March 12, 1940. R. McMILLEN 2,192,981

GRINDING MACHINE

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Fig. 1.

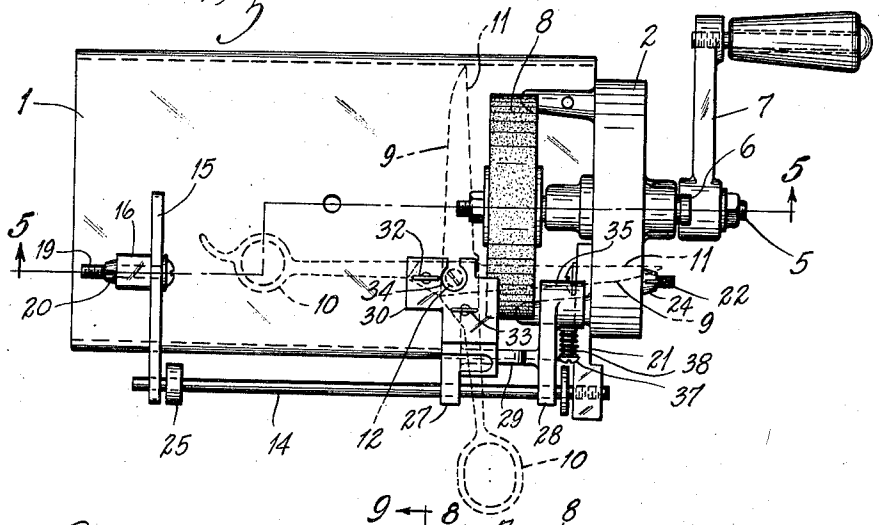


Fig. 2.

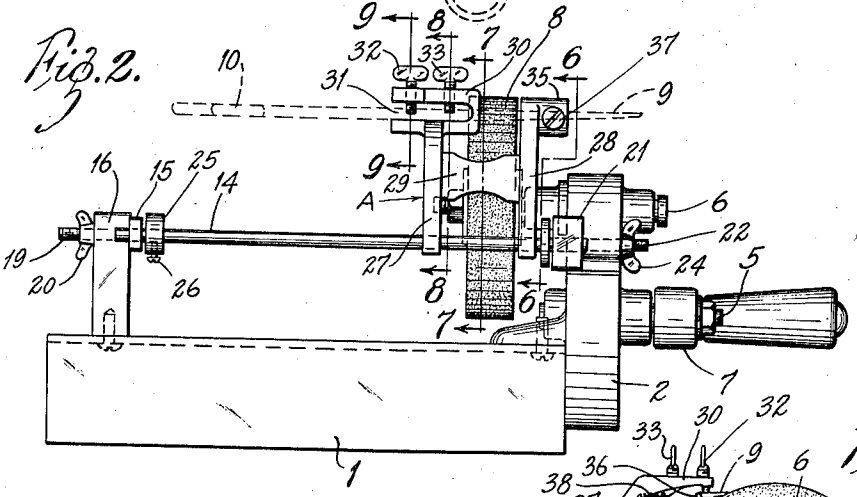


Fig. 3.

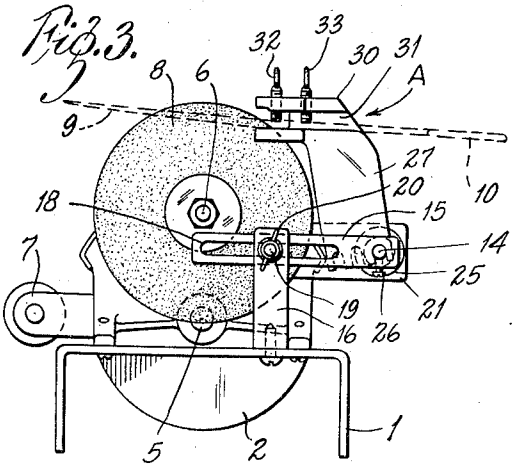
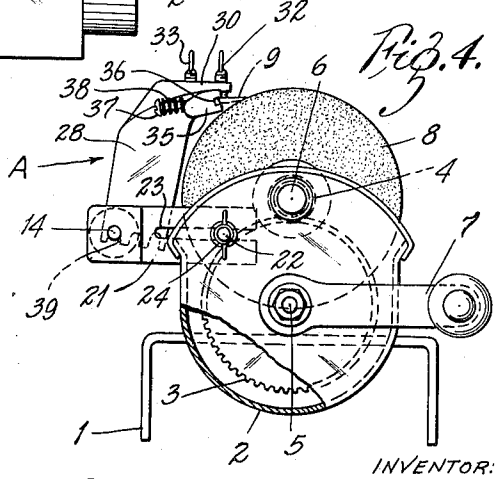


Fig. 4.



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Fig. 5.

