W. A. SPEEGLE.

SHARPENING MACHINE FOR CUTTER HEADS.

APPLICATION FILED AUG. 9, 1916.

1,213,703.

Patented Jan. 23, 1917.

3 SHEETS—SHEET 1.

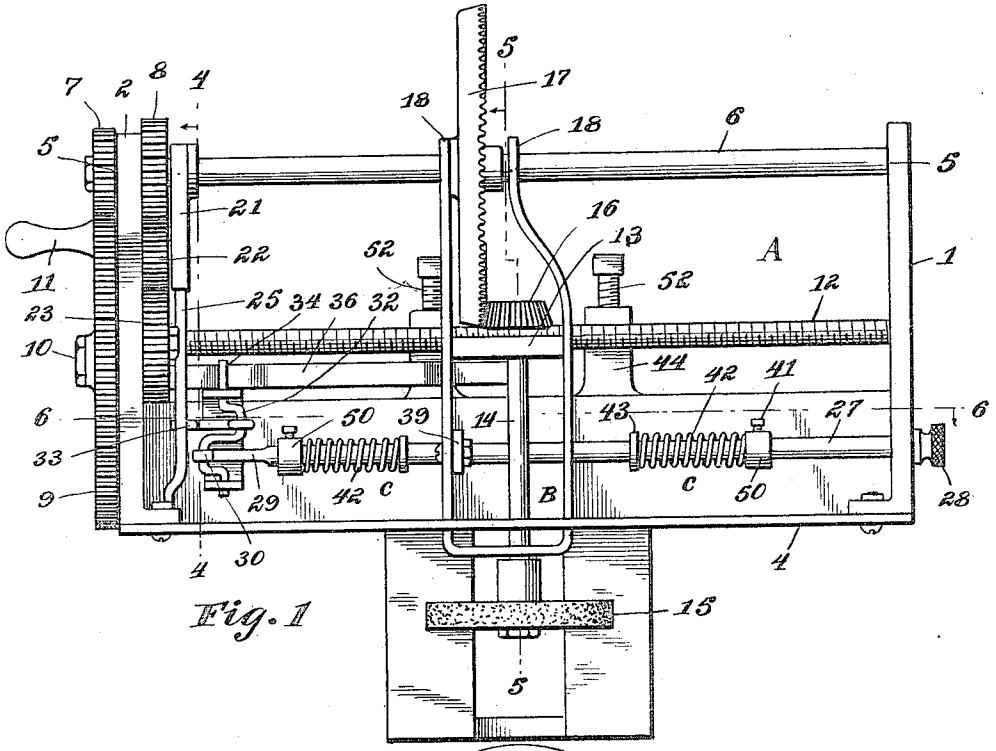


Fig. 1

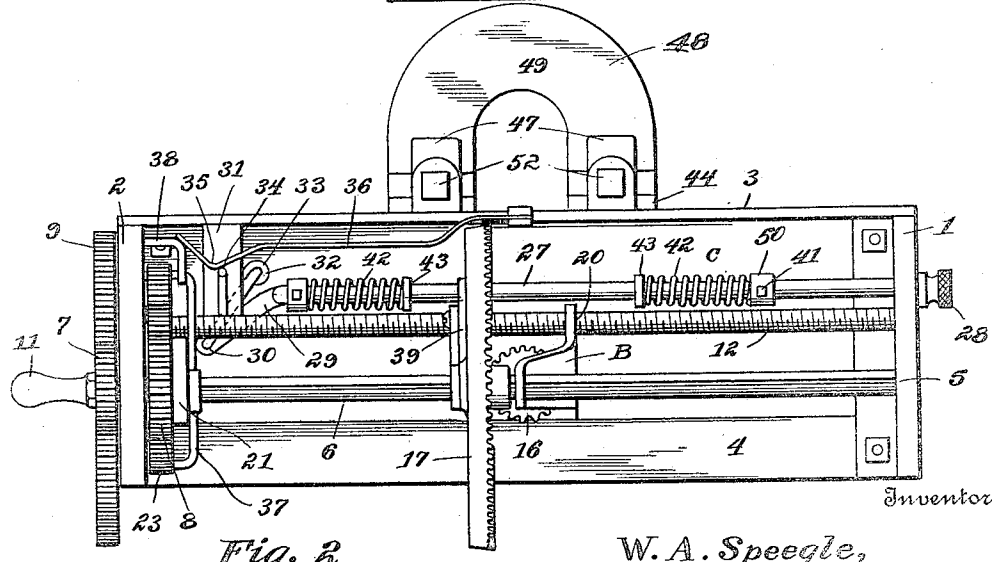


Fig. 2

