This invention relates to improvements in lock-up devices for printers' chases.

Devices of this type are used for locking up type or printer's form in the chase without the use of "printer's furniture" and quoins. With this device, it is essential to rapidly adjust the forming bars, place and hold them under tension, and while under tension to securely lock them.

Heretofore it has been the practice to adjust the bars by a rack and pinion or worm means and by use of either a quoin and quoin key, pawl and ratchet, or separate ratchet for the pinion to lock the bars in the adjusted position. These methods of locking the bars are not satisfactory. The quoins and quoin keys get misplaced, require too much space and too much operating time. The pawl type of lock does not permit a sufficiently fine degree of adjustment to always maintain the bars under tension.

It is an object of this invention therefore to provide an improved lock-up device for printers' chases, the bars of which may be readily adjusted to an infinite variety of positions, held under tension in the desired position and locked while under such tension.

Another object of this invention is to provide an improved lock-up device for printers' chases which is simply operated by a single tool and is easy and comparatively inexpensive to manufacture.

These objects are attained by providing longitudinal and transverse bars which fit within the chase and are adjustable relatively to each other to clamp a printer's form, set type, cut and the like within the chase. The intersecting bars are slidably mounted and guided in a member, there being four such members. Each of the bars is provided with a toothed rack and each of the members rotatably carries a separate rack meshing pinion for each bar guided therein. Each pinion has tool engaging portions by which it may be rotated to adjust its respective bar. In order to lock each bar in an adjusted position and while under tension, each of the pinions is provided with a frictional lock or clutch which upon operation prevents rotation of the pinion. In one form, the pinion has a split hub which is expanded by movable cone to engage the bearing for the pinion and frictionally resist rotation of the cone within the interior of the hub and when moved along the axis of the pinion will expand the hub. The axial movement of the cone is controlled by the rotation of a threaded operator. The lock operator is co-axially mounted in the pinion and has tool engaging portions by which it may be rotated. A tool, which has two co-axially arranged relatively rotatable parts, one engageable with the pinion and the other engageable with the frictional lock operator, is simultaneously engaged with both the pinion and lock operator. By it the pinion is rotated to adjust the bar to any desired position and held in such position under tension while under tension the lock operator is rotated to lock the pinion in such position and thus hold the bar.

The novel features, which are considered characteristic of the invention, are set forth with particularity in the appended claim. The invention itself, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view of a printer's chase having therein a lock-up device embodying the present invention.

Fig. 2 is a fragmentary sectional view taken on the line 2--2 of Fig. 1.

Fig. 3 is a fragmentary sectional view taken on the line 3--3 of Fig. 1.

Fig. 4 is an enlarged fragmentary sectional view taken on the line 4--4 of Fig. 1.

Fig. 5 is an enlarged fragmentary sectional view taken on the line 5--5 of Fig. 1.

Fig. 6 is a bottom plan view of the pinion shown in Fig. 4 with the cone and operator removed.

Fig. 7 is a view in side-elevation of the pinion shown in Fig. 5; and

Fig. 8 is a view in side elevation of the tool by which the pinion and frictional lock are operated.

Referring to the drawings by reference numerals the lock up device is shown in position within the customary printer's chase. The lock up device consists of longitudinal bars intersecting with transverse bars. At each intersection there is an L-shaped member for slidably guiding the intersecting bars. While only one of each bar and one member is shown, in the complete device there are two longitudinal bars and two transverse bars and four guiding members. Each guiding member is of identical construction. Each transverse bar is of identical construction. The description will therefore be limited to one of each of these elements. When the complete device is used,
opposite end of each bar 12 and an opposite end of each bar 14 is provided with an adjusting screw and locking nut 16, which bear against the inner sides of the chase 18 and permit the inner frame to be properly aligned within the chase.

