Sept. 18, 1951 H. HELBIG 2,568,393

QUICK ACTING VISE

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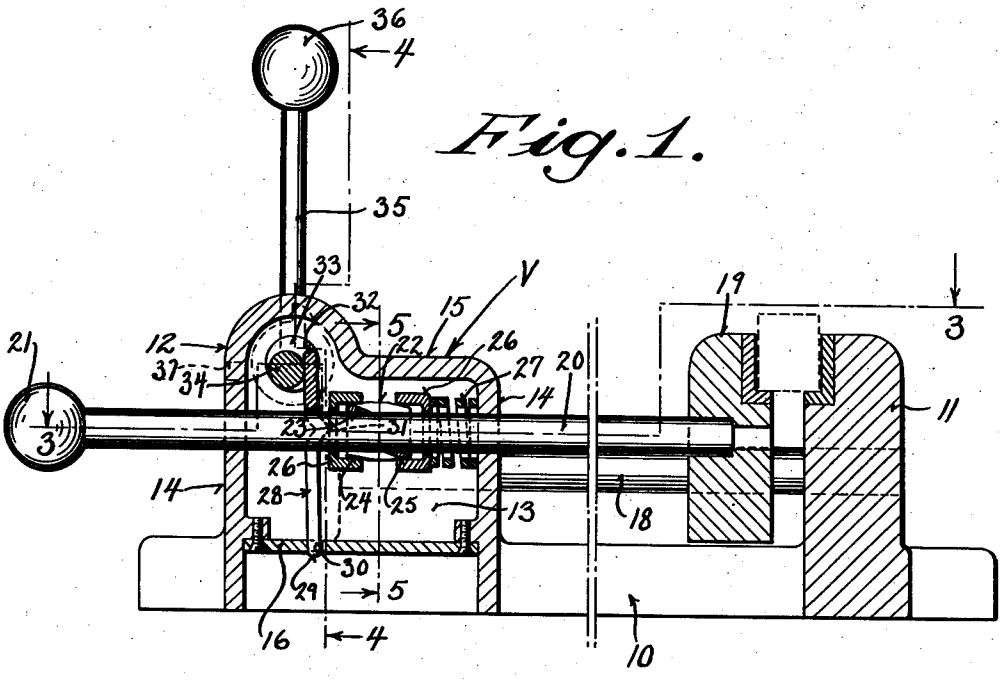
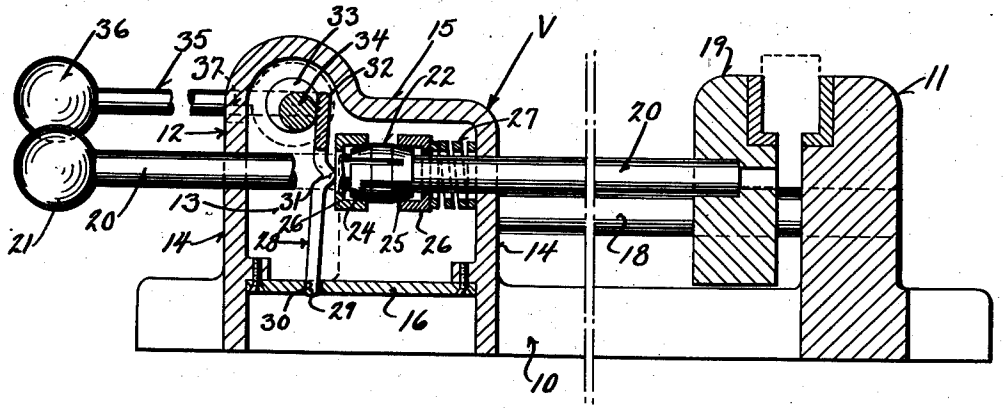


Fig. 1.

Fig. 2.



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Fig. 3.

