H. P. CASWELL.

TOOL SHARPENING MACHINE.

APPLICATION FILED FEB. 7, 1908.

1,026,623.

Patented May 14, 1912.

2 SHEETS—SHEET 1.

Fig. 2.

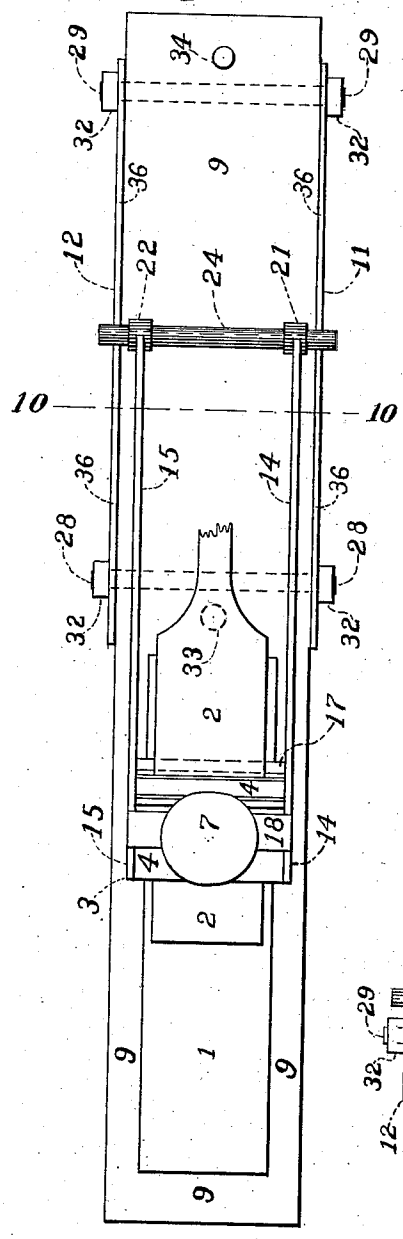


Fig. 1.

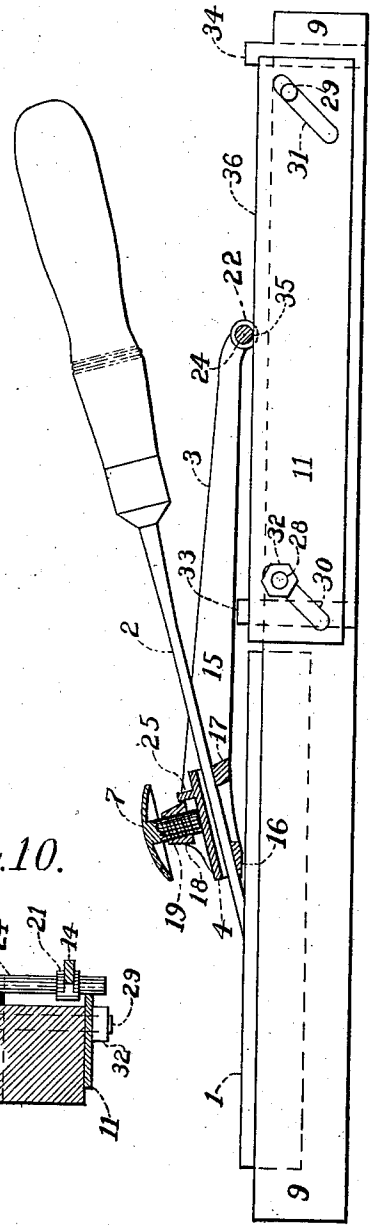
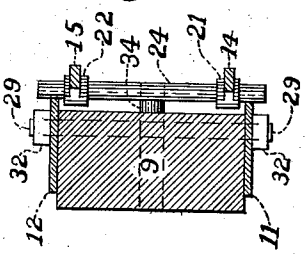


Fig. 10.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 6.

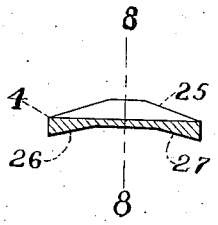


Fig. 8.

