

Aug. 20, 1929.

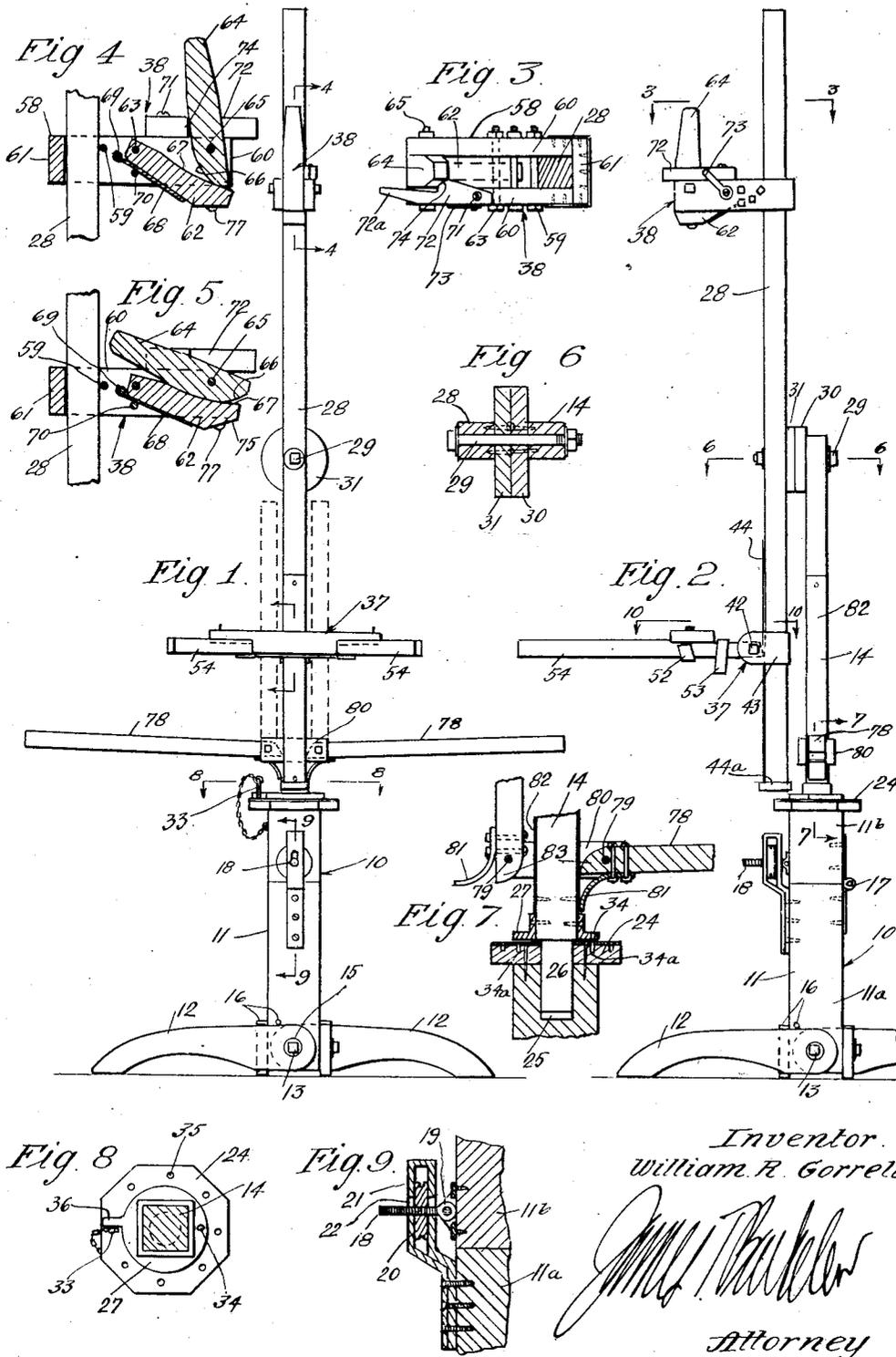
W. R. GORRELL

1,725,072

WORKHOLDING DEVICE

Filed March 29, 1926

2 Sheets-Sheet 1



Inventor.
William R. Gorrell

James H. ...
Attorney

Aug. 20, 1929.

