

Feb. 21, 1939.

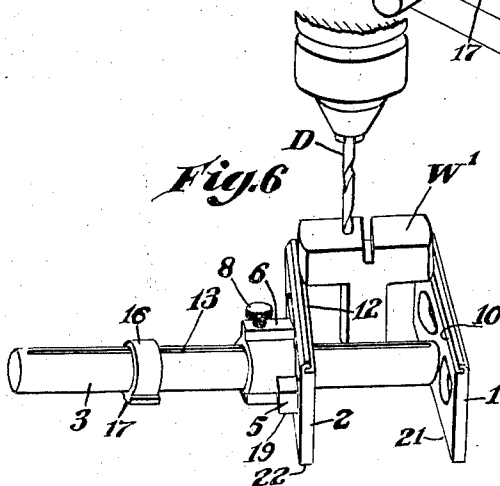
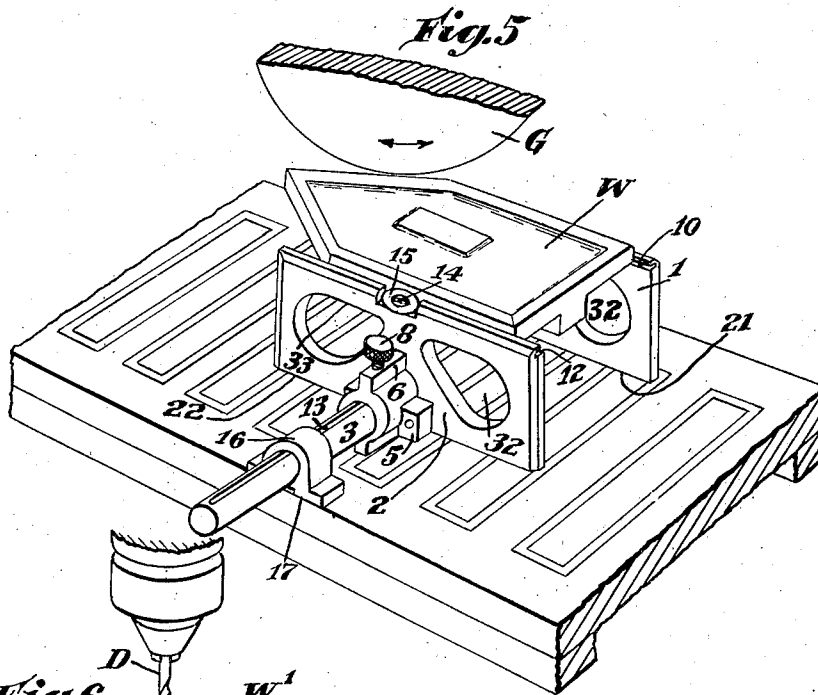
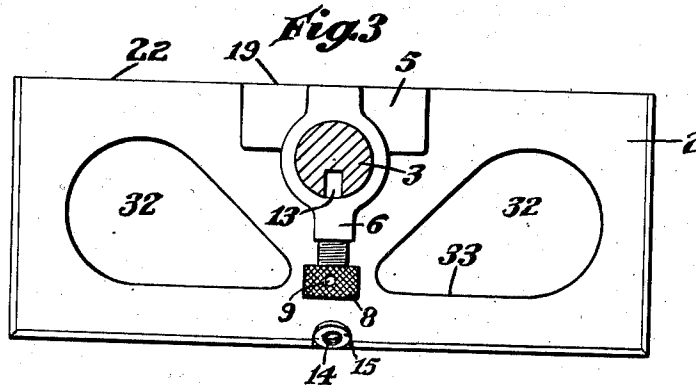
A. HAGOPIAN

2,148,156

COMBINED PARALLEL WORK SUPPORT AND CLAMP

Filed Sept. 15, 1937

2 Sheets-Sheet 2



Inventor
Avides Hagopian
by
Spear, Rawling & Spear.
Attorneys

UNITED STATES PATENT OFFICE

2,148,156

COMBINED PARALLEL WORK SUPPORT AND CLAMP

Avides Hagopian, Springfield, Mass., assignor to
The L. S. Starrett Company, Athol, Mass., a
corporation of Massachusetts

Application September 15, 1937, Serial No. 163,979

2 Claims. (Cl. 90—60)

The subject matter herein involved is a device which may be termed a parallel work holder or support. It is adapted to hold work of irregular form not conveniently held by ordinary jaws as in vises or clamps because of some protuberance but otherwise having parallel surfaces available for firm engagement so that the work can be held as on the platen of a press for drilling, reaming or like operations.