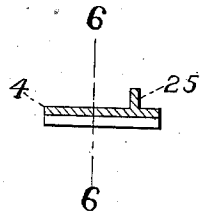


Fig. 9.

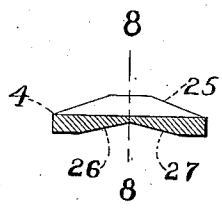


Fig. 7.

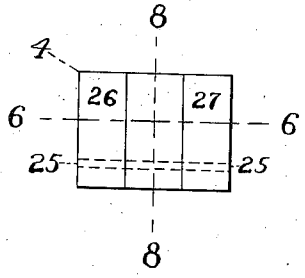


Fig. 4.

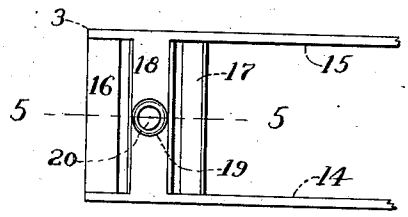


Fig. 3.

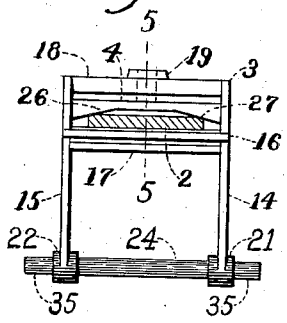
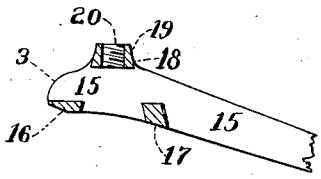


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

HARRY P. CASWELL, OF EVANSTON, ILLINOIS.

TOOL-SHARPENING MACHINE.

1,026,623. Specification of Letters Patent. Patented May 14, 1912.

Application filed February 7, 1908. Serial No. 414,836.

To all whom it may concern:

Be it known that I, HARRY P. CASWELL, a native citizen of the United States, residing in the city of Evanston, in the county of Cook and State of Illinois, have invented a new and useful Tool-Sharpening Machine, of which the following is a specification.

My invention relates to the means of sharpening tools by rubbing the tool on the surface of an abrasive block of any suitable material such as are called whetstones.

In this specification, and my claims, I use the name whetstone to designate any, natural or artificial, block of material, on which a tool can be sharpened by rubbing, whether used dry or with oil or water, and such as are also called oilstones and hones.

The object of my invention is to hold the whetstone, and hold the tool, and guide the movements of the tool, while it is being sharpened, so as to maintain the chosen angle of the tool in relation to the abrasive surface of the whetstone.

To explain the principles of my invention, and the best mode in which I contemplate applying those principles, the accompanying drawings show the form of my invention adapted for sharpening hand wood working tools, such as wood chisels and plane irons, in which:—

Figure 1, is a side elevation, or view, partly in section, Fig. 2, is a plan or top view; Fig. 3, is a front elevation of the frame 3, the lines of sight being parallel with the longitudinal axis of the tool 2; Fig. 4, is a plan, or top view, of the frame 3, with the rear part of the frame broken away; Fig. 5, is a sectional view of the frame 3, on the lines 5—5 of Figs. 3 and 4, with the rear part of the frame broken away; Fig. 6, is a cross section of the clamp saddle 4, on the lines 6—6 of Figs. 7 and 8; Fig. 7, is a reverse plan, or bottom view, of the clamp saddle 4; Fig. 8, is a longitudinal section of the clamp saddle 4, on line 8—8 of Figs. 6 and 7; Fig. 9, is a cross section of an additional, or extra, clamp saddle 4, for narrow tools, on line 6—6 of Figs. 7 and 8; Fig. 10, is a cross section, on line 10—10, of Fig. 2, of the bed 9, the rails 11 and 12 and rear part of the frame 3, showing the frame bearing 35 resting on the guiding surface 36.

Similar figures relates to similar parts throughout the several views.

