June 10, 1947. A. J. MATTER 2,422,114

QUICK LATCH JIG

Filed March 8, 1944 3 Sheets-Sheet 1

Fig. 1.

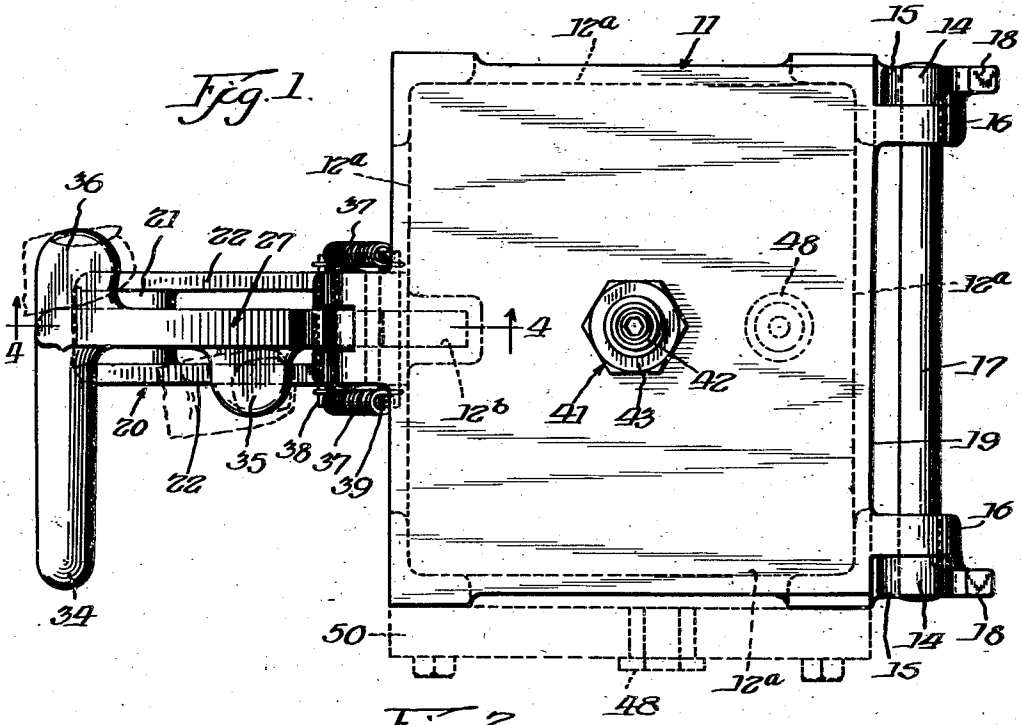
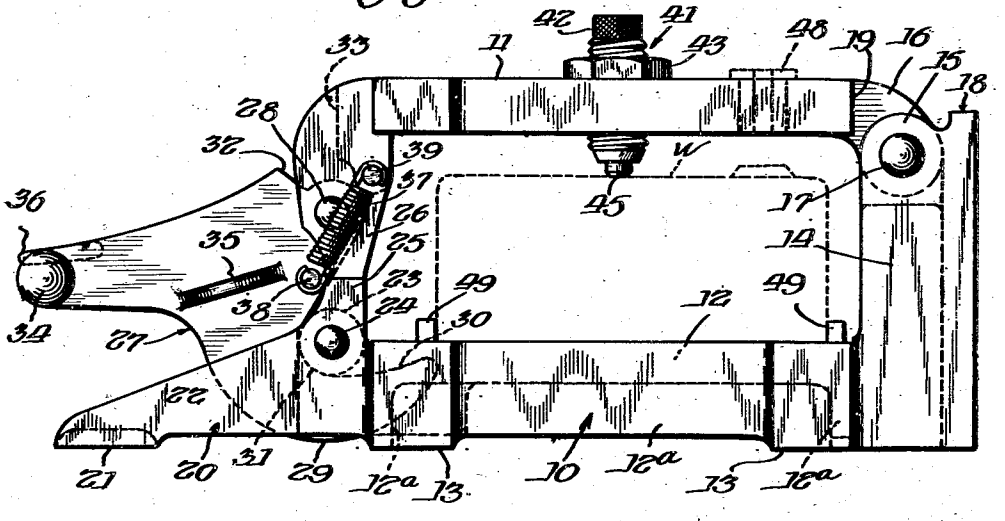


Fig. 2.



