Oct. 22, 1963 M. A. PAUL 3,107,575

SHELL HOLDING JIG

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FIG. 1

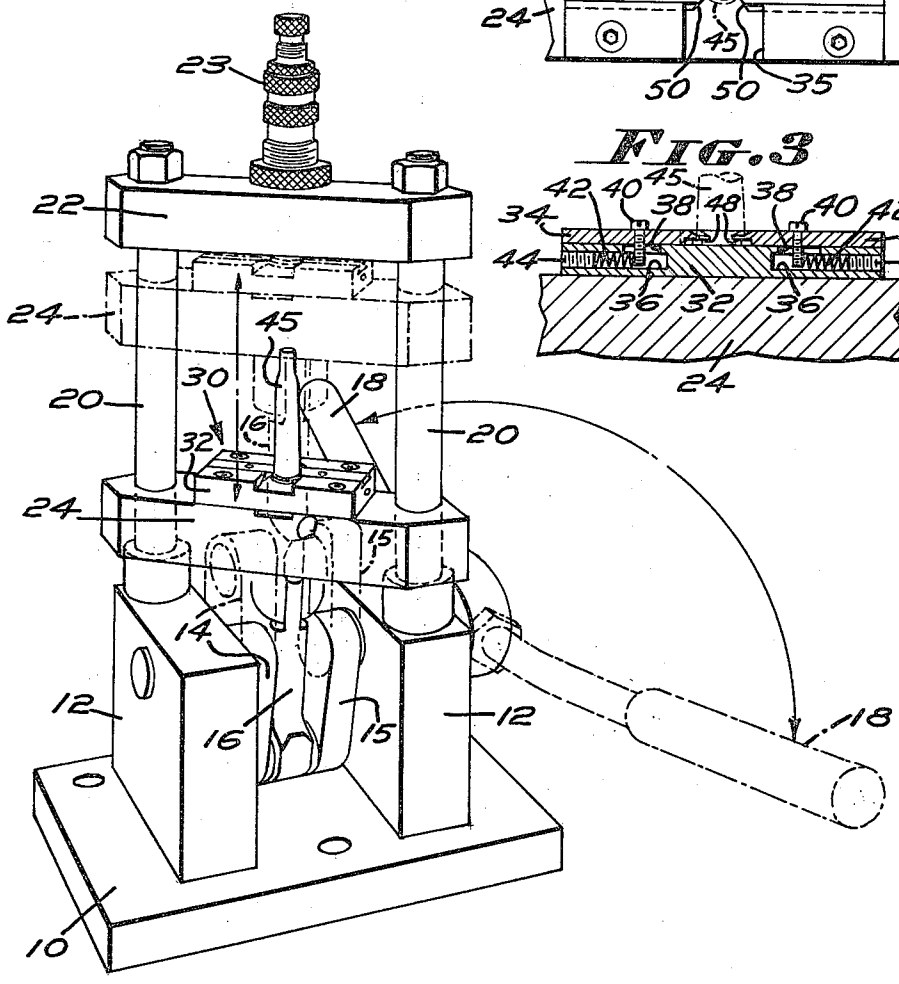


FIG. 2

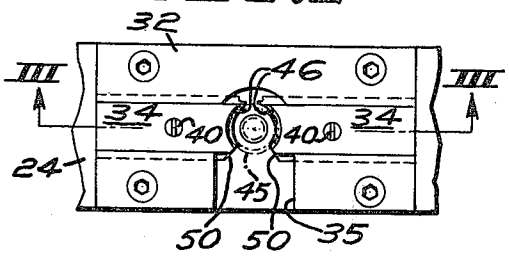


FIG. 3

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FIG. 5

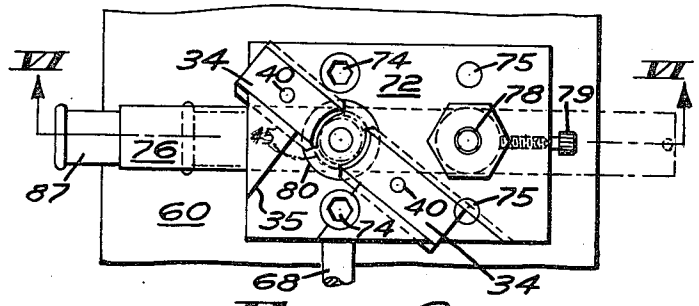


FIG. 6

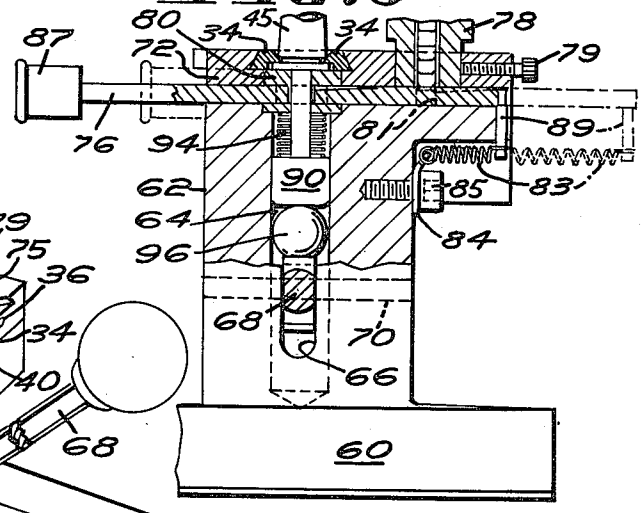


FIG. 4

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SHELL HOLDING JIG

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This invention relates to workpiece holding jigs and more specifically to an improved cartridge shell holder for use during shell reloading operations, particularly the shell re-sizing and primer seating phases thereof.

One object of the invention is to provide an improved holding jig which automatically adjusts to cartridge shells of considerable range in size, thereby eliminating the necessity of purchasing a different holding jig for each caliber cartridge to be reloaded, and likewise dispensing with the changeover of holding jigs when reloading shells of different sizes.

Another object of the invention is to provide a jig as aforesaid which automaatically centers therein the shell being worked on.

Another object of the invention is to provide an improved holding jig as aforesaid which is very simple in design and easily adjustible for degree and balance of shell gripping pressure.

Other objects and advantages of my invention will appear from the detailed description hereinbelow and the accompanying drawings wherein:

FIG. 1 is a perspective view of a shell re-sizing press and holding jig of the invention;

FIG. 2 is a top plan view, on enlarged scale, of the holding jig of FIG. 1;

FIG. 3 is a sectional view taken on line III—III of FIG. 2;

FIG. 4 is a perspective showing another form of holding jig and primer-seating device of the invention;

FIG. 5 is a fragmentary top plan view, on enlarged scale, of the jig device of FIG. 4; and

FIG. 6 is a fragmentary sectional view taken on line VI—VI of FIG. 5.

