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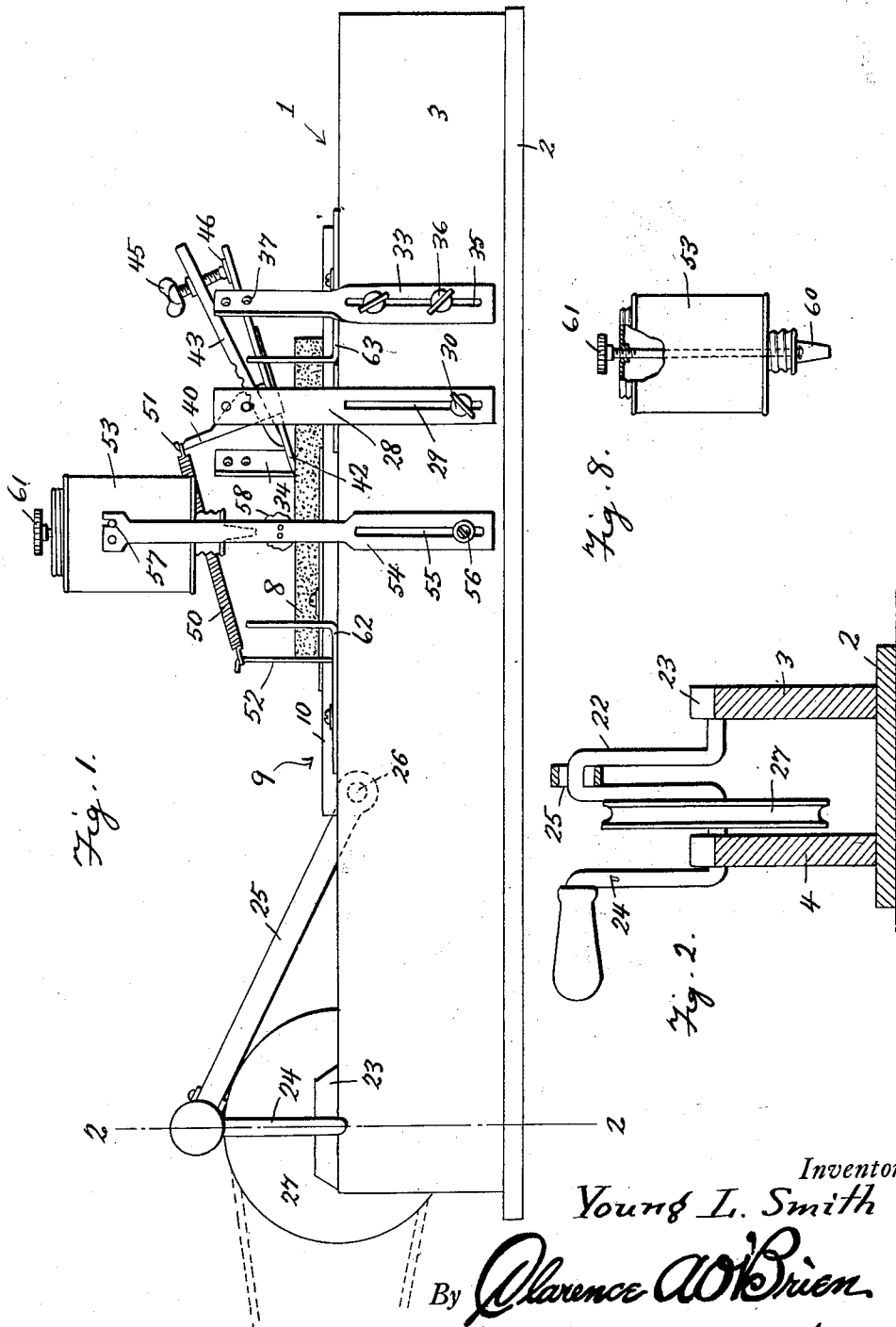
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Y. L. SMITH

