Feb. 23, 1932. G. W. BLACK 1,846,180

SURFACING TOOL

Filed July 7, 1930 2 Sheets-Sheet 1

Fig. 1

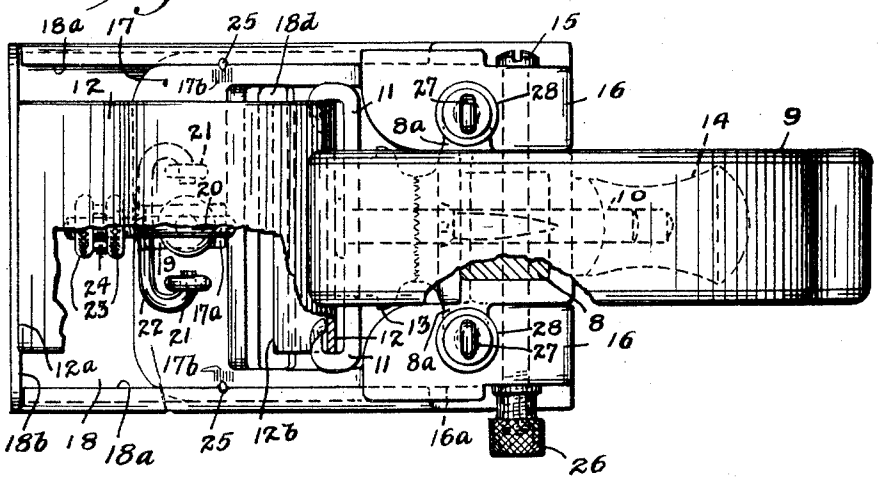
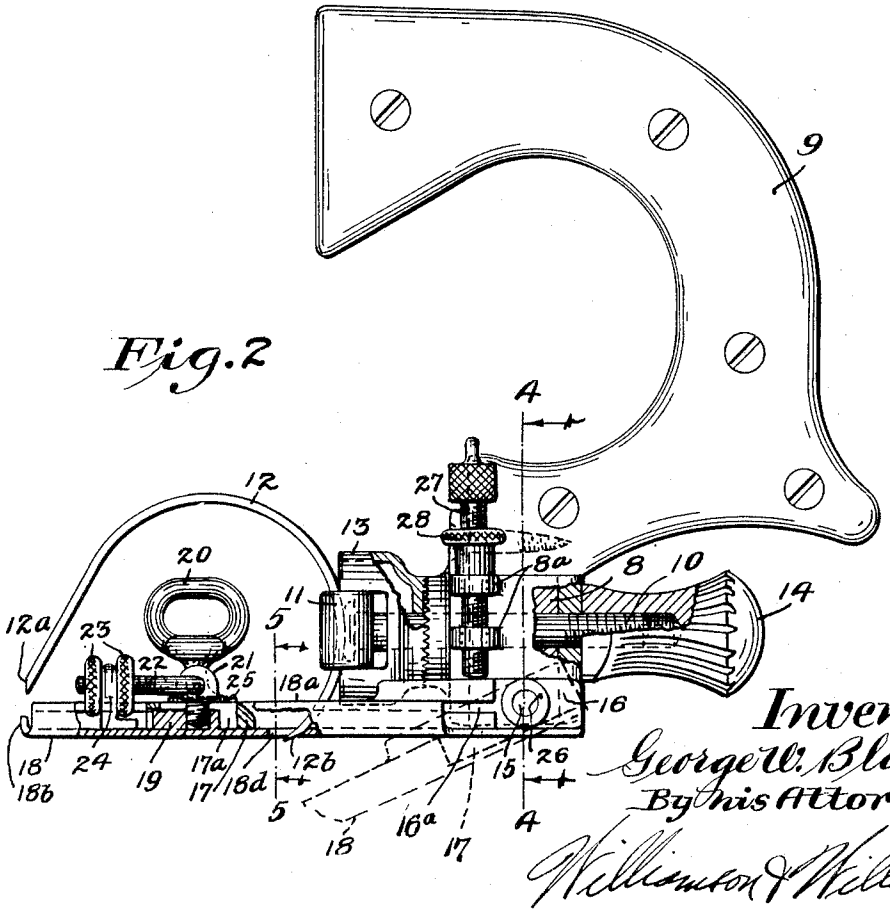


