Oct. 28, 1930. G. E. STRANDT ET AL 1,779,683

ADJUSTABLE POSITIONING MECHANISM FOR BOTTLE CAPPERS

Filed Aug. 24, 1925 2 Sheets-Sheet 1

Fig. 1.

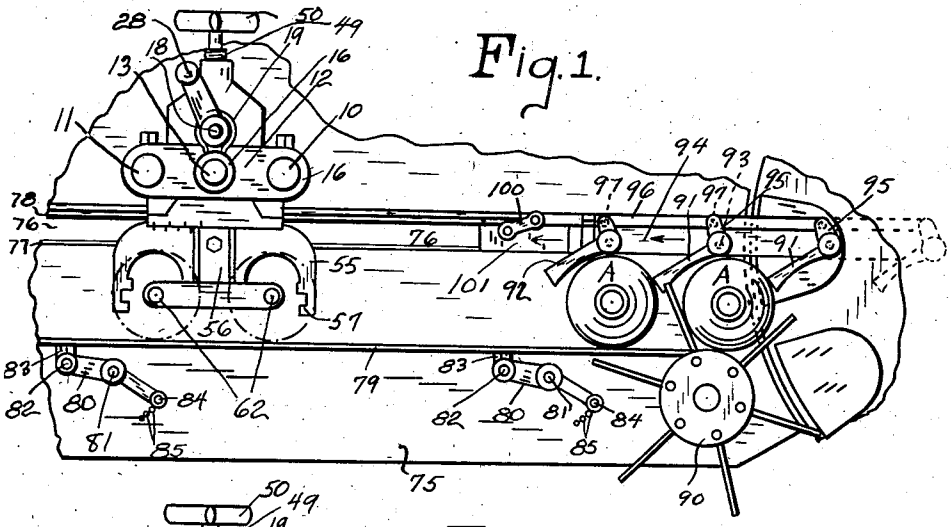


Fig. 2.

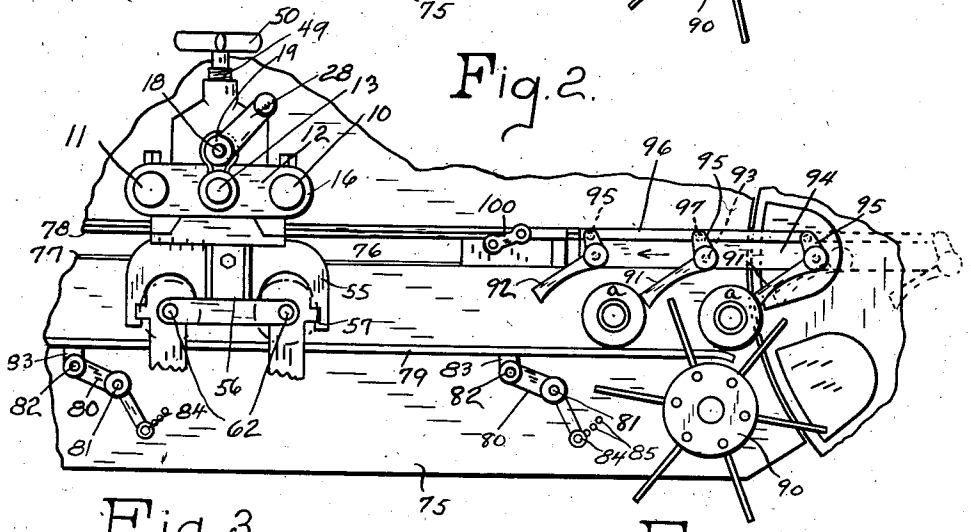


Fig. 3.

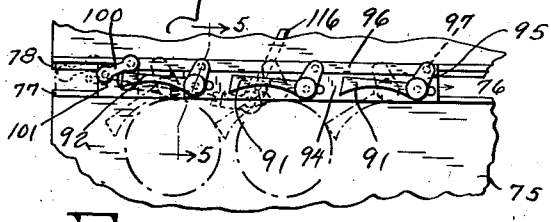


Fig. 5.

