means being provided whereby the first movement of the clips when the ring is moved toward the plate will be upwardly out of the slots and subsequent movement in said direction will move the clips inwardly into clamping position; also when the ring is moved away from the plate the initial movement of the clips will be downwardly into the slots below the plate supporting surface of the cylinder and subsequent movement in said direction will move the clips away from the plate, thus rendering it unnecessary to operate the clip assemblies over the full range of motion permitted by the jack screw during either the locking or unlocking operations.

A further object of the invention is to provide novel movable filler blocks for use in the slots in the plate cylinder, whereby the cylinder may be made to receive a multiplicity of plate lengths. When clamping relatively long plates on the cylinder there would be unused portions of the slots in the plate cylinder below the stereotype plate which slots normally house the plate clips. My filler blocks however may be fitted into the slots, said blocks being shaped exteriorly to match the cylinder body, and being provided with means for holding the blocks in the slots so that the outer surfaces of the blocks will be flush with the cylinder body to prevent bending or warping of the overlying stereotype plate during printing operations.

I will explain the invention with reference to the accompanying drawings, which illustrate one practical embodiment thereof, to enable others familiar with the art to adopt and use the same; and will summarize in the claims the novel features of construction, and novel combinations of parts, for which protection is desired.

In said drawings—

Fig. 1 is a longitudinal section partly in elevation, showing my novel plate clamping means applied to the reduced end and journal of the plate cylinder of a printing press, and showing the plate clips in clamping position with respect to the stereotype plate, but omitting for the sake of clarity the clip actuators.

Fig. 2 is an end elevation of the parts shown in Fig. 1.

Fig. 3 is a longitudinal section on the line 3—3, Fig. 2, showing the plate clips in clamping position, also showing the clip actuators.

Fig. 4 is a transverse section on the line 4—4, Fig. 3.

Fig. 5 is a fragmentary section, similar to Fig. 3, but showing the plate clips retracted into their slots in the plate cylinder, said clips being in unlocking position.

Fig. 6 is a transverse section on the line 6—6, Fig. 5.

Fig. 7 is a transverse section on the line 7—7, Fig. 3.

Fig. 8 is a transverse section on the line 8—8, Fig. 3.

Fig. 9 is a transverse section on the line 9—9, Fig. 3.

Fig. 10 is a plan view showing one of the filler blocks positioned within a T-slot of the plate cylinder, the overlying portion of the stereotype plate being omitted.

The plate cylinder A is adapted to slidably support arcuate stereotype printing plates B of usual substantially tubular form extending more than half way around the circumference of cylinder A so that same must necessarily be slipped over the end of cylinder A when inserting the plate thereon or removing the plate therefrom. One end of plate cylinder is provided with the usual fixed plate engaging device (not shown), the opposite end of cylinder A (shown in Figs. 1 and 3) being provided with a series of spaced plate clamping clips designed to engage the adjacent beveled edge B' of stereotype plate B in the usual manner, and with mechanism actuated by a single element whereby the series of plate clips may be simultaneously projected into plate clamping position, or may be retracted simultaneously below the plate supporting surface of cylinder A so as to permit stereotype plate B to be readily inserted or removed from cylinder A by slipping over the end of said cylinder.

As shown, plate cylinder A forms a plate supporting surface in direct contact with the tubular stereotype plate B, and one end of cylinder A is reduced in diameter as at A' to permit installation of my plate clamping mechanism, thereby providing a squared shoulder A2 between the portion A' and the main body of the cylinder.

Beyond the reduced portion A' is a further reduced journal portion A3 of the plate cylinder A carrying antifriction bearing C disposed between the portion A3 and the walls of an opening D in the press frame E, the outer race C' of said bearing being held against axial movement by rings F and G secured by bolts H to the frame E as shown, while the inner race C2 of bearing C is held against axial movement by the shoulder A4 formed between the reduced portions A' and A3 and a ring J secured by screws K or the like passing therethrough and into the end A3 of the plate cylinder journal.

The reduced portions A' and A3 of the plate cylinder journals are provided with an axial bore A5 housing a rotatable actuating member 1 having a tapped bore 1*a* at its inner end receiving the threaded end of a jack screw 2 also housed within the bore A5, said screw 2 having a head 2*a* in which a cross-rod 3 extends, said cross-rod passing through diametrically opposed slots A6 in the reduced portion A' of the plate cylinder and having its ends entering opposed bores 4*a* in a ring 4, which ring is slidably mounted upon the reduced portion A' between frame E and the shoulder A2 of plate cylinder 2, a pin 5 transfixing one end of cross-rod 3 and passing through the ring 4 and carrying a cotter pin 5*a* or the like as shown in Figs. 1 and 4.