Inventor:
Albert J. Matter.

By: Shee & Shee Attys.

June 10, 1947. A. J. MATTER 2,422,114

QUICK LATCH JIG

Filed March 8, 1944 3 Sheets-Sheet 2

Fig. 3.

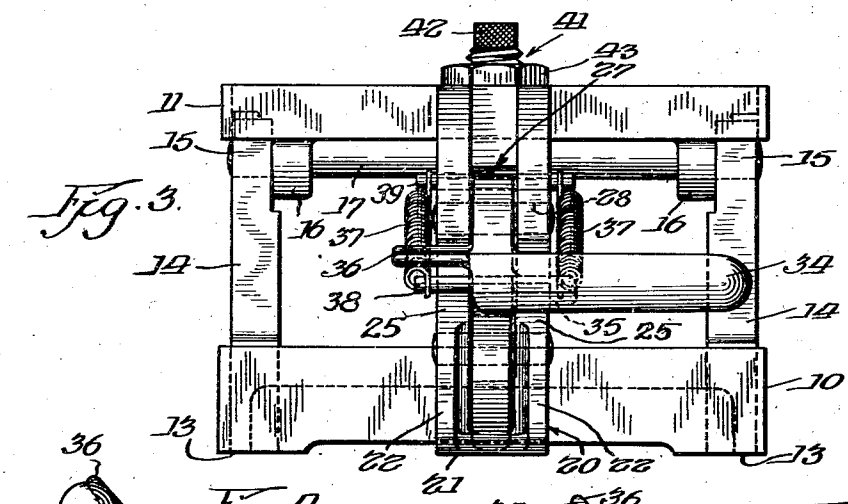


Fig. 4

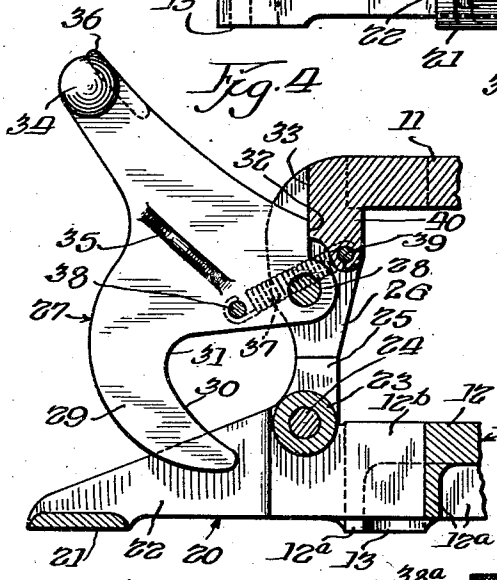


Fig. 8.

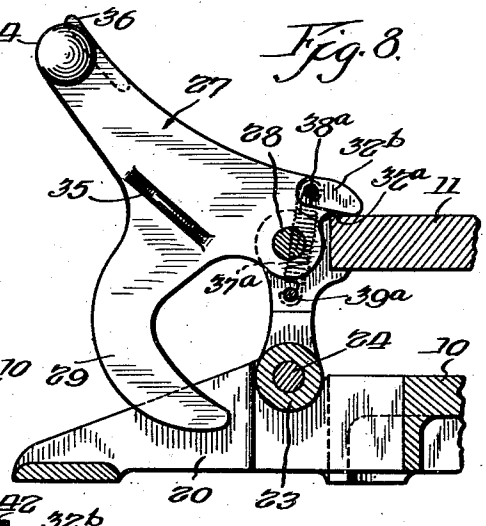
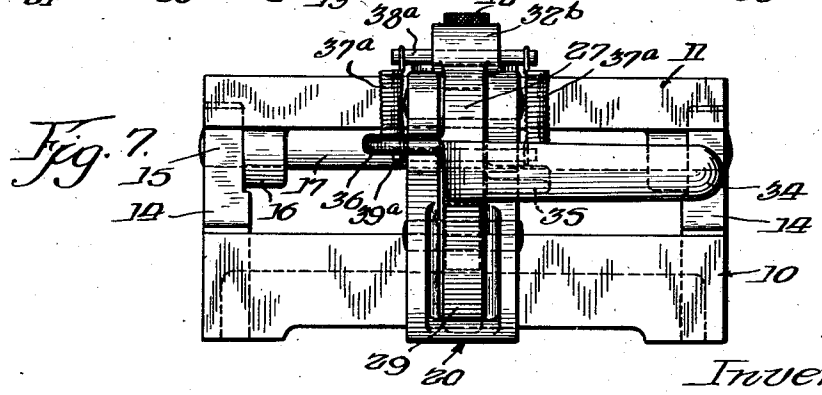


Fig. 7.