Fig. 2



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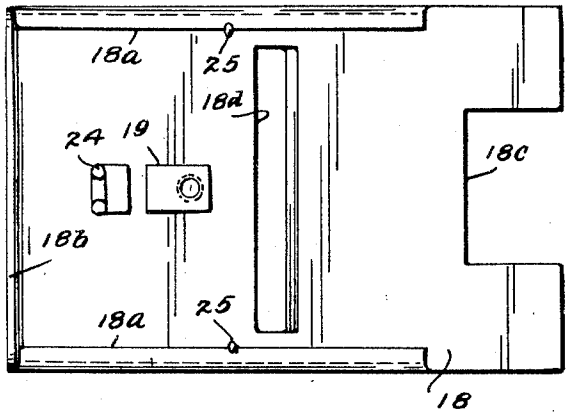


Fig.6

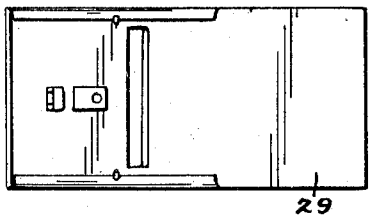


Fig.7

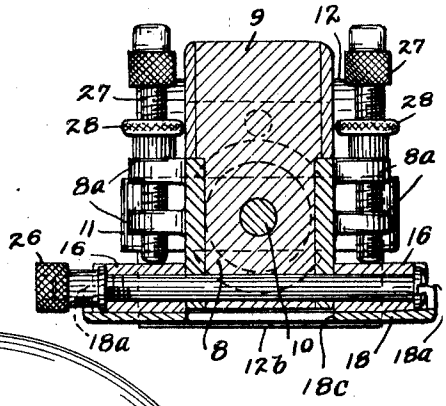


Fig.4

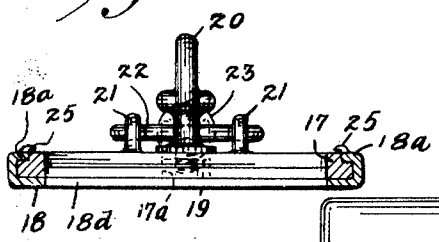


Fig.5

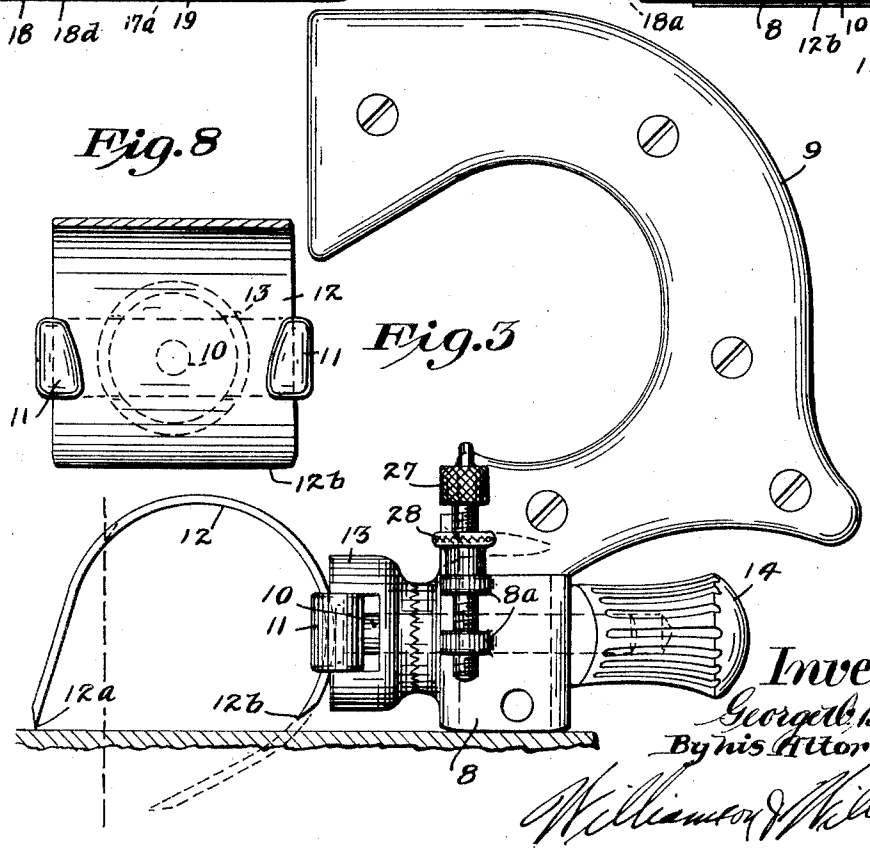


Fig.8

Fig.3

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UNITED STATES PATENT OFFICE

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SURFACING TOOL

Application filed July 7, 1930. Serial No. 465,848.

This invention relates to planes and scrapers.

It is the object of this invention to provide a novel and improved tool of cheap and simple construction, which can be used either as a plane for planing surfaces, such as wood surfaces, or can be used as a scraper for scraping such surfaces.

To this end, the invention consists in the novel parts and novel combinations of parts, hereinafter defined in the claims and described in the following specification, made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the various views, and, in which,

Fig. 1 is a plan view illustrating the complete tool, certain of the parts being broken away to more clearly show the construction thereof;

Fig. 2 is a view in side elevation of the complete tool, certain of the parts being broken away and the plane bottom being illustrated in one position in full lines and in another position in dotted lines;

Fig. 3 is a view in side elevation of the tool set up for use as a scraper, the blade being shown in one position in full lines for scraping a surface indicated in full lines, and being shown in another position in dotted lines for scraping a second surface indicated by dotted lines;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 2, as indicated by the arrows;

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 2, as indicated by the arrows;

Fig. 6 is a plan view illustrating one type of plane bottom that may be used;

Fig. 7 is a plan view on a reduced scale illustrating a second type of plane bottom that may be used; and

Fig. 8 is a sectional view illustrating the cutter and cutter holder.