Actuating member 1 is rotatably mounted within bore A5 but is prevented from axial movement therein, said member having a reduced portion 1*b* passing through an axial bore J' in the ring J and having a further reduced portion 1*c* beyond the portion 1*b* upon which is mounted an antifriction bearing 6, the inner race 6*a* of which is confined between the shoulder formed between the reduced portions 1*b*—1*c* and the hub 7*a* of a guard 7 which encloses the outer non-circular wrench engaging end 1*d* of actuating member 1, the inner periphery of guard 7 being of sufficiently large diameter to permit a socket wrench or the like to enter the guard and to engage the non-circular end 1*d*. The inner end of hub 7*a* of the guard bears against the adjacent end of the inner race 6*a* of antifriction bearing 6, said hub being fixed in position by a pin 8 or the like transfixing the hub and further reduced portion 1*e* of the member A upon which the hub is mounted. The outer race 6*b* of antifriction bearing C seats at one end against the ring J while its other end is engaged by a ring 9 secured by screws 10 or the like passing through ring 9 and into the ring J as shown in Fig. 1.

By the above construction, actuating member 1 is rotatably mounted within the bore A5 of the plate cylinder journal but is prevented from axial movement thereof. When a socket wrench is applied to the end 1*d* of the actuating member the latter may be rotated, thereby shifting the jack screw 2 and thereby moving the ring 4, to which ring each of the plate clip actuators is attached as hereinafter described, the ring 4 being moved along the reduced portion A' of the cylinder according to the direction of rotation of the actuating member 1. Thus the above mechanism provides a single wrench lock-up, the same having a relatively long range of motion, and having exceptional sturdiness of parts in the lock-up mechanism.

The plate supporting surface of cylinder A adjacent shoulder A2 is provided with a plurality of spaced T-slots A7 parallel with the axis of the plate cylinder A, said slots being shown more particularly in Figs. 6 and 7, said slots opening through the shoulder A2. Four such T-slots are shown in Fig. 4; however, a greater or less number of slots may be used. Ordinarily however four such slots would be sufficient. In each slot A7 is a clip actuator 11 of such thickness at its sides that same will make a sliding fit within the lower wider portion of the slot A7, as shown in Fig. 7, said actuator 11 however being of somewhat narrower width than the lower wider portion of the slot A7. Each actuator 11 has an outer narrower central portion 11*a* slidably engaging the outer narrower portion of the slot A7, whereby the actuator is slidably mounted in the slot but is prevented from lateral movement therein.

The inner end 11*b* of each actuator 11 is inclined inwardly away from the ring 4 and towards the axis of plate cylinder A as shown in Figs. 3 and 5, and in the inclined face thereof is a T-slot 11*c* (Fig. 7) having its wider portion innermost, said T-slot 11*c* extending from the lower to the upper edge of the actuator 11 and being disposed axially thereof.

Each actuator is provided with a tapped bore 11*d* in its outer end receiving the threaded end of a bolt 12 passing through a bore 4*b* (Fig. 3) in ring 4, said bolt having a head 12*a* on its outer end. A washer 13 around the bolt 12 engages the inner face of ring 4, and a spacing sleeve 14 is provided upon bolt 12 between the actuator 11 and the washer 13. On bolt 12 between the washer 13 and the sleeve 14 is a coiled compression spring 15 normally urging the actuator 11 inwardly of the slot A7 so that the bolt head 12*a* will contact the outer face of ring 4. The length of the sleeve 14 controls the compressive strength of spring 15. Each of the slots A7 contains a similar actuator 11 similarly mounted therein so that the single unslidable ring 4 will simultaneously control each of the clip actuators 11.

Mounted in the T-slots 11c of each actuator 11 is a clip 16 (Figs. 3 and 7) having a T-projection 16a slidably engaging the T-slot 11c, whereby the clip 16 will be moved upwardly or downwardly in the slot A7 with respect to the actuator 11 as the latter is moved axially of the slot A7 due to the angularity of the inclined face 11b of the actuator, the upper portion of each clip 16 being of width slightly less than the upper or smaller portion of the T-slot A7 as clearly shown in Fig. 7, while the lower portion of each clip is of greater width and movable within the lower wider portion of T-slot A7 as shown in Fig. 6. The upper inner corner of each clip A7 is cut out as at 16b a depth somewhat less than the thickness of stereotype plate B, and the inner end 16c of the cut out 16b is beveled to correspond with the bevel B' at the end of stereotype plate B, whereby when the clips are in the position shown in Fig. 3 the edge 16c will overlap the beveled edge B' of stereotype plate B, while the bottom of the cut out 16b will overlie and support the adjacent portion of the said plate B as clearly indicated in Fig. 3. The depth of each clip 16 is such that when the bottom of the clip contacts the bottom of slot A7 as shown in Fig. 5, the upper edge of the clip will lie entirely below the surface of the plate cylinder A, the clip being thus housed completely within the slot A7.