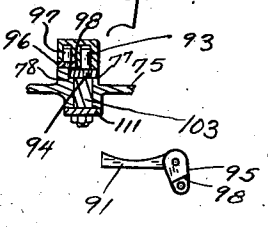
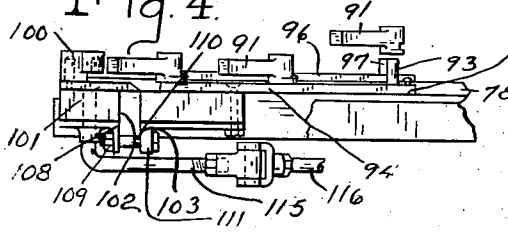


Fig. 6.

Fig. 4.



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Fig. 8.

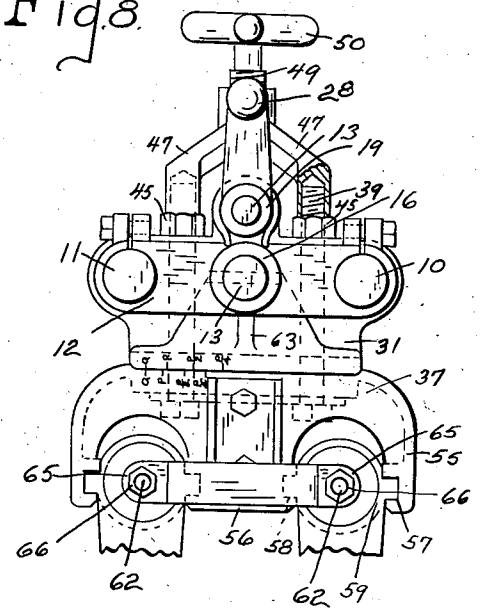


Fig. 10.

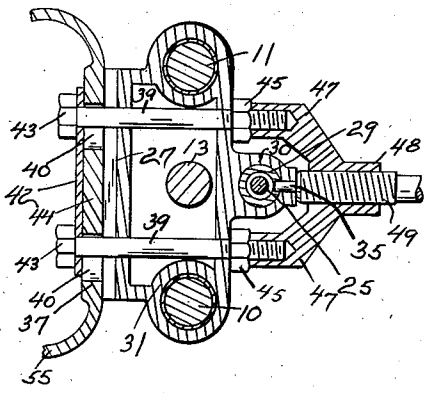


Fig. 9.

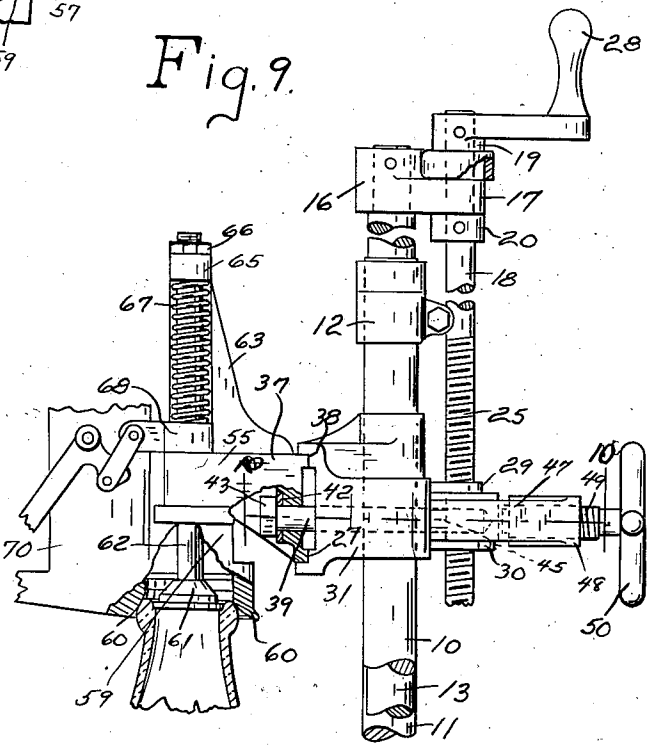
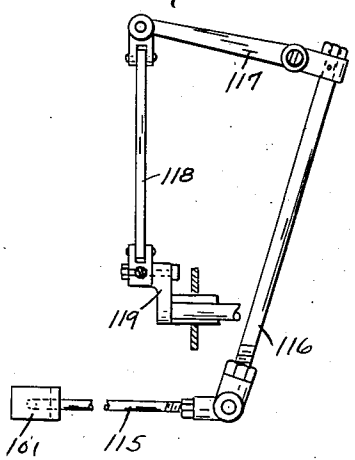


Fig. 7.