W. R. GORRELL

1,725,072

WORKHOLDING DEVICE

Filed March 29, 1926

2 Sheets-Sheet 2

Fig. 15.

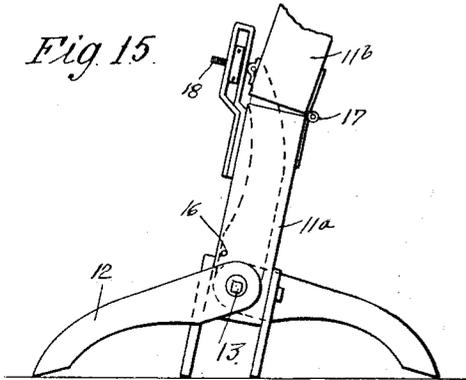


Fig. 10

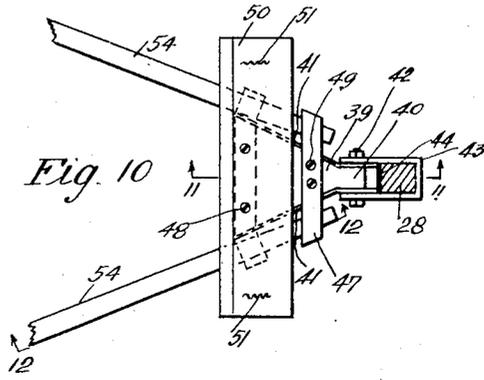


Fig. 12

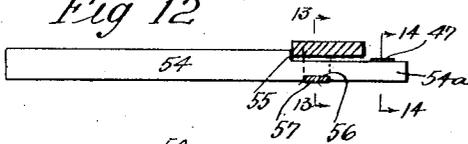


Fig. 11

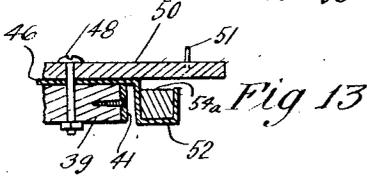
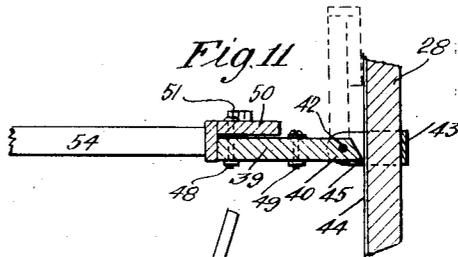


Fig. 14.

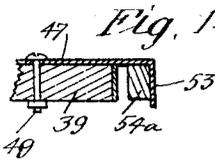


Fig. 16.

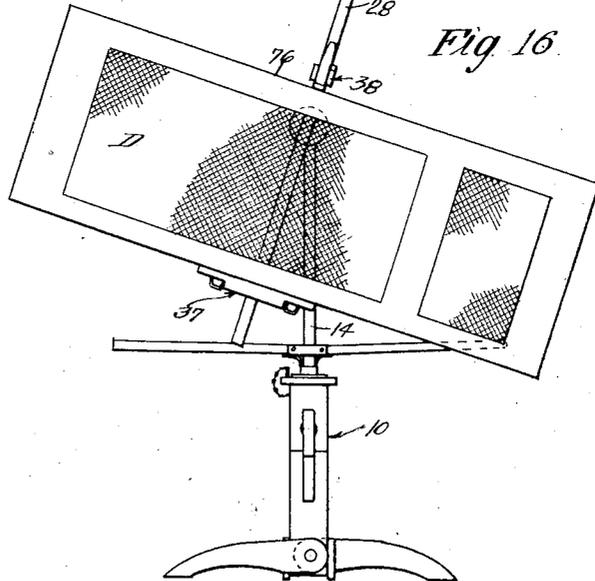
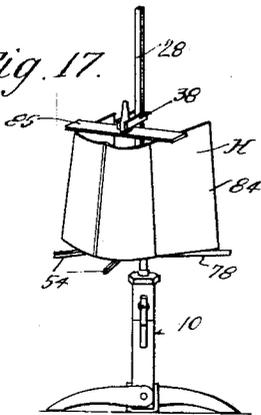


Fig. 17.



