March 15, 1927. 1,621,146

W. WELP

SAFETY DEVICE

Filed Jan. 23, 1926

Fig. 1.

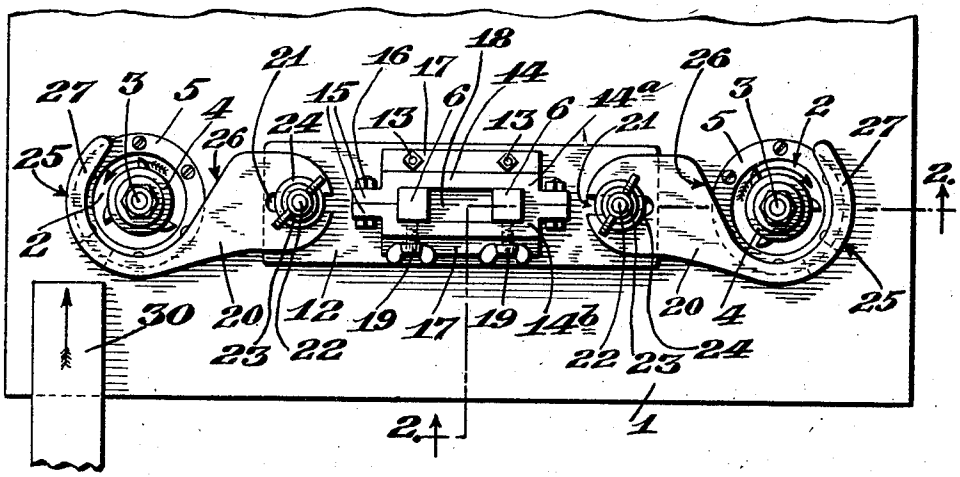


Fig. 2.

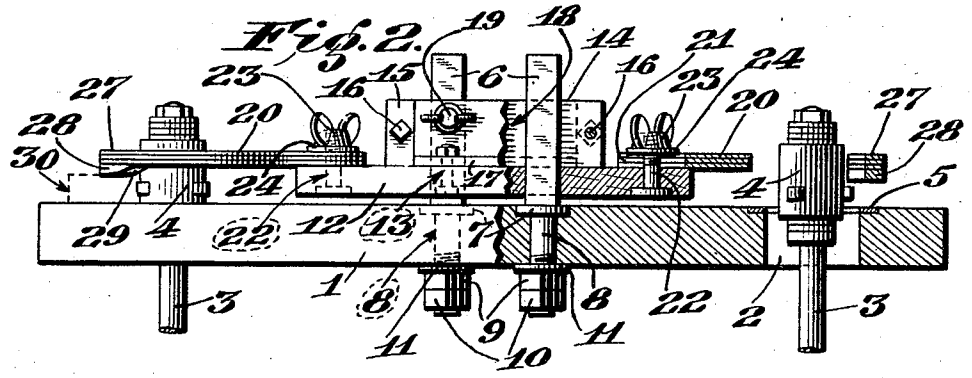
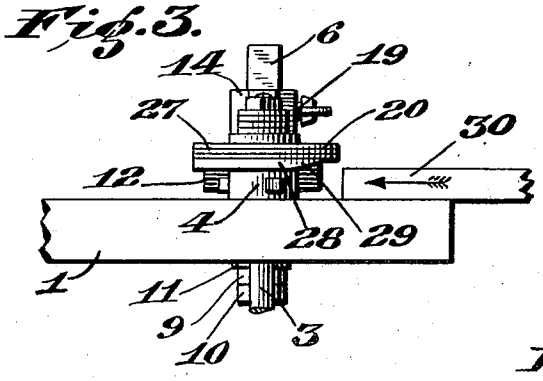


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE.

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This invention relates to safety devices and more particularly to a guard for the rotary cutter of a wood-working machine commonly known in the art as a "shaper." It has for its objects to produce a simple and practical device which will amply protect the hands of the operator under the usual operation of the machine; to produce a guard structure which is adjustable to suit work of different thicknesses and for cutters of different diameters; to provide for readily mounting the device on the work-table of the machine and removing it therefrom at will; and to attain certain advantages as will more fully appear in the following description.

The invention consists in the novel construction and arrangement of parts hereinafter described and afterwards pointed out with particularity in the appended claims.

In the accompanying drawings forming part of this specification and illustrating a practical adaptation of the invention—

Figure 1 is a fragmentary top plan view of the forward end portion of the work-table of a wood-shaper, showing the guard applied to the cutters;

Figure 2 is a view partly in front elevation and partly in cross section on the line 2—2 of Figure 1; and

Figure 3 is an elevation looking at the side of the machine.

Referring now to the drawings, the numeral 1 designates the work-table of the machine. Working through circular openings 2 in said table are the vertical shafts 3 on the upper end portions of which are the usual cutters 4.

Embedded in the top face of the work-table 1 and flush therewith are the usual ring-plates or bushings 5 which protect the upper edge portions of the openings 2.

The foregoing described parts are shown in the drawings only more or less conventionally as they are well known in the art and only enter into the present invention in a general way.

Mounted on the work-table 1 are two vertical posts 6 whose upper portions are preferably square in cross section, as shown. At the bases of these square portions of the posts are fixed collars or flanges 7 which are embedded in the work-table and flush with the top face thereof, while below said collars or flanges 7 the posts are provided with rounded shank portions 8 which are extended beneath the table and screw-threaded so as to receive jam nuts 9, 10, with an interposed washer 11, whereby the posts may be secured tightly in place yet readily removed at will by releasing the jam nuts.