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UNITED STATES PATENT OFFICE

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ADJUSTABLE POSITIONING MECHANISM FOR BOTTLE CAPPERS

Application filed August 24, 1925. Serial No. 52,008.

Our invention relates to improvements in adjustable positioning mechanism for bottle cappers.

The object of this invention is to provide adjusting means for a bottle capper which is adapted to be quickly and conveniently adjusted for use in capping bottles of different sizes fed to the capping machine by a single feeder; to provide a co-operative adjustable feeder which will properly place bottles in position for registry with the capper plungers; to provide a capper to which bottles may be mechanically fed in pairs by an adjustable positioning feeder, the feeder and the capper being adapted to be mutually adapted or re-adjusted in correspondence with the size of the bottles to be fed, preparatory to such feeding operation and in such a manner that the capping plungers will be in a position to accurately register with the pairs of bottles as delivered by the feeder; to provide means whereby a capper may not only be adjusted vertically in accordance with the height of the bottles but in which adjustments can be made horizontally to meet the requirements of a horizontally reciprocating feeding mechanism when used for feeding bottles having differing diameters and which are, therefore, deposited in different positions by the feeder from the delivery positions occupied by bottles of other diameters; to provide a co-operative adjustment of the feeder; and in general to provide means whereby bottles of differing sizes may be positioned and capped by a single capping mechanism of ordinary type.

In the drawings:

Figure 1 is a plan view of a portion of a feeding and capping mechanism embodying my invention as used for capping large bottles, with the feeding arms in bottle engaging position.

Figure 2 is a similar view showing an adjustment of the capping mechanism for capping small bottles.

Figure 3 is a plan view of the feeding mechanism and its actuating connections as they appear when the feeder levers retract at the delivery end portion of the slideway, with dotted lines indicating their extreme position to which they move during the final portion of their delivery stroke.

Figure 4 is a side elevation of the parts of the feeder shown in Figure 3 when at delivery position.

Figure 5 is a sectional view on line 5—5 of Figure 3.

Figure 6 is a detail view of the under side of the actuating arm of one of the bottle feeding levers.

Figure 7 is a plan view of the actuating connections of the feeding slides.

Figure 8 is an enlarged plan view of the capper.

Figure 9 is a fragmentary side elevation of the upper portion of the capper.

Figure 10 is a sectional view drawn on line 10—10 of Figure 9.

Like parts are identified by the same reference characters throughout the several views.

The means for positioning the capper with reference to the size of the bottles to be capped at any given setting will first be described. This mechanism is illustrated in Figures 8, 9 and 10.

A pair of guide posts 10 and 11 are connected at their upper ends by a cross head 12 which is clamped to the respective posts and provided with a central aperture through which the capper operating rod 13 extends. This capper operating rod carries a head piece 16 at its upper end having a rearwardly projecting arm 17 in which a vertically disposed slide adjusting rod 18 is swiveled, said rod having a crank hub 19 and a collar 20 above and below the arm 17 as clearly shown in Figure 9.

The lower end portion 25 of the rod 18 is threaded into an internal nut 29 mounted in a rearwardly projecting arm 30 carried by a slide 31, the latter being guided by the posts 10 and 11. The internal nut 29 is locked against rotation by a key pin or screw 35 inserted in the arm 30 at its rear end and socketed in the nut as clearly shown in Figure 10. The nut is thus locked against rotation and the upper and lower walls of its socket in the arm 30 prevent vertical movement of the nut with reference to said arm.

Therefore, rotation of the screw 25 will raise or lower the slide 31.

A cross slide 37 is adjustably mounted in a longitudinal channel or way 38 on the front face of the slide 31 and is secured in position by bolts 39 which pass through slots 40 in the rear wall 44 of the cross slide 37 and loosely through apertures in the front and rear walls of the vertical slide 31. A clamping plate 42 is preferably interposed between the heads 43 of the bolts 39 and the rear wall 44 of the slide 37 and the nuts 45 are preferably applied to the bolts 39 at the rear side of the vertical slide 31. The rear ends of the bolts also have screw threaded engagement in suitable sockets formed in the arms 47 of a yoke shaped member which includes a head piece 48 through which a clamping screw 49 is passed in a position to bear against a rear end of the arm 30. This clamping screw 49 is provided with a hand wheel 50 which may be turned in one direction to cause the screw 49 to bear against the arm 30 of the vertical slide whereby the yoke draws the bolts 39 rearwardly and causes their heads 43 to exert a clamping pressure against the plate 42 and the rear wall of slide 37 to bind the latter in its position of adjustment upon slide 31. By turning the hand wheel 50 in the opposite direction this clamping pressure is relieved and the slide 37 may then be adjusted horizontally along the slideway or channel 38.