In order to effect the desired movement of the clips 16 when the actuators 11 are shifted, I provide means for producing a drag against movement of the clips 16, the same consisting of friction plugs 16d (Fig. 6) projecting from the ends of a transverse bore 16e in the lower wider portion of each clip 16 which is confined within the lower wider portion of the slots A7 by the shoulders 16x, said plugs 16d being urged into frictional contact with the sides of the slots A7 by a spring 16f interposed between the plugs in the bores 16e, as clearly indicated in Figs. 6 and 8, said plugs 16d thereby setting up a frictional drag against the side walls of the slots A7, said opposing axial movement of the clips 16 in said slots A7. Since each clip 16 is fitted to the T-slot 11c of the clip actuating member 11, which T-slot 11c is disposed at an angle to the line of movement of the actuator, the drag set up by the friction plugs 16d will cause the clip 16 to move initially upwardly within the T-slot A7 until the shoulders 16x contact the top of the lower wider portion of the T-slot A7, and then to move inwardly with the actuator 11 when the actuator 11 is moved inwardly towards the stereotype plate B, and to move initially downwardly of the slot A7 until the bottom of the clip 16 engages the bottom of the slot A7 and then to move outwardly with the actuator 11 when the actuator is retracted outwardly away from the stereotype plate B.

Since all of the actuators 11 are operated simultaneously by the single ring 4, when said ring is moved inwardly towards the stereotype plate B by the jack screw 2, each spring 15, washer 13, sleeve 14 and clip actuator 11 will be correspondingly moved towards the plate, and due to the drag of the plugs 16d each clip 16 is initially moved upwardly out of the clot A7 and subsequently moved inwardly into clamping position with respect to stereotype plate B as shown in Fig. 3, the springs 15 allowing all the clips 16 to apply approximately equal pressures on the stereotype plate. When the ring 4 however is moved away from the plate B by movement of the jack screw 2, all of the bolts 12 and clip actuators 11 will be moved therewith, but the drag set up by the pins 16d of the clips will cause each clip 16 to initially move downwardly into the slot A7 below the plate cylinder body A as shown in Fig. 5 so that the stereotype plate B can be removed from the plate cylinder over the tops of the clips 16 which are at that time housed within the slots A7 below the surface of the cylinder A.

My mechanism allows clamping any length of plate B on the cylinder within the range of motion of the clip actuators 11 since the first movement of the clip 16 when the ring 4 is moved towards the plate is to shift same upwardly into clamping position and then the clip 16 moves toward the plate into clamping position shown in Fig. 3. When the ring 4 is moved in the opposite direction the first movement of the clip 16 is downwardly within the slots A7 below the cylinder body. Thus for this reason it is unnecessary to operate the lock-up motion over its full range for either the locking or unlocking operations.

As shown the T-slots A7 extend inwardly a considerable distance from the shoulder A2 of the plate cylinder, so that the plate cylinder can be utilized for multiplicity of plate lengths, and therefore when relatively long stereotype plates B are mounted on the cylinder considerable lengths of unused portions of the T-slots A7 are covered thereby. To support the plate B over said unused portions of slots A7 filler blocks 20, Figs. 3, 9 and 10 are used, said blocks 20 being substantially T-shaped having upper portions when in position adapted to fit within the narrower upper portions of the slots A7 as shown in Figs. 9 and 10, said blocks 20 being of less width than the narrower upper portions of the slots and having lugs 20x at their ends adapted to enter the lower or wider portions of the slots A7, as shown, said blocks carrying screws 21 fitted in tapped bores 20a at the centers of the blocks, said screws having non-circular tool engaging sockets in their upper ends whereby a tool can be inserted into the upper ends of the screws 21 in order to screw same downwardly to engage the bottom of the T-slots A7, thereby raising the projecting end portions 20x of the blocks 20 until they engage the tops of the wider lower portions of the slots A7, as clearly shown in Fig. 9, in which position the upper end of the filler blocks will conform with the curvature of the plate engaging portion of the cylinder A to form bridges over the slots A7. Thus the filler blocks 20 are made to fit the T-slots A7 and are also shaped to match the curvature of the cylinder A. The filler blocks 20 can be removed from or replaced in the slots A7 by merely loosening the set screws 21 and turning the blocks through an arc of 90°. One or more such filler blocks 20 may be used in such T-slot, as desired, between the inner ends of the slots A7 and the clips 16, to provide a continuous surface with the plate cylinder body over the slots A7, thus forming a support for the overlying stereotype plate B and preventing distortion or sinking-in of its printing surface under pressure of printing. Prior fillers for this purpose were removable only at special cut-outs in the plate cylinder body or through the clip slot after disassembly of other parts to provide a clear passage. My filler block has projections 20x to fit under the undercut part of the T-slots A3 and is provided with one (or more) screws 21 which bear on the bottom of the T-slot and force the filler

