Oct. 27, 1959 B. C. POLGLASE, JR., ET AL 2,909,999

MAGAZINE PRESS PLATE CYLINDERS

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FIG. 2.

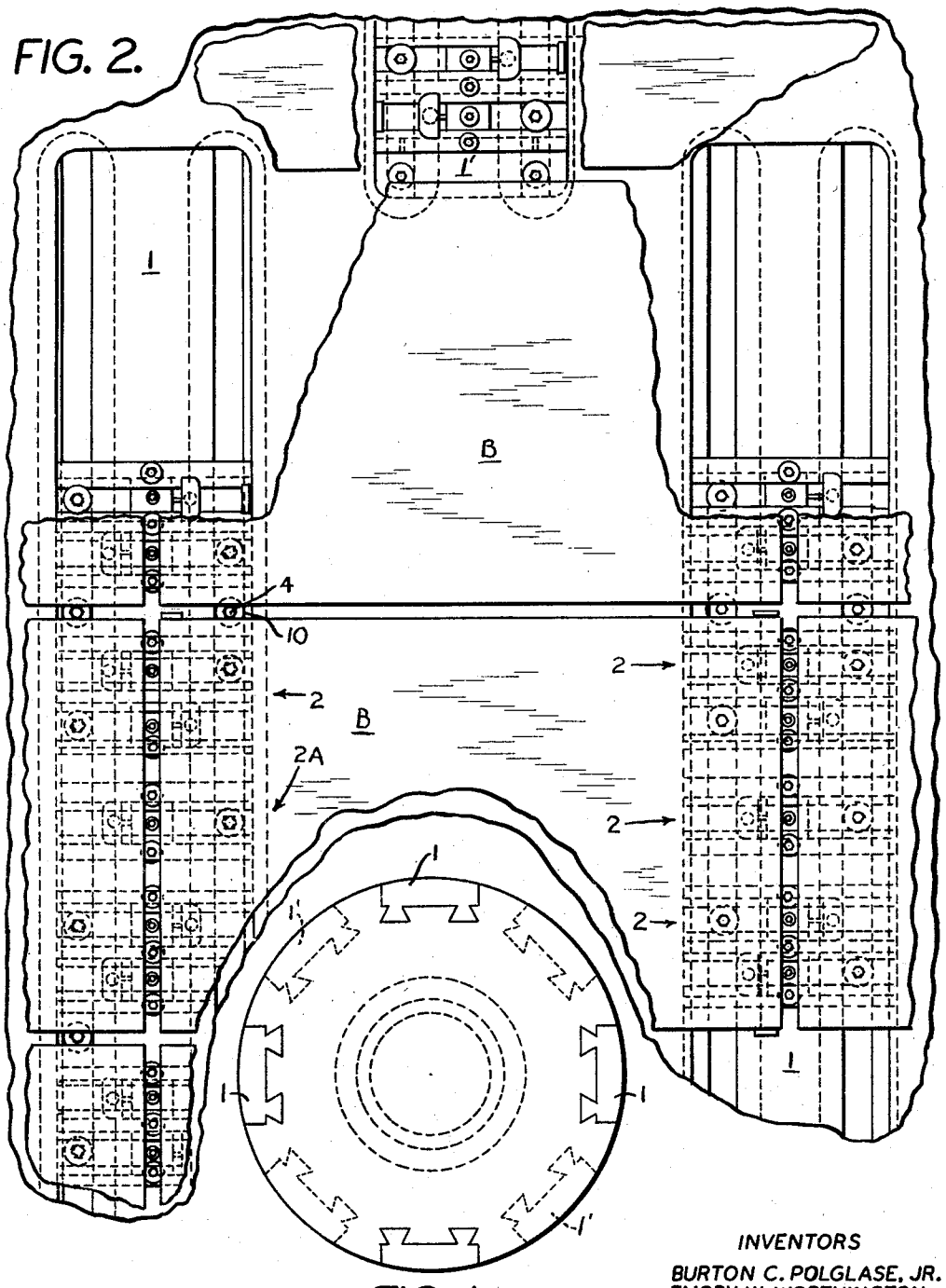


FIG. 1.