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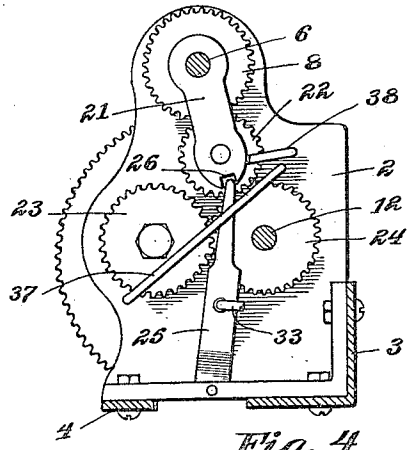


Fig. 4

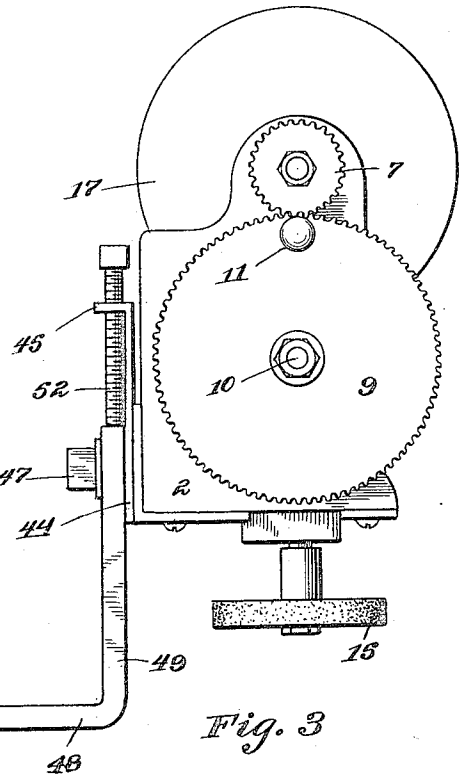


Fig. 3

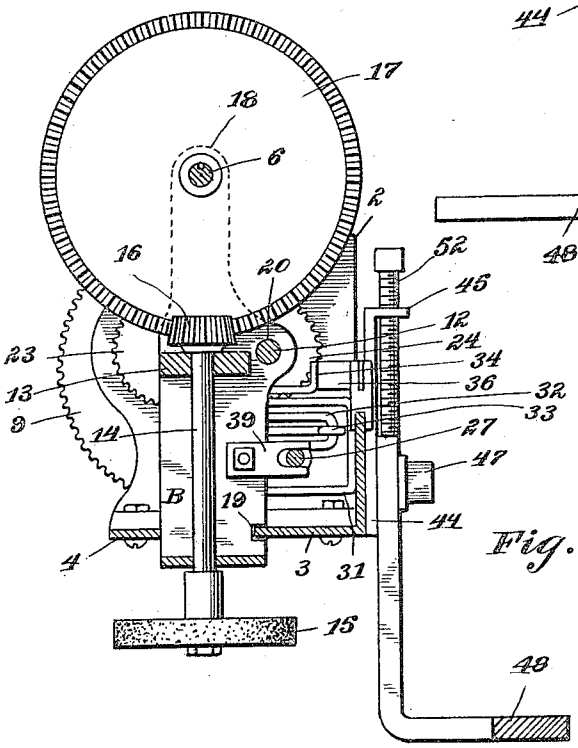


Fig. 5

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3 SHEETS—SHEET 3.

