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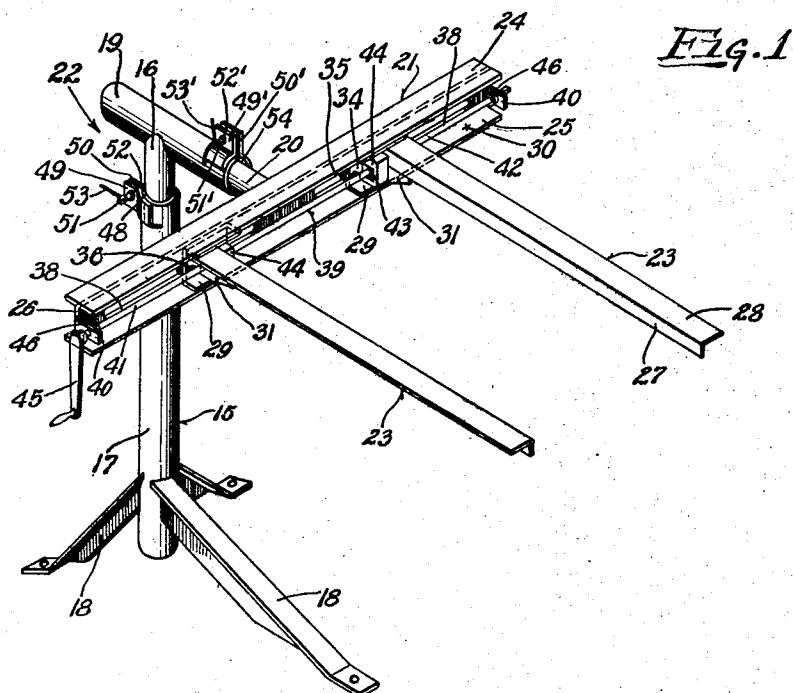
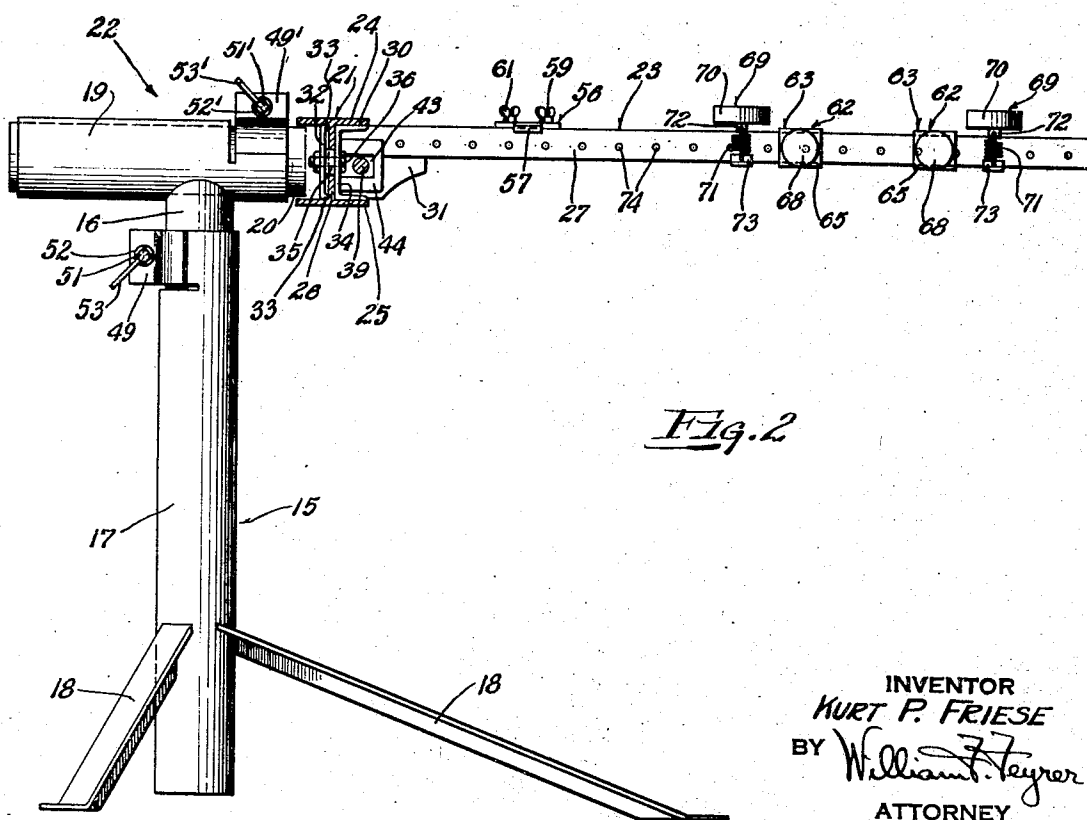
**K. P. FRIESE**