Referring to the drawings, in accordance with the present invention, a block 8 of substantially rectangular shape is provided having secured thereto at its upper end a suitable handle 9 preferably of substantially C-shape as shown. The block 8 is provided with a horizontal bore within which fits a screw 10 secured at its forward end to a cutter holder 11. The cutter holder 11 comprises merely a straight bar set transversely relative to the screw 10 and having forwardly and inwardly extending hook portions with diagonal and bevelled edges at its two ends to receive a curved cutter 12 of substantially U-shape. The cutter 12 is preferably formed from high grade steel and is provided with what may be termed forward and rear sharpened, straight edges 12*a* and 12*b* at its two ends. The edge 12*a* as formed by providing a comparatively narrow bevel at the forward end of the cutter, while the sharpened edge 12*b* is formed by providing a comparatively long bevel at the rear end of the cutter. The edge 12*b* is, accordingly, more like a razor edge than is the edge 12*a*. The portion of the cutter 12 immediately adjoining the edge 12*a* is straight for a short distance, while the portion of the cutter adjoining the edge 12*b* is arcuately curved. It will be seen that the cutter 12 may be slid upwardly or downwardly in the holder 11 and that, accordingly, the angle of inclination of the sharpened edges 12*a* and 12*b* may be varied relative to the block 8 and the level of the two edges can be varied relative to each other. It will also be understood that the cutter 12 may be so disposed in the holder 11 that the edge 12*a* is disposed most closely adjacent the block 8 in place of the edge 12*b*. The holder 11 is received in a transverse groove formed in a hollow hub 13 having a number of radial corrugations at its rear side which are adapted to interfit with radial corrugations formed on the forward side of the block 8. It will be understood that the groove in the hub 13 will prevent tilting action of the holder 11 and the cutter 12 relative to the hub 13 and that the holder and cutter can be held in any desired tilted relation relative to the block 8 by turning the hub 13 and then engaging the corrugations on the hub with the corrugations on the forward side of the block. A nut 14 fits on the screw-threaded rear end of the screw 10 and this nut when drawn up tightly against