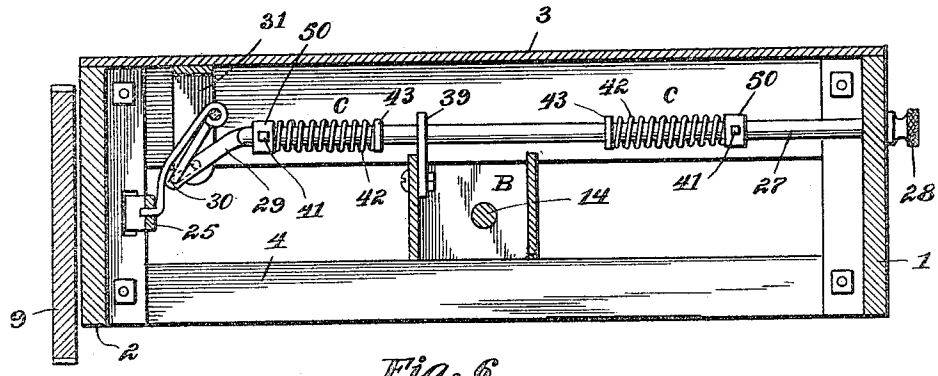


Fig. 6

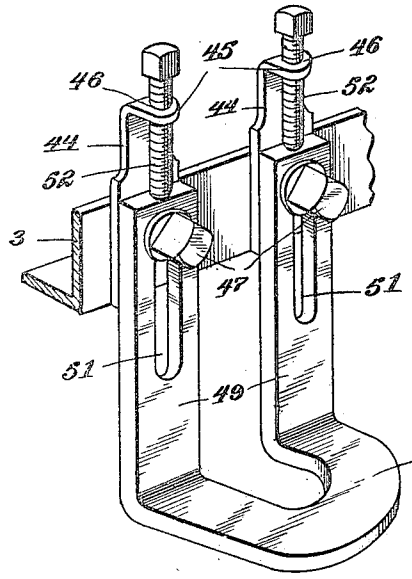


Fig. 7

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UNITED STATES PATENT OFFICE.

WILLIAM A. SPEEGLE, OF DREXEL, NORTH CAROLINA, ASSIGNOR OF ONE-FOURTH TO T. P. BRACKMAN, ONE-EIGHTH TO WILL SHUPING, AND ONE-EIGHTH TO W. L. CANNON, ALL OF DREXEL, NORTH CAROLINA.

SHARPENING-MACHINE FOR CUTTER-HEADS.

1,213,703. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed August 9, 1916. Serial No. 114,041.

To all whom it may concern:

Be it known that I, WILLIAM A. SPEEGLE, a citizen of the United States, residing at Drexel, in the county of Burke and State of North Carolina, have invented new and useful Improvements in Sharpening-Machines for Cutter-Heads, of which the following is a specification.

This invention relates to grinding or sharpening machines which are applicable to cutter heads for planing and molding machines.

The chief characteristic of this invention resides in the provision of a device of this character which is so constructed as to permit the same to be readily applied to the blades of the cutter head for the sharpening of the same without necessitating the removal of the blades from the cutter head.

Another characteristic of this invention is to provide a sharpening machine having both manually and automatically operated means for moving the grinding element along the blades to be sharpened, thereby causing the accurate sharpening of the blade.

Another characteristic of this invention is to provide novel means for moving the grinding element along the base frame and over the blade to be sharpened, said means being adjustable as well as resilient to move the grinding element a predetermined distance in either direction, whereby the reversing of the grinding element may be performed without subjecting the machine to unnecessary jars.

Another characteristic of this invention is to provide a device of the above described character which is simple, efficient, and durable in its construction and furthermore a device which may be manufactured at a nominal cost.

Other objects of the invention will appear as the specification is read in connection with the accompanying drawings in which:—

Figure 1 is the front elevation of a device constructed in accordance with the invention. Fig. 2 is a top plan view of the same. Fig. 3 is an end elevation of the machine showing the operating gears. Fig. 4 is a vertical section taken on the line 4—4 of Fig. 1 and looking from the interior of the machine to one end thereof, the reversing mechanism shown in one of its positions. Fig. 5 is a vertical section taken on the line 5—5 of Fig. 1 showing a portion of the mechanism for rotating and reversing the movement of the carriage. Fig. 6 is a longitudinal sectional view taken on the line 6—6 of Fig. 1. Fig. 7 is a detailed perspective view of the supporting bracket.

