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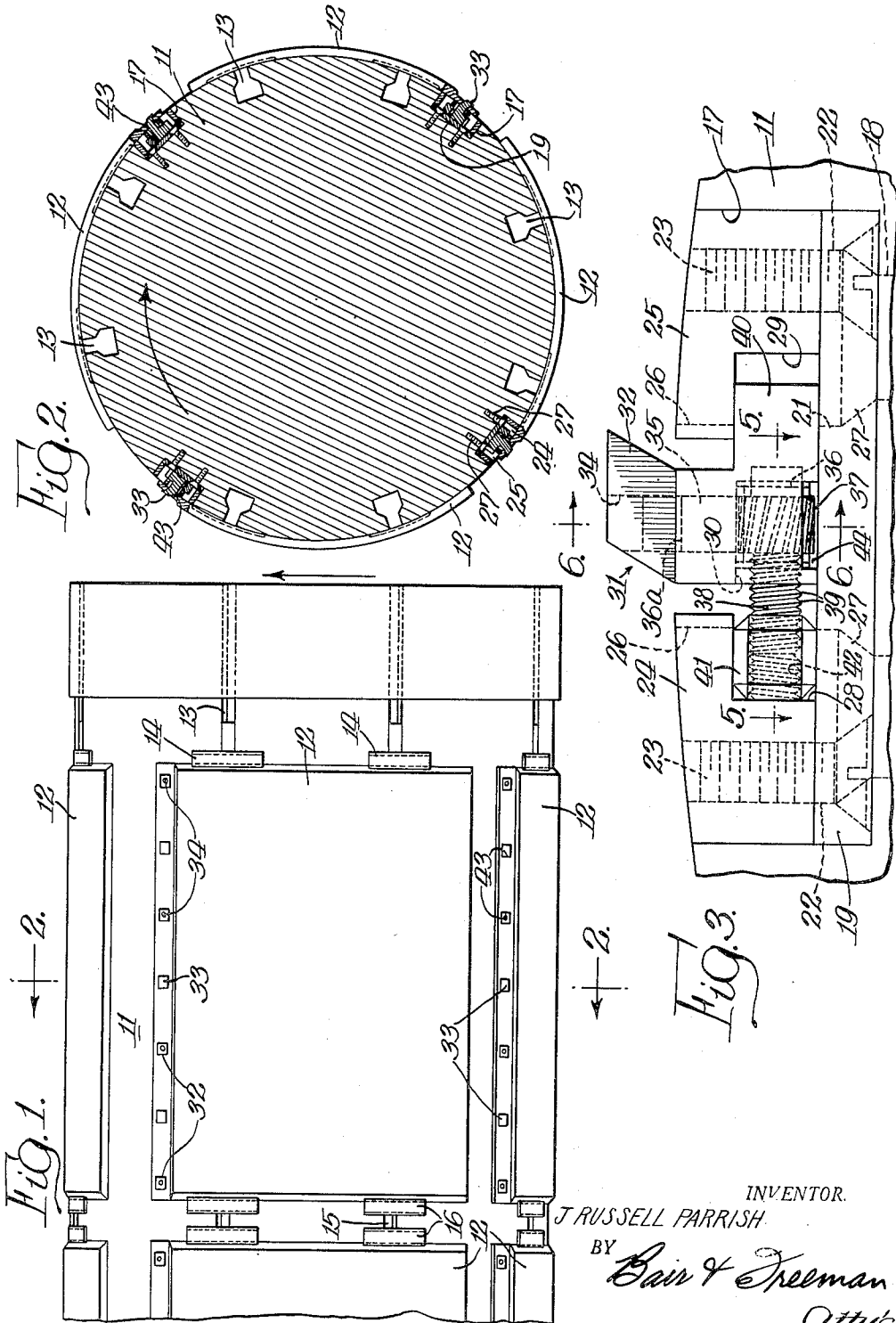
J R. PARRISH

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PRINTING PLATE LOCK-UP DEVICE