the rear side of the block 8, will cause the holder 11 and cutter 12 to be drawn in a rearward direction, so that the forward end of the hub 13 bears against the cutter 12 and firmly and securely holds the same in place in a desired adjusted position.

The lower rear end of the block 8 is bored to receive a screw 15 which runs through a pair of comparatively heavy lugs 16 formed on the rear ends of a U-shaped frame 17. The screw 15 forms a pivot for this frame to permit the frame to be swung forwardly and upwardly as from the dotted line position illustrated in Fig. 2, to the full line position illustrated in Figs. 1 and 2. The lugs 16 at their sides are provided with grooves 16*a* within which are fitted upwardly and inwardly extending side flanges 18*a* on a plane bottom 18. The forward side edges of the frame 17 fit below the side flanges 18*a* of the plane bottom 18 and the plane bottom can be slid relative to the frame 17. The forward end of the plane bottom is equipped with a short upwardly projecting curved flange 18*b* and the plane bottom is provided with a notch 18*c* at the central portion of its rear end to permit the frame 17 and plane bottom 18 to be swung rearwardly past block 8. A slot 18*d* is provided in approximately the central portion of the plane bottom and one of the sharpened edges of the cutter 12 is adapted to be projected more or less through the slot 18*d* to extend below the bottom plane surface of the plane bottom when it is forwardly swung. The forward central portion of the frame 17 is recessed on its under surface to receive therein a small rectangular lug 19 formed on the top side of the plane bottom 18 adjacent its forward end. The recess on the lower side of the frame 17 joins a rectangular opening 17*a* formed at the forward central portion of the frame and a thumb screw 20 fits within a screw-threaded bore in the lug 19 and is adapted to be turned down to clamp the forward end of the frame 17 tightly against the lug 19 and prevent relative sliding movement between the frame 17 and the plane bottom 18. The frame 17 at the sides of the opening 17*a* is provided with a pair of spaced ears 21 and pivoted in these ears is a yoke 22 having a forward centrally extending screw portion on which a grooved nut 23 is screw-threaded. The grooved nut 23 is adapted to fit within a small fork 24 carried by the plane bottom 18.

It will be seen that sliding movement of the plane bottom 18 relative to the frame 17 may take place when the thumb screw 20 is loosened and sliding movement of the plane bottom in a forward direction from the frame will be limited by engagement of the thumb screw 20 with the portion of the frame 17 forward of the opening 17*a*, while rearward sliding movement of the plane bottom will be limited by engagement of the lug 19 with the portion of the frame 17 rearward of the opening 17*a*. It will also be clearly understood that when the nut 23 is fitted within the fork 24 and the thumb screw 20 is loosened, the plane bottom 18 can be slid relative to the frame 17 by turning the nut 23. Small pointers 25 are preferably provided on the side flanges 18*a* of the plane bottom and these pointers are adapted to register with a series of small spaced grooves 17*b* formed adjacent the two edges of the top side of frame 17. The relative sliding adjustment between the frame 17 and the plane bottom 18 can be quickly and readily determined by examining the position of the pointers 25 relative to the series of grooves 17*b*. In order that the plane bottom 18 and frame 17 may be held in a desired swung position relative to the block 8, a clamping nut 26 is screwed on to one end of the screw 15.