Inventor.
William R. Gorrell

James M. ...
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM R. GORRELL, OF ALHAMBRA, CALIFORNIA, ASSIGNOR OF ONE-HALF TO
HENRY BARKSCHAT, OF LOS ANGELES, CALIFORNIA.

WORK-HOLDING DEVICE.

Application filed March 29, 1926. Serial No. 98,075.

This invention relates generally to devices for holding work, and is more particularly concerned with that type of holding device designed to support relatively large and bulky articles which are to be painted or otherwise superficially finished.

While the device may be useful as an adjustable easel for the use of artists or sign painters, it has been particularly designed as a means for holding such articles as window screens, screen doors, furniture, engine hoods of automobiles and the like; and, therefore, I will describe it as applied to such uses, though this is not intended as in any way limiting the invention to such particular usage.

The difficulty of handling window screens and screen doors during painting or surfacing operations is well known to workers in the art, their bulk and awkward configuration, as far as handling is concerned, rendering it very difficult to handle them with speed and ease, this being particularly true since they must be finished on both sides and held in various positions in order that all parts of the surface to be finished may be reached.

I have provided a device whereby such articles may be clamped rigidly in fixed position and then swung about into a number of positions so that the entire surface of the article is accessible to the operator without change of position on the operator's part. Consequently, the operator may handle the work expeditiously and turn out a superior job since at no time need he be placed in an awkward position or be required to support the article with one hand while he is applying paint or surfacing implements with the other.

The device is fully adjustable so as to take articles of varying size and configuration, and as a further feature is collapsible so it may be folded to occupy minimum space for storage and transportation.

Other objects and novel features of the invention will be made apparent in the following detailed description, reference being made to the accompanying drawings, in which:

Fig. 1 is a front elevation of a work holder embodying my invention;

Fig. 2 is a side elevation thereof;

Fig. 3 is an enlarged plan section on line 3—3 of Fig. 2;

Fig. 4 is an enlarged section on line 4—4 of Fig. 1, the clamp head being shown in operative position;

Fig. 5 is a view similar to Fig. 4 but showing the clamp head in inoperative position;

Fig. 6 is an enlarged section on line 6—6 of Fig. 2;

Fig. 7 is a section, partly in elevation, on line 7—7 of Fig. 2;

Fig. 8 is an enlarged section on line 8—8 of Fig. 1;

Fig. 9 is an enlarged section on line 9—9 of Fig. 1;

Fig. 10 is an enlarged section on line 10—10 of Fig. 2;

Fig. 11 is a section on line 11—11 of Fig. 10;

Fig. 12 is a section on line 12—12 of Fig. 11;

Fig. 13 is an enlarged section on line 13—13 of Fig. 12;

Fig. 14 is an enlarged section on line 14—14 of Fig. 12;

Fig. 15 is a fragmentary side elevation of the supporting structure shown in tilted position;

Fig. 16 is a front elevation of the holding device showing a door held therein; and

Fig. 17 is a perspective view showing the engine hood of an automobile held by the device.

The supporting structure, generally indicated at 10 of the device, is made up of a base block 11, feet 12 pivotally secured by bolts 13 to the bottom of said block, and an upright post 14 which is in axial alinement with block 11. Between the heads of bolts 13 and feet 12 are friction plates or washers 15, and stops 16 extend outwardly from block 11 to engage the upper edges of said legs when they are in horizontal position to prevent the block from moving pivotally into an inclined position even though bolts 13 be loose. However, when it is desired to incline the block, the forward legs may be pivotally moved away from stops 16 and then frictionally locked in adjusted position by tightening bolts 13, as shown in Fig. 15. When the device is to be collapsed for storage or transportation, the legs may be swung around into a position alongside the block as indicated in dotted lines in Fig. 13.