Inventor:
Albert J. Matter.
By Hiee & Hiee
Attys.

June 10, 1947. A. J. MATTER 2,422,114

QUICK LATCH JIG

Filed March 8, 1944 3 Sheets-Sheet 3

Fig. 5.

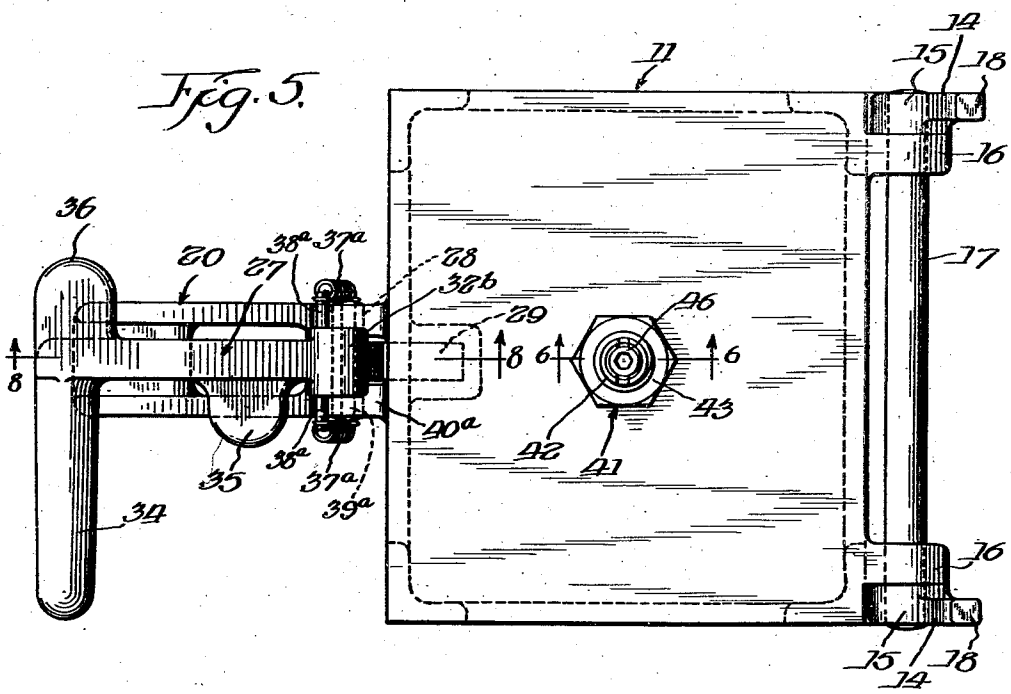
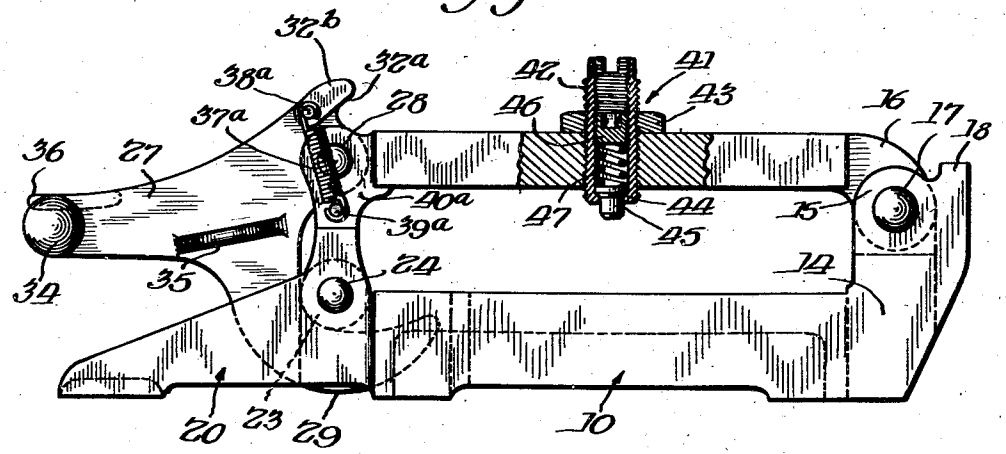


Fig. 6.



