Feb. 3, 1942. C. T. ALLMENDINGER 2,271,532

COMBINED WORK AND TOOL HOLDER

Filed April 7, 1941 2 Sheets-Sheet 1

Fig. 2

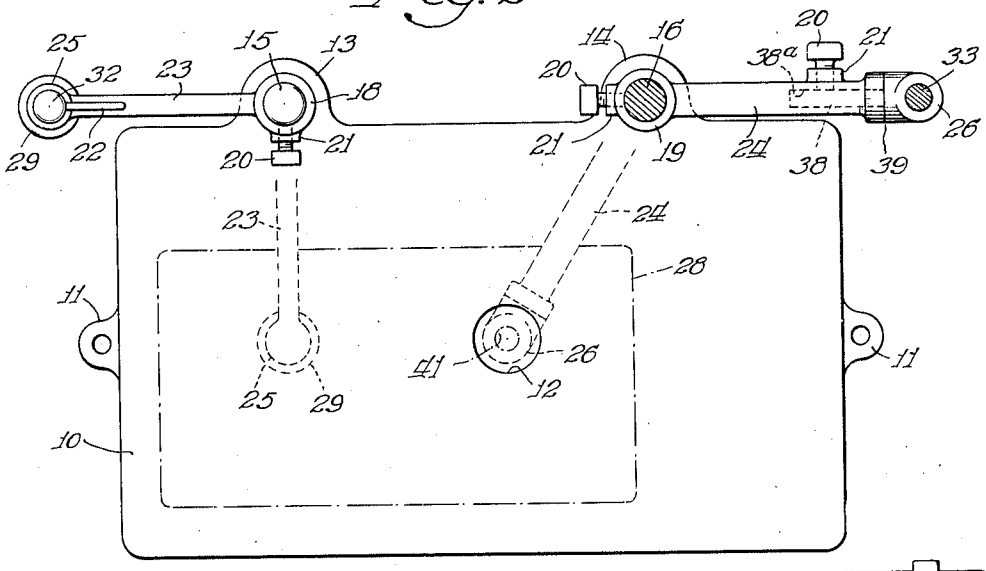
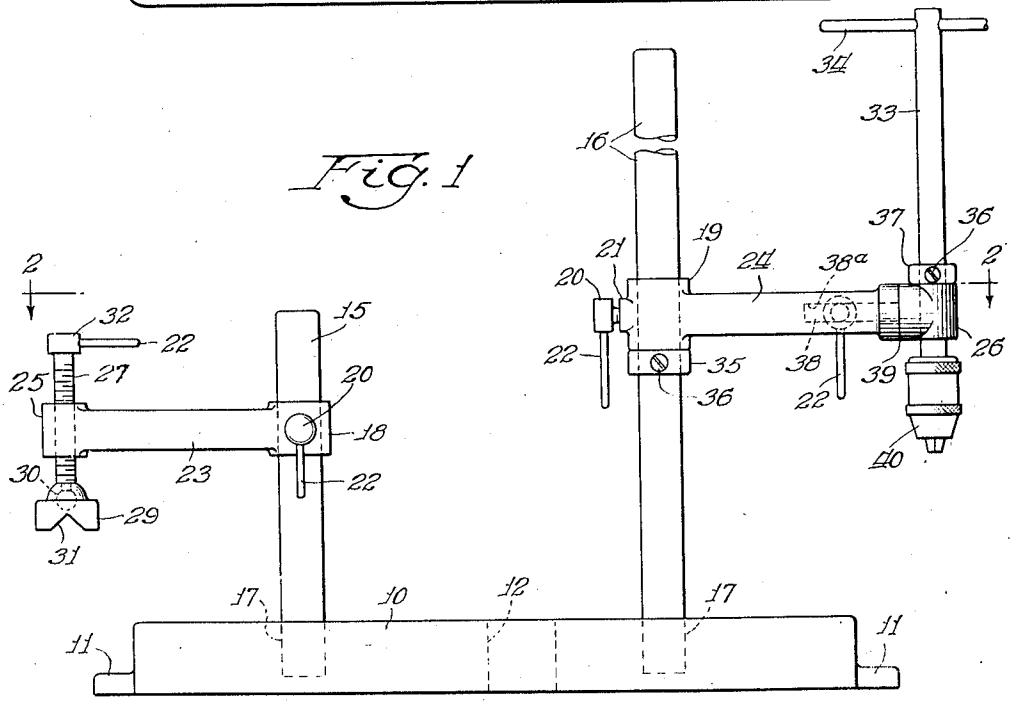


Fig. 1



Inventor:
Charles T. Allmendinger
By: A. Trevor Jones
Atty.