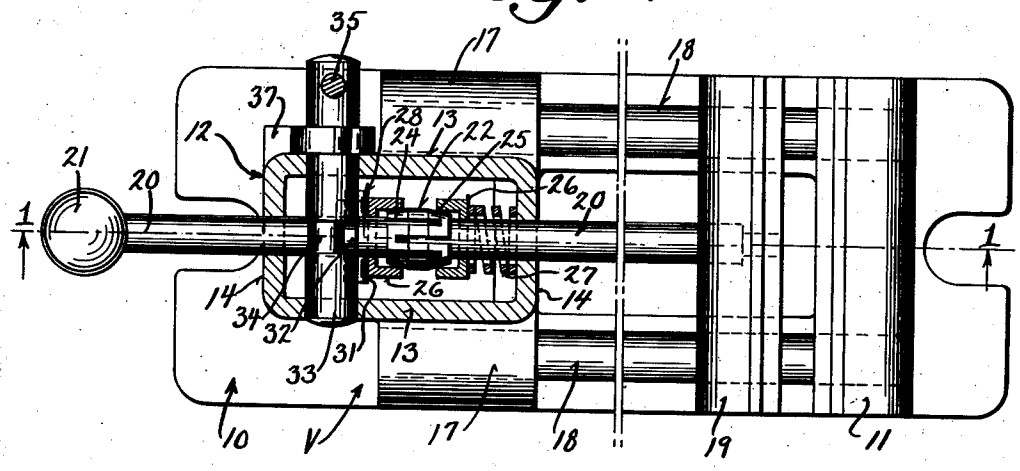


Fig. 4.

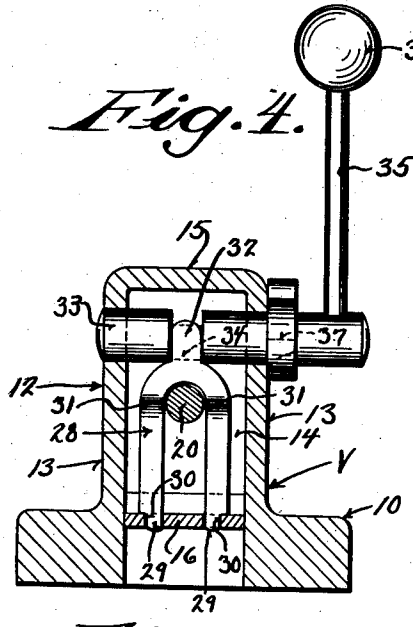


Fig. 5.

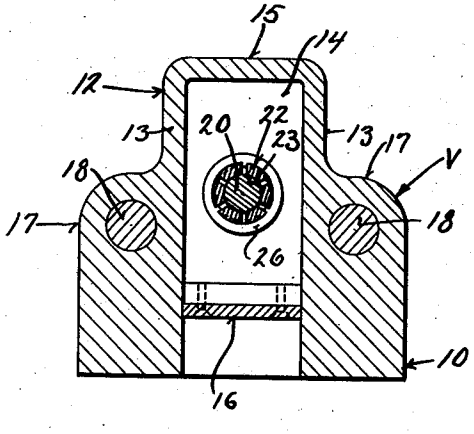
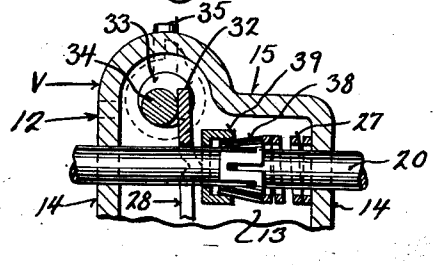


Fig. 6.



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QUICK-ACTING VISE

Hugo Helbig, Racine, Wis.

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4 Claims. (Cl. 81—26)

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This invention appertains to quick adjusting vises and more particularly to a novel means for holding the movable jaw of a vise in its work clamping position.

One of the primary objects of my invention is to provide, in a vise of the type having an adjustable jaw and a smooth beam or rod connected therewith for moving the jaw back and forth toward and away from the work and rigid jaw, novel means for firmly gripping the vise beam without marring the same after the desired adjustment of the jaw relative to the work.

Another salient object of my invention is to provide an adjustable jaw vise embodying a split resilient collar having a smooth internal bore for normally slidably receiving the smooth vise beam, with a novel and simple means for contracting the collar about the beam for firmly gripping the beam to hold the same and its jaw in an adjusted position.

A further important object of my invention is to provide novel means including thimbles or cups for receiving the ends of a split collar with means for moving the thimbles or cups over the collar to contract the collar about the vise beam upon the mere actuation of a throw lever.