Referring now to FIGS. 1–3 of the drawing, one form of the holding jig of the invention is shown therein in use with a shell re-sizing press. The press is shown to comprise a base 10 which carries a pair of mounting pedestals 12, 12. A crankshaft including a pair of crank arms 14, 15 is journalled in the pedestals 12, 12 and pivotally mounts thereon one end of a thrust arm 16. At one end the crankshaft extends through and outwardly beyond its mounting pedestal to receive an operating lever arm 18 which is keyed thereto. A slide bar 20 is mounted in each of the pedestals 12, 12, and the two bars 20—20 extend upwardly from the pedestals in parallel relation. A die mounting bar 22 is fixed to the upper ends of the slide bars 20, 20 as shown, and is centrally bored and tapped to mount a conventional shell-sizing die as indicated generally at 23. A feed bar 24, carried intermediately of the ends of the slide bars 20, 20, and adapted to slide thereon, is pivotally connected to the thrust arm 16; and thus shells mounted upon and carried by the feed bar 24 as will be explained hereinafter, will be fed to the die 23 upon operation of the lever 18.

When used with the press as described, the holding jig of my invention, designated generally at 30, includes a body portion 32 which is longitudinally grooved to accommodate a pair of opposed gripping plates 34, 34. The side walls of the groove are angled so that the groove grows progressively wider from top to bottom and the gripping plates 34, 34 are complementarily shaped so that the plates may slide longitudinally of the groove but will be prevented from upward displacement. A feed groove 35 intersects the longitudinal groove at a point between the plates 34, 34. A bore 36, underlying

and substantially paralleling the gripping plate retaining groove, is provided at each end of the body portion 32, and slots 38, 38 are provided to intercommunicate a certain extent of each bore 36 with the upper groove. Each gripping plate is bored and tapped to threadably accommodate a stop screw 40 which, when threaded through the gripping plate while the plate is positioned in the body 32, will extend through the slot 38 and into the bore 36. A compression spring 42 is then inserted in each bore 36, against the stop screw 40, and is retained in the bore as by a headless set screw 44. By this means, the gripping plates 34, 34 are biased toward one another, and their range of travel is determined by the extent of slots 38, 38.

