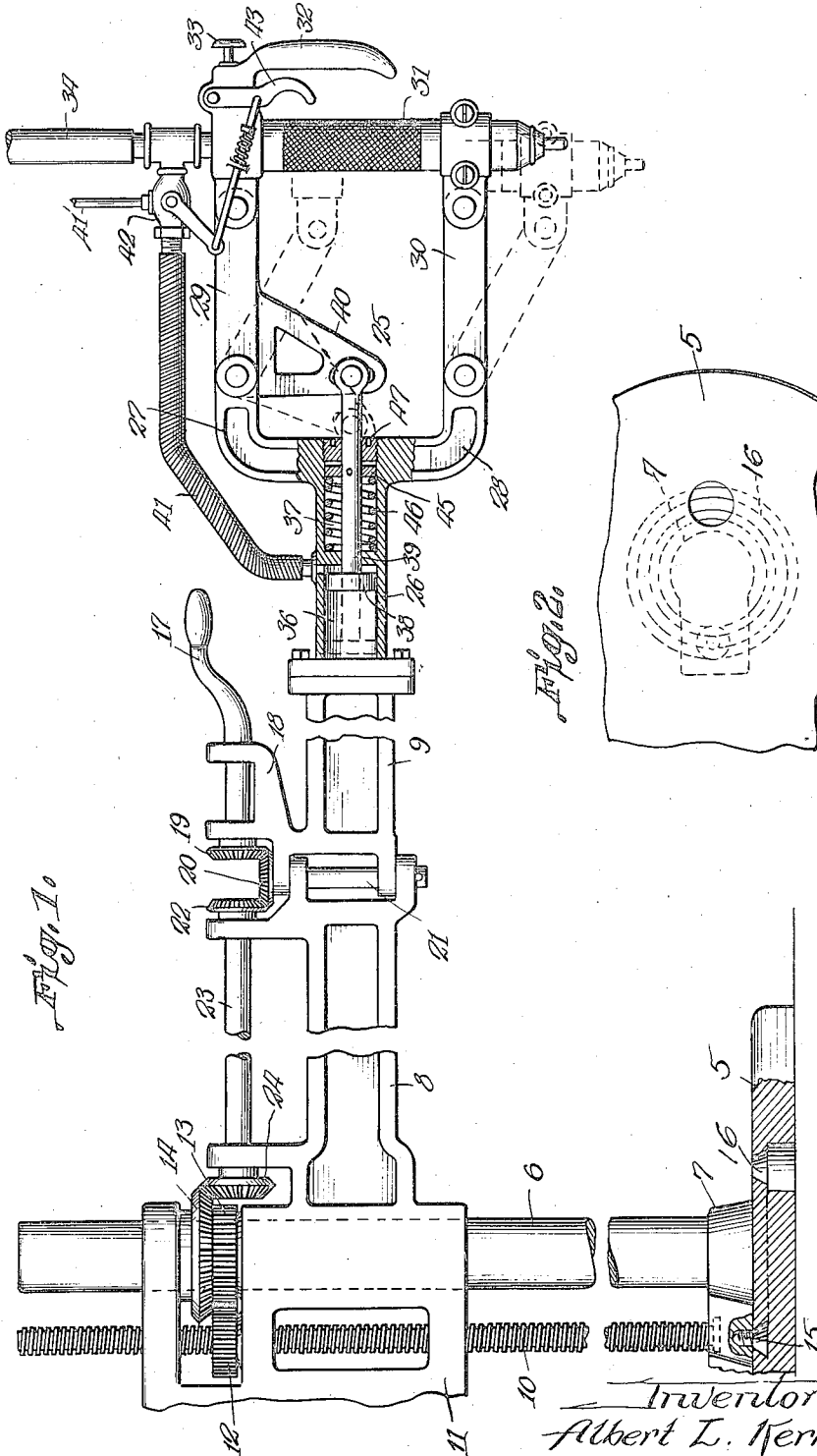


A. L. KERN.
TOOL SUPPORT.

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TOOL-SUPPORT.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT L. KERN, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Tool-Supports, of which the following is a specification.

This invention relates to tool supports.

More particularly it relates to supports for machines or tools used for boring, riveting, surfacing and similar operations.

Tools of this character, as ordinarily used, require that the machine be manually held to the work, or, as in the case of stationary, or semi-stationary, machines, that the machine be manually applied accurately to the work where it may be mechanically held.

The holding of the tool or machine to the work necessitates arduous and often prolonged labor, especially where the machine or tool is heavy. The machines wherein manual application but mechanical holding are employed, while they are intended to relieve the operator, nevertheless require accurate positioning and are not adapted to readily accommodate themselves to inequalities and variations in the work.