Inventor:
Albert J. Matter:
By: Hill & Hill Attys.

Patented June 10, 1947 2,422,114

UNITED STATES PATENT OFFICE

2,422,114

QUICK LATCH JIG

Albert J. Matter, Park Ridge, Ill.

Application March 8, 1944, Serial No. 525,496

11 Claims. (Cl. 77—62)

1

This invention relates to a quick latch jig and more particularly to drill jigs and one of the objects of this invention is the provision of novel latch means between the base and swinging cover of a jig, by means of which the cover may be quickly and easily latched to the base and unlatched therefrom.

Another object is the provision of a jig latch which also serves as a handle or hand grip for raising and lowering the cover. Another object is to provide a latch whereby the cover may be unlatched from the base and raised into open position by one continuous upward swing of the latch and whereby the cover may be lowered upon the work and latched to the base by one continuous downward swing of the latch. Another object is to provide a latch which occupies two operative positions; namely, one position in which it latchingly engages with a latch member on the base and the other position in which it abuts against the cover, when raising and lowering the same. Another object is to provide tension means to hold the latch in either of said operative positions. Another object is to provide work clamping means having a preloaded tension.

With these and other objects and advantages in view this invention consists in the several novel features hereinafter fully described and claimed.

The invention is clearly illustrated in the drawings accompanying this specification, in which:

Fig. 1 is a plan of a drill jig embodying one form of the present invention and showing the cover in closed position.

Fig. 2 is a side elevation of the jig seen in Fig. 1.

Fig. 3 is an end elevation of the jig.

Fig. 4 is a detail view of the latch means partly in side elevation and partly in vertical longitudinal section taken on the line 4—4 of Fig. 1.

Fig. 5 is a plan of a slightly modified form of the invention.

Fig. 6 is a side elevation of the jig illustrated in Fig. 5 with a part of the cover shown in section taken on the line 6—6 of Fig. 5.

Fig. 7 is an end elevation of the jig seen in Figs. 5 and 6, and

Fig. 8 is a detail view of the modified latching means partly in side elevation and partly in vertical longitudinal section taken on the line 8—8 of Fig. 5.

Referring to said drawings and first to Figs. 1 to 4 inclusive, the reference character 10 designates a base for supporting the piece of work and 11 designates a bushing carrying cover, pivotally mounted on the base. The base may be of rectangular form, and may be formed with a plate-

2

like body portion 12, having flanges 12a which project down from the marginal edges thereof to give the base added strength and rigidity. At the corners of the body portion the flanges are extended down slightly below the intermediate portions of the flanges to form short feet 13.

Extending up from the base at its rear end are cover carrying uprights 14 that are formed with hinge ears 15 at their upper ends which cooperate with hinge ears 16 formed on the rear edge of the cover. A pintle or pin 17 extends through apertures in the hinge ears and pivotally connects the cover with the base. Rests or seats 18 are provided on the uprights 14 adjacent the hinge ears and cooperate with the edge 19 of the cover to hold the latter in its raised position.

Projecting horizontally from the front of the base opposite the hinge end is a bifurcated leg 20 formed at its free end with a short foot 21 that terminates in the same horizontal plane as the feet 13, and connecting the foot with the base are spaced vertical webs 22 which support between them a latch member 23 here shown in the form of a roller mounted on a pin 24 carried by the webs 22, which at this place are extended upward to provide two lugs 25, which cooperate with two downwardly projecting lugs 26 that are formed on the cover, and support the free end of the cover on the lugs 25.