The block 8 at the two sides thereof is provided with pairs of apertured spaced ears 8*a*, the aperture in, at least, one ear at each side of the block being screw-threaded. Screws 27 extend through the apertures in the ears 8*a* and these screws are equipped with lock nuts 28. The said screws 27 project downwardly below the ears 8*a* and form adjustable stops adapted to bear against the top surfaces of the lugs 16 to limit the distance that the frame 17 and the plane bottom 18 carried thereby, can be swung upwardly and forwardly relative to the block 8. Also these screws 27 serve to form a fine adjusting means for regulating the tilt of the cutter 12 and take up the play between the pivot screw 15 and the lugs 16 when the tool is in use as a plane.

The operation of the tool is probably obvious from the above description but may be briefly summarized as follows:—

If it is desired to use the tool as a plane, the cutter 12 may be set in the holder 11 so that either one of the sharpened edges 12*a* or 12*b* will extend rearwardly depending on the type of surface that is to be planed. If a very smoth surface is desired, the edge 12*b* will preferably be used, while if rougher work is required, the edge 12*a* will be used. Let us assume that a very fine surface is desired on the wood to be planed. The cutter 12 will then be set so that the edge 12*b* projects downwardly through the slot 18*d* in the plane bottom. When the cutter has been adjusted in the holder 11, so that the edge 12*b* projects downwardly below the plane bottom 18 the desired distance, the nut 14 will be tightened to clamp the cutter firmly in place. Of course, the transverse tilt of the edge 12*b* will be determined by the engagement of the corrugations on the hub 13 in the proper corrugations on the forward side of the block 8. The plane bottom 18 and frame 17 will then be swung forwardly and by adjustment of

the nut 23 after the thumb screw 20 has been loosened, the plane bottom 18 will be set so that the portion of the plane bottom adjacent the rear edge of the slot 18*d* abuts the cutter 12 adjacent the edge 12*b*. The thumb screw 20 will then be tightened against the frame 17 to hold the frame 17 and plane bottom 18 in fixed relation relative to each other. The screws 27 will be set so that when the plane bottom and frame have been swung forwardly to the desired position, the lower ends of the screws will abut the lugs 16. The thumb nut 26 will be tightened on the screw 15 to prevent pivotal action of the plane bottom and the frame relative to the block 8. The tool can now be used as a plane and due to the curvature of the cutter 12 and to the long bevel of the edge 12*b*, a fine razor-like cut will be produced on the surface when the tool is pushed forwardly over the same. It will be seen that practically any desired adjustment of the cutter 12 may be made so that either a light cut or a heavy cut can be made. The angle of inclination of the edge 12*b* can be varied to suit different requirements by a cooperative adjustment between the cutter 12 in the holder 11 and the nut 23 in the fork 24. The edge 12*a* can be similarly adjusted for use through the slot 18*d*.

If it is desired to use the tool as a scraper, either the plane bottom 18 and frame 17 can be completely removed from the tool by loosening the nut 26 and withdrawing the screw 15, or the plane bottom 18 and frame 17 may be swung downwardly and rearwardly past the block 8 to be out of the way of the cutter. Either one of the edges 12*a* or 12*b* can then be adjusted in the holder 11 for use as a scraping edge. When the tool is used as a scraper, it will be drawn over the surface that it is desired to be scraped in a direction towards the user. In Fig. 3, the tool in use as a scraper with the plane bottom 18, frame 17, screw 15 and nut 26 removed is shown, one position of the cutter for use on a surface being shown in full lines, and a second position of the cutter for use on a second surface being shown in dotted lines.

It will be understood that different types of plane bottoms can be substituted for the plane bottom 18. Thus in Fig. 7, a plane bottom 29 is shown which is similar to the plane bottom 18 in all respects with the exception that the plane bottom 29 is considerably longer than is the plane bottom 18, and it is not provided with a notch similar to the notch 18*c* in its rear end. When the plane bottom 29 is used, no swinging action of the plane bottom and frame 17 relative to the block 8 about the screw 15 as a pivot, is possible. The plane bottom 29 will preferably be used when the tool is to be operated as a "jack plane", while the bottom 18 will be used when the plane is to be operated as an ordinary "smoothing plane" or "block plane".