One of the objects of this invention is to provide an improved support for machines for performing such operations as boring, riveting, surfacing, and the like.

Another object is to provide a tool support whereby the labor and accuracy of application are reduced.

Another object is to provide a support wherein the final application and holding of the tool to the work is mechanically performed.

Another object is to provide a support of the stationary or semi-stationary type having a wide radius of action and ready application.

Other objects and advantages will appear from the specification and claims.

An embodiment of the invention is illustrated in the accompanying drawing, wherein, Figure 1 shows a side elevation of the support in partial section and

Fig. 2 is a bottom plan of a part of the base showing the movable connection between the base and the rest for the elevating and lowering screw.

The support illustrated has a base 5, which

may rest upon the floor, a bench, or other foundation. If desired, the base may be bolted or otherwise secured in position.

Mounted upright on base 5 is a shaft or post 6 having an enlarged foot 7 at its bottom. Post 6 carries a rotatable and longitudinally adjustable pivotally sectioned bracket. The bracket comprises a section 8 to which is pivoted a tool carrying extension section 9.

The height of the tool above the base or the work may be varied at will by the operator.

A spiral screw 10 is threaded through an extension of the bracket bearing 11. Screw 10 has a slidable pinion 12 feathered thereto. Pinion 12 meshes with a gear wheel 13 journaled on post 6 and to which is secured a beveled gear wheel 14. Gear wheels 13 and 14 are located between portions of bracket bearing 11 to travel therewith along the post. The rotation of gear wheel 13 rotates pinion 12 which rotates screw 10. The rotation of screw 10, because of the coöperation of its thread and the thread in bracket bearing 11, causes the raising or lowering of the bracket bearing and bracket sections 8 and 9 and the tool carried thereby, depending upon the direction of rotation. Screw 10 is seated in a rest 15 which is adapted to move around but be longitudinally stationary relative to post 6. The movable connection between rest 15 and base 5 may be provided in various ways such, for example, as by forming a circular guide way 16 in the bottom of the base, as shown most clearly in Fig. 2, and providing the rest with a screw threaded stud having an enlarged head. The stud may be screwed into the rest until its head bears against the top of the guideway and holds the rest and base together so that they will not separate but the rest may be moved about the foot of the post.

Gear wheel 13 is rotated, to raise and lower the tool, by a crank 17, which may be manipulated by the operator. Crank 17 is journaled in a bearing block 18 projecting upwardly from bracket section 9 near its pivot. The crank has a small beveled pinion 19 secured thereto. Pinion 19 meshes with a pinion 20 carried on the end of a short stud shaft 21 which forms the pivot between bracket sections 8 and 9. Pinion

20 meshes with a beveled pinion 22 secured to a shaft 23 journaled in a bearing projecting from bracket section 8. Shaft 23 carries a beveled pinion 24 which meshes with
5 gear wheel 14.

The rotation of crank 17, through the action of the shaft and gear trains above described, causes the rotation of pinion 12 and the raising and lowering of the bracket.
10 Because of the relation of gears 19, 20 and 22 and the pivot shaft 21, the operation of the crank is possible in any angular position of bracket section 9 relative to bracket section 8 and the crank is always toward and
15 readily accessible by the operator. Also because of the relation of gears 24 and 14, the rotation of crank 17 is effective in any angular or longitudinal position of bracket section 8 relative to post 6.

20 Bracket section 9, which may be of any desired length, has a mechanically actuated tool carrier 25 secured to its outer end. This tool carrier comprises a hollow cylinder 26, whose outer end carries a pair of
25 arms 27 and 28. Arms 27 and 28 have pivoted thereto links 29 and 30, respectively. The outer ends of links 29 and 30 are pivotally secured to the tool 31.

30 Tool 31 may be of any desired type of pneumatic, electric or power operated drill, hammer, boring machine, surfacer, or other appliance. The tool illustrated is a pneumatic riveting hammer. The hammer may be of the usual internal construction. It
35 has a handle 32 for the operator and a push valve 33 whereby the supply of compressed air, from an air line 34, is controlled. The riveting head of the tool is carried by suitable chuck at the lower end.

40 The hammer may be pivotally moved about the pivots of the parallel links 29 and 30, as represented by the dotted lines, to be applied and held directly to the work. The parallel links always maintain the tool in a
45 perpendicular or other desired position relative to the work. The angle may be varied from the perpendicular by selecting different lengths of links.