The tool to be sharpened and the frame 3 with the clamping mechanism, by which the tool is held rigidly in the frame, in combination with the frame bearing 35, together form a separate combination which I call the tool unit or combination. The whetstone 1 in combination with the guiding surface 36, held rigidly in a fixed relation to each other, form another separate combination which I call the whetstone unit or combination. All the parts of each of these two units, or combinations, when being used, remain fixed in relation to the other parts of the same unit, while the separate units, or combinations, are free to move in relation to each other.

When the tool, to be sharpened, is rigidly held in the tool unit, and, is placed on the whetstone unit, as illustrated by Figs. 1 and 2, with the cutting edge of the tool 2, resting on the abrasive surface of the whetstone 1, and with the frame bearing 35, of the frame 3, resting on the guiding surface 36, of the whetstone unit, the cutting edge of the tool may be rubbed, by any chosen motion, on the whetstone 1, and the frame bearing 35, of the tool unit, will slide on the guiding surface 36, of the whetstone unit; thus the chosen angle of the tool 2 in relation to the abrasive surface of the whetstone 1 will be maintained. The gage of the frame bearing 35, on the guiding surface 36, maintains the lateral angle of the tool 2, to the whetstone 1.

Allowance should be made in setting the tool, when dull, so, after the amount of metal required to sharpen the tool is removed, the final angle of the tool with the whetstone will be the chosen angle for the required cutting edge of the sharpened tool.

The frame 3, consists of two side bars 14 and 15, a front cross bar 16, a rear cross bar 17, and a top cross bar 18; the top cross bar has a boss 19, and through the top cross bar and the boss is formed the screw hole 20, with screw threads formed in the hole; the two side bars 14 and 15 have hubs 21 and 22, pierced by holes through which the rod 24 is forced and rigidly held. The bottom surface of the rod 24 forms the frame bearing 35, this frame bearing 35 is one of the important elements of my invention. The rod 24 should be tool steel and hardened to resist wear of the frame bearing 35.

The clamp saddle 4, is formed to fit accurately between the side bars 14 and 15, and to be movable up and down between the plane of the top surface of the front cross

bar 16, and the rear cross bar 17, and the bottom surface of the top cross bar 18, of the frame 3.

On the upper surface of the clamp saddle 4, is formed the rib 25, Figs. 1, 6, 7, 8 and 9, which strengthens and stiffens the clamp saddle, and forms a stop, when bearing against the back edge of the top cross bar 18, to locate the position of the clamp saddle in the frame. The reverse or under side of the clamp saddle 4, is formed with two inclined surfaces 26 and 27, which are inclined downward as they diverge as shown by Figs. 6 and 9. The opening, in the frame 3, between the side bars 14 and 15, the front cross bar 16, the rear cross bar 17, and the top cross bar 18, through which the tool is inserted, and in which it is held, I call the tool opening.

The tool, to be sharpened, is inserted, adjusted and held in the tool opening of the frame 3, resting on top of the front cross bar 16 and the rear cross bar 17, under the clamp saddle 4, which is clamped down on the tool by pressure applied by means of the clamp screw 7.

The plane of the top surface of the two cross bars 16 and 17, on which the tool rests, which I call the tool seat fixes the angle of the tool in the frame 3, and the inclined surfaces 26 and 27, of the clamp saddle 4, hold the tool from skewing, or turning sidewise, and maintain the tool in line with the vertical plane of the longitudinal axis of the frame 3, without requiring excessive pressure from the clamp screw 7 and clamp saddle 4.

The clamp saddle shown by Fig. 6, will hold flat tools of any width that will allow both inclined surfaces 26 and 27, to bear on the corners of the tool, as indicated by Fig. 3: For narrower tools the clamp saddle shown by Fig. 9, with inclined surfaces 26 and 27, joining each other on the center line of the clamp saddle, must be used.

The clamp screw 7, is formed with external threads to engage with the internal threads in the screw hole 20, and the head of the clamp screw is shaped to afford a bearing for the hand, to press the tool on the whetstone 1.

