

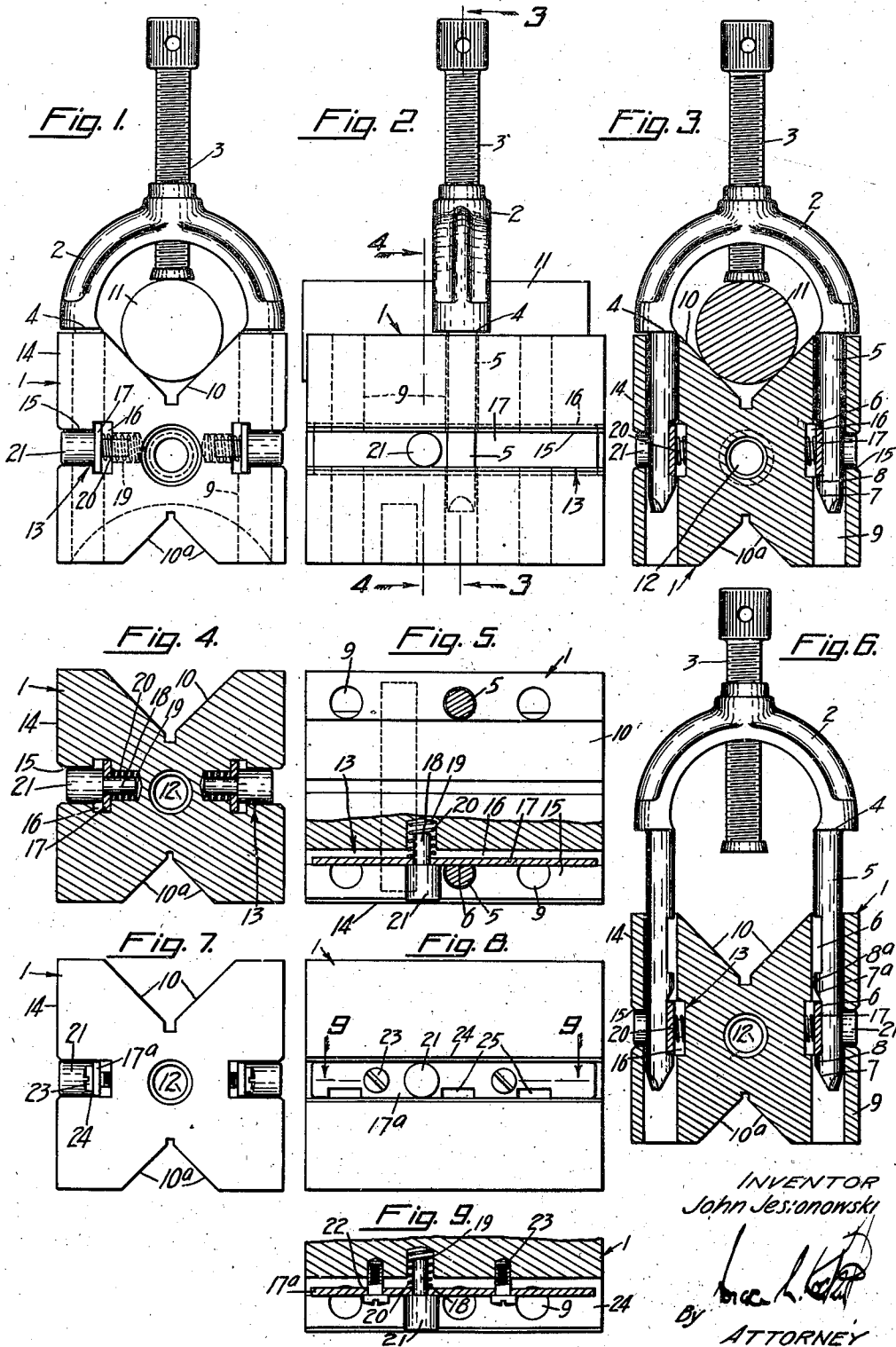
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WORK HOLDER

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WORK HOLDER

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My invention relates to work holders.