In certain cases it is desired to secure a little finer degree of tilting adjustment for the supporting structure, and I, therefore,

prefer to provide a tilting device of the type shown in detail in Fig. 9, though it will be understood that the invention, considered in its broader aspects is not limited to the inclusion of such a tilting device. When such a fine degree of adjustment is to be had, block 11 is made up of two parts 11^a and 11^b, the lower part 11^a being that to which feet 12 are secured and the upper part being in axial alinement. Parts 11^a and 11^b are also normally in axial alinement, a hinge 17 connecting the parts and allowing them, under certain conditions, to be thrown out of vertical, axial alinement. As a means for swinging part 11^b with respect to part 11^a I provide a bolt 18 pivoted at 19 to part 11^b, and a nut 20 is threaded on this bolt and held by a yoke 21, to part 11^a, the bolt extending through vertical slots 22 in yoke 21. By rotating nut 20, bolt 18 is moved longitudinally to swing part 11^b about hinge 17, the lost motion connection provided by slotting the yoke where it receives the bolt, permitting bodily vertical movement of the nut and bolt necessary to accommodate the arcuate movement of part 11^b. The nut in its co-action with the bolt and yoke also serves, of course, to hold part 11^b releasably in adjusted position.

The upper end of part 11^b carries a turntable head 24 and is provided with a central socket 25 to receive the cylindrical extremity 26 of post 14 whereby said post may be rotated axially with respect to the supporting block. Terminal 26 preferably stops short of the bottom of socket 25, the load of post 14 being taken by head 24 which is facially engaged by an annular, downwardly facing flange 27 secured to post 14 just above terminal 26.

Post 14 serves as a means for supporting the work clamping mechanism, this mechanism including a clamp bar 28 which is pivotally connected approximately midway between its ends to said post. The pivotal connection is made by a bolt 29 which extends through the post and bar and through friction discs 30 and 31 secured to said post and bar respectively. These discs being pressed into firm facial engagement by taking up bolt 29, serve frictionally to hold the clamp bar in any position to which it may be moved about the bolt, and by axially rotating the post with respect to the supporting block, and swinging the clamp bar about bolt 29, it will be seen that any side of an article held by the clamping means may be presented to a worker without change of position on the worker's part. As a means for holding the post against axial movement in either direction, I may provide a pin 33 adapted to be thrust downwardly through an aperture 34 in flange 27 into a selected aperture 34^a in plate 24. When it is desired to limit the axial rotation of the post without

entirely preventing such rotation, pin 33 is thrust into any selected aperture 35 of plate 24 where it is adapted to be contacted with by an arm 36 on flange 27. Occasions for thus entirely preventing axial rotation of the post or for limiting such axial rotation will be apparent to those accustomed to use this type of work holding device.

On clamp bar 28 are the two clamp elements generally indicated at 37 and 38, and in order to distinguish clearly between these elements, I will term element 37 a "work rest" and element 38 a "clamping head," and either or both of these elements may be moved to adjusted position longitudinally along the clamp bar so that work of various dimensions may be accommodated and clamped therebetween.