Referring to the drawings in detail, my invention comprises a base frame generally indicated as at A and which includes in this instance a pair of end members 1 and 2 disposed in vertical position and connected at their lower ends by means of the angle bar 3 and a flat bar 4, the latter being arranged in spaced relation to the angle bar throughout its length as is clearly shown in the drawings. The end members 1 and 2 are provided at the upper ends with a pair of alined bearings 5 in which is journaled the opposite extremities of the shaft 6. The shaft 6 has one of the extremities projecting beyond the end member 2 while keyed to the shaft on opposite sides of the end member is a pair of gears 7 and 8. The outer gear 7 is in mesh with the relatively larger gear 9, the latter being the prime mover which is rotatably mounted upon the end member 2 by means of the shaft 10. In this instance I have shown the prime mover or gear 9 provided with the handle 11, for imparting motion thereto although, I wish it to be clearly understood that any means such as electric motor or the like may be provided for rotating the gear 9 to operate this machine.

Journaled within the end members 1 and 2 and disposed below and at one side of the shaft 6 is a screw threaded shaft or feed screw 12. Arranged between the bars 3 and 4 and projecting upwardly from the same, is the vertically disposed carriage, here shown as a U-shaped frame generally indicated as at B, the parallel portions of whose arms are connected by a bearing plate 13. Journaled within the bearing plate 13 and the horizontal portion of the carriage B are the opposite ends of a vertically disposed shaft 14, the lower extremity of which is provided with a grinding wheel 15 which may be made from any suitable material to obtain the result desired. The upper end of the shaft 14 projects beyond

the bearing plate 14 and has keyed thereto a small gear 16 which is in mesh with the beveled gear 17, the latter being slidably keyed to the shaft 6. The arms of the carriage B terminate in ears 18 which loosely receive the shaft 6 and which are disposed upon opposite sides of the beveled gear 17 so as to force the latter to move with the carriage B as will be clearly understood. The arms have one of their vertical edges provided with recesses 19 adjacent their lower ends which receive one edge of the angle bar 3 so as to properly guide the frame upon the frame A, while above the base recesses the vertical edges are provided adjacent the upper ends with alined openings 20 the walls of which are threaded to receive the threaded feed shaft 12. It will thus be seen that upon rotation of the feed shaft, the carriage B will be moved along the base A in a direction depending upon which way the threaded shaft is rotated, it being understood that the ears 18 of the carriage will impart a similar movement to the beveled gear 17 to move the same longitudinally on the shaft 6.

Loosely mounted upon one end of the shaft 6 adjacent the gear 8 and depending from the same is a link 21, the lower end of which has mounted thereon a gear 22 which is in mesh with the gear 8 at all times. The inner end of the shaft 10, upon which the gear 9 is keyed, projects beyond the inner face of the end member 2 and has keyed thereon a gear 23 which is in mesh with the gear 24 secured to the adjacent end of the screw threaded shaft 12. The gears 23 and 24 are substantially of the same diameter, the gear 24 being arranged slightly above the gear 23 so that when the gear 22 is moved by the link 21, it will engage either of the gears 23 and 24 as will be understood. It will be seen from the foregoing construction that when the gear 22 is in engagement with the gear 23 that upon rotation of the gear 9, the gear 7 meshing therewith will cause the rotation of the shaft 6 while the gear 8 will impart a rotary motion from the gear 23 through the medium of the gears 24 and 22 thereby causing the shaft 12 to be rotated. It will be evident that upon rotation of the threaded shaft 12, the carriage B will be fed along the shaft from left to right, it being understood that the prime mover of the gear 9 is rotated in a clockwise direction. Simultaneously with the movement of the carriage B, the grinding wheel will be rotated through medium of the shaft 6 and gears 16 and 17, the beveled gear 17 moving longitudinally of the shaft as described and thereby remaining in mesh with the gear 16 at all times. Upon shifting of the gear 22, it will be evident that upon moving the gear 29 in clockwise direction, a reverse movement will be imparted to the feed shaft 12 thus causing the frame B to move in an opposite direction along the frame C.

