Oct. 7, 1952 E. J. WATT ET AL 2,612,917

WEDGING BENCH CLAMP

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Fig. 1

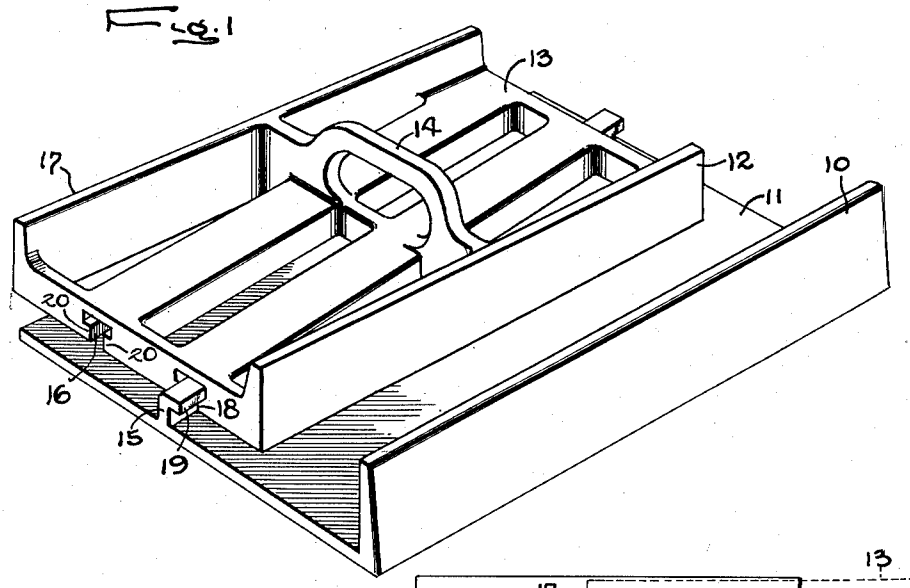


Fig. 2

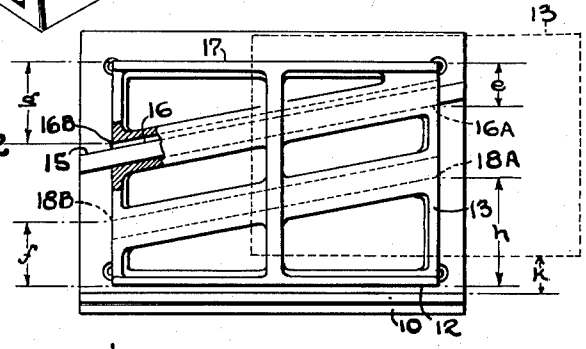


Fig. 3

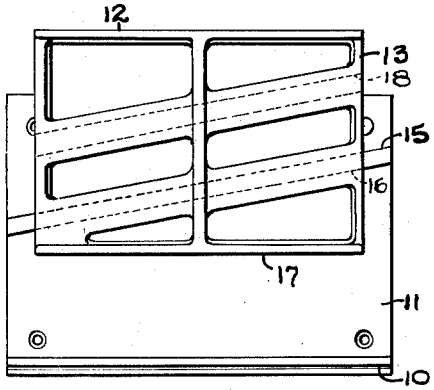
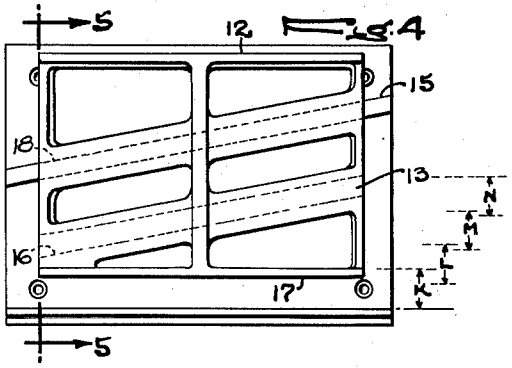


Fig. 4



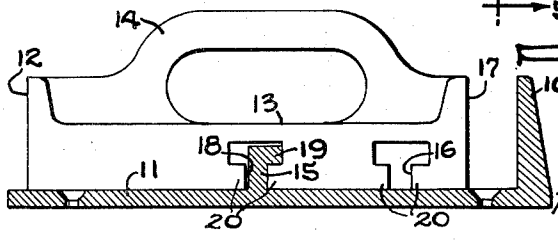


Fig. 5

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WEDGING BENCH CLAMP

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1 Claim. (Cl. 144—307)

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This invention relates generally to clamps adapted to be mounted on benches, walls or the like and, more particularly, to clamps of the type having two parallel jaws one of which is upstanding from a base or support and the other of which is carried by a block slidable back and forth along the base. By means of coacting cam and follower surfaces disposed respectively on the base and the block, the movable jaw is moved laterally toward and away from the fixed jaw during sliding of the block endwise along the base.

