Aug. 24, 1948. E. BURRI 2,447,562

DEVICE FOR SUPPORTING WORKPIECES TO BE TOOLED

Filed April 21, 1945

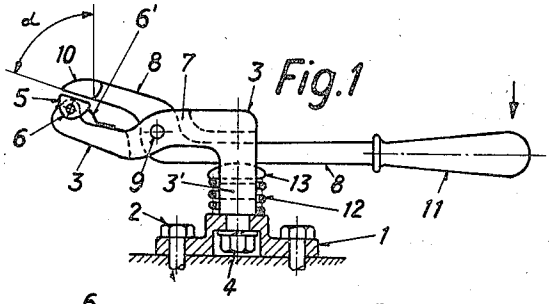


Fig. 1

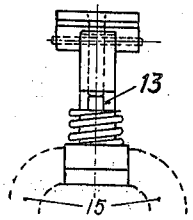


Fig. 3

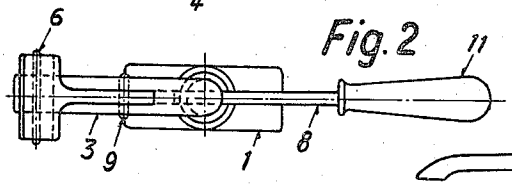


Fig. 2

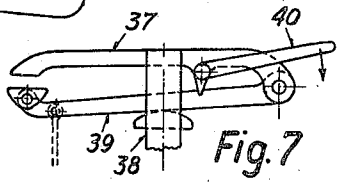


Fig. 7

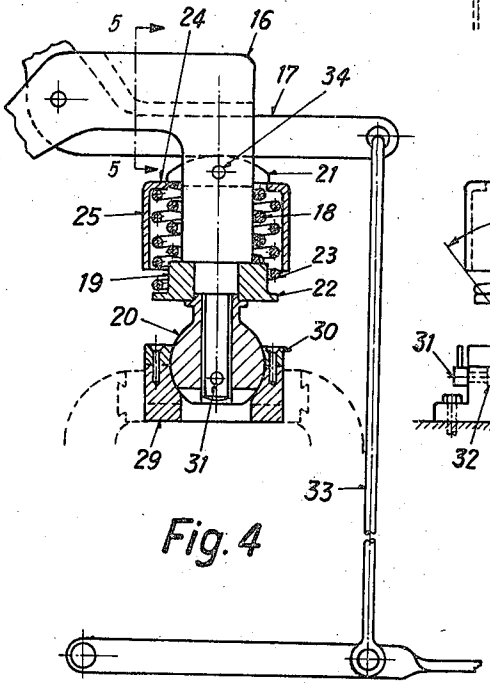


Fig. 4

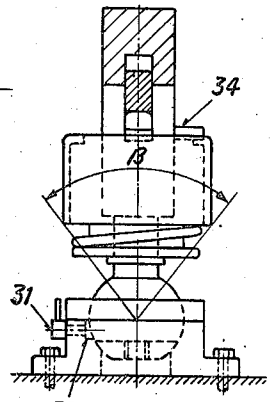
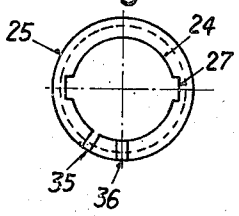


Fig. 5

Fig. 6



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DEVICE FOR SUPPORTING WORKPIECES TO BE TOOLED

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1

The present invention relates to a workpiece fixing device which chiefly serves to allow workpieces, which have to be tooled in a horizontal or inclined position, to be quickly fixed and unfixed, or changed in position. The manufacture of articles in series very often requires touching-up by hand which can be done in less time than is required for fixing, unfixing or changing the position of the workpiece. The opening and closing of known fixing devices requires a manual operation which compels the workman to lay down his tool in order to be able to hold the workpiece with one hand and to open or close the fixing device with the other, and this means a comparatively great loss of time. Preferably it should also be possible to bring the fixing device into another position relative to the workbench during the tooling, but that is impossible with the fixing devices hitherto used.