To provide manual as well as automatic means for shifting the gear 22 to control the movement of the grinding wheel carriage on the base, I provide the frame A adjacent the end member 2 with a lever 25 one end of which is pivotally secured to the end member 2 while the upper or other end is of wedge formation and is adapted to lie within the notch 26 formed in the lower end of the link 21. Loosely mounted in the end member 1 and extending longitudinally of the base A is an actuating rod 27 which has one of its extremities projecting beyond the end member 1 and provided with a collar 28, the latter being adapted to limit the inward movement of the rod as will be understood, while the opposite or inner end of the rod is bent laterally as at 29 and terminates in an eye 30. Arranged upon the angle bar 3 and disposed adjacent the end member 2 is a U-shaped bracket 31 in which is journaled an upright double crank shaft 32, one of the cranks extending through the eye 30 formed in the bent end of the rod 27 while the remaining crank is provided with a connecting rod 33 which leads to the lever 25. It will be seen from the foregoing construction that upon moving the rod 27 longitudinally in either direction, the double crank shaft 32 will be actuated to reciprocate the connecting rod 33, whereby the lever 25 will be rocked upon its pivot, thereby causing the gear 22 to mesh with the gear 23 or 24, depending upon the direction of movement of the rod 27 as will be understood.

To lock the crank shaft and consequently the gear 22 in engagement with either of the adjacent gears 23 or 24, one extremity of the crank shaft 22 is formed with the laterally offset portion 34 which is adapted to engage the cam surface 35 of the leaf spring 36, the latter being secured to the angle bar 3 as is clearly shown in the drawings. To limit the movement of the lever 25 in either direction, I have provided the end member 2 upon its inner face with the angularly disposed bracket 37 which is of substantially U-shaped formation and which has its opposite ends secured to the end member, the medium portion of the bracket being arranged in spaced relation to the end member and overlying the upper end of the lever 25. To prevent excessive movement of the link 21 and the gear 22, I provide the end member 2 with an angularly disposed stop lug 38 which engages the link 21 when the gear 22 is moved into engagement with the gear 23 thus limiting the movement of the link in one direction, as it will be unnecessary to limit the movement of the link in the opposite direction as the gear 22 en-

gages the gear 24 in such a manner as to prevent the same from passing the gear as will be understood.

To make the shifting of the gear 22 and actuation of the rod 27 automatic, I provide the latter, preferably adjacent its opposite extremities, with a pair of resilient stops generally indicated as at C, which are adapted to coöperate with a substantially U-shaped lug 39 carried by one arm of the carriage B. The stops C each comprise a collar 50 which surrounds the rod 27, the same being provided with a set screw 41 which permits the collar to be locked in adjusted position upon the rod. Encircling the rod 27 and having one end thereof engaging the confronting sides of the collars 40, are the outer ends of the coil springs 42, the confronting ends of the springs being provided with angular washers 43. The U-shaped lug 39 carried by the frame B is adapted to engage the rod 27 and is disposed between the washers 43 so that when the screw threaded shaft 12 is rotated to feed the carriage longitudinally of the base, in one direction the lug 39 will engage one of the washers 43 whereby, the lug will compress the spring 42 against the respective collar and thereby cause the rod 27 to be moved longitudinally to actuate the crank shaft 32 and thus cause the gear 22 to be shifted from the gear 23 to the gear 24 or vice versa, depending upon in which direction the shaft 12 is rotated.

It will be seen from the foregoing that, I have provided means for automatically shifting the rod 27 to reverse the movement of the carriage, thereby causing the grinding wheel 15 to be reciprocated over the surface of the blade to be sharpened thus causing a proper sharpening of the blade. It will be further seen that I have also provided means for adjusting the stops to limit the movement of the carriage and that the said stops resiliently engage the lug 39 to cause the gradual actuation of the rod 27, and thus prevent the jarring of the grinding wheel during the grinding operation.