A still further object of my invention is to provide a quick adjusting vise of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture and one that can be placed upon the market at a reasonable cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described and claimed, and illustrated in the accompanying drawings, in which drawings,

Figure 1, is a central longitudinal sectional view through my novel vise taken on the line 1—1 of Figure 3, looking in the direction of the arrows, the view showing the operating lever in its raised position for permitting the free sliding of the vise beam and movable jaw toward or away from the work.

Figure 2, is a view similar to Figure 1, but showing the throw lever in its lowered position and with the split collar contracted about the vise beam to hold the beam and the movable jaw in an adjusted position.

Figure 3, is a horizontal view through the vise taken on the line 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4, is a transverse sectional view through the vise taken on the line 4—4 of Figure 1, looking in the direction of the arrows, illustrating the actuating plate for the collar and the throw lever for moving the plate.

Figure 5, is a transverse sectional view through the vise taken on the line 5—5 of Figure 1, looking in the direction of the arrows, illustrating the novel split collar about the vise beam.

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Figure 6, is a fragmentary detail vertical longitudinal sectional view, the view illustrating a slightly modified form of the vise.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter V generally indicates my novel vise and the same includes a rigid frame 10 having secured thereto or formed thereon adjacent to one end thereof, a rigid jaw 11. Secured to or formed on the frame 10, adjacent to the opposite end thereof, is a housing 12, the purpose of which will later appear. This housing includes side walls 13, end walls 14 and a top wall 15. The bottom of the housing is closed by a removable bottom plate 16, which facilitates assembling of various parts, as will later appear. Secured to, or formed on the frame on opposite sides of the housing 12, are ears 17. Rigidly connected to the ears 17 and to the rigid jaw 11, are a pair of spaced parallel smooth guide rods 18, and it is to be noted that these guide rods are disposed on opposite sides of the longitudinal center of the frame.

Freely slidable on the guide rods 18 is the movable jaw 19, and this jaw has connected thereto a smooth vise beam or bar 20, which slidably extends through the housing 12. The end walls 14 of the housing are provided with suitable guide openings for receiving the beam. The extreme outer end of the beam is provided with any preferred type of hand grip 21, whereby the beam 20 and the movable jaw 19 can be adjusted toward and away from the rigid jaw 11.

In connection with the smooth beam or bar 20, I employ a novel locking mechanism therefor, which includes a gripping collar 22. This collar is provided with a smooth axially extending bore 23, through which normally the beam 20 slidably extends. The collar is split to permit the contracting thereof about the beam 20 to permit the firm gripping of the beam without the marring thereof. As illustrated, the gripping collar 22 has oppositely extending kerfs or slots 24 therein, to permit the free expansion and contraction thereof. These slots or kerfs 24 extend inwardly from the opposite ends of the collar and each slot terminates short of one end of the collar and these slots are alternately arranged, as is best shown in Figures 2 and 3. The outer surface of the collar 22 has its terminals tapered in opposite directions to provide conical wedge surfaces 25. As shown in the first form of my invention, Figures 1, 2 and 3, these tapered ends of the collar 22 are received in cups or thimbles 26, and these cups or thimbles are provided with axial openings for slidably receiving the vise beam or bar 20. An expansion spring 27 is coiled

about the beam or bar **20** and is confined between one end wall **14** of the housing **12** and one thimble or cup **26**. The other thimble is engaged by a rocking actuating plate **28**. The plate **28** is preferably of an inverted U-shape, so as to straddle the beam or bar **20**, and the lower ends of the plate are provided with fingers **29** which are received in openings **30** formed in the bottom closure plate **16** of the housing **12**. The plate **28** is preferably bowed out slightly intermediate its ends to provide transversely aligned bearing points **31**, for engagement with the adjacent thimble. Extending upwardly from the plate **28** at the central portion thereof is a tongue **32**, best shown in Figure 4, of the drawings.