The aim of the present invention is to create a fixing device which eliminates this drawback. The invention consists in that the surfaces of the gripping jaws of the fixing device stand at an angle to the vertical plane and are forced together by spring pressure, and that the fixing device is opened by members which can be actuated by the foot or the arm, and that further the clamping device can be fixed in such a way that the position of the clamping jaws can be altered.

In the accompanying drawing three examples of execution of the subject matter of the invention are illustrated;

Fig. 1 shows a tongs-shaped fixing device of simple designs, in side view, partly in section;

Fig. 2 the same, seen from above.

Fig. 3 the same, seen from the front, with the bolt head and bench top removed;

Fig. 4 a tongs-shaped fixing device, with two springs and ball-joint for setting the tongs in an oblique position, in side view, partly in section,

Fig. 5 the tongs-shaped fixing device according to Fig. 4 in end view, partly on the line 5—5.

Fig. 6 a spring guide bush for Figs. 4 and 5, seen from above,

Fig. 7 a gripper-shaped fixing device.

On a base 1 (Fig. 1), which can be fixed to a workbench by screws 2, the bent-over part 3' of a tongs-arm 3 is firmly clamped by a nut 4 and a spring washer in such a way that it can be turned round, but yet remains sufficiently firm to tool the workpiece fixed in the device. The tongs-arm 3 forms the lower part of the tongs and is provided with a swivelling clamping jaw

2

5 which is fixed by a bolt 6 to the tongs-arm 3. A spring 6' presses the clamping jaw 5 into its middle position. The tongs-arm 3 has a slot 7 through which a movable tongs-arm 8 passes which is connected to the tongs-arm 3 by a bolt 9. The tongs-arm 8 is provided at one end with a clamping jaw 10 and at the other end with a handle 11. The tongs-arm 8 is pressed upwards by a spring 12 acting through a pressure-key 13, whereby the jaws of the tongs are pressed together. By pressing on the handle 11 in the direction of the arrow, which can be done by the workman with his hand or arm without having to lay down his tool, the tongs opens. The clamping jaws of the tongs are arranged in Fig. 1 at an acute angle α to the vertical plane; they may, however, stand also horizontally or at another angle, according to the kind of workpiece which is to be held in the device. The side faces of the base 1 are parallel, so that the fixing device can be gripped in a vice 15 as shown in Fig. 3, with the clamping jaws in an oblique position. The oblique position of the clamping jaws is limited in this example of execution to the direction of the vice jaws.

Fig. 4 shows a tongs-shaped fixing device which, in contrast to the fixing device of Fig. 1, can be set in any desired position. A tongs-arm 16 and also a tongs-arm 17 can be operated in the same manner as the tongs-arm 3 and 8 of Fig. 1. A spring 18 is supported below on a ring 19, which is pressed by a ball-nut 20 against a shoulder on the bent-over end of the tongs-arm 16, and presses above against a pressure-key 21 which presses the tongs-arm 17 upwards. On a projecting edge 22 of the ring 19 is supported a second spring 23, on which an edge 24 of a bush 25 rests. The edge 24 of the bush has two recesses 27, through which the key 21 can glide. The key 21 is shorter than the internal diameter of the outer spring 23. When the bush 25 is set so that the key 21 can enter the recesses 27, only the spring 18 acts on key 21 or the tongs-arm 17. As soon as the bush 25 is turned a little, the key 21 comes on to the edge 24 of the brush 25, so that both springs 18 and 23 press against the key 21 and through it against the tongs-arm 17. By a pin 34, which is fixed in the arm 16, upward movement of the bush 25 may be limited. Notches 35 and 36, in which the pin 34 fits, limit the turning of the bush and keep it firmly in the two end positions. 35 is also a vertical slot allowing vertical travel to the spring cup or bush 25. The ball-nut 20 is carried in the socket formed by a base 29 and a plate 30. By a screw

31, which presses on a clamping cheek 32, the ball-nut, and with it the fixing device, may be set so firmly that it can be adjusted in any desired direction comprised within the angle.