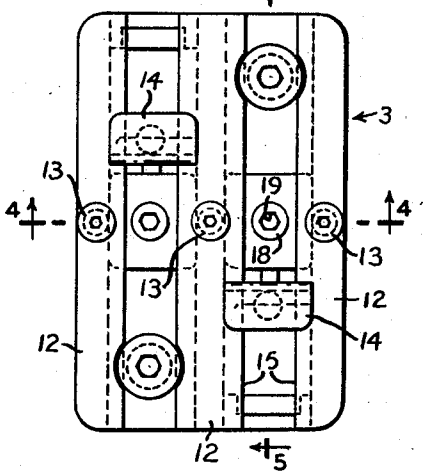
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FIG. 3.



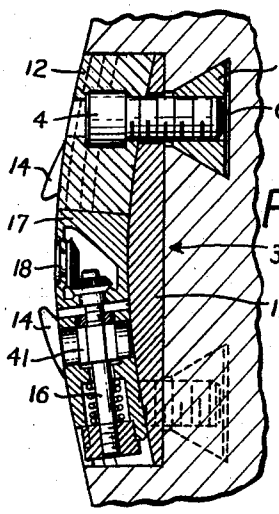
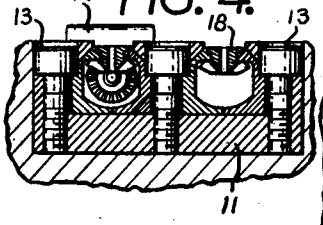


FIG. 5.

FIG. 4.



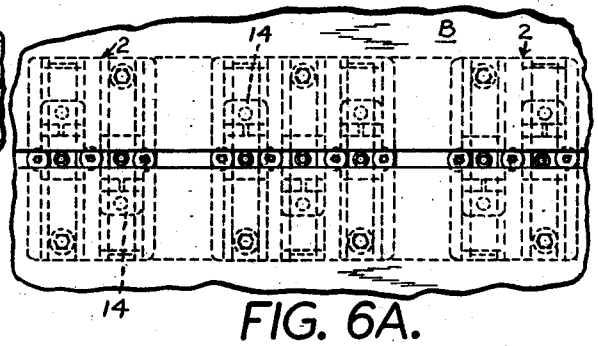
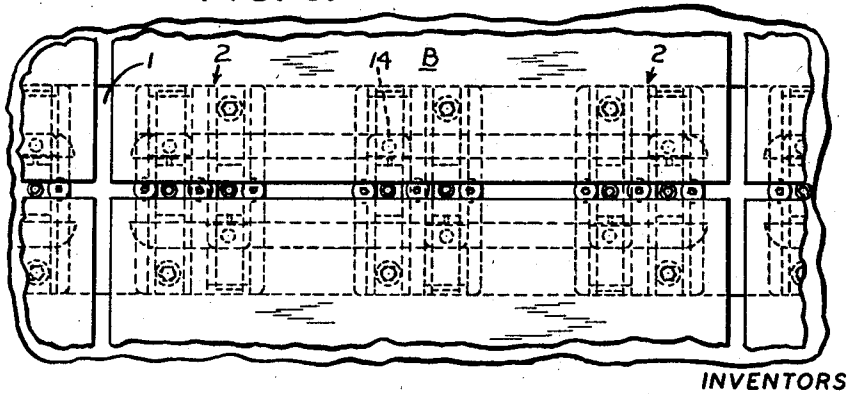


FIG. 6A.

FIG. 6.



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FIG. 7.

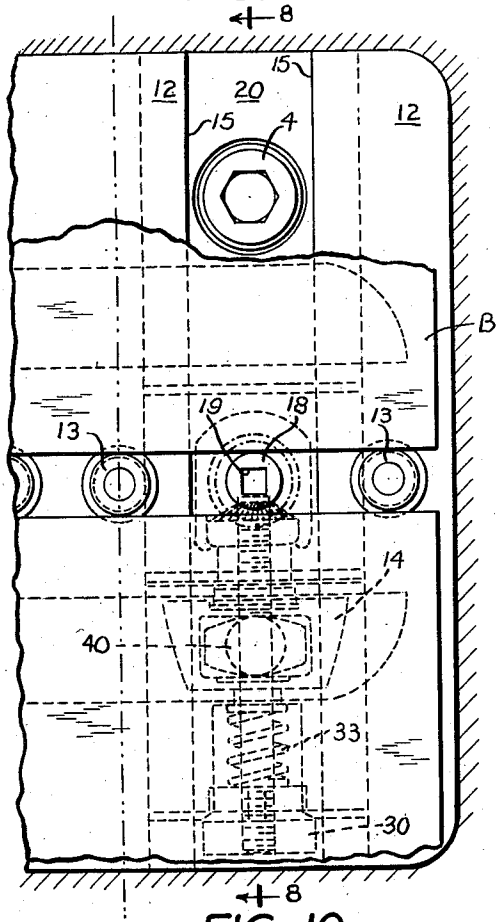


FIG. 8.