As illustrative of such devices, I have shown a specific construction of proven versatility in use and capable of production and distribution on a commercial basis so as to be available to the general trade for quick and convenient use on a wide variety of jobs. These heretofore have had to be handled on blocks and parallels in improvised ways that were slow and costly. The present invention makes possible a simple and convenient equipment adapted to new and better standardized technique in shop practice.

A characteristic device is shown in the accompanying drawings in which:—

Fig. 1 is a plan view of a holder in accordance with my invention.

Fig. 2 is a side elevation of the same.

Fig. 3 shows a section on the lines 3—3 of Fig. 1.

Fig. 4 shows the slidable bearing block on the section 4—4 through the longitudinal guide bar.

Fig. 5 illustrates the set-up of a characteristic piece of work as in a grinder or like machine.

Fig. 6 is a view showing another and differently shaped piece of work clamped and indicated as positioned under a drill as in a drill press.

Fig. 7 illustrates another work set-up in which parallel clamps are used to hold two pieces of work as for example a die plate and shoe, the latter being held between the edges of the clamp jaws.

Fig. 8 is a fragmentary partly sectional detail of a modified form of bar attachment to the fixed jaw and a modified bearing on the movable or floating jaw, and

Fig. 9 is an end view of the same.

In the form shown in the drawings my parallel work holder or combined work holder and support consists of a fixed jaw 1 and a relatively movable jaw 2, preferably of the same shape but at least having an edge disposable in parallel coincidence with that of the jaw 1.

The so-called fixed jaw 1 carries a guide bar 3 on which the jaw 2 is slidably supported by a cylindrical bearing 4 in a block 5 on its outer face. The guide bar 3 also forms a convenient handle for picking up or holding against rotation

the holder and its work. The bearing block 5 is formed with a longitudinal web 6 disposed radially of the bearing 4 and tapped to receive the clamp screw 7 turned by a knurled head 8 which may have a transverse capstan hole or holes 9 for tightening the clamp screw 7 when the work is in place between the jaws 1 and 2. The bottom face 19 of the block 5 provides a broad bearing which with the extended bottom edges 21 and 22 of the jaws 1 and 2 give the holder great stability.

The upper edges of these jaws are formed with shallow shoulders 10 and 12 in opposed parallel relation so as to be engageable with the work on any available edges or lines of free clamping contact. It is thus possible to clamp and support castings or other irregular pieces of work to be drilled, reamed or otherwise prepared or finished on a drill press or the like, without the usual inconvenient use of blocks or parallels to secure clearances or establish or maintain the desired planes or angles of reference in the layout of the work.

The top face of the bar or post 3 is longitudinally kerfed as at 13 to receive the end of the clamp screw 7. The bottom of the kerf or slot 13 is milled at an incline to the longitudinal axis of the bar 3 with its deeper end adjacent the fixed jaw 1. The point of the screw 7 when set up against any part of the kerf bottom has a resistant advantage to any opening pressures developed between the jaws while holding the work. The kerf 13 also forms a keyway for the movable or floating jaw 2 to preserve the general parallelism of the shoulders 10 and 12 of the cooperating jaw pair. The ultimate parallelism when the work is set up is maintained by the parallel edge faces 21 and 22.

To provide for a clamping or pinch of the work between the jaws 1 and 2 to prevent lateral slip as in grinding, a clamp screw head 15 is let into the edge of the shoulder 12 and is tapped into the upper jaw 2. It is easily set up by the small screw slot 14.