TOOL GRINDING MACHINE

Filed May 26, 1926

3 Sheets-Sheet 1



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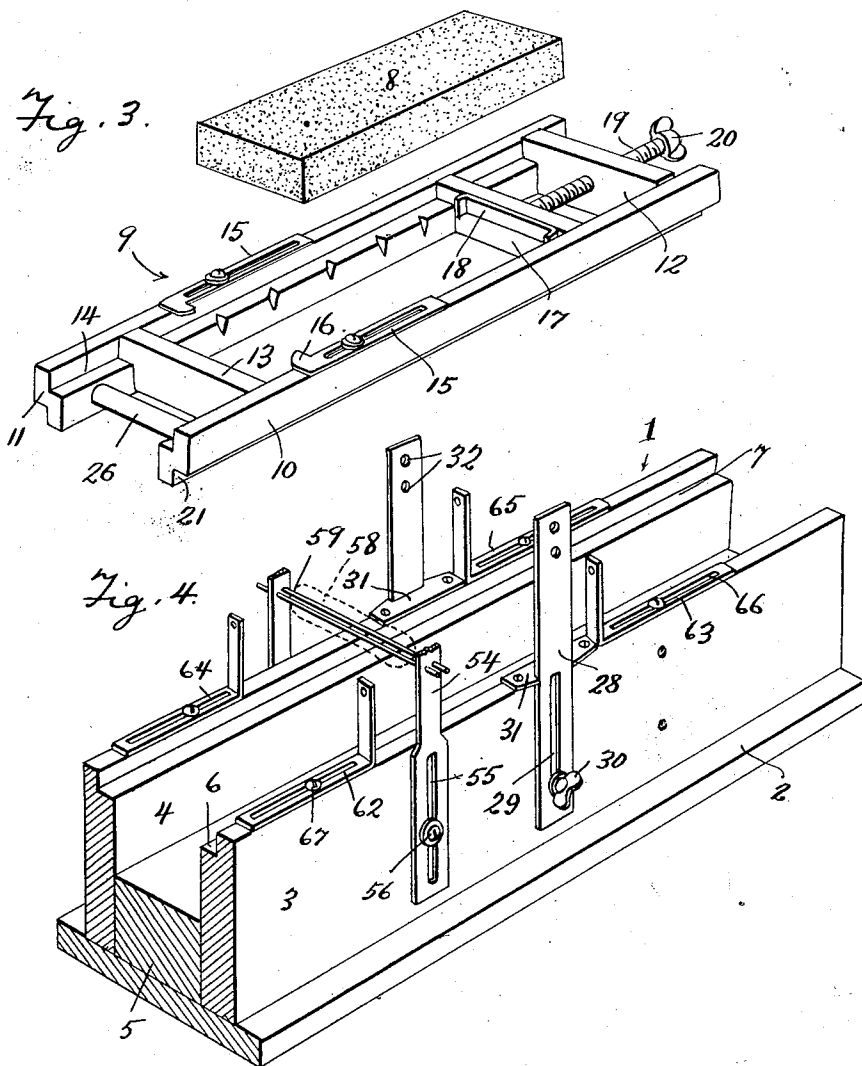
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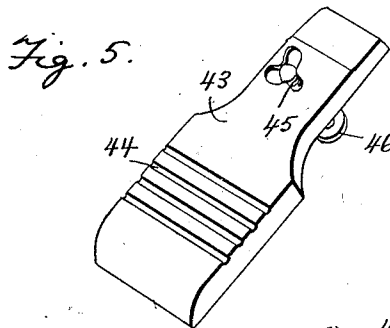
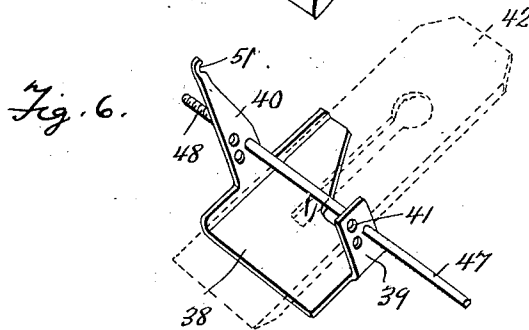
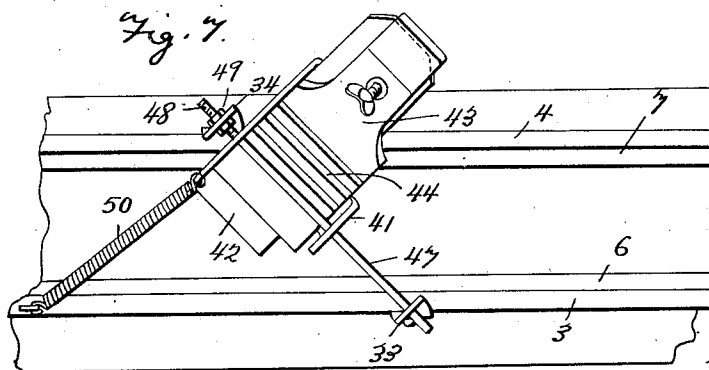
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

YOUNG L. SMITH, OF KUTTAWA, KENTUCKY.