**2,188,433**

WORK HOLDING DEVICE

Filed June 9, 1937

2 Sheets-Sheet 1



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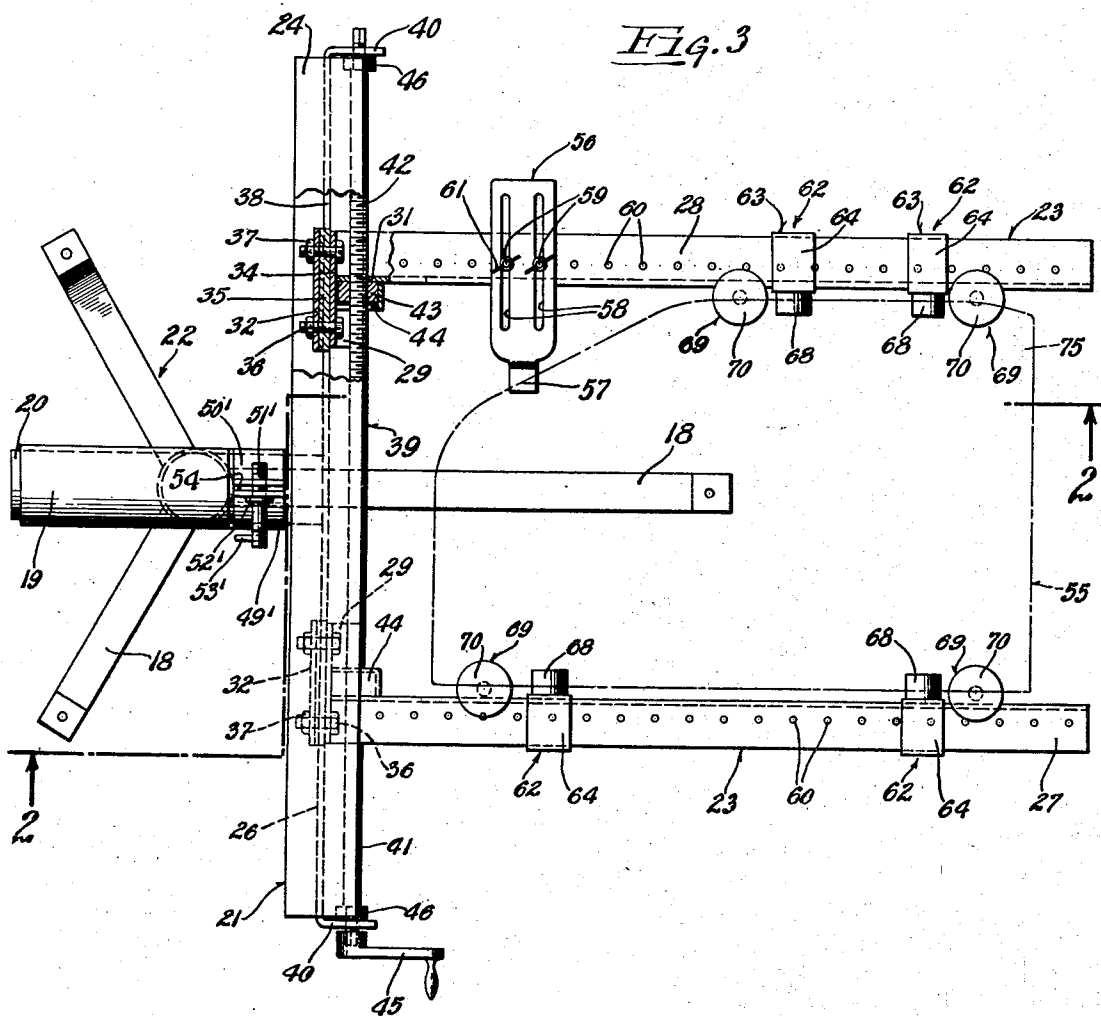
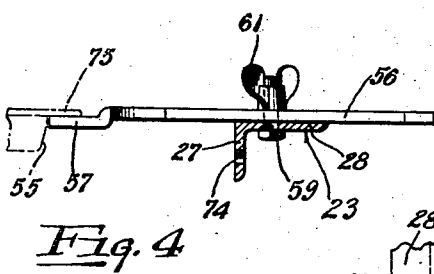
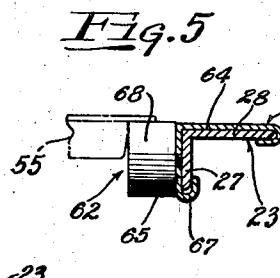
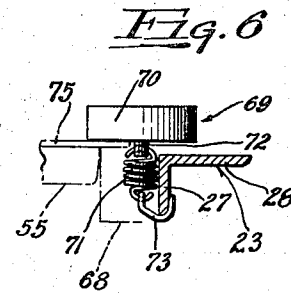
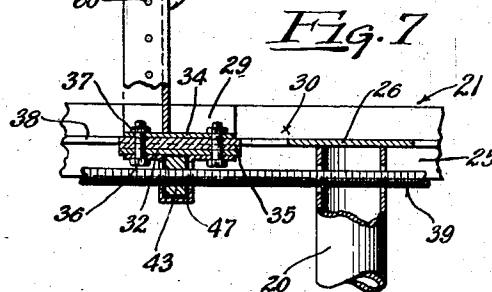
K. P. FRIESE