Filed March 6, 1948

2 Sheets-Sheet 1



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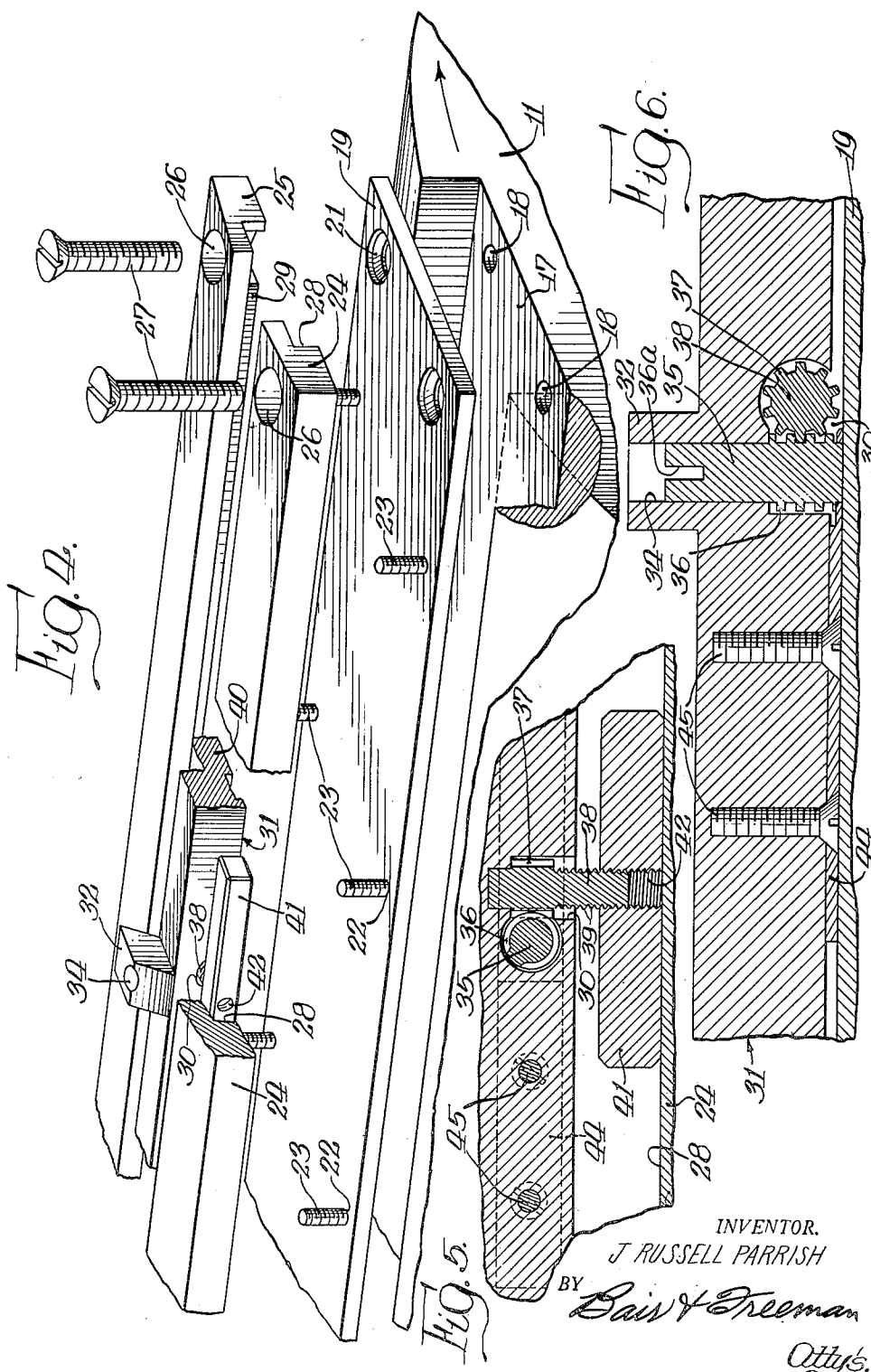
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UNITED STATES PATENT OFFICE

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PRINTING PLATE LOCK-UP DEVICE

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7 Claims. (Cl. 101—378)

1

This invention relates to a printing plate lock-up device for high speed rotary printing presses.

The standard printing plate lock-up which has heretofore been used on high speed printing presses, consisted of a backstop bar against which the trailing edge of the plate is forced. The backstop bar, as well as side plate clamps or hooks, have been secured to the rotating cylinder and the backstop bar pushes the plate to rotate it. The standard plates are curved and are beveled at their edges with a 45° angle, and the plate hooks and backstop bars are provided with corresponding bevels to positively grip the printing plates.

