

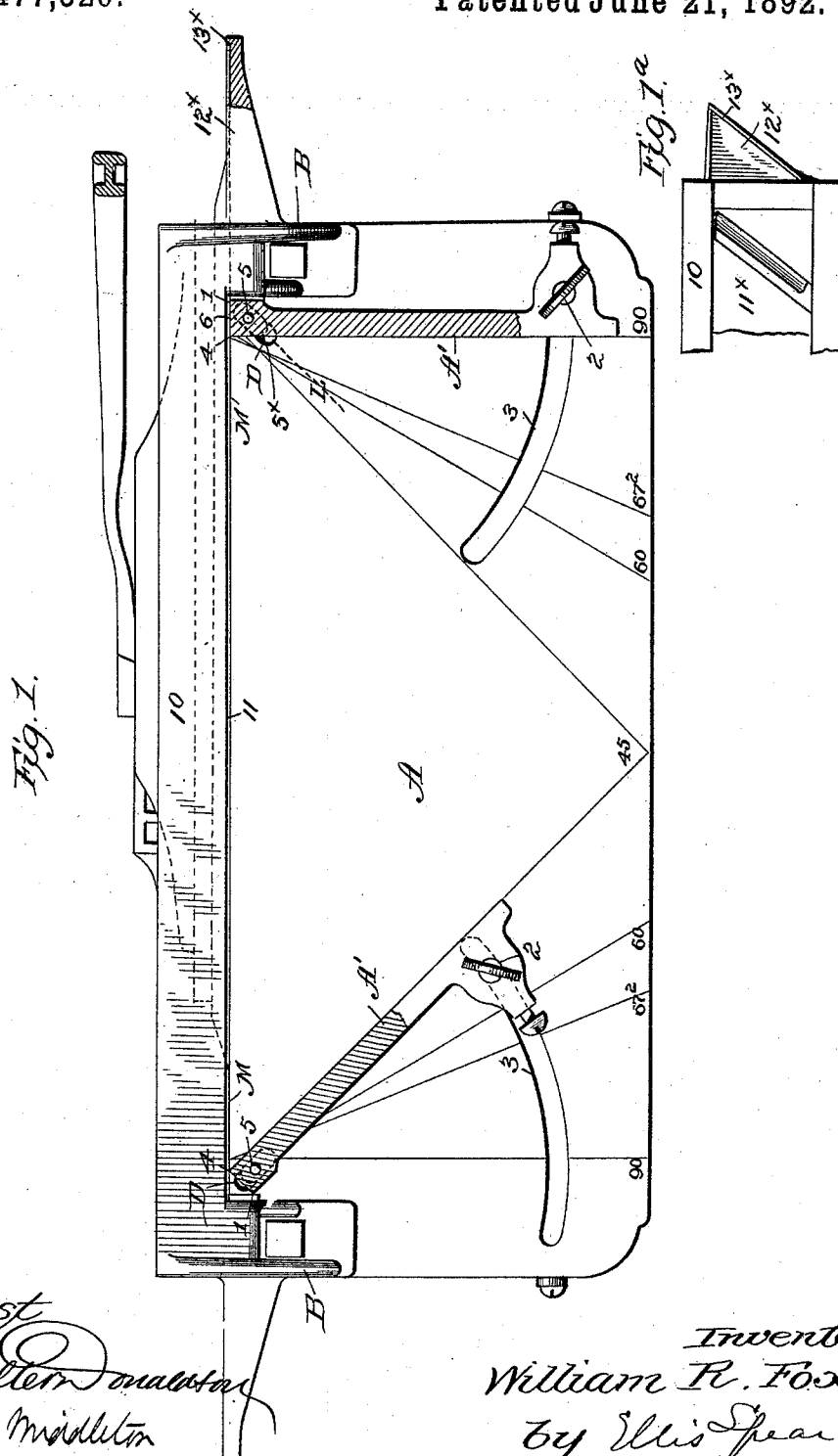
(No Model.)

2 Sheets—Sheet 1.

W. R. FOX.
MITER CUTTER.

No. 477,526.

Patented June 21, 1892.