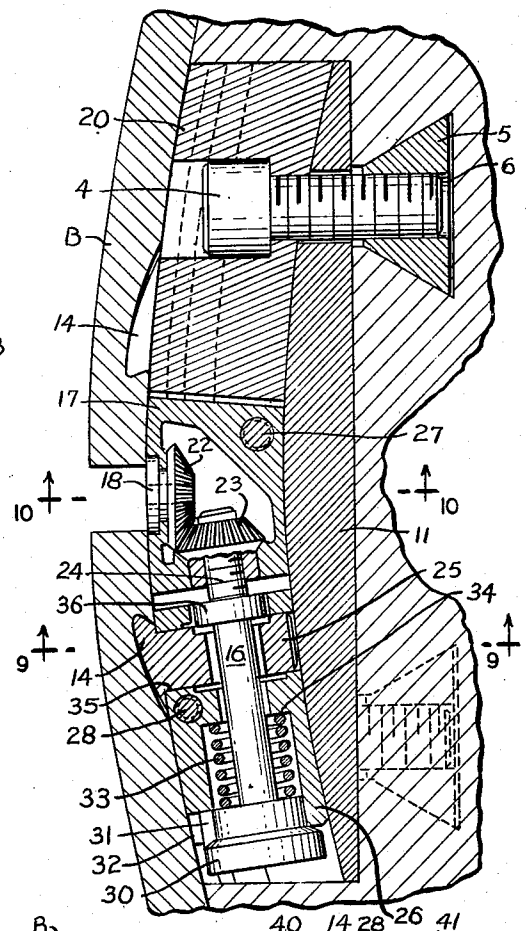
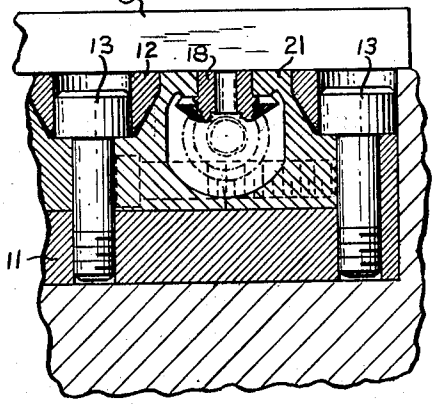


FIG. 10.



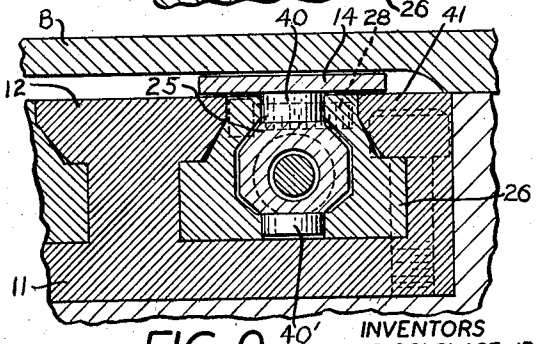


FIG. 9.

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MAGAZINE PRESS PLATE CYLINDERS

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Application November 21, 1955, Serial No. 548,125

4 Claims. (Cl. 101—378)

This invention relates to plate cylinders for printing machines, and, in particular, to so-called magazine presses.

The general object of the invention is to provide an improved clamping mechanism for holding printing plates on the plate cylinders of such machines, by gripping the same by means of hooks or clamping members engaged in recesses formed on the inner surfaces of the plates.

Plate cylinders provided with means for gripping the plates by means of hooks engaging the pockets or recesses on their inner surfaces have been used in newspaper printing presses, but only to a very slight extent in magazine presses, and it is found that clamping mechanisms which are suitable for newspaper plates, are not fully satisfactory for use in magazine plates. In the former class of service, quickness of locking and unlocking is a very vital feature, while this consideration is of less importance in magazine presses, and registry and quality of printing are less important than they are in magazine presses. A magazine press printing plate is also generally thinner, providing less space for pockets to receive the clamping hooks and is subjected to somewhat less severe pressure conditions due to the general use of bearer rings on the cylinders of such presses. At the same time, rigidity of the cylinder is of great importance and it is desirable to reduce the weakening of the cylinder by grooves in the plate holding mechanisms to a minimum.

A plate clamping mechanism embodying the invention in a preferred form will now be described with reference to the accompanying drawing, and the features forming the invention will then be pointed out in the appended claims.

