Nov. 26, 1963 D. H. KRAFT ETAL 3,111,895

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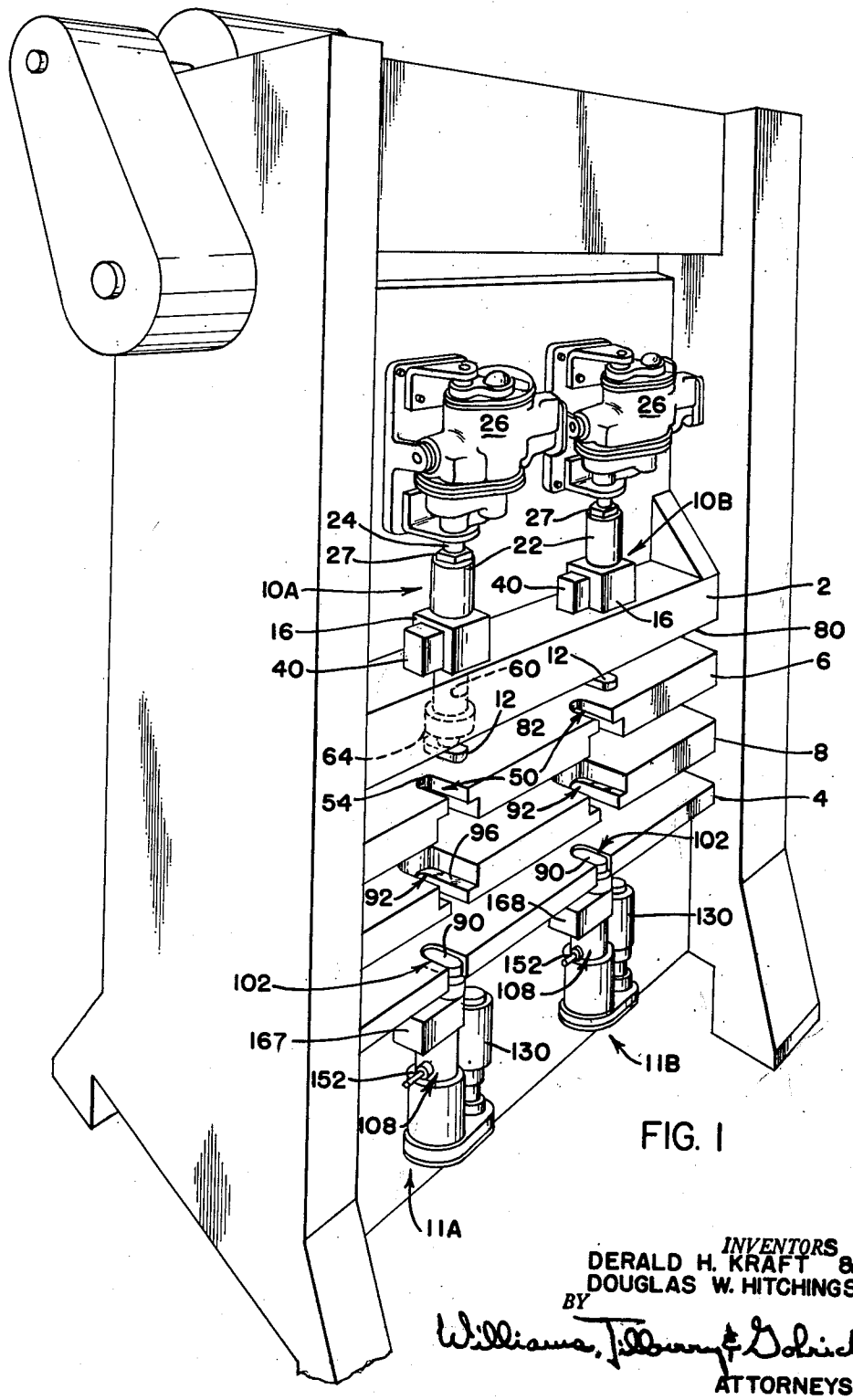