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

2,188,433

## WORK HOLDING DEVICE

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3 Claims. (Cl. 29—89)

This invention relates to a work holding apparatus.

It is an object of the invention to provide such an apparatus that is readily adaptable for the holding of work of various sizes and shapes and which may be adjusted to support the work in divers positions to facilitate operation thereon.

In achieving this object there is provided as a feature of the invention a work holding apparatus in which a pair of supporting and clamping arms carried by a frame are relatively movable laterally toward and away from each other and in which the frame is so supported that it may be moved vertically and also pivoted on both a vertical and a horizontal axis.

Another feature of the invention resides in so associating the supporting arms with each other and with the frame that a single operating member may be utilized for concurrently moving the supporting and clamping arms toward and away from each other.

Another feature of the invention resides in providing a frame supporting structure composed of two pairs of telescoping members, the members being so associated that the frame may be moved both vertically and horizontally and likewise be pivoted on both a vertical and a horizontal axis to thereby permit a ready access to any portion of the work by an operator.

A further feature of the invention resides in providing on the supporting arms means by which peculiarly shaped articles, such for example as automobile doors, may be clamped and securely held relative to the supporting arms while being worked upon.

Thus, for example, when an automobile door is held by the apparatus provided by the present invention it is possible to remove the upholstery from one side of the door, turning and adjusting the frame while so doing to facilitate the operation; and then without removing the door from the frame perform any other operation thereon, as painting on the opposite side, by merely adjusting the frame to locate the door in a convenient position relative to the workman.

Because of the novel mounting of the holding apparatus which includes an easily operated and efficient supporting and clamping means, bulky and unwieldy articles of many kinds may be effectively held in divers positions in which they may be advantageously operated upon by a workman.