The direction of rotation is such that, as stated above, the trailing edge of the plate is pushed by the backstop bar, and the leading edge of the plate is not clamped. This construction has the disadvantage that, as the impression cylinder contacts the leading edge of the plate, the impact tends to buckle the curved plate in such a manner that the center portion of the plate is raised from the cylinder, thus causing the plate to "hump." As the impression cylinder progresses toward the cylinder of the plate, the hump tends to move back toward the trailing edge, but at some point it is forced to snap down against the cylinder, thus causing plates to crack after several hundred thousand impressions.

Since, in large printing establishments, a plate may be utilized for printing a million or more impressions, and since the plates are quite expensive, it is obvious that cracking of the plates is a serious disadvantage.

It has been heretofore suggested to pull the plates on the cylinder, rather than pushing them by a backstop bar. However, none of the mechanisms utilized for pulling the plates have been satisfactory in all respects and, furthermore, have not provided for the necessary adjustments axially and circumferentially of the cylinder, or on a bias with respect to the cylinder.

It is an object of the invention, therefore, to provide an improved lock-up device for attachment to the leading edge of impression plates on high speed rotary printing presses.

It is also an object of the invention to provide axial and circumferential adjustment of the printing plate with a lock-up device which engages the leading edge of the plate.

It is a further object of the invention to provide an improved lock-up device for pulling the plate rather than pushing it.

It is an additional object of the invention to provide a lock-up device for a printing plate

2

which eliminates the possibility of humping, and thus insures longer life for the plates.

It is also an object of the invention to provide a lock-up device of the type described which is very sturdy and which may be used with standard printing plates.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a partial elevational view of a plate cylinder provided with a preferred embodiment of the improved lock-up device;

Figure 2 is a sectional view of the plate cylinder and plates taken on line 2—2 of Figure 1;

Figure 3 is an end view of the improved lock-up device, with a portion of the plate cylinder being shown;

Figure 4 is a partially exploded perspective view of the lock-up device, with a portion of the plate cylinder being shown;

Figure 5 is a sectional view of the device taken on line 5—5 of Figure 3; and

Figure 6 is a sectional view of the device taken on line 6—6 of Figure 3.

Referring specifically to the drawings for a detailed description of the invention, numeral 11 designates a conventional printing press cylinder on which are secured printing plates 12. The standard impression cylinder 11 has end grooves 13, in which standard side plate hooks or clamps 14 are disposed. The hooks 14 adjacent the ends of the cylinder are moved axially of the cylinder by an ordinary screw.

Split hooks 16 are provided between the plates 12, and are movable in grooves 15 provided in the cylinder 11. As pointed out above, the edges of the plates 12 are beveled at an angle of 45°, and the clamps 14 and 16 are, likewise, beveled to closely engage the beveled edges of the plates 12.

The printing cylinders 11 are also normally provided with a rectangular groove 17, at spaced locations in the periphery thereof. These grooves were heretofore used for the backstop plate, which has been dispensed with in accordance with this invention. Tapped holes 18 are provided in the surface of the grooves 17 and extend into the cylinder 11.

A base plate 19, which is preferably rectangular in shape, is provided with holes 21, which are adapted to register with the tapped holes 18 in the cylinder 11. The base plate 19 is also pro-

vided with a plurality of apertures 22 adjacent the longitudinal edges thereof, for the reception of upwardly extending flat screws 23.

A pair of side stop guide bars 24 and 25 are provided and are formed generally in the shape of an angle. Each of the guide bars is provided with a hole 26 adjacent the end thereof, for the reception of flat headed screws 27. The holes 26 are adapted to register with the holes 21 in the base plate 19, and with the tapped holes 12 in the cylinder 11. The holes 26, however, are sufficiently large that the heads of the screws 27 may pass freely therethrough, and, actually, the screws 27 are utilized to retain the base plate 19 in position on the cylinder 11. The holes 21 in the base plate 19 are tapered to receive the heads of the screws 27.