TOOL-GRINDING MACHINE.

Application filed May 26, 1926. Serial No. 111,746.

The present invention relates to improvements in grinding machines and has for its principal object to provide a machine which will efficiently sharpen the cutting edges of various tools such as the bit of a plane and the like.

One of the important objects of the present invention is to provide a grinding machine which includes a reciprocating sharpener supporting carriage, the tool to be sharpened to be mounted above said carriage, additional means being provided for holding the cutting edge of the tool in engagement with the surface of the sharpener.

A further object of the invention is to provide a grinding machine of the above mentioned character wherein means is provided for supporting the tool in various positions with regard to the sharpening element.

A further object is to provide a grinding machine of the above mentioned character which is simple in construction, inexpensive, strong and durable and further well adapted to the purpose for which it is designed.

Other objects and advantages of the invention will become apparent during the course of the following description taken in connection with the accompanying drawings.

In the accompanying drawings forming a part of this application and in which like numerals designate like parts throughout the several views:

Figure 1 is a side elevation of the grinding machine embodying my invention.

Figure 2 is a vertical sectional view taken approximately on line 2—2 of Figure 1 showing the construction of the crank in elevation.

Figure 3 is a detail perspective view of the sharpening stone supporting carriage, the stone being shown along with the carriage.

Figure 4 is a fragmentary perspective view of the frame or bed showing the construction of the vertically adjustable bracket provided for supporting the tool to be sharpened at right angles to the grinding stone, the bracket for supporting the lubricating means being also disclosed, as well as the supporting means for stones which are to be polished.

Figure 5 is a detail perspective view of the bit clamp.

Figure 6 is a similar view of the bit supporting plate and the pivot rod associated therewith.

Figure 7 is a fragmentary top plan view showing the angularly disposed bracket for supporting the tool at an oblique angle with respect to the grinding stone, and

Figure 8 is a detail view of the oil can associated with the grinding machine.

In the drawings wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates generally the frame or bed of the grinding machine, the same including the base 2 on which is secured the spaced sides 3 and 4 respectively, a spacing block 5 being interposed between the sides and also secured on the base 2 in the manner as clearly shown in Figure 4. The inner opposed upper edges of the sides 3 and 4 are cut away longitudinally to provide the tracks 6 and 7 respectively, and the purpose thereof will be hereinafter more fully described.

The grinding element in the present invention comprises a sharpening stone 8 of any well known type now on the market, the same being preferably rectangular in design. This sharpening stone is adapted to be removably supported on the carriage 9 provided therefor and the construction of which will now be specifically described. This carriage 9 comprises the side members 10 and 11 which are arranged in parallel spaced relation through the medium of the cross members 12 and 13. The inner opposed upper edge portions of the side members 10 and 11 are cut away longitudinally as illustrated at 14 on which said cut away portion is adapted to rest the bottom of the side edge portions of the sharpening stone 8 as is readily obvious from the construction shown more clearly in Figure 3.

It of course is understood that these sharpening stones are of the same width but vary frequently in length and for the purpose of accommodating sharpening stones of various lengths, I provide a pair of complementary clamps shown at 15, the same being slidable on the upper edges of the side members 10 and 11 and the outer ends of these clamp members terminate in inwardly extending hooks or jaws 16 which engage one end of the sharpening stone. An additional cross member 17 is adapted for slidable movement between the side mem-

bers 10 and 11 and associated with this cross member 17 is a spring metal clip 18 which is adapted to engage the other end of the sharpening stone, the ends of the spring clips being disposed laterally for engagement with the respective sides of the stone. This movable cross bar 17 is actuated through the medium of a screw 19 which is secured at its forward end in any appropriate manner to the movable cross bar 17, the same being threaded through the stationary cross bar 12 and having a suitable actuating handle 20 on its outer end.

The outer lower edge portions of the side members 10 and 11 of the carriage 9 are also cut away as indicated at 21 in order that the side members 10 and 11 will be permitted to move along the tracks 6 and 7 respectively formed on the inner opposed upper edge portions of the sides 3 and 4 of the bed or frame 1.