The primary object of the invention is to adapt the clamp for different widths of workpieces by utilizing opposite sides of the block selectively as movable jaws with the follower surface laterally spaced a different distance from each of these jaws and adapting the cam and follower surfaces, for reversing the block end for end to enable each movable jaw to be utilized and provide different ranges for movement of the block toward the fixed jaw.

Another object is to increase the number of ranges for movement of the block by providing a plurality of follower surfaces thereon each laterally spaced different distances from the respective movable jaws.

A further object is to provide for interlocking of the cam and follower surfaces in a novel manner to hold the movable jaw at all times in proper relation with respect to the fixed jaw.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

Figure 1 is a perspective view of a bench clamp embodying the novel features of the present invention.

Fig. 2 is a top view of the clamp.

Figs. 3 and 4 are views similar to Fig. 2 but showing the parts in different positions.

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 4.

In the drawings, the invention is shown for purposes of illustration in a bench clamp comprising generally a fixed jaw 10 upstanding from a flat base plate or support 11 adapted to be secured to benches, walls, or the like, and a movable jaw 12 parallel to the fixed jaw. The movable jaw forms one edge of a generally rectangular slide or block 13 which is slidable along the uper side of the base and, by means of straight cam and follower surfaces disposed respectively on the base and the block, is urged laterally toward and away from the fixed jaw during sliding movement back and forth in an endwise

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direction along the base. If desired, a suitable handle 14 may be secured to the slide intermediate the ends of the latter as shown to facilitate moving of the slide along the base plate.

In the present instance, the cam surfaces are the sides of a generally straight guide rib 15 upstanding from the base 11 and the follower surfaces are the sides of a groove or slot 16 which is formed on the slide 13 and opens downwardly toward the plate to receive the guide rib. To maintain the jaws in parallel relation during sliding of the block along the base, the groove and the rib are inclined at equal angles with respect to the different jaws. The size of these angles is sufficiently close to a locking angle that under the friction created by the relatively rough cam and follower surfaces the block and the base are held in clamping engagement automatically.

In accordance with one aspect of the invention, the clamp above described is adapted for use with workpieces of widely varying widths by constructing and arranging the follower groove 16 in a novel manner which enables the block 13 to be moved toward the fixed jaw 10 in a plurality of ranges of movement without increasing the overall size or the cost of construction of the clamp. To accomplish this, the side of the block opposite the movable jaw 12 is utilized as a second movable jaw 17 parallel to the first jaw and the groove 16 is spaced a different distance from each movable jaw and adapted to receive the rib 15 with either jaw disposed adjacent the fixed jaw. Thus, with the first movable jaw 12 disposed adjacent the fixed jaw (see Fig. 2), the clamp is adapted for workpieces in one range of widths while, with the slide reversed end for end and the other movable jaw 17 adjacent the fixed jaw (see Fig. 3) the clamp is adapted to accommodate workpieces having larger widths.

To increase the number of ranges for movement of the block toward the fixed jaw, a second groove 18 parallel to the first groove 16 is formed in the block and spaced from the respective movable jaws at distances differing from the distances between the first groove and the movable jaws. While any number of grooves may be formed in the block with each groove spaced a different distance from the respective movable jaws, in the present instance only two grooves are used as shown to provide for four ranges of movement of the block.

In the embodiment of the invention shown in the drawings (see Fig. 2), one end 16A of one groove 16 is spaced a distance indicated at *e* from one movable jaw 17 and the opposite end 18B

of the other groove 18 is spaced a longer distance, indicated at *f*, from the other jaw 12. The other ends 16B and 18A of the grooves are spaced respectively at longer distances, indicated at *g* and *h*, from the different jaws, the distance *g*, of the other end 16B of the groove 16 from the jaw 17 being longer than the distance *f* but shorter than the distance *h* of the other end 18A of the groove 18 from the other jaw. Thus, depending upon which of the movable jaws is disposed adjacent the fixed jaw and which groove is receiving the rib, there are four possible ranges for movement of the slide toward the fixed jaw.