The slide 37 is provided with forwardly projecting arms 55 and 56 which have vertical channels 57 and 58 which serve as guides for the plunger enclosing members 59 which carry the bottle engaging funnel shaped members 60. The plungers 61 are supported by rods 62 from an arm 63 which projects upwardly and forwardly from the slide 37 and carries eye pieces 65 through which the rods 62 extend, the upper ends of the rods being provided with nuts 66. Springs 67 are interposed between the eye pieces 65 and collars 68 on the rods 62.

The specific construction of the cap feeding and inserting mechanism carried by the plunger enclosing members 59 is similar to that disclosed in Letters Patent of the United States to Gustav Strandt for bottle capping machines, No. 1,221,105, dated April 3, 1917, and No. 1,360,463, dated November 30, 1920. Therefore, detailed description of these parts is deemed unnecessary. It is sufficient for the purpose of this description to state that during capping operations the rod 13 is reciprocated vertically and during its downward movement if the funnel shaped member 60 is brought into contact with the top of a bottle, a continued downward movement of the supporting slides will be transmitted to the plunger 61 while the movement of the holder is arrested by the resistance of the bottle to the downward movement of the funnel shaped member 60. This causes the plunger to force an interposed cap into the mouth of the bottle and also operates a cap feeding slide (not fully shown herein but disclosed in said former patents) to engage another cap preparatory to feeding the same from the bottom of the pile in the magazine 70 underneath the plunger during the retractive movement of the slides. The spring 67 retracts the plunger from bottle capping position to the position in which it is shown in Figure 9, thereby permitting the feeding of the cap from the magazine underneath the plunger preparatory to the next bottle capping operation.

By vertically adjusting the slides 31 by means of the screw 25 the capping mechanism may be properly positioned with reference to the height of the bottles to be capped.

By adjusting the slide 37 horizontally to the right or left along the front face of the slide 31 the capping mechanism may be properly positioned with reference to the spacing and the location of bottles of any given diameter when fed to the capping mechanism by the feeding devices now to be described. This is desirable in order to avoid complex re-adjustments of the feeding mechanism.

The feeding mechanism is like that described in our pending application, Serial No. 654,652, filed July 30, 1923, this being a companion application.

A feeding table 75 has a slideway 76 bordered by slide supporting flanges 77 and 78. A guard rail 79 is movably mounted on the table 75 and adjusted toward or away from the slideway 76 by levers 80 which are fulcrumed at 81 to the table 75. One arm of each lever is pivoted at 82 to an associated bracket 83 on guard rail 79. The other arm of the lever 80 carries a pin 84 which may be engaged in any one of a series of holes 85 in the table, said holes being disposed along an arcuate line corresponding with the arc in which the locking pin 84 swings.

The bottles may be delivered to the table 75 in any suitable manner, such for example, as the rotating star wheel 90 which pushes them into the space between the guard rail 79 and the slideway 76. They are advanced in said space by pairs of elbowed feeding levers having bottle engaging arms 91. A third feeding lever has a similar arm 92. The arms 91 are adapted to engage and advance bottles to the capper in pairs and the arm 92 of the third lever is used for out-feeding from the capper.

These three feeding levers are each connected by a pivot pin 93 with a slide bar 94 mounted for longitudinal movement along the slideway flanges 77 and 78 and their short arms 95 are pivoted to an auxiliary slide bar 96 by pivot pins 97 as clearly shown in Figures 1, 2 and 3. This auxiliary slide bar 96 is mounted to slide freely upon the surface

of the table on the inner side of the guideway 76 and is held parallel with the slide bar 94 by the short arms 95 of the levers. Each short arm has a shoulder 98 on the under side (Figure 6) which is adapted to serve as a limiting stop when brought into engagement with slide 94 thereby steadying the finger in bottle engaging position.