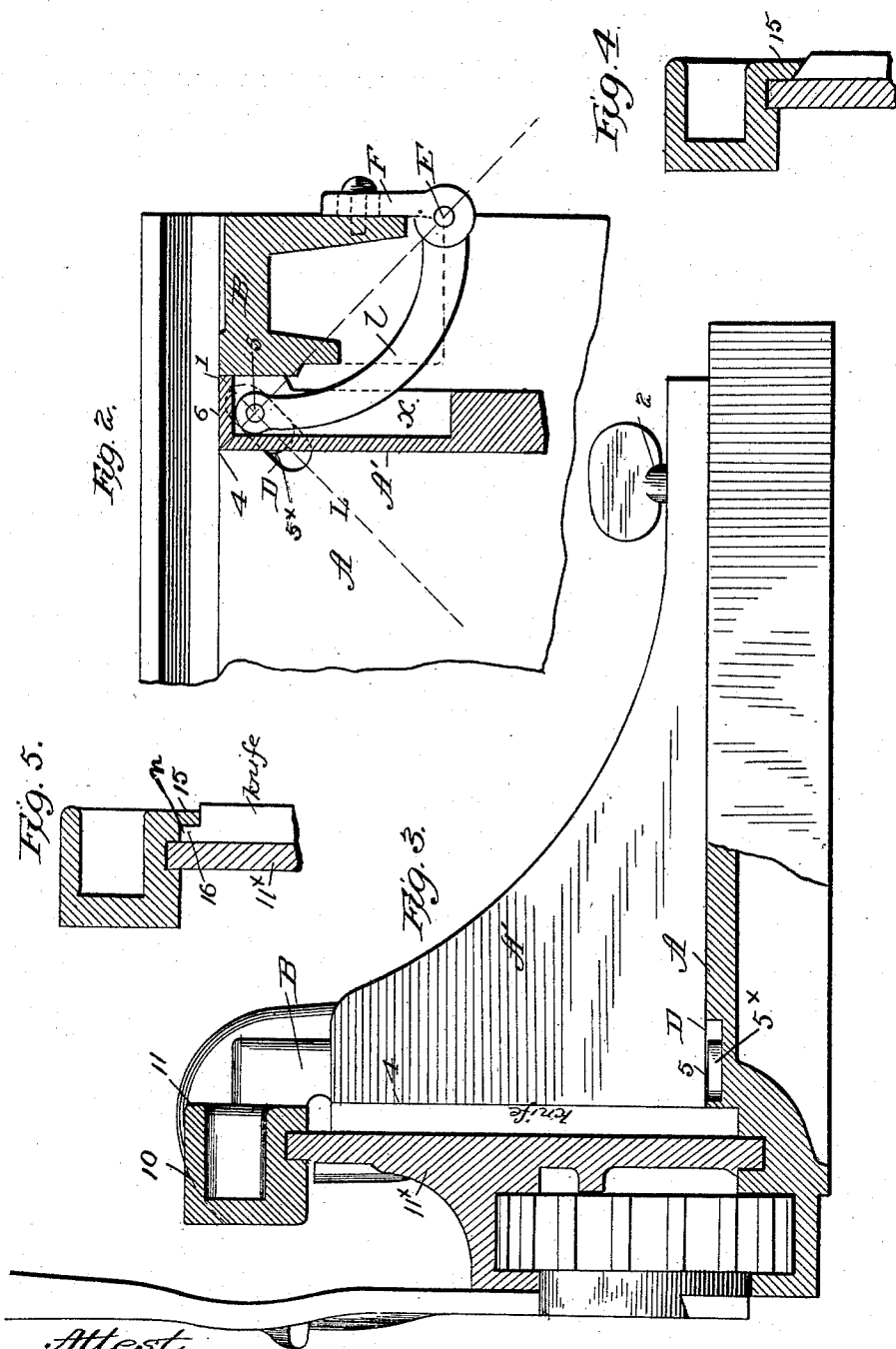
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Attest
William H. Fox
J. L. Maddison

Inventor
William H. Fox
by *Ellis Spear*
ATTY.

UNITED STATES PATENT OFFICE.

WILLIAM R. FOX, OF GRAND RAPIDS, MICHIGAN.

MITER-CUTTER.

SPECIFICATION forming part of Letters Patent No. 477,526, dated June 21, 1892.

Application filed July 29, 1891. Serial No. 401,053. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. FOX, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Miter-Cutters, of which the following is a specification.

My object is to provide simple and effective means for holding and guiding the gage so that the shearing-edge thereof will always lie close to the path of the knife in whatever position the gage may be adjusted.