Referring now to FIGS. 2 and 3, for the specific use of gripping a cartridge shell as indicated at 45, the lower portions of the opposed end walls of the plates 34, 34 are relieved as indicated at 48 to accommodate the shell rim; thus holding the shell against upward displacement. The end surfaces are radiused as indicated at 46 (FIG. 2) so that a shell placed therebetween will be centered therein and held from displacement laterally of the gripping plates. Proper settings of the set screws 44, 44 will provide equal force from each of the compression springs 42, 42, and the shell will thereby be centered in the longitudinal direction of the plates 34, 34.

Additionally, the outer corners of the plates 34, 34 facting the feed groove 35 are beveled as indicated at 50, 50 so that the plates 34, 34 will be cammed apart to receive a shell by pressing the cartridge shell thereagainst. The shell may be removed from between the plates 34, 34 by a simple pullling motion as, in this case, the radiused portions of the ends of the plates will act as cam surfaces.

FIGS. 4–6 illustrate the holding jig of the invention as adapted for use with a primer-seating device. As shown, the primer-seating device may comprise a stable base platform 60 having a pedestal body 62 mounted thereon. The pedestal body 62 is vertically bored as indicated at 64 (FIG. 6) and a relatively narrow slot 66 (FIG. 4) extends through one side of the pedestal into the bore 64. A lever arm 68 is pivotally mounted in the slotway 66, as by means of a pin 70 and the inner end of the lever arm extends into the bore 64.

A pedestal top plate 72 is fitted to the top of the pedestal 62 where it is detachably secured as by machine screws 74 and positioning dowels 75. The underside of the plate 72 is grooved along its full length to accommodate a sliding feed bar 76. A vertical bore, which intersects with the groove for the feed bar 76, is provided to receive a primer magazine 78 which may be locked therein by means of a set screw 79. The top plate 72 is also bored from its underside to receive a guide plug 80. As the guide plug 80 also intersects the groove holding the feed bar 76, it is milled out to accommodate the feed bar 76.

The slide feed bar 76 is provided with a primer receiving bore 81 (FIG. 6) so positioned as to be in registry with the primer magazine when the slide bar is at its forward position, as shown in broken lines in FIG. 6, and to register with a similar bore provided through the guide plug 80 when the feed bar is in its rearmost position. Travel of the feed bar 76 is limited at one end by a shouldered hand knob 87 and at its other end by a depending stop pin 89. A tension spring 83 is connected at one end thereof to the pedestal 62 by any suitable means such as the bracket 84 and a machine bolt 85, and is connected at its other end to the stop pin 89. The slide bar 76 is thereby biased to its rearmost position.

Thus, when the feed bar is moved to its forward position, the lowermost primer cap in the feed magazine 78

will fall into the primer receiving bore 81 and upon return of the feed bar to its rearward position the primer cap will be aligned with the bore 81 in the feed plug 80.

A plunger member 90 is carried in the bore 64 in the pedestal 62. The plunger 90 is shaped and dimensioned to travel easily within the bore but sufficiently fills the bore so as to be maintained in proper alignment. The upper end of the plunger 90 is of reduced diameter of such dimension as to slide within and substantially fill the bore in feed plug 80. A compression spring 94 is mounted within the bore 64 and confined between the feed plug 80 and the shoulder formed on the plunger member 90 by reducing the diameter of the upper end thereof. The compression spring 94 functions to bias the plunger 90 to its downward or retracted position. A thrust ball 96 is also carried in the bore 64 to lie between the inner end of operating lever 68 and the bottom end of the plunger 90 to transmit upward motion to the plunger when the lever arm is depressed.