The rear end portion of the auxiliary slide bar 96 is connected by a link 100 with an actuating slide 101 mounted in the rear end portion of the slideway 76. Assuming these parts to be in the position in which they are shown by dotted lines in Figure 3 a movement of the actuating slide 101 toward the right will be initially transmitted through the link 100 to the auxiliary slide bar 96 causing that slide to move relatively to the slide bar 94 and thereby swing the feeding levers to the positions in which they are shown by full lines in Figure 3. Thereupon the depending portion 102 of the actuating slide 101 will be brought in contact with a correspondingly depending portion 103 of the slide 94 and the two slides 94 and 96 will then move in unison toward the right to their extreme right hand position. A reverse movement of the actuating slide 101 will be transmitted through the link 100 of the auxiliary slide 96 to swing the lever arms 91 and 92 to bottle engaging position whereupon a bracket 108 carried by the portion 102 of the actuating slide 101 will engage a nut 109 on the end of a bolt 110 which loosely connects it with a corresponding bracket 111 carried by the portion 103 of slide 94. A continued movement of the actuating slide 101 toward the left will then be transmitted to the slide 94 causing the latter to move in unison with the slide 96. During this movement the lever arms 91 will push engaged bottles A—A (Figure 1) or *a*—*a* (Figure 2) along the surface of the table in contact with the guard rail 79 and the final movement in this direction will bring the bottles into registry with the capper, the latter having previously been properly adjusted with reference to the diameters and heights of the bottles to be fed.

During the left hand movement of the slides, as above described, the arm 92 of the rear feeding lever will engage and push the capped bottles from their positions of registry with the capper plungers preparatory to the action of the lever arms 91 in placing a pair of uncapped bottles in such positions.

Owing to the fact that the auxiliary slide 96 is freely movable upon the surface of the table 75 it is free to move laterally with reference to slide 94 in comformity with the arcuate paths of its pivotal connections with the short arms 95 of the bottle feeding levers. But the slides 94 and 101 are guided in the table guideway 76.

The actuating slide 101 may be reciprocated from any suitable source of power. In Figure 4 of the drawings we have shown the slide 101 with an actuating arm 115 pivoted to an arm 116 of a lever 117 (Fig. 7) the power arm of which is connected by a link 118 with a crank 119. The arrangement being such that the crank 119 and link 118 will be substantially in alignment with the end of the stroke of the actuating slide 101 in either direction. Therefore, the bottles engaged by the lever arms 91 and 92 will be initially moved slowly as the crank crosses the line of centers through its axis and the link and this movement will be accelerated during the middle portion of the stroke and retarded at the end, the slides and the lever arms 91 and 92 being practically brought to rest preparatory to the withdrawal of the arms from the bottles, and the bottles having substantially no momentum at the time their advancing movement ceases, i. e. at the time they reach positions of registry with the capper plungers.

It will be understood from the foregoing description and from an inspection of Figures 1 and 2 taken with Figures 8, 9 and 10 that when feeding bottles of the sizes indicated at A—A in Figure 1 the capper mechanism will be adjusted at a height for capping bottles of that size and its horizontal or cross slide 37 will be adjusted to bring the capper plungers in position for registry with bottles of that size delivered by the levers 91. The guard rail 79 will also be so positioned that the vertical center lines of the bottles A—A will coincide with the center lines of the capping plungers.

But when feeding smaller bottles, such as the bottles *a*—*a* shown in Figure 2, the guard rail 79 will be moved inwardly to a distance equal to the difference between the radii between bottles A—A and the bottles *a*—*a* and the capper slide 37 will be correspondingly adjusted toward the infeeding side. Crank 28 will then be rotated to adjust slide 31 vertically to a distance equal to the difference in the height of the bottles whereupon the capper may be operated for capping bottles of the smaller size. These adjustments are made necessary by the fact that the feeding cranks or lever arms 91 engage the peripheries of the larger bottles a little earlier during the feeding movement than is the case with the smaller bottles and advance them a correspondingly greater distance along the slideway. It will, therefore, be obvious that by combining a capper having a vertical slide 31 and a horizontal slide 37 with a feeder of the construction described having an adjustable guide wall or rail 79, only three simple adjustments will be required to adapt the apparatus for capping bottles of any given size.

We claim:

1. Positioning mechanism for bottle cap-

pers including the combination of a vertically adjustable slide, a cross slide adjustable horizontally thereon, and means for supporting cap feeding and placing mechanism from the cross slide, means for accurately centering bottles of differing diameters with reference to the cap feeding and placing mechanism.