FIG. 1

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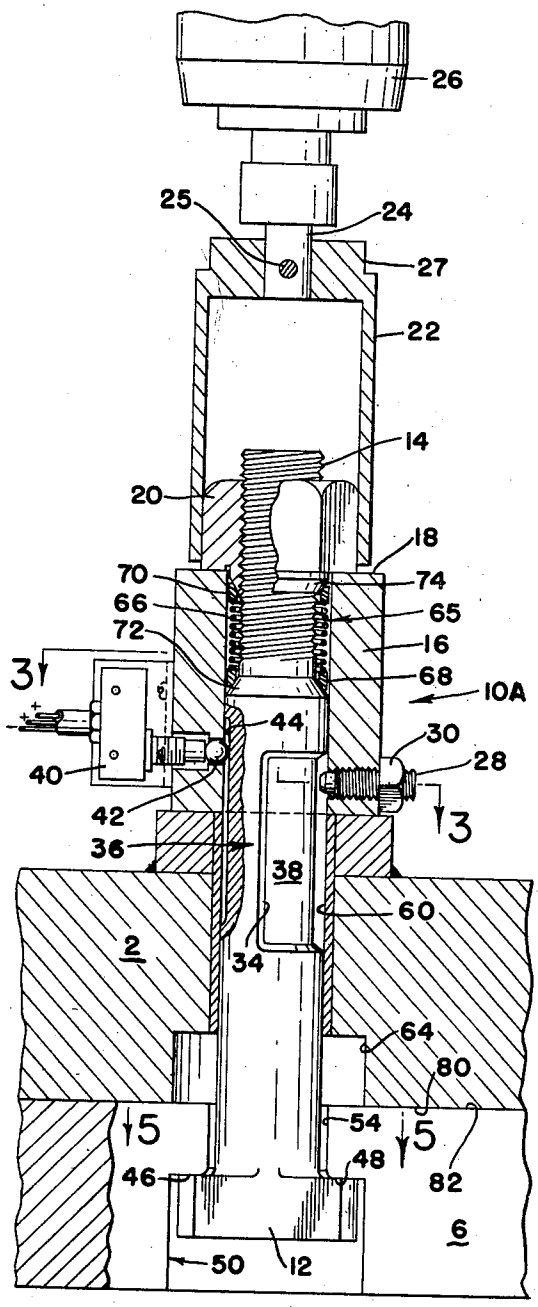

FIG. 2

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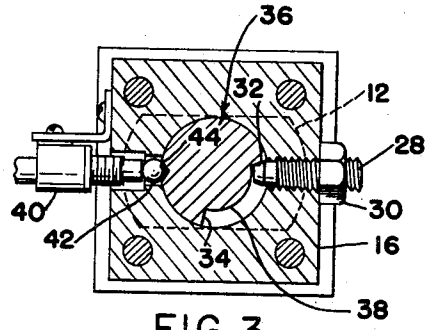

FIG. 3
(LOCK)

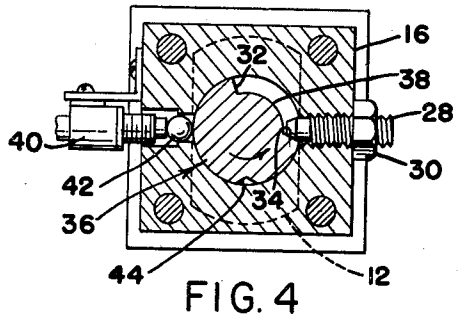

FIG. 4
(UNLOCK)

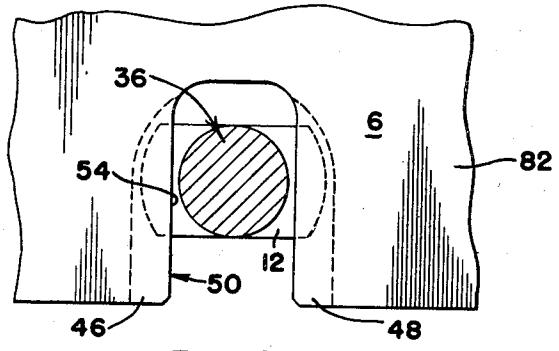

FIG. 5

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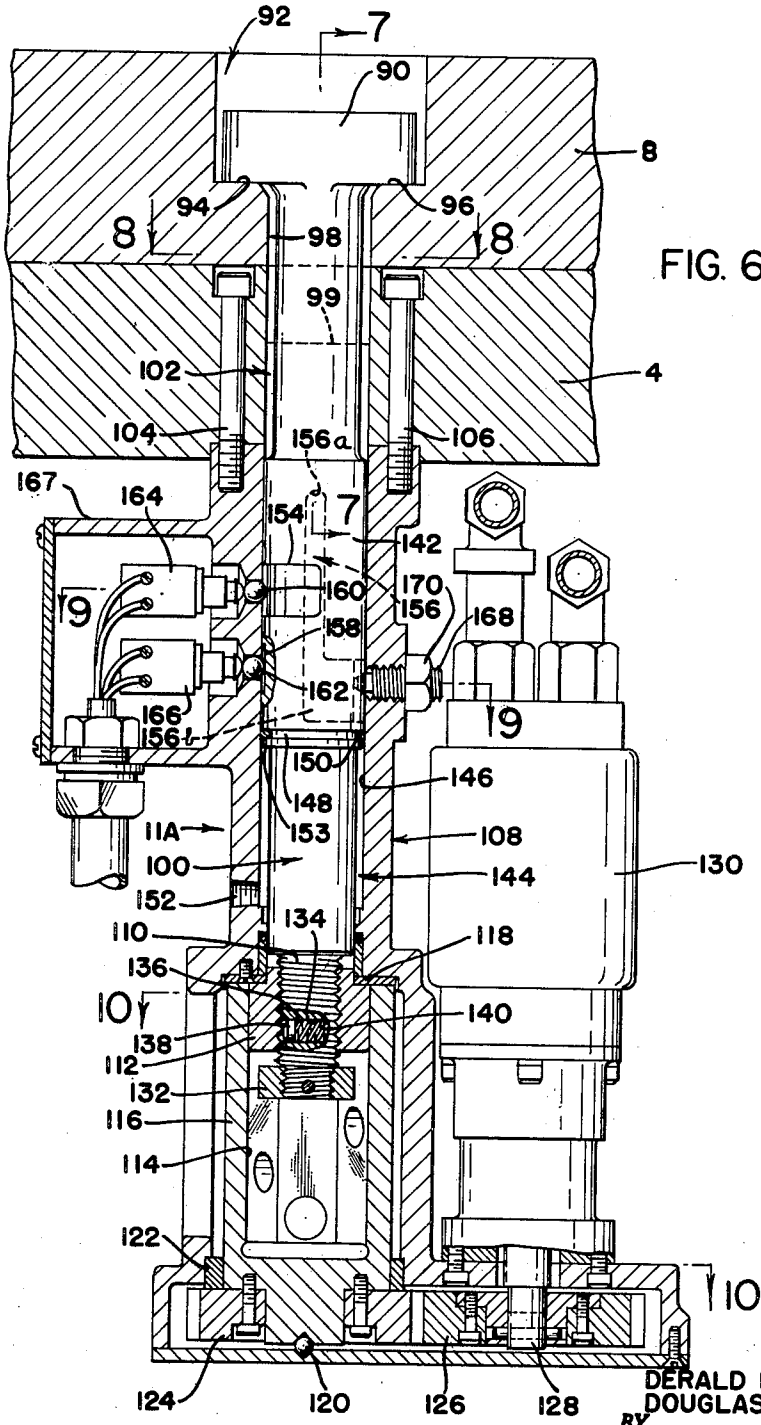