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Filed April 7, 1941 2 Sheets-Sheet 2

Fig. 3

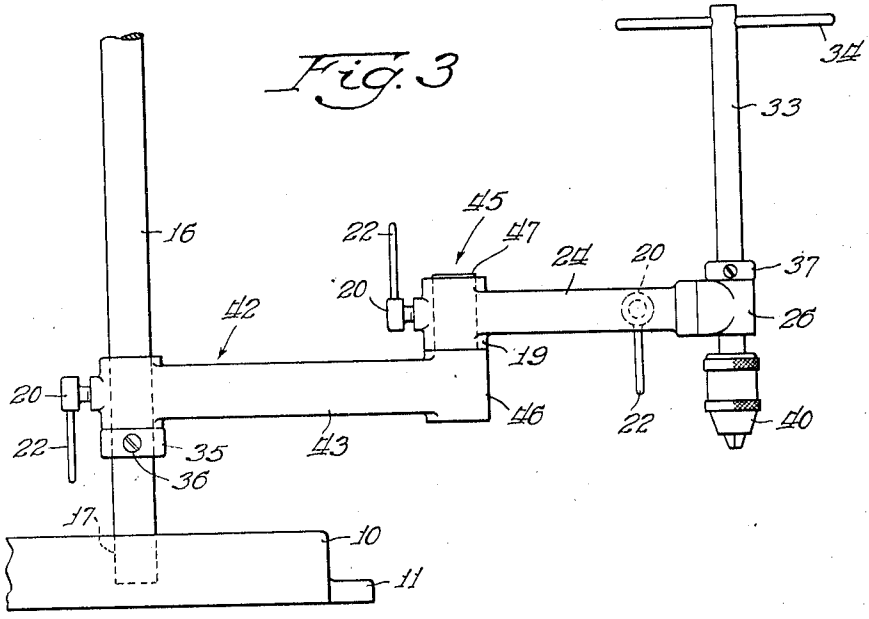
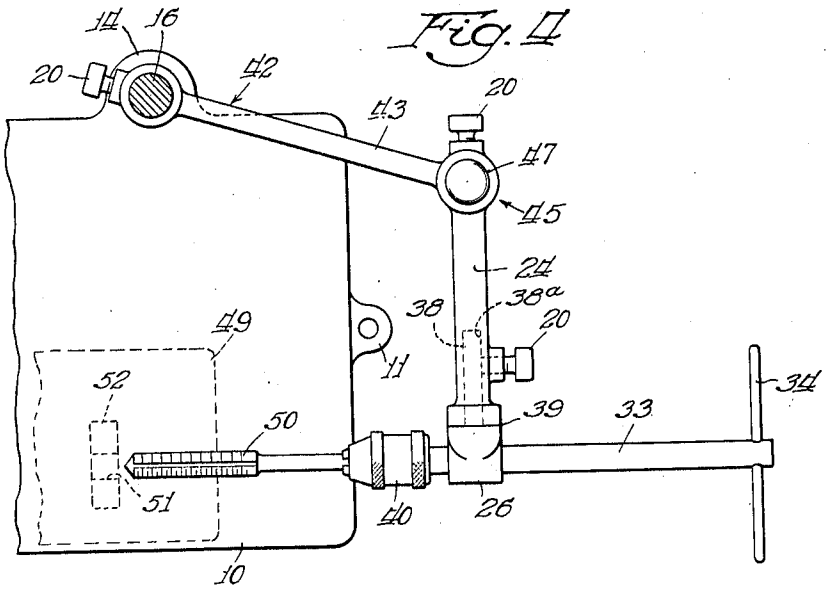


Fig. 4



Inventor:
Charles T. Allmendinger
By: A. Trevor Jones
Atty.

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UNITED STATES PATENT OFFICE

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COMBINED WORK AND TOOL HOLDER

Charles T. Allmendinger, Chicago, Ill.

Application April 7, 1941, Serial No. 387,203

5 Claims. (Cl. 10—129)

This invention relates to combined work and tool holder more particular for machine shops.

The device is specially adapted for metal parts to be worked on by such tools as a reamer, tap or the like, which, for example, can be appropriately operated by hand.

The invention desirably provides improved means for these purposes, as a somewhat unitary device affording enhanced accuracy and speed of operation while at the same time being markedly simple and economical in construction and assembly.