Work rest 37 includes a triangular block 39 having a tongue 40 at its apex, and reinforcing side irons 41. Bolt 42 pivotally connects tongue 40 with a U-shaped carrier member 43 which extends about three sides of bar 28, the fit between the carrier member and bar being such that the carrier member and all members supported thereby may be shifted longitudinally along the bar. The fourth side of the clamp bar is provided with a wear plate 44 with which the horizontally offset nose 45 of tongue 40 is adapted to engage when block 39 is in approximately horizontal position. Block 39 is adapted to be swung about horizontal pivot 42 into a substantially vertical position as indicated by dotted lines in Fig. 11 when the device is to be folded for transportation or storage. However, when the block is swung downwardly into full line or work-taking position, the engagement of nose 45 with plate 44 limits the extent of its pivotal movement, holding it from dropping below the position of Fig. 11 even when work is resting thereon. The nose also serves as a means for holding releasably the block or work rest in adjusted position along the clamp bar, for it engages plate 44 with sufficient force to prevent the carrier member from sliding along the clamp bar, especially when downward, clamping pressure is exerted thereon in the manner to be described. When the rest is to be adjusted, it is tilted just enough to clear nose 45 from plate 44, the rest then being manually shifted along the bar to predetermined position, whereupon it is tilted reversely to bring nose 45 again into contact with plate 44. When there is no work supported on the work rest, the preponderance of the weight of the rest is at the left of pivot point 42, as viewed in Fig. 11, tending to rotate block 39 with sufficient force to press nose 45 against plate 44 to prevent the work rest and clamp from dropping by gravity. An upwardly facing shoulder 44^a at the lower end of bar 28 prevents the rest from dropping clear of said bar.

Straps 46 and 47 extend transversely from block 39, being secured to the upper face thereof by bolts 48 and 49, respectively. Bolts 48 also secure a transversely extending rest plate 50 to the top of block 39, and upwardly projecting and horizontally spaced corrugated nails 51, or the like, may be provided on plate 50 as work gripping members. Strap 46 is bent at its opposite ends to provide upwardly opening channels 52, while strap 47 is bent downwardly at its opposite ends to provide a downwardly opening hook 53. These channels and hooks are for the reception of removable work-supporting arms 54 which converge horizontally toward tongue 40. The forward ends 54^a of arms 54 are of reduced size so they may be slipped longitudinally beneath plate 50 and through channels 52 and hooks 53 into the operative position of Fig. 12, shoulders 55 being adapted to engage the front edge of plate 50 to limit the longitudinal inward movement of the arms. Preferably, the under sides of arms 54 are notched as at 56 to take the cross bar portions 57 of straps 46, the notch and bar engagement holding the arms releasably against movement longitudinally out of operative position. However, when the arms are in operative position, there is sufficient vertical clearance between reduced portions 54^a and the under side of plate 50 to allow the arms to be raised sufficiently to clear notches 56 from cross bars 57 so the arms may be withdrawn when they are unnecessary to support given work or when the device is to be folded for transportation or storage. Of course, when work is applied to the free extremities of the arms, said arms tend to rock about straps 46 as fulcrums, the engagement of extremities 54^a with straps 47 limiting such movement so as to hold the arms in a substantially horizontal position.

Referring now particularly to Figs. 3, 4, and 5, I will proceed to describe the improved clamping head making up a portion of my device. A U-shaped carrier member 58 is adapted to extend with sliding fit about three sides of clamp bar 28. A pin 59 extends between the opposite sides of pieces 60 of carrier 58 and across the fourth side of bar 28. However, the end 61 of the carrier member and the pin 59 are so spaced horizontally that when member 58 is substantially horizontal there is sufficient clearance between the bar and said end and pin to allow the carrier to be slid freely along the bar to any desired position of adjustment. The preponderance of weight of the clamping head is at the right of pin 59, as viewed in Fig. 4, so when the head has been manually moved to adjusted position and manual pressure is released, the head swings slightly about pin 59 in a clockwise direction causing the upper, inner edge of end 61 and the pin 59 to engage bar 28 frictionally with

sufficient force to hold the head from gravitating out of adjusted position. Said inner edge and pin may therefore be considered as releasable holding means operable to hold the head against movement along the bar. On the other hand, when work is gripped between rest 37 and head 38 in a manner to be described, the head is swung slightly about pin 59 in a counterclockwise direction, as viewed in Fig. 4, whereupon the lower inner edge of end 61 and the pin 59 engage the opposite sides of bar 28 to hold the head frictionally against movement upwardly out of adjusted position.