It has among its objects to provide an improved work holder and, more particularly, such a work holder of the type known as a V-block and adapted to hold round work or the like. A further object of my invention is to provide such an improved block having improved detent mechanism whereby the yoke, upon insertion into the block, is automatically gripped, and wherein the detent is quickly releasable manually to permit removal of the work, all in such manner as markedly to facilitate and expedite the connection and release of the work. Still further objects of my invention are to provide improved cooperating detent mechanism on the yoke and block and to provide such an improved mechanism including improved prongs on the yoke and improved cooperating manually releasable members on the block whereby it is made possible materially to expedite the clamping of the work in the block, while also expediting the removal of the work from the block. Other objects of my invention are to provide such an improved V-block construction wherein the yoke may be connected in different relations to the block in such manner as to adapt the same to a wide field of use, while the block, yoke and detent mechanism carried on the latter are of such an improved and simplified construction as, while enabling the latter to be accurate, also to be capable of being inexpensively produced. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear. In the accompanying drawing, I have shown for purposes of illustration certain embodiments which my invention may assume in practice.

In this drawing:

Figure 1 is an end elevation of one form of my improved V-block;

Fig. 2 is a side elevation of the same;

Fig. 3 is a section on line 3-3 of Figure 2;

Fig. 4 is a section on line 4-4 of Figure 2, the yoke, however, being removed and the detents in the block being shown in releasing position;

Fig. 5 is a plan view of the construction shown in Figure 2, the yoke and a portion of the block being shown in horizontal section to facilitate illustration;

Fig. 6 is a view similar to Figure 3 but showing a modified construction;

Fig. 7 is an end view of a block carrying a further modified form of detent mechanism;

Fig. 8 is a side elevation of the block shown in Figure 7, and

Fig. 9 is a section on line 9-9 of Figure 8.

Referring first to the form shown in Figures 1 to 5, it will be noted that I have shown a V-block, generally indicated at 1, and carrying a yoke 2 including a vertically adjustable work holding clamp 3 threaded in the yoke 2; improved connecting mechanism hereinafter described being provided between the yoke 2 and the block 1.

Referring more particularly to the yoke, it will be noted that the same is of an improved construction. Herein the same is provided with shoulders 4 at its lower end carrying depending generally cylindrical holding members or prongs 5 which are receivable in block 1, as hereinafter described. Here it will also be noted that these members 5 herein extend below the horizontal center line of the block 1 and are provided with transverse horizontally disposed generally rectangular notches 6 on the opposite inner faces thereof. Further, these holding members herein are provided with suitable tapered ends or lower extremities 7 spaced below the notches 6, and preferably including elongated sloping faces leading toward the notched surfaces and spaced therefrom by a wearing portion 8 on the periphery of these members. Thus, it will be evident that the yoke 2 is insertable vertically through the upper ends of parallel vertical apertures 9 in the block 1 of but slightly larger diameter than the members 5, while the latter are so constructed that their lower ends 7 may deflect and pass beyond cooperating detent mechanism, hereinafter described and carried by the block 1, in such manner as to enable the detent mechanism to be received in the notches 6.

Referring more particularly to the block 1, it will be observed that the same is herein provided with a series of parallel apertures 9 spaced longitudinally along the block and extending clear through from top to bottom thereof. Three series of these apertures are herein provided, one adjacent the left-hand end of Figure 2, one midway between the ends of the block, and one substantially midway between the middle series and the opposite end of the block; this arrangement being provided in order to enable the yoke to be used with different classes of work. Herein also the block 1 is provided with usual V-grooves 10, 10a of different size in its opposite top and bottom faces in such manner that work, herein indicated as round stock 11, may be pressed into engagement with the walls of these grooves by the working end of the threaded clamping member 3 and thereby clamp the work securely to the block 1 when the latter is carried on or suitably connected to any suitable supporting sur-

face; a longitudinal aperture 12 herein being provided, for example, to permit the block 1 to be attached to a supporting rod. Moreover, it will be noted that herein improved holding mechanism adapted to cooperate with the improved holding members 5 is provided, this mechanism herein being of detent type and further so disposed relative to the series of apertures 9 as to permit a single mechanism to cooperate with the improved members 5, irrespective of the location of the yoke in the different longitudinally spaced series of apertures 9 and also irrespective of whether the yoke 2 is inserted from the top or bottom of the block 1.