Doors, fenders, engine hoods and cover hoods for tires are only a few of the many unwieldy articles which may be expeditiously handled by

means of the novel holding apparatus provided by the present invention.

Other objects, features and advantages of the invention will hereinafter appear.

In the drawings:

Figure 1 is a perspective view of the holding apparatus.

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 3 and showing the advantageous clamping and supporting means associated with one of the holding and supporting arms.

Fig. 3 is a top view of the holding apparatus.

Figs. 4, 5 and 6 are detail views showing the advantageous supporting and clamping members associated with the holding and supporting arms.

Fig. 7 is a detail of a modified construction in which the supporting arm operating member is associated with the frame in a somewhat different manner than illustrated in Figs. 1, 2 and 3.

Before describing the present improvements and mode of operation thereof in detail it should be understood that the invention is not limited to the details of construction and arrangement of parts shown in the accompanying drawings, which are merely illustrative of the present preferred embodiments, since the invention is capable of other embodiments, and the phraseology employed is for the purpose of description and not of limitation.

Referring now more particularly to the drawings which show the present preferred embodiments of the invention there is disclosed a vertical standard 15 composed of upper and lower telescopically associated members 16 and 17, the lower member 17 having a plurality of supporting legs 18 extending therefrom, and the upper member 16 being welded or otherwise suitably secured to a tubular member 19 extending horizontally and at a right angle thereto. A member 20, telescopically associated with the tubular member 19 and secured, as by welding, to a holding frame 21 at one end completes the frame mounting 22.

The holding frame 21, as shown, carries a pair of forwardly extending holding and supporting arms 23 which are mounted for movement laterally toward and away from each other. To provide a rigid and strong construction, the frame 21 is advantageously formed as an I beam having upper and lower flanges 24 and 25 connected by a web 26, while the holding and supporting arms 23 are formed as angle beams with a vertical portion 27 and a horizontal portion 28.

Association of the arms 23 and frame 21 is

achieved by providing a slide member 29, preferably of channel shape, for each of the arms 23 and adapted to closely fit and slide in the guideway 30 provided by the upper and lower flanges 24 and 25 and the web 26 of the frame 21. A welded or other suitable connection may be provided between the arms 23 and the respective slide members 29, and preferably, as shown, bracket plates 31 are inserted in the channel slide members 29 and welded thereto beneath the vertical portions 27 of the arms 23 to further support the latter.

Followers plates 32 with bulbs 33 formed at their upper and lower edges, positioned on the side of the frame web 26 opposite the channel slide members 29 and secured to the upstanding web portions 34 thereof by blocks 35, and bolts and nuts 36 and 37 extending through longitudinal slots 38 in the frame web 26, serve to maintain the supporting arms 23 in rigid and sliding relation with the frame 21.

For moving the spaced arms 23 relative to each other to accommodate work of various sizes there is provided an operating member 39 which extends longitudinally in the guideway 30, being supported adjacent each end thereof in forwardly extending ears 40 which may be formed integral with the frame web 26. Opposed right and left hand screw threads 41 and 42 formed on the member 39 and respectively engageable with cooperating screw threads in floating nuts 43 confined in housings 44 fixed to the two slide members 29 provide a positive means for moving the supporting arms laterally relative to each other when the operating member 39 is rotated, as by a crank 45 secured thereto at one end thereof. Collars 46 fixed to the operating member and engageable with the inwardly extending supporting ears 40 serve to effectively prevent longitudinal movement of the screw member 39 during its rotating movement.

Instead of positioning the screw member 39 forwardly of the frame web 26 as shown in Figs. 1, 2 and 3 it may, if desired, be positioned rearwardly of the web 26 as shown in the modified construction of Fig. 7. In such case the floating nuts 43 are located in housings 47 fixed to the follower plates 32 by the bolts 36 rather than to the slide member 29. The operation of this form is the same as of the form first described. A somewhat less congestion of operating parts, however, is present on the forward side of the frame.