The holding jig of the invention is incorporated in the structure of the top plate 72 with the longitudinal axes of the gripping plates 34 and the associated bores 36, slots 38, compression spring 42 and other associated structures, canted diagonally across the top plate 72 in order to accommodate the slide bar 76. All the required components for the holding jig are substantially the same as, and function in the same manner in this embodiment as in the embodiment described in our description of the device of FIGURES 1–3, so that the functioning thereof need not be described again.

In operation of the device, a cartridge shell will be inserted between the gripping parts 34. The slide bar 76 will then be advanced to its forward position where it will pick up a primer cap and return of the slide bar to its rearward position will align the primer cap with the bore in the guide plug 80. In this position it will overlie the end of the plunger 90. The lever 68 is then pushed downwardly which wil cause the plunger 90 to move upwardly and carry the primer cap upwardly therewith to be seated in the end of the cartridge shell 45. The plunger is returned automatically to retracted position by the action of the compression spring 94 when the lever is released.

Thus it will be apparent that the holding jig of my invention provides a means for holding work pieces such as cartridge shells firmly in the properly seated position and that work pieces are easily fed thereto. The construction of the holding jig is relatively simple and inexpensive, the jig is easily adjusted, and the assembly is not subject to misalignment or other deviation from proper adjustment.

Although only two adaptations of the invention have been shown and described it will be understood that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A cartridge shell holding jig comprising a base member having formed into the upper face thereof an elongate groove having upwardly converging side walls, two elongate bores formed in said base member to underlie and parallel said elongate groove, a pair of gripping plates shaped to complement the cross-sectional shape of said groove and mounted in spaced apart aligned relation in said groove, each gripping plate having stop pin means extending therefrom into one of said bores, and a compression spring disposed in each bore and bearing against one of said stop pin means thereby biasing said plates to slide in said groove toward one another.

2. A cartridge shell holding jig comprising a base member having formed into the upper face thereof an elongate groove having upwardly converging side walls, two elongate bores formed in said base member to underlie and parallel said elongate groove, said base member having a pair of spaced apart slots extending between said groove and a respective one of said bores, a pair of gripping plates shaped to complement the cross-sectional shape of said groove and mounted in spaced apart aligned relation in said groove, each gripping plate having stop pin means extending therefrom through different ones of said slots and into one of said bores, and a compression spring disposed in each bore and bearing against one of said stop pin means thereby biasing said plates to slide in said groove toward one another.

3. A cartridge shell holding jig comprising a base member having formed into the upper face thereof an elongate groove having upwardly converging side walls, two elongate bores formed in said base member to underlie and parallel said elongate groove, said base member having a pair of spaced apart slots extending between said groove and a respective one of said bores, a pair of gripping plates shaped to complement the cross-sectional shape of said groove and mounted in spaced apart aligned relation in said groove, each gripping plate having stop pin means extending therefrom through different ones of said slots and into one of said bores, and a compression spring disposed in each bore and bearing against one of said stop pin means thereby biasing said plates to slide in said groove toward one another, the opposed end faces of said plates being concaved to receive and grip a shell therebetween, said base member being also formed with a shell feed groove intersecting said elongate groove at a position between the opposed ends of said gripping plates, said plates being bevelled at their corner portions engaging a shell when fed through said feed groove so as to be cammed apart by pressure of a shell thereagainst to permit the shell to move into centered position between said gripping plates.

4. A cartridge shell holding jig comprising, a base member having formed into the upper face thereof an elongate groove having upwardly converging side walls, two elongate bores formed in said base member to underlie and parallel said elongate groove, said base member having a pair of spaced apart slots extending between said groove and a one of said bores, a compressed spring positioned in each of said bores with their outer ends engaging adjustable stop plugs threaded in the ends of said bores, a pair of gripping plates shaped to complement the cross-sectional shape of said groove and mounted in spaced apart aligned relation in said groove, each gripping plate having stop pin means extending therefrom through different ones of said slots and into one of said bores into engagement with the inner end of one of said compressed springs thereby biasing said plates to slide in said groove toward one another, the opposed end faces of said plates being concaved to receive and grip a shell therebetween, said base member being also formed with a shell feed groove intersecting said elongate groove at a position between the opposed ends of said gripping plates, said plates being bevelled at their corner portions engaging a shell when fed through said feed groove so as to be cammed apart by pressure of a shell thereagainst to permit the shell to move into centered position between said gripping plates.

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