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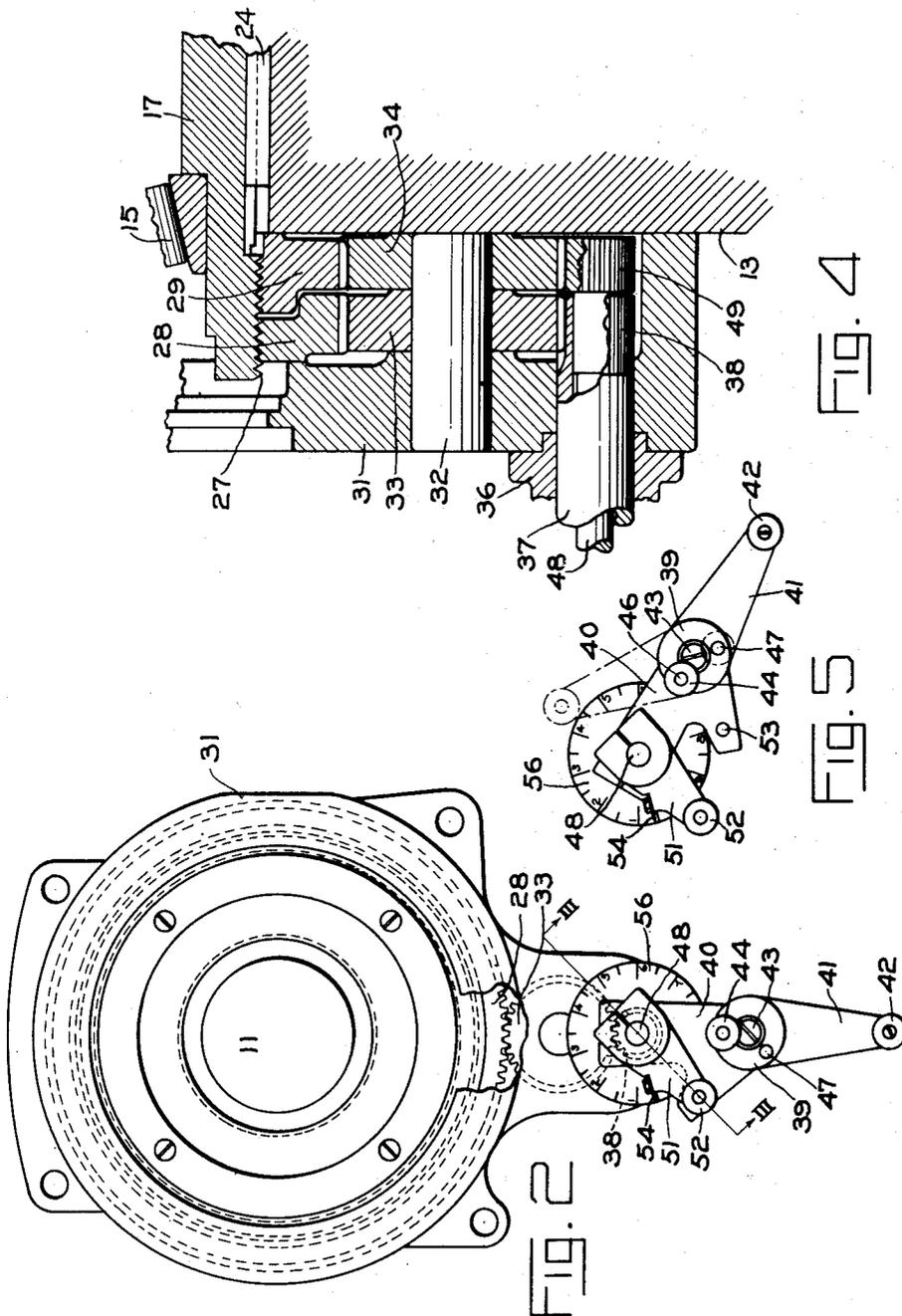
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PRINTING CYLINDER ADJUSTMENT AND LOCKING MEANS

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## PRINTING CYLINDER ADJUSTMENT AND LOCKING MEANS

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1

This invention relates to improvements in rotary printing presses and it is directed more particularly to mechanism for effecting lateral adjustment of the form cylinders of multi-color presses and for maintaining the cylinders in their adjusted position.