block upwardly into positive contact with undercut portions of the slots; and the blocks can be removed easily by loosening screws 21 and then turning the filler blocks one-quarter turn, since the blocks are made narrower than the open part of the T-slot, and radial clearance is provided on the ends of the projections 20x on the blocks. Thus my filler blocks 20 can then be lifted straight out of the slots in the plate cylinder without necessitating special provisions of extra cut-outs or disassembly of other parts. The filler block 20 can be placed into the slots A7 by reversing the above procedure, and any number of filler blocks can be provided as desired in each slot A7.

I do not limit my invention to the exact form shown in the drawings, for obviously changes may be made therein within the scope of the claims.

I claim:

1. In combination, a plate cylinder having a cylindrical plate supporting surface and having an axially disposed reduced portion at one end forming a cylinder journal provided with an axial bore; said reduced portion having a slot communicating with the inner end of said bore; an actuating member rotatably mounted in said bore and having a tool-engaging end projecting beyond the end of said journal; means for preventing axial movement of the member within the bore; an axially movable member in the inner end of said bore actuated by the actuating member and having a cross-rod slidable in said slot; a ring slidably mounted on the reduced portion and engaged by the cross-rod; and axially movable plate clips carried by the cylinder and actuated by the ring.

2. In a combination as set forth in claim 1, said actuating member having a reduced end; and said means for preventing axial movement comprising an antifriction bearing on said reduced end; a collar having an internal annular flange receiving the reduced end; means for securing the collar to the outer end of the journal; the annular flange maintaining the outer race of the bearing against the end of the journal; one side of the inner race engaging the shoulder formed by the reduced end of the actuating member; and a second collar mounted on the reduced end of the member engaging the opposite side of the inner race of the bearing.

3. In a combination as set forth in claim 1, said actuating member having a reduced end; and said means for preventing axial movement comprising an antifriction bearing on said reduced end; a collar having an internal annular flange receiving the reduced end; means for securing the collar to the outer end of the journal; the annular flange maintaining the outer race of the bearing against the end of the journal; one side of the inner race engaging the shoulder formed by the reduced end of the actuating member; and a cylindrical guard around the tool-engaging end of the actuating member having a hub fixed on the reduced end of the member and engaging the other side of the inner race of the bearing.

4. In a plate cylinder or the like having guide slots with parallel side walls opening into the surface of the cylinder; an axially movable actuator housed within each slot having a downwardly inclined inner end; means for moving each actuator; a plate clip in each guide slot of less depth than the slot and having a correspondingly inclined outer end slidably mounted on each actuator and having a plate engaging portion; means preventing separation of each clip from its actuator; means on each clip for exerting frictional drag on the side walls of the guide slot, whereby the initial movement of each clip as its actuator is moved in one direction will be outwardly of the slot to expose its plate engaging portion, and whereby the initial movement of each clip when its actuator is moved in the opposite direction will be inwardly of the slot to house the plate engaging portion thereof within the slot; and means for limiting the initial outward and inward movements of the clips.

5. In a plate cylinder as set forth in claim 4, said slots being undercut, and said means for limiting the outward and inward movements of the clips comprising lateral projections on the clips within the undercut portions of the slots, said projections being of less depth than the undercut portions.

6. In a plate cylinder as set forth in claim 4, said frictional drag means comprising plugs slidably mounted in transverse bores in the clips engaging the sides of the slots, and springs in the bores engaging the plugs.

7. In a plate cylinder as set forth in claim 4, said slots being undercut, and said means for limiting the outward and inward movements of the clips comprising lateral projections on the clips within the undercut portions of the slots, said projections being of less depth than the undercut portions; and said frictional drag means comprising plugs slidably mounted in transverse bores in the lateral projections of the clips engaging the sides of the undercut portions of the slots, and springs in the bores engaging the plugs.