The form and dimensions of the frame 3, the clamp saddle 4 and the frame bearing 35 may be varied to hold other, and different, sizes, forms and kinds of tools, and guide such tools while same are being sharpened.

The bed 9, is shaped to receive and hold the whetstone 1 and the guiding surface 36 in relation to each other.

The bars 28 and 29 are rigidly fixed in the bed; the ends of the bars protruding from both sides of the bed, and have screw threads formed on the protruding ends. Mounted on the bars 28 and 29 are the rails 11 and 12, each rail having two oblique slots 30 and 31, Fig. 1, which fit on to the bars 28 and 29. The top surfaces or edges of the rails 11 and 12 together form the guiding surface 36. This guiding surface 36 is one of the important elements of my invention. The slots 30 and 31 allow parallel vertical adjustment of the rails 11 and 12, which adjustment changes the angle of the tool, to be sharpened, in relation to the whetstone, and also allows adjustment for wear. The form of the rails also allow them to be reversed, to bring the other edge up, when the edge first used, to form the guiding surface 36, becomes worn. The bars 28 and 29 protrude through the slots 30 and 31 to receive nuts 32, by means of which the rails 11 and 12 are clamped firmly against the bed 9.

In Fig. 1 the rear nut is omitted, to more clearly show the oblique slot 31 fitting on the bar 29. Stops 33 and 34 are provided which, by limiting the travel, of the rod 24, and of the frame 3, and of the tool 2, held in the frame, thereby prevents the tool being accidentally moved off the ends of the whetstone 1. These stops consist of cylindrical pins, made a driving fit, in holes extending entirely through the bed, so the stops may be adjusted, by driving them from either end, and thus set to the proper height when the rails 11 and 12 are adjusted up or down. The lower parts of the hubs 21 and 22, of the frame 3, work between the inside surfaces of the rails 11 and 12, and the rear end of the frame is thus guided sidewise so as to keep the frame bearing 35 on the guiding surface 36.

To allow freedom for various regular or irregular motions of the tool 2, on the whetstone 1, the outside distance over the hubs 21 and 22 is made less than the distance between the inside surfaces of the rails 11 and 12 as shown by Figs. 2 and 10.

The form and arrangement of the elements of my invention cause the frame bearing, when resting on the bearing surfaces, to become fulcrums through which the working forces and resistances are resolved longitudinally laterally and horizontally.

The longitudinally extended frame, by leverage divides the working pressure, exerted downward on the tool and front end of the frame, so most of such pressure does useful work, pressing the tool onto the whetstone, while much less of the pressure is carried back and consumed in resistance and friction, at the frame bearing, at the rear end of the frame, in maintaining the angles of the tool to the whetstone.

The width or extension, crosswise of the frame, of the frame bearing, by leverage, reduces the friction, on the bearing, of the resistance by which the lateral angles of the tool to the whetstone are maintained.

The length of the frame and the crosswise extension of the frame bearing com-

bined with the surface form of the frame bearing, operating together, maintain the longitudinal and lateral angles of the tool to the whetstone, and enable the workman to rub the tool with crosswise, diagonal, longitudinal or irregular motions, on the whetstone, and to rub any part of the cutting edge of the tool on any part of the abrasive surface of the whetstone. This is necessary, owing to variations of texture in different parts of tools and whetstones, to produce even wear of the whetstone and to evenly sharpen the tool; such staggered motions also more easily, rapidly and perfectly sharpen the tool.

The length of the frame and lateral gage of the frame bearing, by leverage, also reduce the effect on the cutting edge of the tool of irregularities of the abrasive surface of the whetstone or the bearing surfaces of the mechanism.

The length of the frame places the frame bearing 35, and the guiding surface 36, at all times in extension endwise, away from the abrasive surface of the whetstone. This protects the frame bearing and guiding surfaces from the grit and debris of the whetstone, allows motions of the tool, while being sharpened, to overlap the whetstone, sidewise, without danger of damaging the cutting edge of the tool by contact with the rails forming the guiding surface and reduces the slight change of angle as the sharpening of the tool proceeds due to the shortening of the tool.