FIG. 6

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FIG. 7

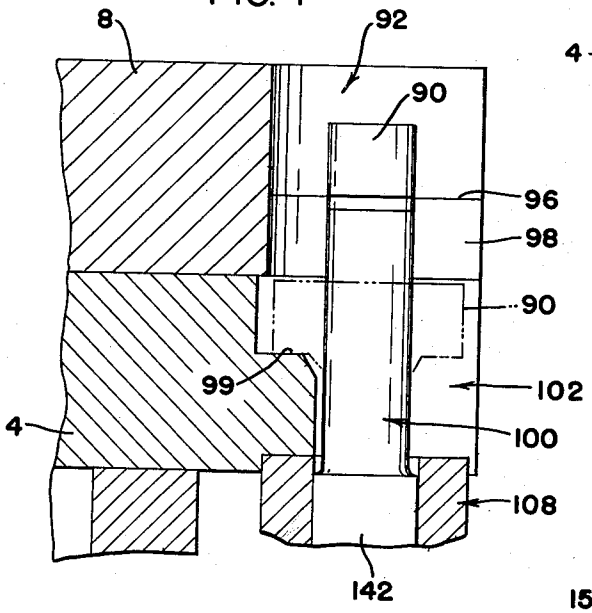


FIG. 8

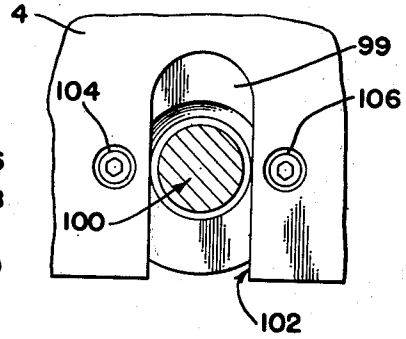
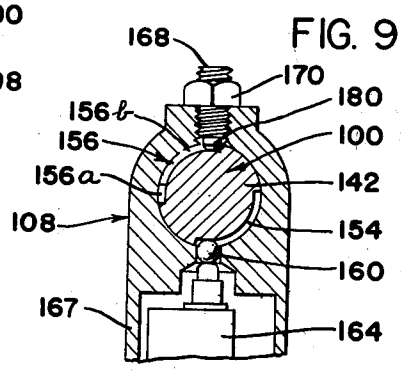


FIG. 9



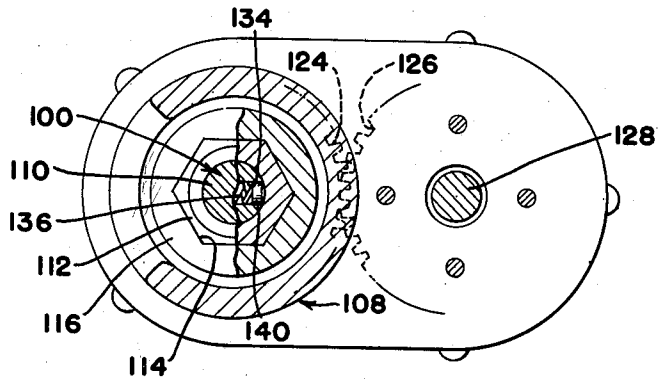


FIG. 10

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United States Patent Office 3,111,895 Patented Nov. 26, 1963

3,111,895

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Filed Jay 13, 1961, Ser. No. 123,803
17 Claims. (Cl. 100—295)

This invention relates to means for securing dies to presses, and more particularly to means relating to quick-acting clamping and unclamping mechanisms for securing dies to the slide and bolster plates of presses.

This application is a continuation-in-part of our co-pending application Serial No. 825,731, filed August 8, 1959, now abandoned and assigned to the assignee of the present application.