In process printing, whereby multi-color work is accomplished, the different color impressions are applied in succession from the individual color plates on successive form cylinders and these impressions must be in perfect register relation so that the finished prints will be of acceptable quality.

Many devices are in use whereby cylinders of printing presses can be adjusted laterally as well as circumferentially for the purpose of bringing the printing plates into register with each other, but not any of the mechanisms known to me have incorporated therein, provisions for eliminating all play in the adjusting members when the respective form cylinders are locked in their adjusted positions. This provision of positive locking means whereby all manufacturing tolerances in the adjusting mechanism, wear in the operating parts, etc. can be compensated for is highly desirable in order to secure such cylinders against any unintended lateral shifting while the press is in operation.

Therefore, it is one of the primary objects of my invention to provide a device which will not only accomplish lateral adjustment of a printing cylinder but will also include means for locking the cylinder securely in its adjusted position.

Another object of my invention is to provide a locking device which will be simple in construction and efficient in its operation.

A still further object of my invention resides in the provision of adjusting means for cylinders, having indicia associated therewith to indicate the degree of adjustment imparted to a cylinder.

Still further objects and inherent advantages of my invention will become apparent from the specification when read in conjunction with the accompanying drawings of which:

Figure 1 is a front elevational view, in section, showing the plate cylinder of a printing press embodying my invention;

Figure 2 is an end view of Figure 1 as seen from the left;

Figure 3 is an enlarged view taken along line III-III of Figure 2;

Figure 4 is an enlarged sectional view of a portion of Figure 1, and

Figure 5 is a view showing the adjusting levers in their locked position.

2

Referring now more specifically to Figure 1 of the drawings, a plate cylinder 10 having the journal members 11 and 12 formed integral therewith, is journaled for rotation in the side frame members 13 and 14 of a conventional multi-color printing press. In the particular embodiment illustrated, the journalling means for the cylinder comprise the combination radial and thrust bearings 15 and 16 and their respective housings 17 and 18 which are mounted on the journal members 11 and 12 respectively. On the right end of the cylinder, as viewed in this figure, the housing 18 and its associated bearings 16 are maintained in position without radial or end clearance on the journal 12 by means of the collar 19 which is held in position by the nut 21. The arrangement at the other end of the cylinder is quite similar with the housing 17 and bearings 15 being secured in position on the journal member 11 by the collar 22 and nut 23. As a result, the bearings 15 and 16 and housing 17 and 18 form an integral part of the cylinder assembly, permitting independent rotary motion of the cylinder, but being movable as a unit with said cylinder when lateral adjustments thereof are made.

For this reason, the housing 17 and 18 are slidably mounted in the frame members 13 and 14 to enable them to move laterally with the cylinder, but they are restrained from rotating therewith by the keys 24 and 25 which fit into grooves provided therefor in the journal openings of the frame members 13 and 14 and in the respective housings 17 and 18.

The bearings housings 17 and 18 are almost identical in construction with the exception that housing 17, on the feed side of the press, is provided with threads 27 on a portion of its periphery which projects beyond the side frame member 13. A pair of annular, externally toothed nuts 28 and 29 are adjustably mounted on the threads 27 of the housing 17 and as will be explained more fully hereinafter, these nuts are actuated to effect axial adjustment of the cylinder when the press is in operation as well as when it is stopped and they are also utilized for locking the cylinder securely in its adjusted position to prevent any unintended axial movement thereof while the press is in operation.

An auxiliary frame member 31, which constitutes an essential part of the adjusting and locking mechanism, is fitted over the annular nuts 28 and 29 and is secured in position on the side frame 13. Frame member 31 provides support for the stub shaft 32 on which are rotatably mounted the intermediate gears 33 and 34 which

are arranged to mesh with the teeth of the annular nuts 28 and 29 respectively, see Figures 1 and 4.