To support the grinding machine in operative position upon a planing machine, I provide the angular bar 3 at its medial portion with a pair of spaced plates 44 which are arranged in vertical position and which have their upper ends bent outwardly at right angles as at 45 and provided with the threaded eyes 46. In this instance the plates 44 are secured to the angle bar by means of the bolts 47, the latter also receiving the opposite extremity of a U-shaped bracket 49. The bracket 49 has its lower end arranged with an angular end 48 whereby the grinding machine may be suitably secured upon the planing machine, the arms of the bracket being provided with the longitudinally extended slots 51 which received the bolts 47, whereby the machine may be adjusted upon the bracket by the manipulation of the bolts 47 as will be understood. To further assist the bolts 47 in locking the machine upon the bracket I have provided the eyes 46 with screws 52, the lower ends of which engage the upper ends of the bracket arms 49 to prevent upward movement of the bracket upon the machine and thus securely lock the machine in adjusted position.

It is thought from the foregoing taken in connection with the accompanying drawings that the construction and operation of my device will be apparent to those skilled in the art, and minor changes in size, shape, proportion, and minor details of construction may be made without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a device of the class described, the combination with a base, a main shaft and a threaded feed shaft journaled therein, a train of gears connecting said shafts, and reversing mechanism within said train; of a carriage including a frame, a gear splined on the main shaft within said frame, a tool shaft journaled in the carriage and driven by the splined gear, a rock lever for actuating said reversing mechanism, a double crank rod, connections between one of its cranks and said lever, a rod connected with the other crank, and stops on said rod engaged by the carriage at the extremes of its movements, for the purpose set forth.

2. In a device of the character described, the combination with a base, a main shaft and a threaded feed shaft journaled therein, means for rotating the main shaft, a train of gears connecting it with the feed shaft, and reversing mechanism within said train; of a carriage including a frame whose arms are slidably mounted on both shafts, a gear splined on the main shaft between said arms, a tool shaft journaled in the carriage and having a small gear meshing with the splined gear, a rock lever for actuating said reversing mechanism, a double crank rod, connections between one of its cranks and said lever, a rod slidably mounted in the base and connected with the other crank, and adjustable stops on said rod engaged by the carriage at the extremes of its movements, for the purpose set forth.

3. In a device of the character described, the combination with a base, a main shaft and a threaded feed shaft journaled therein, a train of gears connecting said shafts, and reversing mechanism within said train; of a carriage including arms, a gear splined on the main shaft between said arms, a tool shaft journaled in the carriage and driven by the splined gear, a rock lever for actuating said reversing mechanism, a double crank rod, connections between one of its cranks and said lever, a rod slidably mount-

ed in the base and connected with the other crank, collars adjustable on said rod, springs thereon against the collars, washers against the inner ends of the springs, and a U-shaped lug on the carriage loosely embracing the rod between said washers, for the purpose set forth.

4. A device of the class described comprising a base, a grinding wheel carriage movably mounted thereon, a screw threaded shaft engaging said carriage, means for rotating said shaft, a shiftable gear interposed between said means and the screw threaded shaft for reversing the rotation of said shaft, a rod slidably mounted in the base, a crank connection between said rod and said gear, and means mounted upon said rod and engaged by said carriage for actuating said rod to shift the gear for reversing the direction and rotation of said shaft.

5. A device of the class described comprising a base, a carriage movably mounted thereon, a screw threaded shaft engaging said carriage, means for rotating said shaft, a shiftable gear interposed between said means and the screw threaded shaft for reversing the rotation of said shaft, a rod slidably mounted, a crank connection between said rod and said gear, and adjustable resilient means engaged by said carriage for actuating said rod to shift the gear for reversing the direction of rotation of said shaft.

6. A device of the class described comprising a base, a grinding wheel carriage movably mounted upon the base, a screw threaded shaft journaled in the base, means for rotating said shaft, shiftable means interposed between the last mentioned means and the said shaft for reversing the direction of rotation of said shaft, and reciprocating means carried by the base and engageable with the last mentioned means and controllable from said carriage for shifting the said means.

7. A device of the class described comprising a base, a grinding wheel carriage movably mounted upon the base, a screw threaded shaft engageable with the carriage, means for rotating said shaft, a shiftable gear interposed between said means and the screw threaded shaft for reversing the rotation of said shaft, a rod slidably mounted in the base, a crank connection between said rod and said gear, means mounted upon said rod and engageable by said carriage for actuating said rod to shift the gear for reversing the direction and rotation of said shaft, and means for locking said gear in shifted position.

In testimony whereof I affix my signature.

WILLIAM A. SPEEGLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."