In conventional practice, the die members for use in presses are provided with T-slots adjacent the face of the die abutting the press slide or bolster plate. A plurality of bolt holes are usually provided in the slide or bolster plate to receive bolts therethrough, the heads of which are placed in engagement with the T-slots of the dies. Thus, by threading nuts onto the ends of the bolts projecting through the slide or bolster plate, the heads of the bolts are drawn into contact with the T-slots of the dies, thereby clamping the dies to the adjacent faces of the slide and bolster plates. The number of bolts required to securely fasten the dies to the press is, of course, dependent upon the size and weight of the dies; but in any event, the operation of manually fastening dies to the slide and bolster plates of the press is slow and inefficient.

It is, therefore, among the objects of our invention to provide means for clamping dies to the slide and bolster plates of a press which is automatic, quick-acting, fail-safe, and universal in adaptability with respect to dimensional specifications for most dies.

To the accomplishment of the foregoing objects and related ends, the invention consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawings, and the following description, setting forth in detail certain structure embodying the invention, such disclosed means constituting, however, but one of the various forms in which the principle of the invention may be used.

With reference to the drawings:

FIGURE 1 is a perspective view of a press and its associated dies employing the clamping means of the invention;

FIGURE 2 is a cross-sectional view of one of the upper clamping units employed to secure a die to the press slide;

FIGURE 3 is a cross-sectional view taken along line 3—3 of FIGURE 2 illustrating the rotational stop means of the upper clamping unit in the locked position;

FIGURE 4 is a cross-sectional view similar to FIGURE 3 but with the clamping member of the upper clamping unit rotated 90° from that position shown in FIGURE 3;

FIGURE 5 is a cross-sectional view taken along line 5—5 of FIGURE 2 showing the clamp engaging head of the upper clamping unit in engagement with the T-slot of a die adapted for connection to a press slide;

FIGURE 6 is an elevational view of one of the lower clamping devices for the press bolster plate, partially in section and with parts broken away to illustrate the relationship between the various elements;

FIGURE 7 is a cross-sectional view taken along line 7—7 of FIGURE 6 illustrating the manner in which the rotational stop means of the lower clamping device for the press bolster plate may be rotated and retracted into the bolster plate;

FIGURE 8 is a cross-sectional view taken along line 8—8 of FIGURE 6 illustrating the recess in the press bolster plate into which the rotational stop means of the lower clamping unit may be retracted;

FIGURE 9 is a cross-sectional view taken along line 9—9 of FIGURE 6; and

FIGURE 10 is a cross-sectional view taken along line 10—10 of FIGURE 6.

Referring now to the drawings, and particularly to FIGURE 1, a press is shown having a reciprocable upper slide plate **2**, a lower stationary bolster plate **4**, and dies **6** and **8** adapted to be secured to the slide plate **2** and bolster plate **4**, respectively. In accordance with the present invention, improved die clamping units **10A** and **10B** are provided on the slide plate **2** for securing the die **6** to the slide plate; and, in a similar manner, clamping units **11A** and **11B** are provided below the bolster plate **4** for securing die **8** to the bolster plate.

Referring to FIGURE 2, the clamping unit **10A**, for example, is seen to comprise an elongated, cyclindrical shaft **36** having a T-shaped head **12** (see also FIGURE 5) on one end and a threaded shaft portion **14** on the opposite end. A housing **16** encases the upper mid-portion of the shaft **36** and the housing top surface **18** provides a shoulder upon which a threaded collar or nut **20** rests in threaded engagement with the threaded shaft portion **14**. A recessed or socket-type adaptor **22** is secured to the shaft **24** of motor means **26** by a pin **25** and is adapted to engage the nut **20**. Preferably, the motor means **26** comprises an air motor or other similar device. It will be observed that the adaptor **22** is elongated to permit sliding movement of the nut **20** therein. The T-shaped head **12** may be adjusted manually by application of a wrench to the squared portion **27** on socket **22**.

Stop means comprising a set screw **28** and a nut **30** are threadedly engaged in the housing **16** to alternately make engagement with the shoulder **32** or shoulder **34** (see FIGURES 3 and 4) formed by recessing the mid-portion of the shaft **36**. The recessed portion **38** is elongated to permit sliding movement of the shaft **36** within the housing **16**. A limit switch **40** is also mounted in the housing **16** and adapted to be tripped by movement of a ball **42** either into or out of a longitudinally elongated recess or groove **44** machined in the shaft **36** (see also FIGURE 4).

As will be seen in FIGURES 3 and 4, the set screw **28** and the elongated slot **38** providing shoulders **32** and **34** permits rotation through 90° from one shoulder to the other shoulder. In so rotating the clamping member from one shoulder to the other shoulder, it will be observed that the position of the head **12** of the clamping member is shifted to and from clamping relationship with the shoulders **46** and **48** of the T-slot **50** in the die member **6**, or in the alternate position for free movement through the narrow slotted portion **54** of tht T-slot **50**. The limit switch **40** may be employed to close circuitry which will provide a visual indication of the position of the T-head **12** or, in the alternative, may be employed to render the press inoperable for production unless the T-head **12** of the clamping means **10***a* is in the position shown in FIGURE 3. Under these circumstances, the groove **44** is positioned so that the ball **42** will seat only when the T-head **12** is in the proper angular relationship with the T-slot **50**. Any rotational movement of the clamping member shaft **36** from the position of FIGURE 3 will cause the ball **42** to ride out of the groove **44**, thereby tripping the limit switch to activate the safety means provided to indicate and/or respond to this condition.