It is to be particularly noted that with the advantageous frame mounting 22 disclosed it is possible to raise and lower the holding frame 21 by sliding the upper telescoping member 16 of the standard 15 in the lower member 17, and that it is likewise possible to pivot the frame on a vertical axis by rotating the upper member 16 in the lower member 17. Also, it is to be noted that the holding frame 21 may be moved both forwardly and rearwardly and pivoted on a horizontal axis.

For locking the upper member 16 in divers adjusted vertical and pivotal positions a split section 48 is formed at the upper end of the lower member. Clamping lugs 49 and 50 fixed to opposite portions of the split section 48 and held together by a screw 51 provide a means for drawing the split section 48 together to thus firmly clamp the upper member 16 in the various adjusted positions. Preferably, and as shown, the screw 51 which is formed with a shoulder 52 thereon engaging the outer face of one of the lugs 49 to draw the latter when the screw is rotated in

a threaded hole, not shown, in the other lug 50, has a turning pin 53 associated with one end thereof to facilitate the clamping and release of the upper telescoping member 16.

A split section 54 formed on the forward end of the horizontally extending tubular member 19, and to the opposite portions of which are fixed clamping lugs 49' and 50' held together by a screw 51' identical with the screw 51 associated with the standard 15, provides a means for effectively maintaining the frame in divers adjusted positions. The clamping of the tubular member 19 on the horizontally extending member is achieved, as in the case of standard 15, by grasping the turning pin 53' on the screw 51' to draw the shoulder 52' thereon against one of the lugs 49' and thereby move the same toward the other lug 50' having the threaded hole therein.

Such a mounting of the holding frame 21 is thus seen to be especially advantageous inasmuch as when an article is clamped between the holding and supporting arms 23 it may be adjusted in various positions to enable easy access to all portions thereof by the workman.

In certain classes of work, due to the irregular configuration of the article to be operated upon and to other factors, such as the danger of damaging the article if it were to be directly clamped between the supporting arms in a vise grip, there may be associated with each of the arms 23 supporting and clamping means which are adapted to firmly hold the work relative to and between the arms 23 without danger of damage thereto as by crushing.

These advantageous means are, for the purpose of illustration, disclosed as cooperating in firmly holding an automobile door 55, shown in dotted lines.

These means include a supporting plate 56, see Fig. 4, adapted to be mounted on one of the arms 23 and adjustable inwardly and outwardly in the work receiving space between the arms. An inwardly extending and downwardly offset tongue 57 is formed at the inner or projecting end of the plate and serves as a rest for the work being operated upon. As shown, to permit adjustment thereof, the plate 56 is provided with a pair of parallel slots 58 therein in which are inserted bolts 59 which pass through holes 60 in the horizontal portion 28 of the supporting arm. Wing nuts 61 are provided on the bolts to facilitate clamping of the supporting plate in various positions of adjustment when the latter is moved inwardly and outwardly in the work receiving space between the arms 23.

While only one such supporting plate 56 is shown it will be appreciated that one or more such plates may be utilized should the character of the work require. Accordingly, it is to be noted that a series of spaced holes 60 are provided in the upper portion of each of the supporting arms to permit not only the use of several plates but the locating of such plates at any desired position longitudinally of the arms 23.

A plurality of cushioned supports 62 are likewise shown associated with the supporting arms. Each of these cushioned supports 62 includes a slide member 63 having angularly disposed portions 64 and 65 with hook shaped ends 66 and 67 adapted to engage respectively with the free edges of horizontal and vertical flanges 28 and 27 of the supporting arms 23. A pad 68, preferably of rubber or the like, secured to the slide member 63 by any suitable connection completes

the cushioned support. Because of the manner in which the slide members 63 are associated with the supporting arms 23 the cushioned supports 62 may be easily adjusted longitudinally thereof.