The lugs 26 are spaced apart to receive between them a latch 27 which is pivotally mounted on the lugs as by a pin 28 carried by said lugs. As shown the pins 24, 28 are disposed one above the other when the cover is in down position. The latch is formed with a hook member 29 having a face 30 which extends along an arc of a circle that is non-concentric with respect to the axis of the pin 28, and said non-concentric face of the hook member is adapted to engage the latch roller 23 with a camming action whenever the latch is swung down into latching engagement therewith, thus drawing the cover down and clamping the work in place. The non-concentric face of the hook member merges into an arcuate face 31 which abuts against the latch roller whenever the latch is swung down into its full latching engagement with the roller and acts as a stop member limiting the downward swing of the latch. The front edge of the base is recessed as at 12b to receive the hook member 29 when latchingly engaged with the latch roller.

Adjacent the pivot of the latch the latter is formed with a shoulder 32 which, whenever the latch is swung upward to the limit of its upward swing with respect to the cover, abouts against

a shoulder 33 formed on the front edge of the cover, whereby the latch and cover may swing as a unit (see Fig. 4). The latch is further provided with a hand grip 34 desirably extending at right angles to the plane of the latch which hand grip is adapted to be gripped by the workman in manipulating the latch and cover.

Associated with the hand grip 34 are two lugs 35, 36 which project laterally from the latch. The lug 35 is located approximately at the middle of the latch and the lug 36 is located at the upper edge of the latch and opposite the hand grip. The lug 35 provides a finger piece upon which the workman places his index finger and the lug 36 provides a thumb piece under which the workman places his thumb when gripping the hand grip to unlatch the latch. The purpose of the finger and thumb pieces is to enable the workman to swing the latch upward when disengaging it from the latch roller without tilting the jig. In use there is considerable pressure exerted by the latch hook on the roller, but by taking hold of the hand grip as above described the workman can press down on the finger piece and press upward on the thumb piece while swinging the latch upward thereby disengaging the hook member from the latch roller without any danger of tilting the entire jig upward. When the workman wishes to unlatch and raise the cover, he swings the latch upward from the position seen in Fig. 2, until the shoulders 32, 33 abut (see Fig. 4) and by one continuous movement swings the cover into its raised position, the latch and cover moving as a single unit.

To lower the cover the workman grasps the hand grip of the latch and swings the latch and cover down as a unit bringing the cover down upon the work and by continuing the downward swing of the latch the workman latches the cover to the base.

Tension means are provided for holding the latch in each of its operative positions, that is to say, in its down position in complete latching engagement with the latch roller (see Fig. 2) and in its other position with its shoulder 32 abutting against the shoulder 33 of the cover (see Fig. 4). As shown said tension means comprises a pair of coiled tension springs 37 disposed at the sides of the latch with their ends hooked over pins 38, 39, one secured in the latch below the pin 28 and one secured above the pin 28 in a lug 40 formed on the front edge of the cover. In either operative position of the latch the springs are disposed to one or the other side of a dead center line running through the axes of the pins 38, 28, 39. In swinging the latch from one of its operative positions to the other the pin 38 passes the dead center and the spring then acts to draw the latch in the direction of its movement with the latch completely engaged with the latch roller or its shoulder 32 in abutting engagement with the lug 40.

Associated with the cover is a clamping screw assembly 41, the details of which are best seen in Fig. 6. As shown, the clamping screw assembly comprises among other things a bored clamp screw 42 threadedly mounted in a threaded hole in the cover and adjustable therein toward and away from the piece of work. A lock nut 43, threaded upon the clamp screw, is provided for locking the latter in adjusted position. When the lock nut is backed off somewhat the clamp screw may be screwed toward or away from the work and when adjusted to its proper position relative to the work the lock nut is screwed up

tight against the cover. The upper end of the clamp screw may be knurled to provide a grip to facilitate turning the screw or its upper end may be otherwise shaped to facilitate adjusting it. Within the bore of the clamp screw is the head 44 of a pin 45 which protrudes through a reduced opening at the lower end of the clamp screw. The upper portion of the bore is internally threaded, and a threaded plug 46 is threadedly engaged with the internal threads of the clamp screw. Resilient means such as coiled compression spring 47 is confined under compression between the plug and pin and serves to yieldingly thrust the pin outward from the clamp screw. The pin can be held under more or less pressure by properly manipulating the plug 46.

