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PLATE SECURING MEANS

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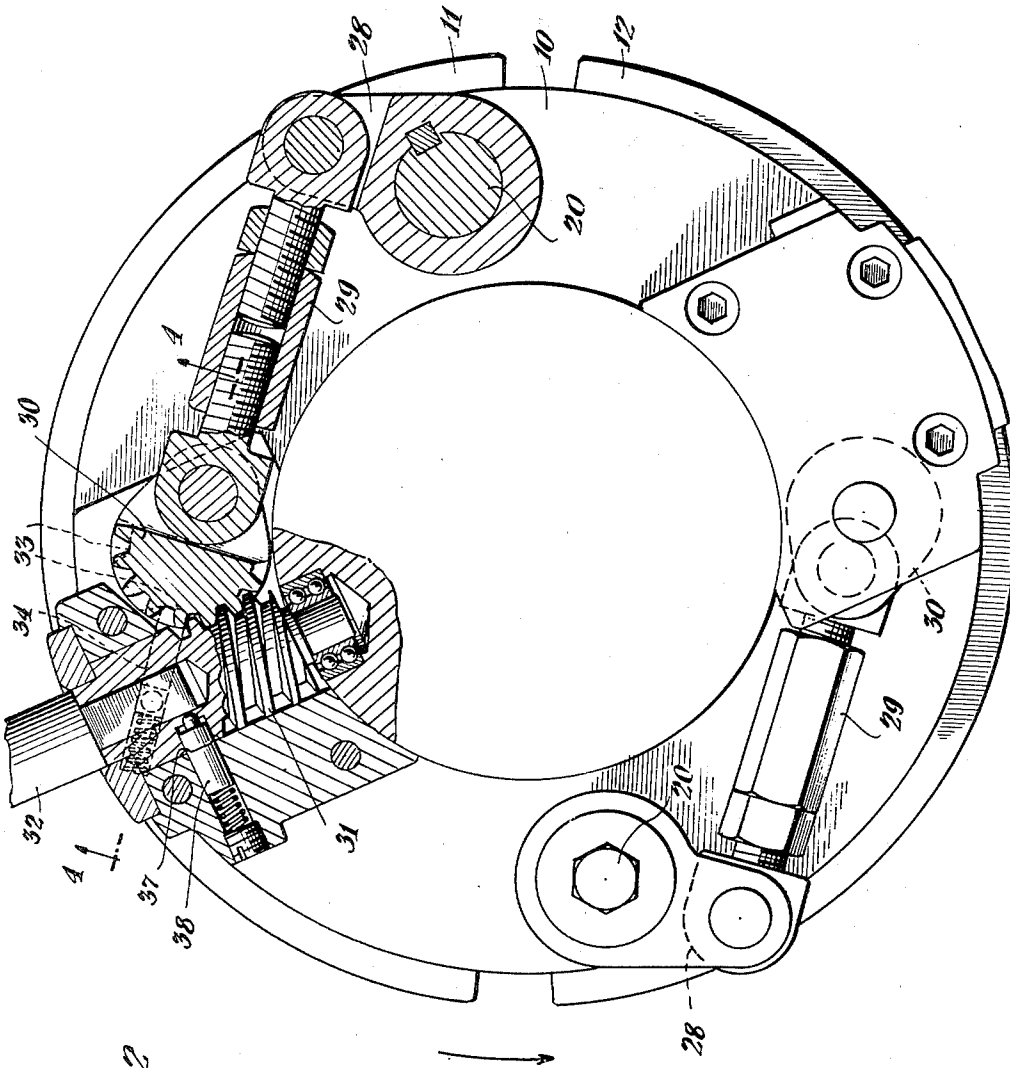


Fig. 2

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## PLATE SECURING MEANS

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1 Claim. (Cl. 101—378)

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The present invention relates to printing cylinders and refers more particularly to mechanism for locking a stereotype plate to a printing cylinder by tension.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claim.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a side elevation of a printing cylinder embodying the present invention;

Figure 2 is a view thereof, partly in end elevation and partly in section along the broken line 2—2 of Figure 1;

Figure 3 is a section along the broken line 3—3 of Figure 1;

Figure 4 is a section along the line 4—4 of Figure 2; and

Figure 5 is a section along the line 5—5 of Figure 4.