Other objects and advantages will be apparent from the following description, taken together with the accompanying drawings, in which—

Figure 1 is an elevational view of one form of the device in accordance with the present invention;

Figure 2 is a plan view of the structure of Fig. 1 showing in dotted lines alternative positions of the device parts and also indicating in broken lines a product part to be worked on;

Figure 3 is a fragmentary elevational view corresponding somewhat to the right-hand side of Fig. 1 but showing one modification of the invention; and

Figure 4 is a plan view of the structure of Fig. 3 but with the parts in other selective positions and a tool in place for operation on a product work part shown in dotted lines.

Referring in detail to the illustrative expedients shown in the drawings, the bed plate 10 provides the customary base for the operations presently to be described, and may be provided with perforated lugs 11 at each end by which it can be bolted to a table, bench or other support (not shown) which will elevate it to a suitable height for convenient use by a workman in standing position. The bed plate 10 may have the usual recess 12 therein over which a hole in the work may be located so that the tool may pass through the hole and not strike the bed plate.

In accordance with the present invention, the bed plate 10 is here shown laterally enlarged along one edge thereof to form ears 13 and 14. In the ear 13 is mounted a cylindrical post 15 and in the ear 14 another cylindrical post 16, the post 16 being advantageously taller than the post 15 for purposes presently described. It will be understood that the ears 13 and 14 may be drilled out to receive the posts 15 and 16 by a tight drive fit, as indicated at 17 so that the posts are securely and firmly mounted on the bed plate, extending upwardly therefrom.

Passed telescopically onto each of the posts 15 and 16 respectively is a tubular mounting 18, for the post 15, and 19 for the post 16. These mountings engage the posts snugly while permitting rotation of the mounting with respect to the post except when prevented by turn screw 20 for each mounting and which passes through an internally threaded boss 21 in the mounting to engage the post and prevent relative movement. Each of the turn screws 20 is preferably provided with a finger lever 22 for ease of turning.

Extending from each of the tubular mountings 18 and 19 respectively is a rigid arm, 23 for mounting 18, and 24 for the mounting 19, and each of these arms terminates in a sleeve part, such as 25 for the arm 23, and 26 for the arm 24, these sleeves being adapted to carry reciprocally each a work engaging element next described.

As here shown, sleeve 25 carries an externally screw threaded clamping member 27 cooperating with internal screw threads in the sleeve 25 and thus adapted to be movable by a helical motion toward and from the bed plate 10 to clamp the work such as 28 (Fig. 2) temporarily to the bed plate. At its lower end, the clamping member 27 may have a foot 29 depending by a swivel ball-joint 30 therefrom, this foot being preferably cloven as at 31 to enhance its frictional engagement with the work, and, so constructed, it will adaptably contact to press the work against the bed plate. For rotating the clamping member as just described, its upper end terminates in a knob 32 from which laterally projects one of the finger levers 22.

As clearly shown in the drawings, the other sleeve 26 on the arm 24 carries, passing slidably therethrough, a tool supporting rod 33, which is freely rotatable in the sleeve, the rod 33 having a cross rod 34 at its upper end which acts as a hand lever for manually rotating the rod 33 for purposes later pointed out.

In order to limit downward movement of the arm 24 toward the bed plate, the post 16 may have a collar 35 thereon below the tubular mounting 19 and the position of which may be adjustably fixed as by a set screw 36 turnable by the usual screw driver. Also, to limit downward movement of the tool supporting rod in the sleeve 26 the rod 33 may carry a collar 37 above the sleeve 26 and which may be adjustably fixed on the rod as by another set screw 36.

Further in accordance with the present invention, the sleeve 26 is desirably rotatably carried by the arm 24 on an axis parallel with the bed plate 10 whereby to vary the angle of the tool supporting rod with respect to the bed plate, and for this purpose the sleeve 26 may be formed separately from instead of integral with the arm 24, and, as here shown, has a cylindrical shank 38 which is snugly but rotatably received in a similar axial bore 38a in the outer end of the arm 24, the arm and sleeve having mating circular faces as at 39. One of the turn screws

20 is shown projecting laterally from the bore 38a for fixing the angle of the tool rod 33 with respect to the bed plate.