In the drawing:

Fig. 1 is an end elevation of a cylinder embodying the invention;

Fig. 2 is a partial developed plan view of the surface of the cylinder;

Fig. 3 is a detail of one of the clamping mechanisms of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Figs. 6 and 6A are developed plan views corresponding to portions of Fig. 2 and showing alternative arrangements of clamping units;

Fig. 7 is an enlarged plan view of one of the clamp mechanisms;

Fig. 8 is a section on the line 8—8 of Fig. 7; and

Figs. 9 and 10 are sections on the respective lines, 9—9 and 10—10, of Fig. 7.

Referring now to Figs. 1 and 2, the plate cylinder is shown as having four axially extending grooves 1, at one end, for holding the plate clamping mechanism, and four axially extending grooves 1' adjacent the opposite end of the cylinder and staggered as usual, and in the embodiment shown, at 45°. The arrangement is shown as provided with four plates B around the cylinder and six plates along it, making a total of twenty-four plates. The mechanism for clamping and holding the plates, however, is the same for each plate, and the mechanism for only one plate will, accordingly, be described in detail.

This mechanism comprises a set of three clamping units 2, mounted in a groove 1, as indicated, and the general structure of which is shown in Figs. 3–5. Each of these assemblies 2 comprises (Figs. 3–5) a body member, shaped as indicated and as further described below, fitting the groove 1 and held therein by means of screws 4 and dovetail nuts 5 which fit slidably in correspondingly shaped undercut grooves 6 formed in the bottom of the grooves 1. As is apparent, the clamping units 2 may be located in any desired places along the cylinder, and the spacing between them may be accurately fixed by means of fill-in blocks 10 also having holding screws 4 and dovetail nuts 5 (not shown). The frame or body member of each unit comprises a block 11 which is milled out or otherwise formed so as to provide grooves for receiving the operating parts and overhanging upper flange elements 12 as shown. The member 11 also is bored and tapped to take screws 13 for holding certain parts in position. The operating parts on the two sides of the clamping unit may be the same except that they face in opposite directions around the cylinder periphery, and for a single unit comprise a pair of hooks 14 movable circumferentially of the cylinder, guided in guide grooves between edges 15 of the upper flanges 12 of the clamping unit and held in position by shafts or rods 16 connected to operating mechanism contained in blocks 17 and operated by rotatable elements 18 having sockets 19 to retain a wrench. The specific operating mechanism for the hooks 14 may be of form later described herein, or of any of a variety of other and known forms, without departing from the invention in one aspect thereof.

A unit 2A (in Fig. 2) similar to the units 2 but having only a single hook 14 may also be used and is combined with units 2 as shown in Fig. 2, and the units 2 may be made right and left hand as there shown. As shown in Fig. 2, right and left hand units 2 are combined with a single hook or clip unit 2A to furnish a set of three hooks for gripping the head (or tail) of one plate, while the two remaining hooks in the units 2 grip the tail (or head) of a circumferentially adjacent plate, with the result that, circumferentially of the cylinder, there is a set of four plates all held in a similar manner by three hooks at one end and two at the other, the location of the hooks being symmetrical with the circumferential center lines of the plate.

Alternatively, right and left hand clamping units 2 with either a right or left hand clamping unit between them may be utilized as shown in Fig. 6. In this case, the plate is gripped by three hooks at each end, the end hooks of each set of three being symmetrically positioned and the middle hooks being asymmetrically positioned. Alternatively, a center hook arrangement as shown in Fig. 6–A may be used, the center clamping hook in this case having three hooks 14, with the result that all hooks are symmetrically located and the heads (or tails) of the plates are gripped by four hooks, while their tails (or heads) are gripped by three hooks.

The detailed structure of the clamping units is better shown in the enlarged views, Figs. 7–10, in which Fig. 7 shows somewhat more than half of one of the clamping units. The members 11, previously referred to, form circumferential channels having the configuration shown in Figs. 9 and 10, and which accommodate the various parts. One end of the space between the flanges 12 is filled in by a block 20 held in place by the screw 4. A housing structure 17 fits in the undercut channel between flanges 12 as shown in Figs. 7, 8 and 10. The operating element 18 is rotatably carried by member 21 and includes a bevel gear 22 meshing with a bevel gear 23 which is internally screw threaded and receives a sim-