The drawings and description herein include features described and claimed in my copending applications Serial No. 512,530, filed December 2, 1943, and Serial No. 607,610, filed July 28, 1945, now matured into patents numbered 2,413,174 and 2,428,263, respectively, as well as the subject matter claimed herein.

The advantages of tension lockup of cylindrical or parti-cylindrical stereo plates on their cylinders are widely recognized in the art of printing from rotary presses and include greater security of fastening, increased blanket life and superior quality of product at higher speeds of production.

One of the problems of tension lockup mechanism is to find enough space interiorly of the printing cylinder to locate efficient tensioning means.

An object of the present invention is the provision of compact mechanism for exerting peripheral tension on stereo plates or the like.

A further object is the location of the source of resilient pressure of the tensioning mechanism at the point of application thereof to the plates.

A further object is that the lockup operation

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of the mechanism and the unlocking thereof shall be easily and quickly performed.

Other objects will become apparent in the course of the following specification.

In accordance with the illustrative embodiment of the invention, there is provided a plurality of rotarily mounted plate engaging resilient hooks, each hook comprising a plurality of laminations and preferably being preloaded so as to exert effective tension upon being rotated through a small angle. Worm actuated toggle means are employed to produce rotation of the common mounting means for the hooks, the worm being operated by a hand wrench and lockable in plate locking position by conventional means.

In operation the hooks engage recesses formed along a straight edge of the plate, preferably the trailing edge, while recesses along the opposite edge of the plate are engaged by rigid and stationary hooks. Upon actuation by the hand wrench, the non-resilient toggle linkage operates to rotate the resilient hooks, which thereupon exert a resilient tension upon the plate, locking it to the printing cylinder.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the illustrative embodiment of the invention as shown in the drawings, a printing cylinder 10 carries two semi-cylindrical stereotype plates 11, 12. According to preferred practice, the cylinder as illustrated will revolve clockwise of Figure 3 and counterclockwise of Figure 2, as indicated by the arrows.

The cylinder 10 is formed with two longitudinally extending recesses 13, 14, on each of its diametrically opposed sides. Removably located in recess 13 is torsion base plate 15 extending substantially the length of the cylinder and set in a semi-cylindrical recess therein are a plurality of semi-cylindrical bearings 16 spaced apart axially. Coincident axially with bearings 16 so as to form split cylindrical bearings are the semi-cylindrical bearings 17, the split bearings being radially and axially positioned by base plate 15, cover plates 18 and bolts 19.

Mounted for limited rotation in bearings 16, 17, is torsion shaft 20 comprising cylindrical bearing portions 21 spaced apart axially and crank blocks 22 located intermediate the bearing portions. Laminated leaf springs 23 in the shape of plate hooks are affixed by two bolts 24 to block 22, preferably in a preloaded condition as illustrated. Preloading is accomplished by having

the larger spring seating surface 25 of block 22 angularly inclined toward a second spring seating surface 26, so that when bolts 24 are tightened considerable loading of the spring hooks 23 results.

A further radial bearing of substantial length and covered by plate 27 is furnished for shaft 20 between the body thereof and crank arm 28, the latter being connected by turn-buckle linkage 29 to worm gear sector 30, which is engaged by worm 31 adapted to be actuated by hand wrench 32.

Worm gear sector 30 has two recesses 33 located therein to correspond to the locked and unlocked position of the lockup mechanism. Recesses 33 have cam surfaces adapted to actuate the spring loaded plunger 34. Plunger 34 has a cam surface illustrated in Figure 4 as adapted to actuate the follower button 35 which has a rounded head adapted to engage the recess 36 in wrench 32. Follower button 37 in Figure 2 has a cam head adapted to be actuated by wrench 32 and in the actuated position illustrated button 37 has actuated the spring actuated plunger 38 so that their boundary is coincident with the boundary of the shank or bearing portion of worm 31.