2. Positioning mechanism for bottle cappers including the combination of a vertically movable actuating rod provided at its upper end with a laterally projecting arm, a hanger screw swiveled to said arm, a vertically movable slide in which said screw is threaded, means for guiding said slide, a cross slide adjustable thereon, clamping bolts extending through portions of said slides and adapted to permit relative horizontal adjustments thereof when the clamping pressure is released, a manually operable screw provided with a yoke adjustably connected with said clamping bolts and adapted to adjust them into and out of clamping position, whereby the horizontally movable slide may be adjusted and locked in various desired positions of adjustment, said cross slide being provided with forwardly projecting, vertically channeled arms provided with capping mechanism.

3. Positioning mechanism for bottle cappers including the combination with a set of guide posts, of a vertically movable slide having apertures through which said guide posts extend, an actuating rod operatively connected with the slide, means for adjusting the slide longitudinally of said rod while retaining said operative connection, a cross slide mounted on the vertically movable slide, a manually operable clamping screw for securing the cross slide in various desired positions relatively to the vertically movable slide, a support for cap feeding and inserting mechanism connected with the cross slide, and positively acting means for accurately centering bottles of differing sizes with reference to the cap feeding and inserting mechanism.

4. The combination with a bottle capper, of a set of relatively fixed guides, a vertically reciprocable slide loosely engaged by said guides, a slide actuating rod disposed in parallel relation to the guides and having adjustable screw connection with the slide, and a capper supporting cross slide mounted on the first mentioned slide.

5. The combination with a bottle capper, of a set of relatively fixed guides, a vertically reciprocable slide loosely engaged by said guides, a slide actuating rod disposed in parallel relation to the guides and having adjustable screw connection with the slide, a capper supporting cross slide mounted on the first mentioned slide, together with means for fixedly securing said slides and actuating rod together for operation as one unit during reciprocation of the rod.

6. Bottle capper positioning and operating mechanism comprising the combination with suitable guides of a slide, vertically movable along said guides, an actuating rod extending through the slide between said guides and provided with a head piece at its upper end, a screw swivelled to said head piece and having threaded engagement with the slide, a capper supporting cross slide horizontally adjustable on the first mentioned slide, and a manually operable member having clamping connections for securing said slides and screw together for operation as one unit during reciprocation of the actuating rod.

7. Bottle capper positioning and operating mechanism comprising the combination of a set of upright guide posts, a slide loosely embracing said guide posts, an intermediate actuating rod extending through the slide parallel with the guide posts, an adjusting screw connecting the upper end portion of the rod with the slide, and a capper supporting cross slide mounted on the first mentioned slide and provided with capper plunger guides.

8. Bottle capper positioning an operating mechanism comprising the combination with common feeding mechanism adapted to deliver bottles of differing sizes in step by step movements and position them for capping operations, of cap feeding and placing mechanism,—said mechanisms containing manually movable elements for relative adjustment in three directions with reference to the delivered bottles in conformity with requirements for capping bottles which differ in length and diameter, an actuating rod connected to operate the capper, and a single manually adjustable clamping means for securing the capper supporting elements to said rods for operation as a single unit after adjustment of the same.

9. In a bottle capper positioning and operating mechanism, the combination with a set of guide posts and an intermediate actuating rod movable axially along a line parallel to said posts, a slide with which said posts have guiding connection, an adjusting screw connecting said slide with the actuating rod, a capper supporting cross slide mounted on the first mentioned slide, and common means for securing said slides together and to the adjusting screw for operation as a single unit.

10. In a bottle capper positioning and operating mechanism, the combination of a set of vertically disposed guide posts, of a slide having apertures through which said posts extend, an intermediate actuating rod extending through the slide between the posts, said rod having an arm at its upper end, and adjusting screw swivelled to said arm and having threaded engagement with the slide to

support the latter at various distances from said arm, a horizontally slotted capper supporting cross slide mounted on the vertically movable slide, clamping bolts extending through the slots in the cross slide and through the vertically movable slide at the respective sides of the adjusting screw, a yoke engaged with said clamping bolts, and a clamping screw threaded in said yoke and engageable with that portion of the vertical slide with which the adjusting screw engages, whereby to draw the cross slide into clamping engagement with the vertical slide.

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