In practice the plug is screwed down to compress the spring and place it under the desired compression, and the clamp screw is screwed down towards the piece of work, indicated at W, until the pin has been moved inward in the bore somewhat against the action of the spring so as to insure efficient clamping action of the pin on the piece of work.

If desired a bushing carrying plate 50 may be bolted to a side of the base if holes are to be drilled in a side of the piece of work. As is well understood the plate 50 is formed with holes to receive bushings.

Conventional bushings 48, are let into holes in the cover that are located in coaxial alignment with the axes of the holes to be drilled in the piece of work, and conventional work positioning means 49 are provided on the base for precisely locating the piece of work in proper position on the base relative to the bushings. As is well understood by those skilled in the art to which this invention pertains, the jig with the piece of work clamped therein is moved under a drill, bringing a bushing into alignment therewith and the drill is then lowered through the bushing, drilling the hole in the piece of work.

The modified form of the invention illustrated in Figs. 5 to 8 inclusive, in the main, is substantially of the same construction as that of the form illustrated in Figs. 1 to 4 inclusive, except that the overall height of the jig is slightly less and its general appearance is slightly different. The same reference characters are applied to the parts of the jig seen in Figs. 5 to 8 which correspond with the same parts of the jig seen in Figs. 1 to 4.

In the form of quick latch shown in the modified form, the shoulder 32*a* is provided by a lug 32*b* formed upon the latch 27, which shoulder is arranged to abut against the top face of the cover whenever the latch is swung to the limit of its upward swing relative the cover as seen in Fig. 8. The points of connection between the tension springs 37*a* and the cover lug 40*a* and the latch 27 are reversed with respect to the corresponding points of connection of the other form. In this case the pin 39*a* is located below the pin 28 and the pin 38*a* is located above said pin 28. However the tension springs function precisely in the same manner as do the tension springs of the other form of the invention.

Having thus described my invention, it is obvious that various immaterial and obvious modifications of details may be made in the same by one skilled in the art without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combina-

tion of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. A quick latch jig comprising a base arranged to support a piece of work, a swingable cover pivotally mounted to said base and provided with work clamping means, and coacting latch members on the base and cover for releasably securing the free ends thereof together, one of said latch members being pivoted on the cover and having a hand grip extending parallel with the axis of the latch pivot, said pivoted latch member having also thumb and finger pieces extending laterally from the pivoted latch member, whereby the pivoted latch member is manipulated to latch the cover to the base and to unlatch it therefrom.

2. A quick latch jig comprising a base arranged to support the work and formed at one end with cover supporting uprights, a swingable cover pivotally mounted on said uprights and provided with spring urged work clamping means, a swingable latch pivotally carried by the cover at its free end, a cooperating latch member on the base adapted to be latchingly engaged by said latch, coacting shoulders on the cover and latch for limiting the movement of the latch relative to the cover when moved from its latching position, whereby said latch and cover may be raised and lowered as a unit, and a coiled spring attached at one end to the swingable latch and at the other end to the cover and arranged to yieldably hold the swingable latch in its latched position and to hold said latch with its shoulder in engagement with the shoulder on the cover.

3. In a quick latch jig, a base arranged to support a piece of work, a cover hinged to said base and provided with work clamping means, a latch member carried by the base, a latch pivotally mounted on the cover and having a hook member for engaging said latch member and having also a hand grip whereby the latch is manipulated and a shoulder arranged to engage the cover to limit the upward swing of the latch on its pivot, said hook member having an arcuate face for engaging the latch member, which face is non-concentric with respect to the pivotal point of the latch, and a coiled spring attached at one end to the swingable latch and at the other end to the cover and arranged to yieldably hold the swingable latch in latched position and to hold said latch with its shoulder in engagement with the shoulder on the cover.

4. A quick latch for jigs comprising a latch member mounted on one element of a jig, a latch pivotally mounted on the other element of the jig and comprising a hand grip and a hook member, the latter having a face for engaging the latch member which face is non-concentric with respect to the pivot of the latch, the second named element of the jig and the latch having coacting shoulders cooperating to limit the upward swing of the latch, and both elements of the jig having coacting lugs to position the cover in its down position, resilient tension means carried by said second named jig element and by the latch, the point of connection between said resilient means and latch capable of being swung past a dead center line intersecting the pivot point of the latch and the point of connection between the resilient means and said second named jig element, whereby to hold the latch engaged with the latch member when the resilient means is disposed on one side of said dead center line, and

to hold the shoulder of the latch in engagement with the coacting shoulder of the cover when disposed on the other side of said dead center line.