For clamping the work on the cushioned supports 62 and/or supporting plates 56 there are provided a plurality of clamping members 69 including a head portion 70, preferably of rubber, provided with an eye member on the lower face thereof. A spring 71, at one end hooked in the eye portion 72 and at the other end secured to a hook 73 adapted to engage the lower edge of the portion 27 of the arm 23 serves to maintain the head in yielding engagement with the face of the work opposite the supports 56 and 62.

It is to be noted that a series of spaced holes 74 is provided in the vertical flanges 27 of each of the supporting arms 23 similar to the holes 60 in the horizontal flanges for receiving divers supporting and clamping mechanisms adapted for use with special types of work.

With the holding apparatus disclosed it is thus seen that the work of various sizes may be securely held between the forwardly extending arms 23 which are easily adjustable by means of the operating screw member 39. It is further seen that because of the advantageous mounting of the holding frame it is possible to turn and otherwise adjust the same so that the work may at all times be accessible to the workman. Moreover, through the use of the advantageous supporting and clamping means associated with arms 23 it is possible to easily and firmly hold articles of divers configurations.

For example, assume that it is desired to repair an automobile door 55 shown in dotted lines. The arms 23 are adjusted to the proper width by rotating the operating member 39. The door 40 may then be placed between the arms with the door flange 75 upon the tongue 57 of the supporting plate 56 and upon the cushioned supports 62 which have been properly positioned and adjusted on the arms. Next the spring urged clamping members 69 are snapped or otherwise moved to overlie the door flange 75. In this manner the door is securely held between the arms 23.

Then the holding frame may be rotated on a horizontal axis by loosening the clamping screw 51' to bring the upholstery in an accessible position relative to the workman. The screw 51' may then be fully tightened to lock the frame in this adjusted position following which the upholstery may be removed. Any dents in the door may then be pounded out, the frame being suitably adjusted to a position desired by the workman. Following this the door may be painted and the upholstery replaced. All of the operations, it is to be noted, are performed with only one initial handling of the door, the frame being readily moved to positions in which the various operations may be most effectively performed.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

Having thus described the invention, what is claimed as new is:

1. A work holding apparatus comprising in combination a vertical standard and a work-holding support solely supported by the upper end of said standard; said support including a holding frame consisting of an I-shaped member presenting U-shaped channels on two sides thereof with an elongated slot in the web; means for mounting said support for compound adjustment on top of said standard; a pair of holding arms having their ends tightly nesting in one of said U-shaped channels to be supported by and slidable in said channel; means connected to each of said ends extending through said elongated slot and guided in the other U-shaped channel of the I-member for holding said ends to said I-shaped member; and driving means associated with said ends for moving said holding arms laterally relatively to each other.

2. A work holding apparatus comprising in combination a vertical standard and a work-holding support solely supported by the upper end of said standard; said support including a holding frame consisting of an I-shaped member presenting U-shaped channels on two sides thereof with an elongated slot in the web; means for mounting said support for compound adjustment on top of said standard; a pair of holding arms having their ends tightly nesting in one of said U-shaped channels to be supported by and slidable in said channel and extending at an angle with respect to said I-shaped member; means connected to each of said ends extending through said elongated slot and guided in the other U-shaped channel of the I-member for holding said ends to said I-shaped member; and driving means associated with said ends for moving said holding arms sidewise relatively to each other.

3. A work holding apparatus comprising in combination a vertical standard and a work-holding support solely supported by the upper end of said standard; said support including a holding frame consisting of an I-shaped member presenting U-shaped channels on two sides thereof with an elongated slot in the web; means for mounting said support for compound adjustment on top of said standard; a pair of holding arms having their ends tightly nesting in one of said U-shaped channels to be supported by and slidable in said channel; means including channel slide members connected to each of said ends extending through said elongated slot and guided in the other U-shaped channel of the I-member for holding the said ends to said I-shaped member; and driving means associated with said ends for moving said holding arms laterally relatively to each other.

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