ilarly screw threaded end 24 of the rod 16. Turning member 18, therefore, serves to move rod 16 axially. The hook 14 is formed on a member or shank 25 which is limitedly rotatable in a member 26, which, in turn, fits slidably in the channel between the flanges 12. Members 17 and 26 may each conveniently be formed in two parts and held together by screws 27 and 28. A head 30 is fixed (as by staked threads) to the end of rod 16 and is formed with a spline rib 31 fitting in the slot 32 of the member 26, so as to permit relative movement axially of the rod 16, while preventing turning thereof. A spring 33 contained in a recess within the member 26 thrusts against the bottom 34 of this recess, and surface 35 on the member 26 thrusts against the hook carrying member 25, so that the spring 33 tends to urge the hook 14 in the clamping direction. A collar 36 fixed to rod 16 limits movement of members 25 and 26 in the clamping direction.

If no plate is gripped by hook 14, the spring 33 presses elements 25 and 26 against the collar 36, so that turning bevel gears 22 and 23 will move the assembly 16 and 25, 26 as a unit. As soon, however, as the hook 14 engages in a plate recess, as shown in Fig. 8, further movement of the rod 16 compresses spring 33 and moves collar 36 away from member 25, as shown in Fig. 8, thus applying the clamping pressure of spring 33 and permitting, in a familiar manner, accommodation of the hooks in pockets which are formed somewhat out of alignment and also permitting the holding of a plate in a cocked position. The upper and lower parts 40—40′ of member 25 are cylindrical in shape, forming a radial shank for the hook, and are received in cylindrical bores in the member 26, there being elsewhere clearance between members 25 and 26 so as to permit a slight turning movement of hooks 14 upon a radial axis. Radial tension on hooks 14 is taken by surfaces 41 on the member 25 and just below the cylindrical neck portion thereof, and these surfaces may be slightly rounded so as not to interfere with a slight pivotal movement of the hook on its radial axis.

The arrangement provided weakens the cylinder to the least extent possible and is an extremely compact one. For example, the width of the cylinder groove may be only three inches or so and its depth at the center only about three-quarters of an inch. The clamping units may also be very small, the width of a unit such as shown in Fig. 3 being only about two inches. It will be apparent that clamping mechanism adaptable to convenient holding of plates of almost any dimensions and readily interchangeable to provide for changes in those dimensions has been provided for and in a very simple manner.

What is claimed is:

1. Plate clamping mechanism for magazine printing press plate cylinders comprising, in combination, a cylinder having axial grooves and a plurality of generally rectangular plate clamping units fitting in the grooves, each such plate clamping unit having an undercut circumferential groove, a gear housing fitting in and occupying the middle part of the said groove, a bevel gear journaled in the said housing and accessible from outside the cylinder for turning it, a meshing bevel gear also journaled in the said housing and having an internally threaded central bore, a correspondingly threaded tension member engaged in the said bore, a hook for engaging in a pocket underneath a plate to be held to the cylinder, a member supporting the said hook and fitting slidably in the said groove, and means connecting the last said member to the said tension member for moving the hook to clamp and release a plate.

2. Plate clamping mechanism for magazine printing press plate cylinders comprising, in combination, a cylinder having axial grooves and a plurality of generally rectangular plate clamping units fitting in the grooves, each such plate clamping unit having an undercut circumferential groove, a gear housing fitting in and occupying the middle part of the said groove, a bevel gear journaled in the said housing and accessible from outside the cylinder for turning it, a meshing bevel gear also journaled in the said housing and having an internally threaded central bore, a correspondingly threaded tension member engaged in the said bore, a hook for engaging in a pocket underneath a plate to be held to the cylinder, a member supporting the said hook and fitting slidably in the said groove, means connecting the last said member to the said tension member for moving the hook to clamp and release a plate, and a filler piece fitting the groove on the opposite side of the gear housing.

3. Plate clamping mechanism according to claim 2, comprising a screw passing through the filler piece for holding the clamping unit to the cylinder.

4. A plate clamping mechanism for magazine printing press comprising, in combination, a cylinder having axial grooves and a plurality of generally rectangular plate clamping units fitting in the grooves, each such unit comprising a member having a circumferential groove, a member slidably fitting in the said groove, a hook for engaging in a pocket in a printing plate and having a radial shank, the said slidably mounted member having an opening receiving the said shank, a chordwise movable tension operating member, means for supporting the said tension operating member in the body member and moving it chordwise therein, the said slidably mounted member and shank having openings receiving the said tension operating member with clearance, whereby the said tension member may be moved chordwise while permitting the said slidable member and hook to move in a curvilinear circumferential path.

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