The bar 12 has an upper part 20 and a lower part 22 joined by spacer blocks 21, so that the bar 14 may slide therebetween. The upper part 20 has toothed rack 24 extending the length thereof. On its lower side it has a longitudinal groove 25 slidably accommodating a pin 26, mounted in member 16 to prevent the rack 24 from being thrust away from the pinion 30. The bar 14 has a toothed rack 32 extending longitudinally along its top edge. It also has a longitudinally extending groove 34 slidably accommodating a pin 36 mounted in the member 16 to prevent the rack 32 being thrust away from the pinion 33.

The guide member 16 is preferably formed from a solid block of metal and has two ways 40 and 42 positioned at right angles to each other. The way 40, which guides the longitudinal bar 12, is formed by two grooves, one cut in the upper surface and one cut in the lower surface of the member 16. The way 42, which guides the transverse bar 14, is cut through the member 16. With this construction, the member 16 holds each of the intersecting bars at substantially right angles to each other and permits each bar to be adjusted longitudinally with respect to the member 16.

The member 16, adjacent each of the ways 40 and 42, has an aperture forming a bearing for the adjusting pinions. The pinion 30 is rotatably carried in aperture 44 and intermeshes with the toothed rack 24. The pinion 36 is rotatably carried in aperture 46 and intermeshes with the toothed rack 32. Each of these apertures 44 and 46 is provided with counterbores at each end which provide sufficient clearance for the toothed part of the pinion and for a retaining ring 48 mounted on the hub 50 of each pinion. The pinions are rotatably guided in their respective apertures by the combined engagement between the teeth of the pinion and the wall of the counterbore and the outer wall of the hub and the wall of each aperture. The pinions 30 and 36 are substantially the same in construction with the exception that the teeth of pinion 30 are formed at the top end of the hub while the teeth of pinion 36 are spaced from ends of the hub to permit them to mesh with the rack 32 which slides between the top and bottom of the member 16. Each of the pinions has a pair of recesses 52, which receive prongs 70 on a tool 66 whereby the pinions may be separately rotated about their axis to individually adjust each bar.

To lock each bar in a desired adjusted position, each pinion is provided with a frictional lock or clutch which operates to prevent rotation of the pinion. This is accomplished by a threaded slot 64 in the hub 50 of each pinion, which permit the hub to expand. In the case of pinion 36, the slots 64 also extend in between the teeth of the pinion in order to provide for sufficient expansion of the hub.

The hub 50 of each pinion is provided internally with a sloping surface which frictively engages with the surface of an upright cone 56. As the cone 56 is forced axially upwardly within the hub, the portions of the hub between the slots 54 are forced outwardly and frictionally engage the wall of the respective aperture to prevent the pinion from rotating in the member 16. Axial movement of the cone 56 is controlled by a revolvable clutch operating member. In the exemplification shown, this member consists of a differentially threaded screw 58. The lower end .

The tool 66 for operating the pinion and the friction clutch operating member consists of an outer member 68, which has a pair of depending prongs 76, engageable in the recesses 52 of the pinion, and an inner member 72 co-axially rotatably mounted in the outer member 68 which has a hexagonal hub 74 at its lower end flippable in the recess 64. A large disc 76 is attached to the upper end of the outer member 68, and a smaller disc 76, superimposed on the large disc 76, is attached to the inner member 72. The tool, when positioned on a selected pinion, simultaneously engages with the pinion and with the clutch operating member. The pinion is rotated through force applied to the large disc 76 until a respective bar is adjusted to the desired position. With the large disc held under tension in the adjusted position, the smaller disc 78 may be rotated by force to turn the friction clutch operating member and lock the pinion in the adjusted position.

Although only one embodiment of the invention is shown and described herein, it will be understood that this application is intended to cover such changes or modifications as come within the spirit of the invention or scope of the following claim.

We claim:
In a lock up device for a printer's chase having a bar adjustable within the chase to engage a form or the like, a rack and pinion operable to adjust said bar to selected position within said chase, said pinion having a split hub, a cone axially movable in said hub to expand said hub and prevent said pinion from rotating, a threaded member carried by said pinion and engaging with said cone to cause axial movement thereof
upon rotation of said member, and means acting between said cone and said hub to prevent said cone from rotating with respect to said hub.

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