In accordance with another aspect of the invention, the rib 15 and the grooves 16 and 18 are formed in a novel manner so as to interlock and hold the block 13 against the base and maintain the movable jaws at all times in proper relation with respect to the fixed jaw. For this purpose, a flange 19 extending along and projecting rigidly from the rib interlocks with flanges 20 projecting from the edges of the grooves along the portions of the latter adjacent the base plate. Herein, the flange 19 projects laterally from the top of the rib on only one side thereof with the flanges 20 projecting laterally from both of the edges of the respective grooves so that the interlocking relation is maintained when either of the movable jaws is disposed adjacent the fixed jaw. With such an arrangement, the grooves are generally T-shaped in cross-section. Because the flanges are disposed intermediate the movable jaws and hold the base and the block in engagement, the clamp may be lifted conveniently and carried about as a unit.

With the movable jaw 12 disposed adjacent the fixed jaw 10 and the guide rib 15 received in the groove 16, as shown in Fig. 2, the movable jaw, by sliding the block back and forth along the rib, is moved toward and away from the fixed jaw in a range, indicated at *k*, which is disposed adjacent and extends a short distance laterally away from the fixed jaw so as to adapt the clamp for workpieces of small width. By sliding the block to the right along the rib the jaw 12 is moved away from the fixed jaw, while moving the block to the left moves the jaws together to effect the clamping action. In such movement of the block along the rib the flanges 19 and 20 interlock continuously to prevent tipping of the block away from the base.

To adapt the clamp for wider workpieces, the block is first moved along the guide rib and out of sliding engagement therewith and then turned end for end and positioned so that the other groove 18 receives the rib and the other movable jaw 17 is disposed adjacent the fixed jaw as shown in Fig. 4. In this relation the jaw 17 by sliding of the block along the rib is movable in a second range, indicated at L, which is spaced from the fixed jaw and extends a farther distance therefrom than the first range K.

The clamp is adapted for still wider workpieces by positioning the block in a similar manner with the movable jaw 12 adjacent the fixed jaw and the guide rib received in the groove 18 to adjust the block for moving the jaw 12 in a

third range M (indicated in Fig. 4) which is spaced from the fixed jaw. In Fig. 3 the block is positioned with the movable jaw 17 adjacent the fixed jaw and the rib is disposed in the groove 16 to move the jaw 17 in a fourth range N spaced farther from the fixed jaw than the third range M.

It is apparent from the foregoing that the clamp is adapted for workpieces of widely varying sizes simply by turning the slide end for end and selectively positioning the same with respect to the base plate so that the guide rib is received in one of the grooves 16 and 18. Such simple adjustment of the range of movement of the slide is made possible by differentially spacing the grooves from the respective movable jaws and adapting the grooves for receiving the rib with either movable jaw disposed adjacent the fixed jaw. Thus, the number of ranges of movement for the slide may be twice the number of grooves without increasing the over-all size of the clamp. Since the interlocking flanges 19 and 20 on the guide rib and the grooves hold the block 13 against the base 11 the clamp may be carried easily and may be used in a vertical position as when the base is secured to a wall.

We claim as our invention:

A clamp having in combination, a generally flat base, a fixed jaw upstanding from said base, a generally rectangular slide with a flat bottom resting on and slidable along said base and having a downwardly opening longitudinally extending groove perpendicular to said bottom and inclined at a predetermined angle with respect to opposite side edges of the slide, said groove being offset from the center of said slide to be nearer one edge of the slide than the other and being restricted along its lower part by similar inturned flanges, a rib upstanding perpendicularly from said base and having along its upper edge a laterally projecting flange complementing said slide flanges and interlocking with one or the other of said slide flanges when either end of said rib is inserted into one end of said groove, said rib being spaced from and inclined at said predetermined angle with respect to said fixed jaw to maintain said slide edges parallel to said fixed jaw during movement of the slide along the base with either edge of the slide opposing said fixed jaw and constituting the movable jaw of the clamp whereby to provide different ranges of adjustment of the clamp by turning said slide end for end.

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