Also fixed to the lower end of frame member 31 is the horizontally disposed member 36 having an axial bore in which the hollow shaft 37 is rotatably mounted. The inner end of said shaft projects through the frame member 31 and is provided with splines 38 which mesh with the intermediate gear 33. To the free end of this shaft is secured the crank 39 comprising levers 40 and 41 and the handle 42. Consequently, when crank 39 is rotated, a relative angular displacement of the nut 28 will result due to the meshing relation of the splines 38 with the gear 33 and the teeth of nut 28. It will also be noted that the levers 40 and 41 are pivotally connected by means of the stud 43 so that while the press is in operation, lever 41 can be moved to an inoperative position as shown by the dotted lines in Figure 5 to make other press adjustments more accessible. Lever 41 carries a spring urged plunger 44 which is arranged to engage the recess 46 in lever 40 when the lever is in its operative position or the recess 47, also in lever 40, when in its inoperative position.

The annular nut 29 is actuated in a similar manner. A shaft 48 is rotatably mounted within the hollow shaft 37 and is provided at its inner end with the pinion 49 which meshes with gear 34. At its outer end shaft 48 carries the lever 51 which is provided with a spring urged plunger 52 by means of which lever 51 is connected to crank 39 for adjustment purposes. As shown in Figures 2 and 3, the pin 52 engages the recess 53 in lever 40 when an adjustment is to be made and it is released when the levers are to be moved to their locking positions as shown in Figure 5. Lever 51 is also provided with an indicator 54 which registers on the dial 56, the axial movement of the cylinder in thousandths of an inch.

When a lateral adjustment of the cylinder is to be made, the mechanism is first released for adjustment by holding lever 51 in position while crank 39 is turned clockwise until the plunger 52 drops into the recess 53 in lever 40. The coacting lever 51 and crank 39 are then interconnected and will move as a single unit to effect adjustment of the cylinder.

The independent clockwise movement of crank 39 also rotates the hollow shaft 37 which, through its splines 38, also rotates the intermediate gear 33 and thereby nut 28. This rotation of the nut 28 causes it to move from its locking relation in contact with the frame member 31, as shown in Figure 4, to a released position as shown in Figure 1 wherein it is spaced from said member 31 and the nuts 28 and 29 are then free to be rotated in unison.

To move the cylinder 10 laterally to the left for instance, as viewed in Figure 1, crank 39 and therewith lever 51 is rotated clockwise until the indicator 54 registers, in thousandths of an inch, the desired degree of movement. This rotation of the crank 39 and lever 51 in unison effects a relative clockwise rotation of the nuts 28 and 29. Because the nuts 28 and 29 are restrained from moving axially on the housing 17 by the outer surface of the side frame 13, the force is exerted against the frame 13 and transmitted through the nuts 28 and 29 to the housing 17 causing the housing and therewith the cylinder 10 to move laterally to the left. An adjustment of the cylinder to the right would be ac-

complished in the same manner, except that crank 39 would be turned counterclockwise and nut 28 would then exert pressure against the auxiliary frame 31 to urge the cylinder 10 to the right.

After the desired adjustment has been accomplished, the complete mechanism is locked securely against any unintended lateral movement. Plunger 52 is withdrawn from its seat in lever 40 and while lever 51 is held stationary, crank 39 is moved counterclockwise until nut 28 is set tightly against the inner face of the frame member 31 as shown in Figure 4.

It will be readily apparent that with the nuts 28 and 29 in firm contact with the frame members 31 and 13 respectively, the cylinder 10 is effectively locked against any unintended lateral movement and any free play in the associated adjusting mechanism will be positively eliminated.

After the cylinder is securely locked in position, lever 41 of crank 39 is moved to its inoperative position, as indicated by the broken lines in Figure 5, by releasing the plunger 44 from the recess 46 in lever 40 and turning lever 41 until said plunger drops into the recess 47.