A clamping jaw 62 is pivotally connected to carrier 58 by pin 63, and an operating lever 64 is pivoted to said carrier by pin 65, the lever being disposed above the jaw and with its cam face 66 in engagement with the upper, cam face 67 of the jaw. Pivot pins 63 and 65 are horizontally offset and a leaf spring 68, supported by pins 69 and 70, is adapted to hold jaw 62 yieldingly in the raised, inoperative position of Fig. 5, when lever 64 is in the inoperative position as shown in this figure. Pivoted at 71 to the upper edge of one of the side pieces 60 is a latch 72, a flat spring 73 on that side piece urging the latch in a clockwise direction as viewed in Fig. 3, the nose 74 of the latch merely engaging the side face of lever 64 when the latter is in the inoperative position of Fig. 5.

Assuming that a screen door D is to be clamped in the device, (see Fig. 16) the lower edge of the door is rested upon plate 50 or gripping means 51 thereof, while clamp head 38, in the condition of Fig. 5, is lowered to bring face 75 of jaw 62 into contact with the upper edge 76 of the door. Stud 77 extends from jaw face 75 in order to engage the inner face of the door for preventing it from slipping inwardly toward bar 28 when the clamp is applied. Lever 64 is then swung into the operative position of Fig. 4, cam 66 acting against face 67 of the jaw 62 to bias said jaw against the action of spring 68 into the operative clamping position of Fig. 4, the head rotating slightly about pin 59, as previously described, to throw it into binding engagement with clamp bar 28 and thus hold it from movement upwardly along said bar during the application of clamping pressure. The pivotal movement of the jaw may therefore be considered as operating means for holding the head releasably from movement along the bar. As soon as lever 64 has reached its operative position, spring 73 swings the nose of latch 72 behind said lever, thus serving as a means for releasably holding the lever and clamping jaw in operative position.

With the door thus clamped between members 37 and 38, bar 28 may be swung about its horizontal pivot 29 and post 14 may be

rotated axially to render every part of the door accessible to a workman who may occupy any given position, and since he may apply his tools or brush without giving any attention to supporting the door, he is enabled greatly to expedite his operation and give more careful attention to the manner in which it is performed.

When it is desired to release the door the operator merely has to grasp the handle 72^a of latch 72 and swing it against the action of spring 73 until latch nose 74 clears lever 64, whereupon spring 68 returns jaw 62 to inoperative position and coincidentally acts against the cam face of lever 64 to return said lever to inoperative position.

Articles of certain types may not easily be rested upon plate 50 of rest 37, and in such cases the articles may usually be taken by supporting arms 54, clamp head 38 still being supported in the manner described above. An article which is peculiarly awkward to handle during surfacing operations thereon, is the engine hood of an automobile, this awkwardness arising not only by reason of the configuration of the hood but also because of the joint connections between the several sections. For aiding in the support of such articles I provide post 14 with a pair of work supporting arms 78. These arms are pivotally connected at 79 to a pair of straps 80 arranged at opposite sides of post 14 and may be swung to the dotted line position of Fig. 1 when they are not in use or when the device is folded for storage or transportation. Extending angularly from the underside of arms 78 are stop pieces 81 which are adapted to engage the sides of post 14 when the arms are in substantially horizontal position, the side faces of post 14 preferably being provided with wear plates 82. These stops 81 hold the arms from dropping below a substantially horizontal position when work is applied thereto. The arms also have terminal noses 83 which are adapted to engage the wear plates when the arms are in a horizontal position, and the noses engage the plate with sufficient force to hold straps 80 and hence the arms against movement longitudinally along posts 14 when work is applied to the top of said arms. The weight of the arms, alone, is sufficient to engage the noses with the plates with sufficient force to hold the side straps and arms from gravitating when no work is on top the arms. By swinging the arms upwardly sufficiently to clear posts 14 the arms may be slid along the post to vary their elevation which ordinarily, though not necessarily, will be in the horizontal plane to which work arms 54 have been moved. Then the lower edges of hinged sections 84 of engine hood H are rested on arms 78 and 54. A board 85 is laid across the top edges of the hood, and head 38 brought down into contact

with said board. Lever 64 is then actuated in the manner described above to throw jaw 62 into clamping position, thus rigidly clamping the hood between the supporting arms and board 85.