Slidably mounted on the posts 6 is a vertically adjustable body-plate 12, preferably made of hard wood, although the same may be made of metal or other suitable material if desired. Secured to the top face of this body-plate, as by bolts or the like 13, is a rectangular metallic box 14. This box, as shown, comprises two half sections 14^a, 14^b, having co-operating end flanges 15 which are bolted together, as at 16, said sections 14^a, 14^b, also having base flanges 17 which are apertured for the reception of the securing bolts 13 which fasten the box to said body-plate 12.

The box 14 is cored from top to bottom, thereby affording an elongated rectangular socket 18 whose side and end walls bear slidably on said posts 6, and in one of the side walls are screw-threaded apertures in which work set-screws or the like 19, which latter impinge on said posts 6 and thereby securely lock the body-plate 12 in its vertically adjusted positions, as will be later described.

Adjustably mounted on the opposite end portions of said body-plate 12 are the guard elements proper 20. These elements are provided with longitudinal open-ended slots 21 so as to bifurcate the inner end portions thereof which rest flatwise on the top face of the body-plate 12 and straddle upstanding bolts 22 on which are wing-nuts 23 and interposed washers 24, whereby said elements may be clamped securely to said body-plate.

The outer end portions of said guard elements 20 are rounded, as at 25, and they are cut-out or recessed from their rear sides to afford an inclined portion 26 and a hooked extension or tongue 27, the gap between said inclined portion 26 and said hooked extension 27 being of somewhat larger dimension than the diameter of the largest cutter 4 to be used on the machine and be-

ing also preferably a little larger than the diameter of the opening 2 in which the cutter works.

The elements 20 are preferably made from a laminated slab of light, tough and elastic wood, such as ash or the like, which possesses sufficient resiliency to give a spring effect to the member so that it will hold the work to the table as it is slid thereunder as will be presently more fully set forth. On the under side of the tongue or hooked extension 27 is a shoe 28 which is bevelled off, as at 29, at its forward end where the work is first brought against it. This shoe is also preferably made of hard wood, but it may obviously be made of metal or other suitable material. So, too, the entire element 20 may be made of metal or other material having the requisite toughness and resiliency.

In the use of the guard, the body-plate 12 is adjusted vertically on the posts 6. This is readily accomplished by loosening the set-screws 19 and shifting said body-plate to bring the under face of the shoe 28 of the guard element to the proper height for the given thickness of work, and then tightening the set-screws. In positioning the shoe relative to the top face of the work-table it is effectively set just a little below the plane of the top face of the work, so that when the work is slid thereunder the guard element is sprung upward, yet to no great extent, but just enough to exert some pressure upon the work while permitting the latter to be moved and conveniently manipulated with relation to the cutter by the operator.

If it is desired to remove the guard from about the cutter, it is only necessary to loosen the wing-nut 23 on the bolt 22 and swing the element 20 toward the forward end of the table to clear the cutter, and the element may be readily removed entirely from the bolt 22 owing to the arrangement of the open-ended slot 21. This slotted portion also permits the element 20 to be adjusted endwise on the body-plate 12 as well as rotatably, so that the hooked extension 27 may be brought into relatively close proximity to the periphery of the cutter where the work is operably engaged therewith.

In practice, the work is usually moved inward from the forward end of the work-table into engagement with the outer side of the cutter. In Figures 1 and 3 the work is indicated by the numeral 30 and its movement is indicated by the arrow shown thereon. The relative position of the work under the guard element 20 is also shown by dotted lines at the left hand side of Figure 2.

In some cases, when the work is of such character or proportions that it has to be carried across the inner side of the cutter and when the space occupied by the body-plate 12 and its supporting posts 6 must be clear for the manipulation of the work on the table, the entire guard structure is easily removed by releasing the jam nuts 9, 10, so that the posts are free to be lifted from their seats. In such contingency this is a material advantage in the present invention.

According to the present invention a very simple and inexpensive structure is produced, which is practical and effective in guarding against accidental injury to the operator's hands in the regular manipulation of the work under the usual conditions in the operation of wood shapers and similar machines.

Obviously, the structure admits of considerable modification without departing from the spirit and scope of the invention as defined by the appended claims. Therefore, it is not limited to the specific construction and arrangement shown in the drawings.

What is claimed is:

1. In a guard of the character described, in combination with the work-table and a cutter rotatable thereon about a vertical axis, a pair of vertical posts on the work-table, a body-plate movable vertically on said posts, a boxing secured to the top face of said body-plate and having a rectangular opening from top to bottom, the side and end walls of said opening slidably engaging said posts, set-screws in a side wall of said boxing and respectively impinging said posts, a vertical screw-threaded stud on said body-plate having a clamping nut thereon, and a flat plate-like guard element having a bifurcated inner end portion resting on said body-plate and straddling said screw-threaded stud thereon whereby to be longitudinally and swingably adjustable and being secured in adjusted position by said clamping nut on said stud, the outer end portion of said guard element being hooked to encompass the cutter and paralleling the top face of said work-table.

2. In a guard of the character described, in combination with the work-table and a cutter rotatable thereon about a vertical axis, a pair of vertical posts detachably mounted on said work-table, said posts having portions of square cross section extending above said work-table, flanges at the bases of said upstanding portions embedded in said work-table flush with the top face thereof, and rounded shank portions extending from said flanged portions through said work-table and beyond the under face thereof and being screw-threaded, securing nuts on said screw-threaded portions of said shanks, a vertically adjustable body-

plate on said upstanding portions of said posts, said body-plate having a boxing secured to its upper face, said boxing having a rectangular opening from top to bottom thereof, the side and end walls of said opening slidably engaging said upstanding portions of said posts, set-screws in a side wall of said boxing respectively impinging said posts, and a flat plate-like guard element longitudinally and swingably adjustable on the upper face of said body-plate, said guard element possessing inherent resiliency and having a hooked outer end portion encompassing the cutter and paralleling the top face of the work-table.

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