Referring more particularly to this detent mechanism, it will be noted that it comprises a pair of detents disposed longitudinally along opposite side faces of the block 1 and each cooperating with a different prong or holding member 5. As shown, a longitudinally extending T groove 13 is provided in each side wall 14 comprising a narrow entry portion 15 and a wider inner or cross portion 16, herein of rectangular cross section. In this latter portion 16, a longitudinally extending holding member or strip 17, substantially narrower than the portion 16 and as high as the latter but preferably of slightly less height than the notch 6, is disposed so that each strip extends longitudinally of the block across the apertures 9 on that side of the block. Further, it will be observed that each strip has an inwardly projecting stud 18 thereon midway between its ends extending into a socket 19 wherein it is surrounded by a coiled spring 20, one end of which engages the bottom of the aperture 19, while the other engages the strip around the stud 18, in such manner as normally to hold the strip in a laterally projected position slightly beyond that shown in Figures 1 and 3, with the outer face of the strip engaging the upper and lower outer walls of the longitudinal passage 16. Moreover, it will be observed that preferably at a point substantially midway between the ends of each strip 17, an actuating button 21 projects outward therefrom into the longitudinal groove portion 15, in such manner as to provide means whereby an operator may simultaneously press the strips 17 from the position shown in Figures 1 and 3 to the position shown in Figure 4, wherein the inner faces of the strips engage the inner longitudinal walls of the portion 16. The outer ends of these buttons do not, however, extend beyond the plane of the side walls 14 of the block, as will be evident from Figures 1 and 4. In a preferred construction, these buttons also carry the studs 18 and have the latter disposed coaxially therewith and of such size as to enable both to be readily and quickly assembled on the strips by merely driving or pressing the studs through a suitable hole in the strips. Thus, it will be evident that cooperating detent mechanism is provided which, upon insertion of the members 5 in any of the series of apertures 9, will automatically interlock with the prongs 5, while the operator, by pressing in the buttons 21, may release the members 5 whenever desired, to permit withdrawal of the latter with the yoke 2.

In the use of my improved construction, when new work is placed in the grooves 10 on the block 1, the yoke 2 is moved into operative engagement with the block, by merely entering the prongs or holding members 5 in either end of the selected series of longitudinally spaced apertures 9. As these members 5 move into these

apertures, the elongated sloping portions on the inner faces of their ends 7 engage the outer upper edges of the strips 17 in such manner as to force the latter inward in the portions 16 of the slots 13 until the portions 8 have passed the strips 17. When, however, the lower ends of the notches 6 are opposite these strips 17, the springs 20 then automatically project the members 17 outward into these notches 6, as shown in Figure 3, in such manner as thereby to provide an effective interlock with the members 5, preventing the withdrawal of the latter. In this position of the parts, it will be noted that the bottom walls of the notches 6 will engage the under sides of the members 17, while the outer walls of the members 17 are pressed against the vertical walls of the notches 6 and the strips 17 are held against vertical movement in either direction by the top and bottom walls of the portions 16 extending between the several apertures 9. Further, it will be observed that the upper wall of each notch 6 is spaced above the upper edge of its strip and that each shoulder 4 on the yoke 2 is also spaced above the upper surface of the block 1, so that a free entry of the member 17 into the notches 6 is provided. With the yoke and block thus automatically connected by the automatically operative detent mechanism, it will be evident that only a slight movement of the member 3 is necessary to clamp the work. Also, when the desired operation on the work is completed, the latter is readily released by the operator, who, after releasing the clamp 3, simply presses in the buttons 21 by his thumb and finger, which causes the portions 17 to be moved laterally out of the notches 6 in such manner as to permit the members 5 to be readily withdrawn with the yoke 2 without requiring any more than a minimum releasing operation of the clamping member 3.

As a result of my improved construction, it is made possible quickly and easily to locate the yoke in predetermined positions on the block and also materially to expedite the clamping and releasing of the work in the V-block, all necessity for the previously necessary extensive operations of the threaded member 3 being eliminated. Further, with the strips 17 extending longitudinally throughout the length of the block 1, the single strips on each side of the latter are enabled to function with the members 5, irrespective of the longitudinal location of the latter, while the substantially centrally located springs 20 similarly cooperate effectively with the members 17, irrespective of the longitudinal position of the yoke, and both these studs 18 and the springs prevent longitudinal loss of the strips. Also, with the substantially centrally located buttons 21, it is found that the strips 17 are readily moved to releasing position in any longitudinal position of the yoke. Thus, obviously, where different pieces of the same stock are being successively operated upon, the necessary operations are minimized, the operator only being required to slip the yoke into operative position with a minimum of adjustment of the member 3, and upon completion of the operation on the work, pushing in the buttons 21 to effect a quick release thereof. With the prongs 5 disposed in the apertures 9 and the buttons 21 within the grooves 15 at all times, it is also made possible to support the block either on its sides or bottom, while since the apertures 9 extend from top to bottom, the block can be used in either of its inverted positions. Further, it will be apparent that the

structure is such as to be very economically produced, while the strips 17 are so located and guided in their possible movements as to enable the work holding mechanism to be quite precise in its construction and to be adapted to long use in service.