It will be noted that the shape of the guide bars 24 and 25 provides coaxially extending shoulders or surfaces 28 and 29, respectively. A trackway is thus formed by the angle stop guide bars 24 and 25 and base plate 19. An adjustable bar is generally indicated by the numeral 31 and includes upwardly extending square projections or studs 32 and 33. The square studs 32 are provided with a central opening 34, for a purpose hereinafter described. It will be noted from Figure 1 that four of the studs 32 are provided and three of the studs 33 are provided for each plate. It will also be noted that the adjustable bar 31 is provided with recesses 30 adjacent the bottom thereof, partially in alignment with the openings 34 in the studs 32.

An adjusting stud 35 is positioned within the opening 34 in the projection 32, and extends downwardly into a portion of the recess 30. The adjusting stud 35 is provided with a slot 36a at its upper extremity, for the reception of a screw driver or other tool, for the adjustment hereinafter described. The bottom of the adjusting stud 35 is provided with worm threads 36.

A stud 38 is contained within a circular portion of the recess 30, and is provided at one end thereof with a worm gear 37, having its teeth in engagement with the worm 36 on the adjusting stud 35. Threads 39 are provided on the other end of the stud 38.

A rectangular adjusting nut of substantial length is generally indicated at 41, and is provided with a tapped hole 42 centrally thereof. The threads 39 of the stud 38 are adapted to cooperate with the threads in the tapped hole 42, so that the nut 41 may be moved closer to, or further from, the adjustable bar 31. The adjustable bar 31, as shown in Figure 4, is provided with a forwardly extending portion 43.

It will be noted from the arrows in Figures 2 and 4 that the cylinder 11 is travelling in a clockwise direction, as viewed in those figures.

The printing plates 12 are provided with seven square holes adjacent the leading edge thereof, which are adapted to slide over the studs or pegs 32 and 33, so that the plate 12 will be pulled by the pegs 32 and 33 as the cylinder 11 rotates. As shown in the drawings, the plates 12 are of substantially uniform cross section opposite the printing surfaces. Furthermore, the portions of the cylinder 11 opposite the printing surfaces of the plates 12 are solid. The lock-up device is assembled in the following manner. First, the side stop guide bars 24 and 25 are assembled to the base plate 19 by means of the upwardly extending screws 23. The worm carrying stud 35 and the worm gear carrying stud 38 are then placed into position on the adjustable bar 31. The worm carrying stud or screw 35 is then re-

tained in position by attaching a plate 44 to the adjustable bar 31 by means of screws 45. As shown in Figure 6, the plate 44 is provided with a suitable aperture for the bottom of the stud 35.

The sliding nuts 41 are then threaded on the ends of the worm gear shaft 38. The adjustable bar 31, which is now assembled, is slid into position from the end of the assembled guide bars and plates. The resultant sub-assembly is then disposed in the grooves 17 and is secured thereto by means of the screws 27. It is obvious that the heads of the screws 27 must not interfere with the movement of the adjustable bar 31 or the sliding nuts 41.

The pegs 32 and 33 extend above the cylinder surface and will protrude through the holes 43 at the forward edges of the printing plates 12. Since the adjustable bar 31 may slide freely, the plates 12 may be adjusted in a direction parallel with the axis of the cylinder 11 by adjusting the plate hooks 14 and 16 along the curved edges of the printing plate. Circumferential adjustment is made by the use of the worm and worm gear arrangement. When a screw driver is inserted through the holes 34 in the studs 32, the worm 36 will be turned, which will in turn rotate worm gear 37 and stud 38 to move the adjustable bar 31 in either direction around the surface of the cylinder, since the sliding nut 41 will remain in engagement with the shoulder 28 on the rear guide bar 24. The pegs 32 and 33 then move the plates 12 circumferentially of the cylinder, since the pegs are projecting through the holes 43 in the plates. The combination of the axial and circumferential adjustments obviously affords adjustment of the plates 12 on a bias with respect to the cylinder 11. It is to be noted that the pegs 32 and 33 do not extend above the main surface of the plates 12. Since the plates are being pulled by the studs 32 and 33, any force exerted on the bar 31 tends to move the nuts 41 against the shoulder 28 on the rear guide bar 24. The side clamps 14 and 16, obviously, prevent any axial movement of the adjustable bar 31 after the clamps are in position.