I have not attempted here to discuss exhaustively all the different manners in which the device may be used to advantage, nor have I set out the various types of articles which may be held thereby, but it is believed I have given sufficient descriptive matter to enable those skilled in the art to understand how the device may be applied with advantage in many different situations.

It will be understood the drawings and description are to be considered merely as illustrative of and not restrictive on the broader claims appended hereto, for various changes in design, structure and arrangement may be made without departing from the spirit and scope of said claims.

I claim:

1. In a device of the character described, a supporting structure, and a work clamp supported thereby, said clamp embodying a bar secured to the supporting structure, a carrier member slidable longitudinally along the bar, a work rest pivotally connected to the carrier member and movable pivotally from a position substantially paralleling the bar to a position substantially perpendicular to the bar, means on the rest adapted, when the rest is perpendicular to the bar, to engage the bar frictionally to hold the carrier in adjusted position on the bar, and a clamp head movable longitudinally along the bar towards and away from the rest.
2. In a device of the character described, a supporting structure, and a work clamp supported thereby, said clamp embodying a bar secured to the supporting structure, a work rest extending transversely from the bar, and a clamp head on the bar and longitudinally spaced from the rest; said head embodying a carrier, a clamping jaw pivotally connected to the carrier, and pivotally movable to and from operative position, a spring adapted normally to hold the lever in inoperative position, an operating lever adapted to bias the clamping jaw into operative position, and a releasable latch adapted to engage the operating lever and thereby hold the clamping jaw releasably in operative position.
3. In a device of the character described, a supporting structure, and a work clamp supported thereby, said clamp embodying a bar secured to the supporting structure, a work rest extending transversely from the bar, and a clamp head on the bar and longitudinally spaced from the rest; said head embodying a carrier, a clamping jaw pivotally connected to the carrier, and pivotally movable to and from operative position, a spring adapted normally to hold the

lever in inoperative position, an operating lever adapted to bias the clamping jaw into operative position, and a releasable, spring actuated latch adapted to engage the operating lever and thereby hold the clamping jaw releasably in operative position.

4. In a device of the character described, a bar and a clamp head on said bar, said head embodying a carrier member, a clamping jaw pivotally connected to the carrier and pivotally movable to and from operative position, spring means adapted yieldingly to hold the jaw in inoperative position, and an operating lever adapted to bias the jaw into operative position against the action of said spring.

5. In a device of the character described, a clamp bar, and a pair of clamp members on the bar and adapted to take between them an article to be clamped, one of said members being movable along the bar towards and away from the other member, releasable means operable to hold said one member against movement along the bar, away from said other member, a clamping jaw on said one member and movable pivotally with re-

spect thereto into and out of clamping engagement with the article, said jaw in its pivotal movement as it engages the article being adapted to operate said holding means. 30

6. In a device of the character described, a clamp bar, and a clamp head on the bar, said head embodying a carrier member, a clamping jaw pivotally connected to the carrier and pivotally movable to and from operative position, an operating lever adapted to move the jaw from inoperative to operative position, and releasable means adapted to hold the jaw in operative position. 35

7. In a device of the character described, a base member, a substantially vertical post supported for axial rotation by the member, spaced clamp members on the bar and adapted to take work between them, and means adapted to be applied to the base and post in a manner selectively to hold the post from axial rotation and to allow only limited axial rotation thereof. 40 45

In witness that I claim the foregoing I have hereunto subscribed my name this 8th day of February, 1926. 50

WILLIAM R. GORRELL.