Referring again to FIGURE 1, it will be seen that the lower portion of upper clamping unit **10A** is adapted to

be fitted into a hole 60 in the slide plate 2 of the press, and that the hole is provided with a counter-bore 64 of sufficient size to completely contain therein the T-head 12 of the clamping member (see also FIGURE 2). Over-riding clutch means 65 (FIGURE 2) comprising a helically coiled spring 66 and the spring pads 68 and 70 on opposite ends thereof are fitted to abut against a tapered portion 72 of the shaft 36 and corresponding tapered portion 74 of the nut 20, respectively. The pressure exerted between the tapered portion 72 and the nut portion 74 by the coiled spring 66 is sufficient to cause the nut 20 and the shaft 36 to be rotated in unison until engagement is made between the stop member 28 and one of the shoulders 32 or 34 of the clamping member. Thereafter, the over-riding clutch will slip if continued rotation of the nut is transmitted by the motor means 26, to either lower or raise the clamping member 36 relative to the die and/or slide plate 2. Thus, it will be seen that the lower portion of the shaft 36 is free to slide within the hole 60 in the slide plate 2, and the upper portion of the shaft, including threaded portion 14, is free to move within the housing 16 and the adaptor 22.

The significance of this sliding arrangement will be readily appreciated upon considering the means for securing the upper die 6 to the slide plate 2. The slide 2 of the press is lowered toward the die 6, which is set up beneath the slide until contact is made between the abutting faces 80 and 82 of the slide and die, respectively. However, in order for clamping engagement to be made, it is necessary that the required orientation of the clamping member T-head 12 exists such as is shown in FIGURE 4 so that the T-head may pass freely through the slot 54 of the die 6. In the event that the T-head should be at some random orientation, i.e., in any position other than that shown in FIGURE 4, then the T-head will strike the top face 82 of the die when the slide 2 is lowered into contact with the die 6. However no harm will come from this engagement of the T-head 12 with the die face 82 inasmuch as the shaft 36 is free to slide vertically upwardly and the T-head 12 will be received within the counterbore 64 of the slide 2 expressly provided for this purpose. From this it is apparent that one function of the elongated adaptor 22, which acts in the nature of a lost motion coupling, is to permit movement up and down as necessary in the event of interference between parts while adjustment is being made between the slide plate 2 and the die 6. To this end, longitudinal slot 38 and groove 44 also coact with the adaptor 22 to permit vertical movement of the shaft 36. Additionally, of course, it provides for power adjustment of the clamping member 12 by motor 26.

In the operation of the upper die clamping units 10A and 10B, the clamping members 12 are adjusted to the correct length before the slide 2 is lowered into contact with the die 6, and the heads 12 of the clamping members are properly oriented as shown in FIGURE 4, and as discussed hereinabove. The slide 2 is then lowered into contact with the die 6, and the individual motors 26 may be operated to finally adjust the clamping members down, if necessary. Thereafter, motors 26 are driven to align the T-heads into clamping positions as shown in FIGURE 3. The coaction between the over-riding clutch 65, stop means 28, and the shoulders 32 and 34 will automatically obtain the proper T-head-T-slot orientation. Once proper orientation is obtained between the shoulders 46 and 48 and the T-head 12 of the clamping member 10, the ball 42 of the limit switch 40 will seat in the groove 44 of the shaft 36, thereby tripping limit switch 40 to indicate proper orientation. The actual indication may be either visual on by actuating circuit enabling means, or both. Concurrently, motor 26 continues to back head 12 into clamping engagement with the shoulders 46 and 48, and thereafter motor 26 will stall or "torque out" when clamping engagement has been made. Suitable motor cut-off means may be provided to deactivate the motor after clamping engagement.

Referring now to FIGURES 6 and 7, the lower clamping unit 11A, for example, is provided with a T-head 90, similar to T-head 12, adapted to fit into a cooperating T-slot 92 provided in the lower die 8. As was the case with the clamping unit 10A, the head 90 is adapted to be shifted to and from clamping relationship with shoulders 94 and 96 of the T-slot 92 in the die member 8, or in the alternate position for free movement through a narrow slotted portion 98 of the T-slot 92. The alternate positions of the T-head 90 are illustrated in FIGURE 7 where the clamping position of the head is shown in full lines while the retracted position is shown in dotted lines. While retracted, the head engages a seat 99 (FIGURES 7 and 8) in the bolster plate 4. In order, then, to effect clamping of the die 8 to bolster plate 4 it is necessary to raise the head 90 and rotate it through 90° as was the case with clamping units 10A and 10B.