From the foregoing it will be apparent that I have provided an improved lock-up device for high speed rotary presses.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. A lock-up device for securing a printing plate having a printing surface to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said plate being of substantially uniform cross section opposite said printing surface, said device including an adjusting bar having a projection thereon adapted to extend into the aperture in said plate, opposed spaced angle members secured to said cylinder and forming a trackway having opposed spaced coaxially extending surfaces, said trackways affording sliding movement of said adjusting bar coaxially of the cylinder and means for moving the adjusting bar circumferentially of the cylinder, said adjusting bar including means for engaging said plate, said coaxial and circumferential movement affording adjustment of the plate on a bias with respect to the cylinder.

5

2. A lock-up device for securing a printing plate to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said device including an adjusting bar having a projection thereon adapted to extend into the aperture in said plate, opposed spaced angle members secured to said cylinder and forming a trackway having opposed spaced coaxially extending surfaces, said trackways affording sliding movement of said adjusting bar coaxially of the cylinder and means for moving the adjusting bar circumferentially of the cylinder, said adjusting bar having projections thereon extending into apertures in the leading edge of said plate, said coaxial and circumferential movement affording adjustment of the plate on a bias with respect to the cylinder.

3. A lock-up device for securing a printing plate to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said device including an adjusting bar having a projection thereon adapted to extend into the aperture in said plate, opposed spaced angle members secured to said cylinder and forming a trackway having opposed spaced coaxially extending surfaces, said trackways affording sliding movement of said adjusting bar coaxially of the cylinder and means for moving the adjusting bar circumferentially of the cylinder, said adjusting bar including means for engaging said plate, said means for adjusting the bar circumferentially of said cylinder including a member secured to the bar and movable relative thereto, said member abutting one of the coaxial surfaces of the trackway, said coaxial and circumferential movement affording adjustment of the plate on a bias with respect to the cylinder.

4. A lock-up device for securing a printing plate to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said device including an adjusting bar having a projection thereon adapted to extend into the aperture in said plate, opposed spaced angle members secured to said cylinder and forming a trackway having opposed spaced coaxially extending surfaces, said trackways affording sliding movement of said adjusting bar coaxially of the cylinder, means for moving the adjusting bar circumferentially of the cylinder, said adjusting bar including means for engaging said plate and a base plate secured to said spaced angle members, said coaxial and circumferential movement affording adjustment of the plate on a bias with respect to the cylinder.

5. A lock-up device for securing a printing plate to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said device including an adjusting bar having a projection thereon adapted to extend into the aperture in said plate, opposed spaced angle members secured to said

6

cylinder and forming a trackway having opposed spaced coaxially extending surfaces, said trackways affording sliding movement of said adjusting bar coaxially of the cylinder, means for moving the adjusting bar circumferentially of the cylinder, said adjusting bar including means for engaging said plate and a base plate secured to said spaced angle members, said base plate, angle members and adjusting bar being insertable as a unit into a coaxial groove in said cylinder, said coaxial and circumferential movement affording adjustment of the plate on a bias with respect to the cylinder.

6. A lock-up device for securing a printing plate having a printing surface to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said plate being of substantially uniform cross section opposite said printing surface, said device comprising a member having a projection thereon, means for securing the member to the cylinder, said projection adapted to extend into the aperture in said plate and means affording adjustment of said member coaxially and circumferentially of said cylinder, said projection having no portion thereof extending above the highest point of said plate, said coaxial and circumferential movement affording adjustment of the plate on a bias with respect to the cylinder.

7. A lock-up device for securing a printing plate to the rotating cylinder of a rotary press, said plate having a leading and a trailing edge with an aperture in the leading edge, said device including an adjusting bar having a projection thereon adapted to extend into the aperture in said plate, opposed spaced angle members secured to said cylinder and forming a trackway having opposed spaced coaxially extending surfaces, said adjusting bar being slidable coaxially of the cylinder in said trackways, means for moving the adjusting bar circumferentially of the cylinder, said adjusting bar including means for engaging said plate, a base plate secured to said spaced angle members, said base plate, angle members and adjusting bar being insertable as a unit into a coaxial groove in said cylinder, means for securing said base plate to said angles with the adjusting bar therebetween and means for securing the resultant assembly to said cylinder.

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