While I have herein disclosed a preferred embodiment of my invention, it is merely by way of example and I do not wish to be limited to specific details of construction. It will be understood that modifications in the design and arrangement of parts may be made without departing from the spirit of my invention or the scope of the appended claims.

I claim:

1. In a printing press of the class set forth, the combination of a side frame, a plate cylinder, journalling means for said plate cylinder including a bearing housing slidably mounted in said side frame for axial movement therein together with said cylinder, a pair of co-acting annular members threaded onto the outer end of said housing, an auxiliary housing mounted on the side frame and having coaction therewith to prevent axial movement of said annular members, and control means including a manually operable lever associated with each said annular members for rotating said members in unison and/or independently of each other, said members when rotated in unison having coaction with said auxiliary housing or said side frame to thereby effect lateral adjustment of the cylinder selectively in either direction and when rotated independently, having coaction with said housing and said side frame to thereby lock said cylinder in its adjusted position.

2. In a printing press of the class set forth, the combination of side frames, a plate cylinder mounted for rotation in said frames, journalling means for said plate cylinder including a bearing housing slidably mounted in one of said side frames for movement axially with said cylinder, a first annular member and a second annular member having threaded engagement with the outer surface of said housing and effective when actuated in unison to impart lateral movement to the housing, retaining means mounted on one of the side frames for coaction therewith to prevent axial movement of said first and second annular members, mechanism operative to rotate said first and second annular members in unison whereby said members coact with said side frame or said retaining means to impart axial movement to said cylinder selectively in either direction, and means associated with said mechanism including a lever having operation to impart in-

5

dependent rotation to said first annular member to thereby lock said cylinder in its adjusted position.

3. In a printing press of the class set forth, the combination of side frames, a printing cylinder, means for journalling the cylinder for rotation in said side frames, including a housing adapted to move axially with the cylinder while permitting independent rotation thereof, a pair of annular, externally toothed members threadedly engaging the outer surface of said housing, an auxiliary frame mounted concentrically over said members in a fixed position on one of the side frames and providing means in association with said frame to define the axial movement of said members, and means having meshing relation with the teeth of said members to effect rotation of both said members in unison whereby to effect lateral adjustment of said cylinder selectively in either direction, said means also being operable to rotate said members independently to thereby effectively lock said cylinder in its adjusted position.

4. In a printing press of the class set forth, the combination of side frames, a plate cylinder, means for journalling the plate cylinder in the side frames including a bearing housing adapted for axial movement with said cylinder, a first annular member and a second annular member threadedly engaging the outer surface of said housing, an auxiliary frame fixed on the side frame and adjacent the first annular member for limiting the axial movement of both said members, manually operable mechanism for rotating said members in unison, said members when rotated in clockwise direction having co-action with the side frame to thereby move the cylinder axially in one direction and when rotated in anticlockwise direction having co-action with the auxiliary frame to move the cylinder axially in the opposite direction, and means associated with said mechanism and operative to effect independent rotation of one of said members whereby to move said second annular member into contact

6

with the side frame and said first annular member into contact with said auxiliary frame to thereby effectively lock said cylinder against unintended lateral movement.

5. In a printing press of the class set forth, the combination of side frames, a plate cylinder, journalling means for said cylinder including bearing housings slidably mounted in the side frames for movement axially with said cylinder, a pair of annular members adjustably mounted on the periphery of one of said housings, an auxiliary frame fixed to said side frame and extending over said members thereby providing means for limiting the axial movement thereof in one direction, said members being adjustable with relation to the side frame and the auxiliary frame to impart lateral movement to said cylinder and to lock said cylinder against any unintended lateral movement, means including a crank associated with each annular member and operative to impart independent rotary motion to said members whereby to move them between locked and adjusting positions with respect to the side frame and the auxiliary frame, and means carried by said cranks and operative to interlock the cranks when in their adjusting positions, so that said cranks and thereby said members may be rotated in unison to effect lateral adjustment of the cylinder.

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