It will be understood that the work 28, clamped to the bed plate 10 as shown, for example, in Fig. 2, may be operated on by use of the tool supporting rod 33 which is shown terminating at its lower end in a conventional chuck 40, the details of which are well known in the art and need not be here particularly described, since they form no part of the present invention. Suffice it to say that the chuck 40 permits the tool supporting rod 33 to support any appropriate tool for the purpose, such as a reamer, tap, or the like. The work, having a hole 41 say therein placed just above and in register with the recess 12, may be reamed or tapped by the means just described, the clamping arm 23 having been swung about its post 15 over the work 28 as shown in dotted lines in Fig. 2, the turn screw 20 having been then tightened to fix the relative positions of the sleeve 18 and post 15, and the clamping member 27 having then been adjusted to press upon the work. Also, as shown in dotted lines in Fig. 2, the tool carrying arm 24 has been swung on its post 16 to a position directly over the hole 41 and the set screw 20 for the sleeve 19 having been tightened to fix this relationship. As shown in Fig. 2, the tool supporting rod 33 is directly perpendicular and its position is further fixed by the set screw 20 carried by arm 24 at the bore 38a.

Turning now to the modification of the invention shown in Figs. 3 and 4, an articulated arm 42 may be substituted for the arm 24 and this articulated arm may comprise one extension arm part 43 and another extension arm part 24, this being conveniently the same arm 24 previously referred to, these parts being articulated by an interengaging coupling 45. In this instance the coupling 45 is formed by a cylindrical enlargement 46 on the lower extension arm part 43 which has a reduced upwardly directed cylindrical continuation 47. This upward extension 47 functions like the post 16 and fits snugly but rotatably into the part 19 on the upper extension arm part 24 which telescopes thereon. The set screw 20 carried by the tubular mounting 19 fixes the relative angular relationships of the extension arm parts 43 and 24, as desired, the arm parts 43 and 24 together forming the articulated arm 42, one relative angular relationship being clearly shown in Fig. 4.

Also, as shown in Fig. 4, by making use of this particular position of the articulated arm 42 the tool supporting rod 33 may be set parallel with a part 48 to be worked on and the tool 50 may thus be directed horizontally toward say a horizontal hole 51 in an upstanding part 52 of the work 49.

It will be apparent to those skilled in the art that by means of my invention herein described the tap, for example, may be started straight and will follow through the hole in perfect alignment, leaving a clean cut thread and avoiding broken taps, and this may be accomplished by one workman with the aid of my invention, while affording a wide range of application.

Manifestly, the invention is not limited to details of construction shown for purposes of exemplification, and such changes may be made as fall within the scope of the following claims without departing from the invention.

Having described my invention, I claim:

1. In a device of the class described embodying a work supporting bed plate and work engaging members carried by the bed plate, one of said work engaging members being for clamping the work to the bed plate and the other work engaging member being for operating upon the work, that improvement therein which comprises a post fixed perpendicular to said bed plate, an arm mounted for rotation about said post, a sleeve carried on the outer end of said arm, the axis of said sleeve being perpendicular to the axis of said arm, and the sleeve being rotatable on the axis of the arm, a tool holder rod passing slidably and rotatably through said sleeve whereby the tool holder rod may be operated on an axis perpendicular to the bed plate or horizontal to the bed plate or at angular positions varying therebetween, and means for adjustably fixing the rotative positions of said arm on said post and of the said sleeve on said arm.

2. In a structure of the class described embodying a support post and an arm for a tool holder mounted on said support post for rotation thereabout, that improvement therein in which the arm is articulated and includes a pair of extension arm parts, mechanism for selectively fixing the relative angular position of the said arm parts, an axially extending bore in the outer end of the outer extension arm part, a shank received in said bore and rotatable therein, a sleeve carried by the shank transversely thereto, and a tool supporting rod slidable in said sleeve whereby the tool supporting rod is rotatable on an axis parallel with said arm, and means for adjustably fixing selective rotative positions of the said shank in said bore.

3. In a device of the class described embodying a work supporting bed plate, means for clamping the work to the bed plate, and a tool holder also mounted on said bed plate, that improvement therein which comprises means for mounting the tool holder for rotation both on an axis perpendicular to the bed plate and on an axis horizontal to the bed plate, and means for adjustably fixing the tool holder in selective positions on both of said axes.

4. In a structure of the class described embodying a support post and an arm for a tool holder mounted on said support post for rotation thereabout, that improvement therein which comprises means for mounting the tool holder on said arm for rotation on an axis parallel with the arm, and means for adjustably fixing the tool holder in a selective position on said axis.

5. In a structure of the class described embodying a support post and an arm part for a tool holder part mounted on said support post for rotation thereabout, that improvement therein which comprises an axially extending bore in one of said parts, a shank on the other part received in said bore and rotatable therein, a sleeve carried by the tool holder part transversely to the arm part, and a tool supporting rod rotatable and slidable in said sleeve whereby the tool supporting rod is rotatable on an axis parallel with said arm, and means for adjustably fixing selective rotative positions of the said shank in said bore.

CHARLES T. ALLMENDINGER.