In Figure 6 I have shown a modified construction wherein the holding members or prongs 5 are elongated and, instead of one set of notches 6 being provided in these members, two such sets of notches are provided. Here it will be observed that between the top and bottom notches, an intermediate portion 8a is provided, generally corresponding to the portion 8, and having a sloping undersurface 7a which performs the function of the surface 7 heretofore described. This construction is especially adapted to use where it is desired to clamp large work or work of widely varying size, the elongated holding members or prongs 5 being adapted to be held by either their top or bottom notches, as desired, in such manner as thus further to minimize the necessary operation of the clamping member 3. Obviously, this construction may be used with a block 1 of the same construction as heretofore described, it only being necessary to provide a yoke 2 having the elongated prongs 5.

In Figures 7, 8 and 9, I have shown a further modified construction adapted to be used, if desired, in lieu of the detent strip mechanism heretofore described. In this construction, each strip 17a is provided with a plurality of spaced holes 22 therein on opposite sides of the button 21, and headed screws 23 have their shanks inserted freely through these holes and are threaded in the inside walls of a larger slot 24 of rectangular cross section and of uniform height clear out to the outside faces of the block. Further, it will be noted that in this construction, the strip 17a is also provided with a series of spaced notches 25 in its lower edge spaced along the same so as to be opposite the several series of longitudinally spaced apertures 9, while the button 21 is also preferably of such diameter as also to assist in guiding the plate in its movement in the slot 24. Here, it will also be observed that V-grooves 10, 10a are also provided of different size and that the slot 24 on each face 14 of the block is substantially centrally located between the inner extremities of these V-grooves. With such a construction, it will be evident that holding members or prongs 5 such as previously described, may be used, and that their portions 7, 8 will cooperate with the strips 17a in substantially the same manner as heretofore described, although with their portions 8 engaging in the notches 25 or with the upper edge of the plates 17a, depending upon whether the prongs are inserted from the top or bottom of the block.

While I have in this application specifically described certain forms which my invention may assume in practice, it will be understood that

these forms of the same have been chosen for purposes of illustration, and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

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

1. A work holder comprising a block having a V-shaped work seat and a yoke member adapted to span said seat and having prongs received in openings in the block, detent means movably mounted in the block and projecting into said openings to engage and retain said prongs therein, said detent means being actuated to non-obstructing position by said prongs when the latter are inserted into the openings, and means accessible at a face of the block for moving said detent means to releasing position.

2. A work holder comprising a block having a V-shaped work seat and a yoke member adapted to span said seat and having prongs received in openings in the block, detent means movably mounted in the block and projecting into said openings to engage and retain said prongs therein, said detent means being actuated to non-obstructing position by said prongs when the latter are inserted into the openings, and a push button movably mounted in the block and accessible at one face thereof for moving each of said detent means to releasing position.

3. In a work holder, a work-holding block having spaced apertures between the side walls thereof, a cooperating holding member having prongs receivable in said apertures, detent mechanism on said prongs and block connectible upon relative reciprocation of said prongs in said apertures and including spring-pressed members in said block normally projected into said apertures, member-receiving recesses wider than said spring-pressed members and in the inner walls of said apertures and having opposite walls forming abutments for said spring-pressed members, springs in said recesses normally projecting said spring-pressed members into the paths of said prongs, and releasing members acting on the outer faces of said spring pressed members.

4. In a work holder, a work-holding block having spaced apertures within the lateral limits of the sides of the block and extending through the top and bottom faces of the block, a cooperating work holder having prongs and detent portions on the latter receivable in said apertures from either said top or bottom face, and cooperating detent mechanism inside said block including notched strips in said apertures biased to cooperate with said detent portions, said block having longitudinal grooves in its side faces and said strips being disposed in said grooves and having spaced strip-guiding members also disposed within said grooves.

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