The tool being immovably fixed in relation to the entire frame combination eliminates defective sharpening which might arise from movable joints in the frame unit and enables the tool and frame unit to be removed from and replaced on the whetstone unit with less danger of damage to the cutting edge, and more conveniently.

I claim:

1. In a tool sharpening machine, the longitudinally extended frame, provided at its front end with the tool seat and mechanism adapted to hold a tool rigidly on said tool seat, in combination with a lateral frame bearing, extending crosswise of the frame fixed to the rear end of said frame, said frame bearing being adapted to slide on a guiding surface fixed in relation to a whetstone to maintain the lateral and longitudinal angles of the frame, and of a tool held in said frame, to the whetstone, and to allow sliding motions in all directions, of the tool on the whetstone, and resulting varying sliding motions of the said frame bearing on the said guiding surface; substantially as and for the purposes set forth.

2. In a tool sharpening machine, the combination, of a whetstone with a guiding surface; said guiding surface being wider than the whetstone, placed in extension endwise in relation to the abrasive surface of the whetstone and adjustably fixed in relation to the abrasive surface of the whetstone.

3. In a tool sharpening machine, a longitudinally extended frame, provided with mechanism, adapted to hold a tool fast in the front end of the frame, and a lateral frame bearing, extended crosswise of the frame, fixed to the rear end of said frame, in combination, with a whetstone, having an abrasive surface, for sharpening the tool, and fixed, in extension endwise, in relation to said abrasive surface, a guiding surface, wider than the whetstone, on which the frame bearing of the frame, holding the tool, is adapted to travel, and maintain the longitudinal and lateral angles of the frame, and of a tool held in the frame, to the whetstone in all directions, while allowing sliding motions, in all directions, of the tool on the whetstone, and resulting varying motions of the frame bearings on the guiding surface; substantially as and for the purposes herein before set forth.

4. In a tool sharpening machine, a frame having a bearing seat shaped for engagement with one side of the tool rectangular in cross section, a saddle movably mounted on the frame above said seat and having on its underside two oppositely inclined plane surfaces each making an angle of less than 90 degrees with the plane of the aforesaid seat, each of said plane surfaces being adapted to engage with one of the corners of such tool adjacent to the side opposite to that resting on said seat.

5. In a tool sharpening machine, a frame, having a tool opening provided with a flat tool seat, in which a tool to be sharpened may be inserted, in combination with a saddle adapted to be inserted in said tool opening and to fit between the sides of said tool opening, and mechanism to clamp the said saddle against said tool, said saddle having two inclined plane surfaces, adapted to press against two corners of one surface of the tool, and hold said tool sidewise in said frame, and against the flat tool seat of the frame; substantially as and for the purposes set forth.

6. In a tool sharpening machine, the combination, of a whetstone with rails, gaged wider apart than the width of the whetstone, and a bed, adapted to hold the rails in relation to the whetstone; said rails being adjustable in relation to the whetstone, and to the bed, and arranged to form a guiding surface to guide the motions of a frame, and of a tool held in said frame, while the tool is being sharpened on the whetstone.

7. In a tool sharpening machine, a frame 3, consisting of longitudinally extended side bars 14 and 15, a front cross bar 16, a rear cross bar 17, a top cross bar 18, said cross bars extending between and joining said side

bars at the front end of said frame and a frame bearing at the rear end of said frame, extending crosswise of the said frame substantially as set forth.

8. In a tool sharpening machine, a frame having a flat tool seat, guides on the frame above and at the sides of said seat, a saddle mounted in the frame on said guides, said saddle having two oppositely inclined plane surfaces on its underside each making an angle of less than 90 degrees with the aforesaid tool seat, the arrangement being such that said surfaces engage with the top corners of a flat tool resting on said seat, and means for adjusting said saddle.

HARRY P. CASWELL.

Witnesses:
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JOHN C. MATHEWS.