Integral with the T-head 90 is a shaft 100 which extends through a slot 102 in the bolster plate 4 and down into a housing 108 for the clamping unit proper. Suitable fastening means, such as bolts 104 and 106 are employed to secure the housing 108 for the clamping unit to the bolster block 4, substantially as shown. The lower end of the shaft 100 has a reduced diameter portion 110 which is threaded to receive a hexagonal nut 112 (see also FIGURE 10), this hexagonal nut being received within a cooperating hexagonal bore 114 provided in a rotatable cylindrical member 116. The cylindrical member 116 rotates about a vertical axis between bushing 118 at the top of the unit and a ball bearing 120 which cooperates with an annular bushing 122 at the bottom of the assembly. Secured to the bottom of the cylindrical member 116 is a spur gear 124 which meshes with a second spur gear 126 secured to the bottom of the shaft 128 of air motor means 130 which may incorporate over-riding clutch means similar to clutch means 65 shown in FIGURE 2. Thus, when the air motor 130 rotates in one direction, the cylindrical member 116 will rotate the nut 112 to lower the shaft 100 and T-head 90; while rotation of the air motor 130 in the opposite direction will rotate the cylindrical member 116 and nut 112 to elevate the shaft and T-head until the nut 112 engages a second nut 132 threadedly received on the lower end of the shaft 100. As will be understood, the arrangement of the spur gears 124 and 126 enables the air motor 130 to be doubled back along the housing 108 to thereby shorten the overall length of the unit.

Provided in the reduced diameter portion 110 of shaft 100 is a transversely-extending bore 134 which receives a coil spring 136 interposed between a pair of button-shaped resilient members 138 and 140. The purpose of the members 138 and 140 is to engage the threads of the nut 112 and provide a frictional drag between the nut and the threaded portion 110 and prevent free or uncontrolled rotation of shaft 100 and the T-head 90 connected thereto.

Intermediate the ends of the shaft 100 is an enlarged diameter portion 142 which forms an annular cavity 144 between the inner periphery of the bore 146 in housing 108 and the periphery of shaft 100 between portions 142 and 110. At the lower end of portion 142 is a groove 148 which receives an O-ring seal 150 for a purpose which will hereinafter be explained. Communicating with the annular passageway 144 is a threaded opening 152 adapted to be selectively connected to a source of fluid under pressure not shown.

It will be appreciated that in the case of clamping units 10A and 10B, the T-heads 12 and shafts 36 will drop into the slots 54 and 50 by gravity; while the T-heads 12 can be removed from the slots 50 and 54 by merely elevating the slide plate 2. In the case of the lower clamping units 11A and 11B, however, these conditions do not exist so that it is necessary to forcibly raise the shaft 100 and T-head 90 to move it through slot 98 and into the T-slot 92. For this purpose, fluid under pressure is introduced into the annular passageway 144 through opening 152,

whereupon the fluid will act upon shoulder **153** below the O-ring **150** to force the shaft **100** and T-head **90** carried thereby upwardly. In order to lower the shaft **100** and T-head **90**, the air pressure is released whereby the shaft and T-head may fall downwardly by gravity, assuming that the T-head is properly oriented with respect to slot **98** to permit it to pass therethrough (i.e., in the position shown in dotted outline in FIGURE 7). By virtue of the elongated hexagonal opening provided in the cylindrical member **116**, the nut **112** may simply slide upwardly or downwardly within the bore, as the case may be. In this respect, the member **116** provides a lost motion coupling similar to that provided by adaptor **22** in FIGURE 2.

Referring now to FIGURES 6 and 9, it will be noted that the enlarged diameter portion **142** of shaft **100** has three slots **154**, **156** and **158** provided in its outer periphery. Slots **154** and **158** are adapted to cooperate with balls **160** and **162**, respectively, carried in the wall of housing **108**. The balls **160** and **162**, in turn, are adapted to actuate limit switches **164** and **166**, respectively, these limit switches being carried within a housing **167**. The slot **156**, on the other hand, cooperates with a stop means comprising a set screw **168** and a nut **170** threadedly engaged therewith. It will be noted that the slot **156** is provided with an upper, axially-extending portion **156***a* which communicates with a lower arcuate portion **156***b* extending around the shaft **100** for about 90°. Thus, when the shaft **100** and T-head **90** are in the elevated position shown in FIGURE 6, they may rotate through 90° while the forward end of the set screw **168** extends into the lower, arcuate portion **156***b* of slot **156**. In order to lower the shaft **100**, however, the T-head **90** must be rotated through 90° from the position shown in FIGURES 6 and 7. Under these circumstances, the forward end of the set screw **168** will extend into the axially-extending portion **156***a* of the slot **156** to permit the shaft **100** to move downwardly. Once the end of the set screw **168** enters portion **156***a*, the shaft **100** can no longer rotate, but it can move upwardly or downwardly.