As a provision for the additional horizontal maintenance of the bar or post 3 to prevent tipping from any predetermined axis of reference, I may provide a sliding bearing block 16 having a footed bottom face 17 and adjustably held on 3 by a set screw 18.

The bottom faces 21 and 22 of the jaws 1 and 2 are preferably ground with flat parallel faces. These with the adjacent face 19 of the block 5 form stable supporting surfaces which are supplemented by the foot face 17 of the slide block 16.

Thus the clamp has a base inclusive of the

planes 21, 22, 19 and 17, upon which it bears on platen or table of the machine in which the work is being acted on.

In practice I have found it usually convenient to lay the clamp on its back in position under the drill D, disc G, or other tool. The work is then clamped between the edges of the jaws 1 and 2 and the whole lined up accurately in the line or plane of the relative feed of the tool used. The whole is then clamped firmly and operations begun as in the case of any similar job heretofore blocked up with parallels and held by clamps as needed. The jaws 1 and 2 may be apertured as at 32 preferably leaving a straight portion 33 parallel with the jaw edge and adapted to be engaged by auxiliary clamps where desired.

As illustrative of characteristic set-ups as in a grinder or in a drill press, I have shown irregular pieces of work W and W' held in one of my devices as in Figs. 5 and 6.

In Fig. 7 I have illustrated another set up where it is desired to use parallel clamps as for example holding a die plate to its shoe during drilling. In such a set-up the clamps may be brought inside the planes of the jaws with their jaw ends and clamp screws free therebetween.

It will be immediately apparent to the skilled workman that my device provides in a single handy device all the necessary means for setting up the average run of pieces of work.

In Figs. 8 and 9 I have shown a modified form of bearing on the movable jaw 2 as indicated at 25 with a corresponding knob like portion 26 spaced by a shallow groove 27. The portions 25 and 26 may be conveniently turned up round and then slabbed off as at 28 and 29 to form flat supporting faces. Also in Fig. 8 I have shown the bar 3 as shouldered at 3' and held by a nut 30 and washer 31.

The two forms function in the same manner but the rectangular form is adapted for production by milling while the knob like form can be turned out on a screw machine. The groove 27 makes a convenient finger grip in moving the movable jaw.

The device herein illustrated is capable of uses limited only by the demands of variant jobs and the aptitude of the workman in utilizing its capacities in meeting such demands as they arise.

Various modifications in design will occur as

standardized production is reached, as for example, apertures or like contour conveniences will be provided conformable to popular or average needs as interpreted by the producer of tools or implements of service for the workman at his task.

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

1. A work holder comprising a jaw, a bar rigid with said jaw, a second jaw slidably mounted on said bar for movement therealong toward and away from said first mentioned jaw, said bar having a groove extending longitudinally thereof, the bottom of said groove being inclined relative to the axis of said bar and progressively approaching the axis of said bar as it approaches said first mentioned jaw, a clamp screw carried by said second mentioned jaw and extending into said groove for cooperation with the bottom thereof to fasten said second mentioned jaw in different positions of adjustment along said bar, the bottom faces of said jaws being disposed in a common plane, a steadying block for said holder slidably mounted on said bar and having a flat bottom face disposed in the same plane as the bottom faces of said jaws.

2. A work holder comprising a jaw, a bar rigid with said jaw, a second jaw slidably mounted on said bar for movement therealong toward and away from said first mentioned jaw, said bar having a groove extending longitudinally thereof, the bottom of said groove being inclined relative to the axis of said bar and progressively approaching the axis of said bar as it approaches said first mentioned jaw, a clamp screw carried by said second mentioned jaw and extending into said groove for cooperation with the bottom thereof to fasten said second mentioned jaw in different positions of adjustment along said bar, the bottom faces of said jaws being disposed in a common plane, a steadying block for said holder slidably mounted on said bar and having a flat bottom face disposed in the same plane as the bottom faces of said jaws, said jaws having formed therethrough work clamping element accommodating openings the walls defining the tops of which are parallel to the top faces of said jaws.

AVIDES HAGOPIAN.