A crank shaft 22 has its ends extending through suitable journals 23 provided therefor on the upper edges of the sides 3 and 4 of the bed or frame 1 adjacent one end thereof, and one end of the shaft terminates in a hand-actuating crank 24. A pitman or connecting rod 25 is secured to the crank 22 at its outer end, the inner end of the pitman or crank rod 25 being pivotally secured to the transverse pin 26 which is secured between the side members 10 and 11 of the carriage 9 adjacent one end thereof. This construction provides a means whereby the carriage 9 which carries the sharpening stone 8 may be reciprocated on the bed or frame 1. If desired, a grooved pulley wheel 27 may be secured on the crank shaft 22 for permitting the latter to be actuated by any suitable motor (not shown), it being understood of course that a belt or the like is trained over the pulley wheel for operatively connecting the same with said motor.

A pair of brackets 28 are secured on the outer faces of the sides of the bed at the intermediate portion thereof and these brackets are adapted for vertical slidable movement. The lower portion of each bracket is provided with the longitudinally extending slot 29 and cooperating therewith is the thumb screw 30. This provides a means whereby each of the brackets may be adjusted in any vertical position. Furthermore, these brackets are adapted for vertical slidable movement through suitable guides 31 which are secured on the upper edges of the intermediate portions of the sides of the head or frame in the manner clearly shown in Figure 4. The upper end portion of each bracket is provided with a pair of vertically spaced openings 32 and the purpose thereof will also be hereinafter more fully described. These brackets are arranged in the same vertical plane.

An additional pair of brackets designated

by the numerals 33 and 34 respectively are also secured on the outer faces of the sides 3 and 4 respectively of the bed or frame 1, the brackets 33 being arranged adjacent the side edge of the bracket 28 which is secured on the side 3, the bracket 34 being secured on the outer face of the other side of the bed adjacent the opposite side edge of the other of the first mentioned brackets 28, and this construction is more clearly shown in Figure 1.

Each of the last mentioned pair of brackets is twisted at its intermediate portion so that the upper edge portions of the brackets 33 and 34 are disposed at an angle and the purpose of this arrangement will be hereinafter more fully described. The lower portion of each of the last mentioned pair of brackets is also provided with a longitudinally extending slot such as is shown at 35 whereby these brackets may be moved vertically and suitable thumb screws 36 are provided for holding these brackets in any vertically adjusted position. The upper end portions of the last mentioned pair of brackets is also provided with a pair of vertically spaced openings shown at 37 similar to the openings 32 formed in the upper ends of the brackets 28.

The tool holding means comprising a plate 38 from the sides of which extend upwardly the ears 39 and 40 respectively. The ear 40 is longer than the ear 39 as is clearly shown in Figure 6, and the purpose thereof will be hereinafter more fully described. Each ear is provided with openings 41. The plate 38 is principally adapted to support thereon a bit 42 such as is commonly used in bench planes, the cutting edge of which is to be resharpened on the present machine. The bottom face of the bit 42 is adapted to lie upon the upper face of the plate 38 so that the cutting edge of the bit will extend beyond the lower edge of the plate and for the purpose of holding the bit on the plate I provide the bit clamp 43.

This bit clamp is provided at its upper face with the transversely extending parallel spaced grooves 44 as is shown more clearly in Figure 5 and the purpose thereof will be presently apparent. A thumb screw 45 is threaded through the upper reduced portion of the bit 43 and carries on its lower end the bit engaging head 46. The pivot forming rod 47 which extends through one pair of registering openings provided in the up-standing ears 39 and 40 has its intermediate portion seated in one of the transversely extending grooves 44 formed in the upper face of the bit clamp 43 and the manner in which the bit clamp secures the bit 42 in position on the plate 38 is clearly shown in Figure 1.

When the bit is to be disposed transversely of the sharpening stone so as to extend at right angles thereto, the outer ends of the

pivot forming rod 47 are disposed in one pair of registering openings formed in the upper ends of the brackets 38. One end of the pivot forming rod 47 is threaded as indicated at 48 and a pair of lock nuts such as are shown at 49 are threaded on the threaded end 48 of the rod 47, the same being disposed on opposite sides of the bracket which is secured on the side 4 of the bed or frame 1. This provides a means whereby the pivot rod 47 will be prevented from being accidentally displaced from the supporting bracket.

For the purpose of holding the cutting edge of the bit 42 in engagement with the upper surface of the grinding stone 8, I provide the contractile coil spring 50, the same being secured at one end to the hook 51 provided therefor on the upper end of the elongated ear 40, the other end of the spring secured to the upper end of the suitable pin 52 which extends upwardly from the upper edge of the side 3 in the manner as clearly shown in Figure 1.