My invention therefore includes as its main feature a guideway or slot formed upon or in the frame of the machine, with which engages a pivot projection on the gage, so that as the gage is turned in adjusting it to its various positions its movement will be controlled to maintain the shearing-edge at the path of the knife.

In machines of this class it is highly important that the strain resulting from the pressure of the knife will be sustained by the standard or post of the machine, in order to relieve the gage, and I have therefore constructed this machine with this essential feature in view, the gage in all its positions bearing vertically along the standard or post, and thus being accurately and securely held against the lateral strain from the knife. I have also specially arranged the top cross-bar of the machine so that the space in rear and above the knife will be entirely free from projections and clear to receive the material close to the knife for making slight bevel cuts.

In the drawings, Figure 1 is a plan view of the bed of the machine and the gage. Fig. 1^a is a detail view showing the triangular shape of the wings for shielding the knife. Fig. 2 is a similar view showing the link connection to the gage. Fig. 3 is an elevation, partly in section. Figs. 4 and 5 are detail views.

The general form and structure of the machine are similar to that shown by me in Patent No. 435,219, granted August 26, 1890, and need not be particularly described, further than to indicate that A is the machine frame or bed, B the posts or standards at the ends of the knifeway, and A' are the gages. As in my former patent, these gages are arranged to bear laterally along the posts B, and in adjusting the gage to its various angular posi-

tions the edge 1 bears upon and moves along the face of the post, and at all times the strain resulting from the pressure of the knife is sustained by the post throughout the vertical extent of the gage. The rear end of the gage has a jam-nut 2, which travels in a curved slot 3 in the machine-bed and by which the gage when adjusted to proper position may be fixed. This slot and nut do not determine the position of the shearing-edge 4, but serve only to hold the rear end of the gage.

In order to control or guide the movement of the gage so that the shearing-edge 4 will be always in the path of the knife, a guiding connection is formed between the horizontal meeting faces of the gage and the machine-frame. This connection consists of a guideway D, preferably in the form of a slot or groove, and the pin 5, upon which the gage pivots when being adjusted, the pin projecting into the slot. This pin is provided with a sliding block 5^x, accurately fitted to the slot. The center of the pivot is equally distant from the sides of the gage, and the front 6 and the slot is formed on an incline, the central line thereof, as at L, coinciding with the miter-line drawn from the inner corner of the gage through the pin, equally dividing the right angle between the bearing-face of the post and the line of cut. From this construction it will be clear that as the gage is adjusted or turned on its pivot the edge 1 bears upon and moves along the face of the post, as shown, and the sliding block with the gage-pivot travels in the inclined slot to the position indicated on the left of Fig. 1, and this controls the movement in such a manner as to maintain the shearing-edge 4 always on the line M M, along which the carriage 11^x, with the knife, moves, and this is true even should the gage be adjusted to the full ninety degrees from its normal position. (Shown in full lines on the right of Fig. 1.)

I do not wish to limit myself to the precise position of the guiding-way shown nor to the precise form of said guideway, nor do I wish to be understood as being compelled to use the sliding block shown, though this is desirable on account of its reducing the liability of lost motion in the gage.

In Fig. 2 I show a link 1, combined with the gage, and guiding means already de-

scribed. The link is pivoted at E to an adjustable ear F, secured to the post B by a screw passing through a slot, and it is pivoted to the gage by the same pin which forms the pivot thereof and passes into the sliding block. The link is above the plane of the bed, and the gage is formed with a slot or recess *x* to receive the end thereof. This link also serves to control the movement of the gage, and, together with the inclined guideway, insures a perfect action. It is desirable that the pivot E of the link shall be on a line drawn from the corner 4 of the gage through the gage-pivot. The adjustment of the ear F with the pivot E makes it convenient to set the shearing-edge at a proper distance from the knife. The movement of the free end of the link is so slight that in practice it does not move materially from a straight line, and therefore moves with the pivot in the slot.

It is often found desirable or necessary to make a very slight bevel cut from the end of a piece of wood, and in order to do this the material must extend vertically and nearly perpendicular from the bed of the machine close to the knife. I have therefore arranged the cross-bar 10, which forms the upper knife-way, so that its rear face 11 will be practically even with or a little forward of the rear face of the knife and the cutting-edge. This will allow the piece of wood when set upright to be at the line of the cut, and by tilting it very slightly its lower end will cross the line of cut and a bevel of slight angle may thus be formed. In other words, the cross-bar is free from projections which would obstruct the space in rear of the knife, and this is left entirely clear above the knife for allowing the material to be placed close to the cutting-edge. By having the rear face of the frame slightly forward of the knife-edge the whole of said edge is brought into action in cutting.