The slot **154** extends through an arc of substantially 90° on the side of shaft **100** opposite the slot **156**. Whenever the shaft **100** is elevated into the position shown in FIGURE 6, the slot **154** will permit the ball **160** to move inwardly, thereby tripping limit switch **164**. Furthermore, the limit switch **164** will remain tripped even though the shaft **100** is rotated through 90° in a clockwise direction from the position shown in FIGURE 9. The slot **158**, however, extends for only a short distance circumferentially around the shaft **100** and will engage the ball **162** to trip limit switch **166** when, and only when, the shaft **100** is rotated into the position shown in full lines in FIGURES 6 and 7. That is, the limit switch **166** will be tripped only when the shaft **100** has been elevated and rotated through 90° such that set screw **168** extends into the lower circumferentially-extending portion of the slot **156** and the T-head **90** is in clamping position.

In the operation of the lower clamping unit **11A**, for example, the shaft **100** will initially be in the dotted line position shown in FIGURE 7, at which time the T-head **90** will extend into the slot **102** provided therefor in the bolster plate **4**. In order to raise the shaft **100**, a valve, not shown, is opened to admit fluid under pressure into the annular passageway **144** through opening **152**, thereby raising the shaft **100** and T-head **90** to the proper height. During this time, the forward end of the set screw **168** slides within the axially-extending portion **156***a* of slot **156**. As soon as the shaft **100** reaches the proper height, the slot **154** will reach ball **160** whereby the limit switch **164** is tripped. When limit switch **164** is tripped, circuitry, not shown, actuates the air motor **130** to rotate spur gears **126** and **124** as well as the cylindrical member **116**. The action of the motor causes the shaft **100** to rotate in a counterclockwise direction as viewed in FIGURES 8, 9 and 10, whereby the forward end of set screw **168** will move into the lower circumferentially-extending portion of slot **156** until it engages a shoulder **180** (FIGURE 9). When the forward end of set screw **168** engages shoulder **180**, the slot **158** will register with ball **162** to trip limit switch **166**. Limit switch **166**, in turn, actuates an indicating means to signal the operator that the shaft **100** and T-head **90** have been rotated to the proper locking position. Thereafter, the air motor **130** continues to rotate the cylindrical member **116** and the nut **112** whereby the T-head **90** is tightened against shoulders **94** and **96** to securely clamp the die **8** to the bolster plate **4**. This action will continue until a maximum torque is obtained and the motor stalls or "torques out." As was the case with motors **26**, suitable motor cut-off means may be provided to de-activate the motor after clamping engagement.

In order to release the clamp, the motor **130** is rotated in the opposite direction to rotate the cylindrical member **116** and nut **112** in a clockwise direction as viewed in FIGURE 10. Initially, the nut **112** will rotate while the shaft **100** remains stationary until the T-head **90** is loosened. Thereafter, continued rotation of the nut **112** in a clockwise direction will cause the shaft **100** and T-head **90** to rotate in a clockwise direction also as viewed in FIGURES 8 and 9 until the set screw **168** engages a side of the axially-extending portion **156***a* of slot **156**. At this point, the T-head **90** will have been rotated into position whereby it may fall through the slot **98** and into slot **102** in bolster plate **4** where it comes to rest against seat **99**. As the shaft **100** drops down, it resets the limit switch **164** to cut off the air motor **130**. The die **8** may thereafter be easily removed from the bolster plate **4**.

Although the invention has been shown in connection with certain specific embodiments, it will be readily apparent to those skilled in the art that various changes in form and arrangement of parts may be made to suit requirements without departing from the spirit and scope of the invention.

We claim:

1. In combination with a press having a die-receiving member and a die having a T-slot therein with shoulders in the T-slot adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position and to engage the shoulders of said T-slot when rotated 90° from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, stop means secured to said housing and stop means located on said shank portion to establish said oriented position when rotated into contact with said housing stop means, second stop means located on said shank portion to establish a position 90° from said oriented position when counter-rotated into contact with said housing stop means, limit switch means secured in said housing, means on said shank portion adapted to trip said limit switch means when said T-head is in T-slot shoulder engaging position, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank, and drive means to rotate said nut.

2. The combination claimed in claim 1 and including over-riding pressure means interposed between said nut and said shank portion.

3. The device set forth in claim 1, in which a recess is provided in said die-receiving member adapted to receive said T-head therein, and a lost motion coupling interposed between said drive means and said nut to permit axial sliding movement of said clamping means through said passageway.

4. In combination with a press having a die-receiving member and a die having a T-slot therein with shoulders

adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position and to engage the shoulders of said T-slot when rotated 90° from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, stop means secured to said housing and stop means located on said shank portion to establish said oriented position when rotated into contact with said housing stop means, second stop means located on said shank portion to establish a position 90° from said oriented position when counter-rotated into contact with said housing stop means, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank, and drive means to rotate said nut.

5. A press die clamp of the class described comprising a clamping member having a T-head on one end adapted to engage a T-slot of a die, a shank portion on the opposite end of said clamping member, a housing to contain the shank portion of said clamping member, stop means secured to said housing to limit rotational movement of said clamping member, over-riding clutch means drivingly connected to said clamping member, and means coacting with said clutch means to rotate said clamping member into contact with said stop means.