5. In a jig having a base and a cover pivotally mounted thereon, a pair of vertical lugs extending up from the base and a pair of vertical lugs extending down from the cover and capable of resting on the lugs of the base, a latch roller disposed between the base lugs and rotatively mounted thereon, a latch disposed between the cover lugs and pivotally mounted thereon, said latch including a hand grip, a shoulder and a hook member, the latter being arranged for latching engagement with the latch roller, and tension springs having points of connection with the cover and latch, and the point of connection of the springs with the latch being arranged to be swung past the dead center line between its points of connection and the pivot of the latch whereby to hold the latter in two operative positions, one in which the latch is engaged with the latch roller and the other in which the shoulder of the latch is abutted against the cover.

6. In a quick latch jig, the combination of a base, a cover pivotally mounted thereon, latch means for latching the cover to the base, a hollow internally threaded clamp screw threadedly mounted in the cover, a spring pressed pin having an end protruding from said clamp screw and threaded means engaging the threads of the clamp screw for tensioning said spring.

7. In a quick latch jig, the combination of a base having a bifurcated base steadying leg projecting from one end thereof, a cover pivotally mounted on the other end of the base and provided with work clamping means, a latch roller rotatively mounted between the furcations of said leg, a latch pivotally mounted on the cover and having a hook member adapted to be swung between said furcations of the leg into latching engagement with the latch roller and tension means connecting said cover with the latch and adapted to hold the latter in latching engagement with the latch roller.

8. In a quick latch jig the combination of a base and a cover pivotally mounted thereon, a latch roller journaled at the front of said base, and a latch pivoted on the cover and having a hook member formed with a cam face adapted to be swung into latching engagement with said latch roller, said latch having a hand grip and a thumb piece and finger piece extending laterally from the body of the latch, substantially as and for the purpose set forth.

9. In a jig, the combination of a jig frame having one member for supporting a piece of work, a hollow internally threaded clamp screw threadedly mounted in another member of the frame and adjustable toward and away from the work, said clamp screw having an inturned annular flange at one end, a pin having an end protruding from said flanged end of the clamp screw, and a shoulder adapted to rest upon said flange, a coiled compression spring within the hollow of the clamp screw and bearing upon said pin, and a threaded plug engaging the internal threads of the clamp screw and bearing against the other end of the spring whereby to pre-tension said spring.

10. In a jig, the combination of a base adapted to support a piece of work, a cover pivotally mounted on the base, latch means for latching the cover to the base, a hollow internally threaded clamp screw threadedly mounted in the cover and adjustable toward and away from the work,

a lock nut for locking the clamp screw to the cover, said clamp screw having an inwardly directed annular flange at one end, a pin having an end protruding from the flanged end of said clamp screw, and a shoulder adapted to rest upon the flange of the clamp screw, a threaded plug threadedly mounted in said clamp screw, and a coiled compression spring in the hollow of said clamp screw and interposed between said pin and plug.

11. In a quick latch jig, the combination of a base adapted to support a piece of work, a cover pivotally mounted on said base, latch means for latching the cover to the base, a hollow internally threaded clamp screw threadedly mounted in the cover and adjustable toward and away from the work, said clamp screw having an internal annular flange at one end, a pin having an end protruding from the flanged end of said clamp screw, and a shoulder adapted to rest upon the flange thereof, a plug threadedly mounted in the hollow of said clamp screw, and a coiled compression spring interposed between said pin and plug.

ALBERT J. MATTER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
837,811	Ebbeson	Dec. 4, 1906
883,869	Fortin	Apr. 7, 1908
1,044,071	Mulvihill	Nov. 12, 1912
1,472,630	Bourque	Oct. 30, 1923
1,583,946	Walters	May 11, 1926

OTHER REFERENCES

American Machinist, Dec. 16, 1926, pp. 989–991.

American Machinist, Feb. 23, 1928, pp. 345–346. Pub. by McGraw-Hill Pub. Co., 330 W. 42nd St., New York, N. Y.