In order to prevent the upper end of the knife from springing out, I have formed a groove *n* in the top bar and rabbeted the upper end of the knife, thereby fitting it to the groove, in which it travels and is held against lateral deflection. This is shown in Fig. 5, in which the flange 15 bears against the shoulder 16, formed on the knife.

In Fig. 4 the flange 15 is beveled, while the upper edge of the knife is formed to correspond thereto.

In Fig. 1 projecting wings 12^x are shown as extending from the main frame in a plane parallel with and close to the face of the knife, and these wings extend a little beyond the extreme point of the knife's movement in either direction. These wings act as shields and prevent the knife-edge from being exposed when in either extreme position, and thus there is no liability of the operator being cut accidentally by reason of the edge of the knife projecting beyond the frame. The wings are triangular in shape, their outer edges being inclined to conform to the incline of the cutting-edge. They are provided

with ribs 13^x about their edges on the face adjacent to the knife, and these aid in shielding the knife.

I claim as my invention—

1. In a miter-cutter, a gage having a shearing-edge, a post forming a bearing for the gage, and a guiding connection between the horizontal meeting faces on the gage, and frame automatically adjustable in the movement of the gage, so as to cause the shearing-edge to move along the line of the cut, substantially as described.

2. In a miter-cutter, a gage having a shearing-edge, a post forming a bearing for the gage, the inclined guideway between the gage and the machine-frame, the pivot-pin engaging said guideway and automatically adjustable in the movement of the gage to cause the shearing-edge to move along the line of the cut, substantially as described.

3. In a miter-cutter, the combination of a gage having a shearing-edge, a post forming a bearing therefor, a guideway in the machine-bed, and a pivot-pin projecting from the lower face of the gage engaging the guideway and automatically adjustable therein in the movement of the gage, substantially as described.

4. In a miter-cutter, the combination of a gage having a shearing-edge, a post forming a bearing for the gage, the inclined guideway adjacent to the shearing-edge, the pivot-pin, and the sliding block in the guideway, substantially as described.

5. In a miter-cutter, the combination of a gage having a shearing-edge, the guideway and pin connection between the gage and the machine-frame adjacent to the shearing-edge, and the pivoted link connected to the gage and said frame, substantially as described.

6. In a miter-cutter, the combination of the gage having a shearing-edge, the guideway adjacent to the shearing-edge, the link, and the pivot-pin passing through the link into the inclined guideway, substantially as described.

7. In a miter-cutter, the combination of the gage having a shearing-edge and the link pivoted to the machine-frame and to the gage, the rear one of said pivots being adjustable toward and from the line of cut, substantially as described.

8. In a miter-cutter, the combination of the machine-bed, the knife, the gages and posts, and the top cross-bar having its rear face free from projections in rear of the knife, substantially as described.

9. In combination, the frame having a top bar 11, extending across the machine, with a guideway for the knife, the carriage having the knife and moving in suitable ways, and the knife having its upper edge held by the guideway throughout its movement, whereby the knife will be held against springing as it enters the wood at any point in its travel, substantially as described.

10. In combination, the frame, the movable

knife, and the stationary shields projecting from and beyond the frame and adjacent to the path of the knife, substantially as described.

5 11. In combination, the frame, the movable knife, and the stationary shields projecting from the frame close to the path of the knife, said shields being triangular in form, substantially as described.

10 12. In combination, the frame, the movable knife, and the knife-shields projecting from the frame close to the path of the knife, said shields having ribs to protect the edge of the knife, substantially as described.

15 13. In combination, the frame, the knife, the post having a straight face extending at

right angles to the line of cut, the gage having an edge bearing against said face, and means for controlling the movement of the gage and maintaining its shearing-edge at the line 20 of the cut, consisting of a guideway extending at an angle to the line of cut and the bearing-face of the post, and a pin engaging said guideway and automatically adjustable along the same in the movement of the gage.

25 In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM R. FOX.

Witnesses:

GEO. G. WHITWORTH,
CHAS. F. ROOD.