The tool is pneumatically applied and
50 held to the work under the control of the operator. Cylinder 26 is divided into two compartments, or sections, a piston compartment 36 and a spring compartment 37. Piston compartment 36 is air tight and it contains a piston 38. Piston 38 carries a piston
55 rod 39 pivotally connected to an arm 40 extending from link 29. The forward end of compartment 36 has an opening therein leading to an air hose 41. Air hose 41 is
60 connected to air line 34 through a valve 42. Valve 42 is actuated by the operator through a fluid controller in the form of a spring retracted trigger 43. Normally the valve is held in position such that connection is
65 broken between air line 34 and hose 41 but

compartment 36 is opened or vented to the atmosphere.

A ring 45, adapted to slide within the bore of cylinder 26, is secured to piston rod 39. A retractile spring 46 is located within
70 spring compartment 37. Normally it maintains the piston, links and tool in the position shown by the full lines and returns them to this position when the air controlling trigger 43 is released. A plug 47 closes
75 the end of spring compartment 37.

In operation the tool may be raised above the plane of the work by rotating crank 17. It may then be swung over the work to approximately the desired position. The rotatable connection between the bracket and the post and between the bracket sections gives a wide radius of action for the tool and the plane of action may be changed in any angular position, by rotating crank 17.
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The tool is positioned a short distance above the plane of the work by the manipulation of crank 17. The operator then pulls trigger 43 at the same time directing the head of the tool to the work, by means of
90 handle 32. The three-way valve 42 is operated by the trigger allowing air to flow through hose 41 into compartment 36 back of the piston. The piston is forced back against the force of spring 46 rotating links 29 and 30 to bring the head of the tool against the work. With the finger holding trigger 43 the operator then presses valve stem 33 with the thumb and the pneumatic hammer performs its work.
100

The tool is held in operative position firmly against the work as long as trigger 43 is maintained in its forward position. When the trigger is released the trigger retractile spring operates valve 42 to close the
105 connection between air line 34 and hose 41 and to vent outlet 41' and consequently compartment 36 to the atmosphere through the vent outlet 41'. Spring 46 thereupon returns piston 38, connecting rod 39, links 29
110 and 30 and the tool to normal position.

With this tool support, the tool needs be only roughly or approximately positioned above the plane of the work. The final positioning and firm seating of the tool is accomplished by the piston and its cooperating elements. Considerable variation in the height of the work is automatically taken care of because the tool is depressed by the air pressure until the head thereof engages
120 the work. There it is firmly held until the trigger is released. This allows rapid and easy operation, since it is only necessary to elevate or lower the bracket when considerable variation is to be met.
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One hand of the operator serves to position the tool to the work, firmly hold the tool against the work and operate the tool to perform the desired operation. The tool is held to the work more firmly and steadily
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than can be done by hand and the strain and work of the operator is materially reduced.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A tool support having a post, a bracket supported by and pivotally and longitudinally movable relative to said post, a tool carrier pivotally mounted on said bracket, and an air operated piston for moving said carrier to apply and hold the tool to the work.

2. A tool support having a post, a bracket supported by and pivotally and longitudinally movable relative to said post, means operable in any angular position of the bracket to elevate and lower the same, a tool carrier connected to the outer end of said bracket, said carrier having a pair of parallel pivoted links to which a tool may be secured, and manually controlled mechanically actuated mechanism for moving said links to apply and hold the tool to the work.

3. A tool support having a bracket composed of two pivotally interconnected sections, a post to which one section is secured to be both rotatably and longitudinally movable, a tool carrier secured to the other section and having a pair of parallel pivoted links for supporting a tool, and a fluid operated piston under the control of the operator for rotating said links to apply and hold the tool to the work.

4. A tool support comprising a post, a pivotally sectioned bracket slidably and rotatably journaled upon said post, a cylinder

carried upon the end of said bracket, a pair of arms extending forwardly from said cylinder, a link pivoted to each said arm and adapted to carry a tool, a piston slidably mounted within said cylinder and connected to one of said links to move the links about their pivots to apply and hold the tool to the work, and a valve and connections for controlling the supply of a fluid to said cylinder to control the action of said piston.

5. A tool support comprising a post, a bracket pivotally and slidably carried by said post, a pair of tool carrying links pivoted to said bracket, a tool secured to said links, a handle for the tool, mechanism for rotating said links to positively apply and hold the tool to the work, and a controller positioned to be operated by the operator's hand on the handle for controlling said mechanism.

6. A tool support comprising a post, a pivotally sectioned bracket rotatably and slidably held to said post, a screw threaded through said bracket, a gear train for rotating said screw to raise and lower the bracket in any angular position thereof, a cylinder secured to said bracket, a spring retracted fluid operated piston within said cylinder, a pair of parallel tool holding links pivoted to said cylinder and operated by said piston to apply and hold the tool to the work, and means controlled by the operator for controlling the supply of fluid acting on said piston.

In testimony whereof I hereunto subscribe my name.

ALBERT L. KERN.