The opening of the tongs can, as in Fig. 1, be effected by pressing the tongs-arm 17 down. The tongs-arm may also be connected by a pull member 33 to a pedal actuated by foot.

Fig. 7 shows a gripper-shaped fixing device. An upper gripper part 37 is connected to a downwardly directed arm 38 which can be fixed in a base as in Fig. 1 or in a base with ball-joint as in Figs. 4 and 5. The connection of the gripper part 37 to the arm 38 may be direct or through a link. For opening the fixing device the lower gripper part 39 may be connected to a pedal. In Fig. 7, for instance, a two-armed lever 40 is provided, by means of which the gripper may be opened. The lever 40 can be moved by the hand or arm of the workman, without his having to lay down his tool.

I claim:

1. A workpiece holding device having a pivoted jaw for holding a tapered workpiece, comprising a base having a spherical socket therein, a horizontally disposed member having a downwardly extending leg, a ball on the lower end of said leg and adapted to be movably secured in said socket, an upwardly extending arm on said horizontal member, a laterally pivoted jaw on said arm, a second horizontally disposed member pivoted to the first said member and having an upwardly extending jaw adapted to coact with the first mentioned jaw, a spring on the downwardly extending leg of the first said member and cooperating with the second said member to forceably close said jaws, said second horizontal member being extended beyond said leg to form an operating lever, whereby said jaws may be manually parted for insertion of the workpiece.

2. A workpiece holding device having a pivoted jaw for holding a tapered workpiece, comprising a base having a spherical socket therein, a horizontally disposed member having a downwardly extending leg, a ball on the lower end of said leg and adapted to be movably secured in said socket, an upwardly extending arm on said horizontal member, a laterally pivoted jaw on said arm, a second horizontally disposed member pivoted to the first said member and having an upwardly extending jaw adapted to coact with the first mentioned jaw, a spring on the downwardly extending leg of the first said member and cooperating with the second said member to forcibly close said jaws, said second horizontal member being extended beyond said leg to form an operating lever, a hole in said operating lever, a foot operated lever, and a rod pivotally secured to said foot operated lever and said hole whereby said jaws may be manually parted for insertion of the workpiece.

3. A workpiece holding device having a pivoted jaw for holding a tapered workpiece, comprising a base having a spherical socket therein, a horizontally disposed member having a downwardly extending leg, a ball on the lower end of said leg and adapted to be movably secured in said socket, an upwardly extending arm on said horizontal member, a laterally pivoted jaw on said arm, a recess in said horizontal member, a second horizontally disposed member positioned in said recess and pivotally secured to the first said member and having an upwardly extending jaw adapted to coact with the first mentioned jaw, a spring on the downwardly extending leg of the first said member and cooperating with the second said member to forcibly close said jaws, said second horizontal member being extended beyond said leg to form an operating lever, whereby said jaws may be manually parted for insertion of the workpiece.

4. A workpiece holding device having a pivoted jaw for holding a tapered workpiece, comprising a base having a spherical socket therein, a horizontally disposed member having a downwardly extending leg, a ball on the lower end of said leg and adapted to be movably secured in said socket, an upwardly extending arm on said horizontal member, a laterally pivoted jaw on said arm, a recess in said horizontal member, a second horizontally disposed member positioned in said recess and pivotally secured to the first said member and having an upwardly extending jaw adapted to coact with the first mentioned jaw, a spring on the downwardly extending leg of the first said member and cooperating with the second member to forcibly close said jaws, said second horizontal member being extended beyond said leg to form an operating lever, a hole in said operating lever, a foot operated lever, and a rod pivotally secured to said foot operated lever and said hole whereby said jaws may be manually parted for insertion of the workpiece.

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