The tool is quite simple in construction and it has been successfully demonstrated in actual practice.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of the present invention.

What is claimed is:—

1. A surfacing tool, comprising a block, a cutter having a sharpened edge mounted on said block, a bottom member pivoted to said block and adapted to project forwardly therefrom and through which the sharpened edge of said cutter is adapted to extend, and means for holding said bottom member at a desired inclination relative to said block.

2. A surfacing tool, comprising a block, a cutter having a sharpened edge, means for mounting said cutter on said block, a bottom member pivoted to said block and adapted to project forwardly therefrom and through which the sharpened edge of said cutter is adapted to project, means for varying the inclination of the sharpened edge of said cutter relative to said block and means for holding said bottom member at a desired inclination relative to said block.

3. A surfacing tool, comprising a block, a cutter having a sharpened edge, means for mounting said cutter on said block so that the sharpened edge thereof will project below the block, a member pivoted to said block and adapted to project forwardly therefrom, a plane bottom mounted on said member for sliding movement thereon, said plane bottom having a slot therein through which the sharpened edge of said cutter may extend, and means for sliding said bottom on said member.

4. A surfacing tool comprising a block, a curved cutter having a straight sharpened edge, a cutter holder mounted on said block, a frame mounted on said block and projecting forwardly therefrom, a plane bottom slidably mounted on said frame and having a slot therein through which the sharpened edge of said cutter projects and means for adjustably sliding said bottom on said frame.

5. A surfacing tool comprising a block, a curved cutter having a straight sharpened edge, a holder mounted on said block for embracing said cutter, said cutter being slidable in said holder to vary the inclination of the sharpened edge thereof relative to the block and also to vary the extension of the sharpened edge thereof below said block, a frame pivotally mounted on said block and projecting forwardly therefrom, a plane bottom slidably mounted on said frame and having a slot therein through which said cutter projects, means for sliding said bottom on said frame and means for tightening said holder against said cutter.

6. The structure defined in claim 5, and

stop means for preventing said frame from being swung forwardly and upwardly relative to said block beyond a certain point.

7. A surfacing tool comprising a block, a handle secured to said block, a curved cutter having a straight sharpened edge, a holder mounted on said block and embracing said cutter, said cutter being slidable in said holder to vary the angle of inclination of the sharpened edge thereof relative to said block and to vary the distance of projection of its sharpened edge below said block, means for tightening said holder against said cutter, a frame pivoted at its rear end to said block, a plane bottom slidably mounted on said frame and having a slot therein through which the sharpened edge of said cutter is adapted to project, means for adjustably sliding said plane bottom on said frame, and means for securing said frame to said block at a desired forwardly projecting angle relative to the same.

8. A surfacing tool comprising a block, a handle secured to said block, a cutter of substantially U-shape having sharpened straight forward and rear edges, a holder mounted on said block and embracing said cutter, said cutter being slidable in said holder to vary the inclination of the sharpened edges thereof relative to said block and to vary the levels of the two sharpened edges relative to each other, means for tightening said holder against said cutter and a plane bottom pivoted to said block and having a slot therein through which one of the sharpened edges of said cutter may be extended when said plane bottom is swung forwardly, said plane bottom being capable of being swung rearwardly out of the way of said cutter.

9. A surfacing tool comprising a block, a cutter having a sharpened edge, a bottom member pivoted to said block and having a transverse slot through which the sharpened edge of said cutter is adapted to be projected and means for supporting said cutter on said block with its sharpened edge at various inclinations relative to said bottom member and with its lower portion bearing against a portion of said bottom member adjacent said slot.

10. A surfacing tool comprising a block, a cutter having a sharpened edge, a bottom member secured to said block and through which the sharpened edge of said cutter is adapted to be projected, means for supporting said cutter on said block with its sharpened edge set at various inclinations relative to said bottom member longitudinally of said bottom member and means for varying the lateral tilt of said cutter relative to said bottom member.

In testimony whereof I affix my signature.

GEORGE W. BLACK.