8. In combination with a plate cylinder as set forth in claim 4, said guide slots being undercut and filler blocks of less width than the slots arranged transversely of the slots between the clips and the inner ends of the slots, each block having projecting end portions entering the undercut portions of the slots of less depth than the said undercut portions, the outer faces of the blocks when positioned in the slots forming continuations of the surface of the cylinder; and set screws mounted in tapped bores in said blocks and adapted to engage the bottoms of the slots to maintain the projecting end portions of the blocks in contact with the upper walls of the undercut portions.

9. In combination, a plate cylinder having a cylindrical plate supporting surface and having an axially disposed reduced portion at one end; a ring of smaller external diameter than the plate supporting surface of the cylinder slidably mounted on the reduced portion; means for moving the said ring; a series of guide slots having parallel side walls opening into the plate supporting surface of the cylinder; an axially movable actuator in each said slot having a downwardly and inwardly inclined inner end; a bolt on each actuator passing through the ring and having a head engaging the outer face of said ring; yieldable means interposed between the ring and actuators; a clip in each guide slot of less depth than the slot and slidably mounted on each actuator and having a plate engaging portion; means preventing separation of the clips and actuators; means on each clip for exerting frictional drag on the side walls of the guide slot, whereby the initial movement of each clip as its actuator is moved away from the reduced portion will be outwardly of the slot to expose its plate engaging portion, and whereby the initial movement of each clip when its actuator is moved in the opposite direction will be inwardly of the slot to house the plate engaging portion thereof

within the slot; and means for limiting the initial outward and inward movements of the clips.

10. In a combination as set forth in claim 9, said slots being undercut, and said means for limiting the outward and inward movements of the clips comprising lateral projections on the clips within the undercut portions of the slots, said projections being of less depth than the undercut portions.

11. In a combination as set forth in claim 9, said frictional drag means comprising plugs slidably mounted in transverse bores in the clips engaging the sides of the slots, and springs in the bores engaging the plugs.

12. In a combination as set forth in claim 9, said slots being undercut, and said means for limiting the outward and inward movements of the clips comprising lateral projections on the clips within the undercut portions of the slots, said projections being of less depth than the undercut portions; and said frictional drag means comprising plugs slidably mounted in transverse bores in the lateral projections of the clips engaging the sides of the undercut portions of the slots, and springs in the bores engaging the plugs.

13. In a combination as set forth in claim 9, said guide slots being undercut, and filler blocks of less width than the slots arranged transversely of the slots between the clips and the inner ends of the slots, each block having projecting end portions entering the undercut portions of the slots of less depth than the said undercut portions, the outer faces of the blocks when positioned in the slots forming continuations of the plate supporting surface of the cylinder; and set screws mounted in tapped bores in said blocks and adapted to engage the bottoms of the slots to maintain the projecting end portions of the blocks in contact with the upper walls of the undercut portions.

14. In a combination as set forth in claim 9, said means for moving the ring comprising an actuating member journaled in the reduced portion and extending beyond the outer end thereof; and means operated by the actuating member for shifting the ring.

15. In a plate cylinder or the like having T-slots opening into its surface; a correspondingly shaped axially movable actuator within each said slot having a downwardly inclined inner end provided with an undercut slot; means for moving each actuator; a clip in each T-slot of less depth than the slot and having a correspondingly inclined outer end provided with a correspondingly shaped rib slidably engaging the undercut slot in each actuator and having a plate engaging portion; means on each clip for exerting frictional drag on the side walls of the wider portion of each T-slot whereby the initial movement of the clip as its actuator is moved toward the plate on the cylinder will be outwardly of the T-slot to expose its plate engaging portion and further movement in said direction will bring the clip into plate clamping position, and whereby the initial movement of each clip when its actuator is moved in the opposite direction will be inwardly of the slot to house the plate engaging portion thereof within the slot; each clip having lateral projections adjacent its lower end engaging the wider portions of the T-slots to limit the inward and outward movements of the clips, said projections being of less depth than the said wider portions.

16. In a plate cylinder as set forth in claim 15, said frictional drag means comprising plugs slidably mounted in transverse bores in the clips engaging the sides of the wider portions of the T-slots, and springs in the bores engaging the plugs.

17. In combination with a plate cylinder as set forth in claim 15, filler blocks of less width than the T-slots arranged transversely of the slots between the clips and the inner ends of the T-slots, each block having projecting end portions entering the wider portions of the slots of less depth than the said wider portions, the outer faces of the blocks when positioned in the slots forming continuations of the surface of the cylinder; and set screws mounted in tapped bores in said blocks and adapted to engage the bottoms of the T-slots to maintain the projecting end portions of the blocks in contact with the upper walls of the wider portions of the T-slots.

ALBERT J. CARPENTER, JR.