Mounted for rocking movement in the housing **12** is a transversely extending shaft **33** having an intermediate throw or eccentric portion **34** against which the tongue **32** rests. The throw or eccentric portion **34** is of considerably less diameter than the diameter of the major portion of the shaft and hence a pocket is formed for the tongue **32** to prevent lateral shifting of the plate **28**. The side walls **13** of the housing are provided with suitable bearing openings for the shaft **33**, and one end of the shaft has rigidly secured thereto a throw or operating lever **35**. The outer end of this lever can be provided with a suitable hand grip **36**.

When the lever **35** is in its raised position, as shown in Figures 1, 3 and 4, the eccentric or throw portion **34** of the shaft is farthest away from the plate **28**. However, the tongue **32** is normally held against the throw portion of the shaft by the spring **27**, which tends to move the cups or thimbles **26** and the collar **22** toward the plate **28**. In this position of the lever **35**, the beam **20** and the movable jaw **19** can be readily slid back and forth toward and away from the work. When the vise is to be used, the work is placed between the jaws **11** and **19** and the jaw **19** is slid into firm contact with the work, after which the operating lever **35**, is swung downwardly as shown in Figure 2, and the throw portion **34** of the shaft will move the plate **28** forwardly, compressing the spring **27** and forcing the thimbles or cups **26** over the tapered ends of the collar **22**, bringing about the contracting of the collar and the firm gripping of the beam or bar **20** by the collar. Hence, the movable jaw **19** is held in its adjusted work engaging position. Upon the mere upward swinging movement of the lever **35**, the cups or thimbles **26** can move away from the tapered ends of the collar and thus permit the expanding of the collar so that free movement of the vise beam **20** and the jaw **19** can be had.

If desired, a stop **37** can be provided on one side of the housing **12** for limiting the downward swinging movement of the lever **35** beyond a predetermined point.

As illustrated in Figure 6, a modification of the collar **22** can be used, and in Figure 6, I have shown a conical collar **28** and this collar is engaged at one end only by a thimble or cup **39**. In all other respects, this form of vise functions in the same manner as the form previously described.

From the foregoing description, it can be seen that I have provide a quick adjusting vise embodying a split collar, with means for contracting the collar about a vise beam for holding the vise beam in an adjusted position without the marring thereof.

Changes in details may be made, without departing from the spirit or the scope of this invention, but what I claim as new is:

1. A quick adjustable vise comprising a frame, a fixed jaw on said frame, a housing on said frame, a movable jaw between the housing and the fixed jaw, a smooth beam secured to the fixed jaw slidably extending through the housing for adjusting the movable jaw toward and away from the fixed jaw, a split contractible collar having a smooth bore disposed in the housing and receiving the beam for normal free sliding movement, said collar having a tapered outer surface, a thimble slidably mounted on the beam and engaging said tapered surface, a rock plate straddling the beam and engaging the thimble, spring means in the housing normally urging the collar and thimble toward the rock plate, and means for rocking the rock plate toward the thimble and against tension of the spring for contracting said collar about the beam.

2. A quick adjustable vise as set forth in claim 1, in which said adjusting means includes a transversely extending rock shaft carried by the housing having a throw portion against which the plate rests.

3. A quick adjustable vise as set forth in claim 1, in which said plate is of an inverted U-shape for straddling the beam, and depending fingers on the plate loosely received in the openings in the bottom part of said housing.

4. A quick adjustable vise comprising a frame, a fixed jaw on said frame, a fixed housing on said frame in spaced relation to the fixed jaw, a movable jaw between the housing and fixed jaw, a beam secured to, and extending between, the housing and fixed jaw for guiding the movable jaw, a beam secured to the movable jaw and slidably supported by said housing, whereby upon sliding movement of the last mentioned beam the movable jaw can be adjusted toward and away from the fixed jaw, a collar in said housing having a smooth bore receiving the last mentioned beam, said collar being provided with a series of inwardly extending slits to permit the contraction thereof, the outer surface of the collar being provided with oppositely tapered terminals, thimbles slidable on the last mentioned beam and receiving said tapered terminals, a plate rockably supported by the housing and engaging one of the thimbles, a transversely extending rock shaft carried by the housing and having a throw portion engaging said plate, a lever for rocking the rock shaft, and an expansion spring coiled about the last mentioned beam and bearing against the housing and the other thimble for normally urging the thimbles, the collar and the plate toward the throw portion of the rock shaft.

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