6. A press die clamp of the class described comprising a clamping member having a T-head on one end adapted to engage a T-slot of a die, a threaded shank portion on the opposite end of said clamping member, a housing to contain the shank portion of said clamping member, stop means secured to said housing to limit rotational movement of said clamping member, a collar threadedly engaged with said threaded shank portion and adapted to bear against said housing, and pressure means in slip-clutch driving engagement between said collar and said shank portion whereby rotation of said collar coacting with said pressure means rotates said clamping member into contact with said stop means.

7. The device set forth in claim 6, wherein said pressure means comprises a helical spring adapted to exert limited axial pressure between said shank portion and said collar, whereby torque applied to said collar is transmitted by said helical spring means to said shank portion.

8. A press die clamp of the class described comprising a clamping member having a T-head on one end adapted to engage a T-slot of a die, a threaded shank portion on the opposite end of said clamping member, a housing to contain the shank portion of said clamping member, stop means secured to said housing to limit rotational movement of said clamping member, a collar threadedly engaged with said threaded shank portion and adapted to bear against said housing, limit switch means secured in said housing, and means on said shank portion adapted to trip said limit switch means when said clamping member is rotated into contact with said stop means and to reset the limit switch means when said clamping member is rotated away from said stop means.

9. A press die clamp of the class described comprising a clamping member having a T-head on one end adapted to engage a T-slot of a die, a threaded shank portion on the opposite end of said clamping member, a housing to contain the shank portion of said clamping member, stop means secured to said housing to limit rotational movement of said clamping member, a collar threadedly engaged with said threaded shank portion and adapted to bear against said housing, pressure means in engagement between said collar and said shank portion whereby rotation of said collar coacting with said pressure means rotates said clamping member into contact with said stop means, limit switch means secured in said housing, and means located on said shank portion to trip said limit switch means upon completion of rotation of said clamping means into engagement with said stop means.

10. In combination with a press having a die-receiving member and die having a T-slot therein with shoulders adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position and to engage the shoulders of said T-slot when rotated from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, limit switch means secured in said housing, and means on said shank portion adapted to trip said limit switch means when said T-head is in T-slot shoulder engaging position.

11. In combination with a press having a die-receiving member and a die having a T-slot therein with shoulders adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position, and to engage the shoulders of said T-slot when rotated from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank portion, drive means to rotate said nut, and a lost motion coupling interposed between said drive means and said nut adapted to permit axial sliding movement of said clamping means through said passageway.

12. In combination with a press having a die-receiving member and die having a T-slot therein with shoulders adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position, and to engage the shoulders of said T-slot when rotated from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, limit switch means secured in said housing, means on said shank portion adapted to trip said limit switch means when said T-head is in T-slot shoulder engaging position, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank, drive means to rotate said nut, and a lost motion coupling interposed between said drive means and said nut adapted to permit axial sliding movement of said clamping means through said passageway.

13. The combination claimed in claim 12 and including over-riding pressure means interposed between said nut and said shank portion.

14. In combination with a press having a die-receiving member and a die having a T-slot therein with shoulders adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a flat sided T-head on one end adapted to axially enter said T-slot when in a predetermined oriented position and to

engage the shoulders of said T-slot when rotated from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass axially therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank, and means for rotating said nut for forcing said T-head axially through said passageway and into said T-slot when the T-head is in said predetermined oriented position.

15. In combination with a press having a die-receiving member and a die having a T-slot therein with shoulders adapted to be engaged by a clamping member; the improvement in means to secure said die to said die-receiving member comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position and to engage the shoulders of said T-slot when rotated 90° from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, fluid pressure means for forcing said T-head through said passageway and into said T-slot when the T-head is in said predetermined oriented position, stop means secured to said housing and stop means located on said shank portion to establish said oriented position when rotated into contact with said housing stop means, second stop means located on said shank portion to establish a position 90° from said oriented position when counter-rotated into contact with said housing stop means, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank, and drive means to rotate said nut.

16. The device as set forth in claim 15 and including limit switch means secured in said housing and adapted to actuate said drive means, and means on said shank portion adapted to trip said limit switch means to actuate the drive means when said T-head extends into said T-slot.

17. In combination with a press having a die-receiving member and a die having a T-slot therein with shoulders adapted to be engaged by a clamping member; the improvement in means to secure said die to said slide comprising a clamping member having a T-head on one end adapted to enter said T-slot when in a predetermined oriented position and to engage the shoulders of said T-slot when rotated 90° from said oriented position, a threaded shank portion on the opposite end of said clamping member, a passageway in said die-receiving member adapted to permit said shank portion to pass therethrough, a housing secured to said die-receiving member adapted to contain such of said shank portion extending beyond said passageway, stop means secured to said housing and stop means located on said shank portion to establish said oriented position when rotated into contact with said housing stop means, second stop means located on said shank portion to establish a position 90° from said oriented position when counter-rotated into contact with said housing stop means, first limit switch means secured in said housing, means on said shank portion adapted to trip said first limit switch means when said T-head is in T-slot shoulder engaging position, a shoulder on said housing, a nut adapted to rest on said shoulder and engage the threaded portion of said shank, drive means to rotate said nut, second limit switch means secured in said housing and adapted to actuate said drive means to rotate said nut, and means on said shank portion adapted to trip said second limit switch means when the T-head extends into said T-slot.

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