When the blade or bit is to be disposed at an oblique angle, the pivot rod 47 is removed from the pair of brackets 28 and the ends of the pivot rod are then disposed through one pair of registering openings formed in the upper ends of the brackets 33 and 34 respectively and the lock nuts 49 are threaded on the rod 48 and engage the opposite faces or sides of the upper portion of the bracket 34 as is clearly shown in Figure 7. In this manner, the bit to be sharpened may either be disposed at right angles or at oblique angles to the sharpening stone.

For the purpose of lubricating the sharpening stone, there is provided an inverted oil can 53, the same being pivotally supported between the upper ends of a pair of vertically adjustable brackets 54, the lower end portions of the brackets being arranged on the outer faces of the respective sides of the bed or frame 1, and being provided with longitudinal slots similar to the longitudinal slots formed in the lower end portions of the brackets heretofore described. Suitable screws 55 extend through the longitudinal slots 56 in the lower end portions of the brackets 54 and into the respective sides of the frame holding the brackets in any vertically adjusted position. The pivotal support for the oil can 53 and the upper ends of these brackets is shown at 57.

A lubricant applying cloth 58 is clamped between a pair of transversely extending rods 59 which rods have their ends extending through the brackets 54 and this cloth is adapted to engage the upper face of the sharpening stone 8. The discharge spout 60 of the oil can 53 is normally disposed directly above the cloth 58 and the oil or other lubricant which is discharged from the can 53 through the spout 6 will by gravity drop onto the cloth 58 and the latter will be satu-

rated sufficient to permit the upper surface of the grinding stone to be properly lubricated. A manually actuated valve designated by the numeral 61 is associated with the spout of the oil can for regulating the flow of oil from the can onto the applying cloth.

With the parts arranged as shown in Figure 1 it is obvious that when the crank shaft 22 is operated, a reciprocatory movement will be imparted to the stone supporting carriage, thus moving the stone across the cutting edge of the bit which is supported on the plate 38 and the coil spring 50 will maintain the cutting edge of the bit in engagement with the upper surface of the stone so that the sharpening of the bit may be readily and easily performed. It is of course understood that the carriage 9 is limited in its reciprocatory movement so that the cutting edge of the bit will at all times be maintained in engagement with the upper surface of the stone.

For the purpose of polishing stones such as are used in honing of razors and the like, there is provided on the upper edges of the sides 3 a pair of adjustable brackets 62 and 63 respectively, a similar pair of brackets 64 and 65 being slidably supported on the upper edge of the other side of the bed or frame 1 as is clearly shown in Figure 4. These brackets are provided with the longitudinally extending slots designated generally by the numeral 66 and a screw 67 extends through each slot for holding each of the brackets in the desired adjusted position. The inner end of each of the brackets is disposed upwardly to provide a jaw and the several jaws are adapted to be secured to the ends of the wooden receptacle usually associated with the stone to be polished so that the face of the stone to be polished will frictionally engage the upper surface of the sharpening stone 8. It is of course understood that the bit holding means as well as the oil distributor cloth must be removed from above the stone 8 in order to permit the machine to be used in polishing other stones.

It will thus be seen from the foregoing description that I have provided a grinding machine which will be very efficient in resharpening the cutting edges of bits and similar tools, the parts of my machine being arranged in such a manner as to enable the same to be readily and easily adjusted or removed.

While I have shown the preferred embodiment of my invention it is to be understood that minor changes may be made in the invention without departing from the spirit and scope of the appended claim.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

In a grinding machine of the class de-

scribed, a bed, a pair of brackets secured on the opposite sides of the bed, a sharpening element adapted for reciprocatory movement on the bed, a tool holder comprising a plate
5 on which the tool rests, upstanding ears formed on the respective sides of said plate, a pivot forming rod extending transversely through the ears and said brackets, a clamp for securing the tool on the plate, said
10 clamp having a series of spaced transversely extending grooves formed in the upper face

of the lower end portion thereof, the intermediate portion of the pivot rod fitting in one of said grooves, a thumb screw threaded through the upper portion of said clamp, a
15 tool engaging head carried by the lower end of the screw, and means for maintaining the cutting edge of the tool in engagement with the upper surface of the sharpening element.

In testimony whereof I affix my signature.

YOUNG L. SMITH.