Mounted in recesses 40 by screws 39 are hook plates 40 comprising rigid hooks 41. The plates 41, 42 have recesses 42 adjacent their straight edges to receive the hooks 23, 41.

The method of operation of the illustrated embodiment of the invention is as follows. A semi-cylindrical stereo or electrotpe plate 11, 12 is placed loosely on cylinder 10 with one set of recesses 42 engaging rigid hooks 41. In the unlocked plate position hooks 23 will be somewhat clockwise displaced from the position of Figure 3 and the left and upper recess 38 of Figure 5 will be engaged by plunger 34. Wrench 32 may therefore be inserted in the socket of worm 31, camming button 35 into the recess of plunger 34. Worm 31 is now actuated by wrench 32 until worm gear sector 30 reaches the locked position of Figure 2. During said actuation, plunger 34 has been cammed downward camming follower button 35 to the right of Figure 4 to lock wrench 32 in its socket. In travelling clockwise to the illustrated position of Figure 2, worm gear sector 30 has actuated turnbuckle linkage 29 upwards, imparting clockwise motion to crank arm 28 and torsion shaft 20. Referring to Figure 3 which is a section viewed from a 180° revolution from Figure 2, shaft 20 actuates spring hooks 23 counterclockwise until they engage recesses 42 to exert powerful tension on plate 11 against the reaction of the respective rigid hooks 41. The parts now being in the locked position of all the figures of the drawings, wrench 32 may be withdrawn. Upon the withdrawal, spring plunger 38 moves upward of Figure 2 and locks worm 31 against rotation, whereby spring hooks 23 are locked in plate locking position.

The advantages of the above construction are numerous. The rigid hooks 41 are also stationary therefore the hook plates 40 are relatively cheap to fabricate and cannot wear out. Moreover, being of hardened construction and screwed tightly in place, they are absolutely stationary and rigid as intended. As such they are ideal reaction members for locating the leading edge of a tensionally held plate. The operative means for applying tension is ideally situated at the trailing

edge of the plate and is not only resilient but the resilience resides in the plate engaging members, the other parts of the torsionally tensioning mechanism being of rigid construction. In this construction the resilient actuation of the plate for tension does not travel over links, levers or by any such indirect course but is present at the place of engagement between hook and plate. The importance thereof is obvious to those skilled in the art of tension lockup. This art envisions theoretically perfect parallel engagement of the respective surfaces of plate and cylinder. Such perfect engagement cannot take place at the moment of lockup and is only possible after considerable rolling action by the coating impression cylinder in the operation of printing. Furthermore both this rolling action and the tension of lockup cause a small amount of creep of the metal of the plate. Both of the above factors result in a rearward adjustment of the trailing edge of the plate which is measured in thousandths of an inch and the best way to make adjustment therefor in the tension lockup is by resilience in the plate engaging means, as the indicated adjustment is so small that it might be entirely lost or at least imperfectly translated by a system of links or levers between rigid plate hooks and a source of resilient pressure.

A further advantage of the above construction is that spring hooks 23, by serving the two functions of hooking and resilience, conserve space within the cylinder, where location of efficient tensioning mechanism has always been embarrassed by space limitations, as is evident from a review of the art.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claim without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

In a tension lockup mechanism for stereotype plates or the like, the combination with a printing cylinder and a reaction member mounted thereon, of means for engaging a plate for the application thereto of circumferential tension, said means comprising a relatively thick and short laminated spring member as a plate engaging hook, a shaft rotatably mounted in said cylinder, block means on said shaft to rotate therewith, said spring member being mounted on said block means for rotary movement therewith in a preloaded condition, radially offset with respect to the axis of said shaft about which it is adapted to rotate, and positively actuated locking means for rotating said shaft in the direction of circumferential tension to provide locking tension on a plate through engagement of said spring member with the plate.

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#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

| Number    | Name               | Date          |
|-----------|--------------------|---------------|
| 1,895,124 | Crafts et al. .... | Jan. 24, 1933 |
| 2,072,909 | Stephenson .....   | Mar. 9, 1937  |
| 2,100,207 | Wood .....         | Nov. 23, 1937 |
| 2,236,230 | Worthington .....  | Mar. 25, 1941 |