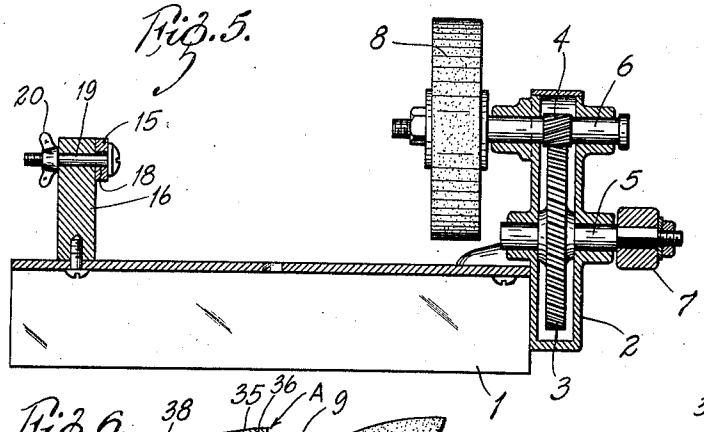


Fig. 6.

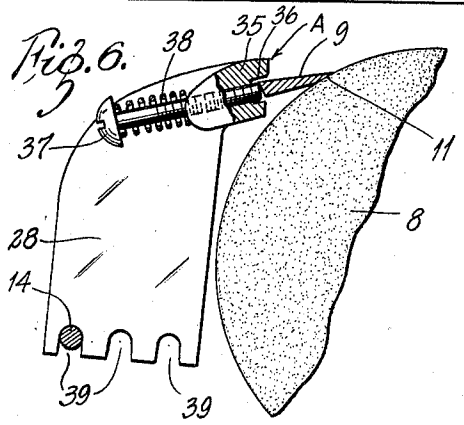


Fig. 7.

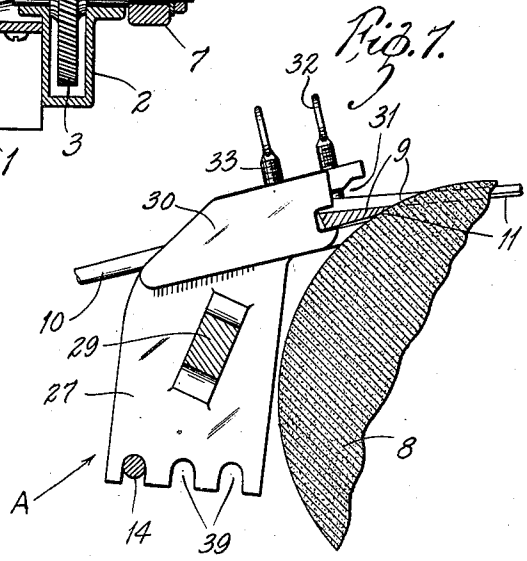


Fig. 8.

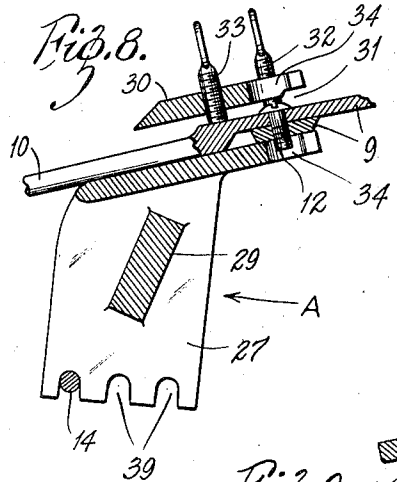


Fig. 10.

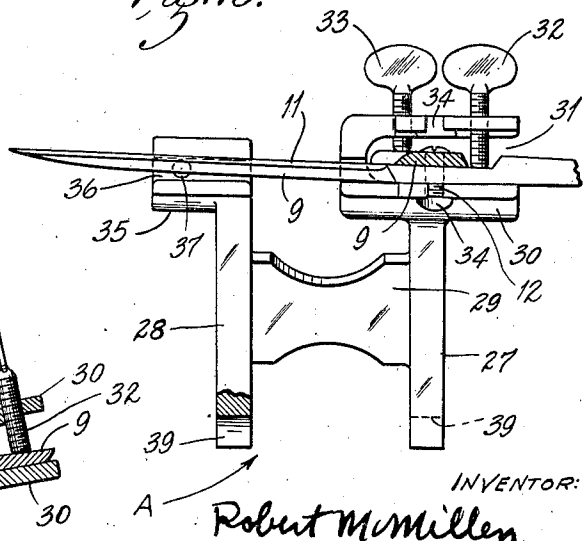


Fig. 9.

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Patented Mar. 12, 1940 2,192,981

UNITED STATES PATENT OFFICE

2,192,981

GRINDING MACHINE

Robert McMillen, St. Louis, Mo.

Application August 24, 1938, Serial No. 226,408

7 Claims. (Cl. 51—92)

This invention relates to grinding machines for grinding cutting instruments, particularly shears or scissors. It has for its principal objects to provide a simple, strong, economical and easily operable machine that will accommodate sheas having beveled cutting edges of various angles and that will provide for properly positioning and firmly holding the shears in the machine. The invention consists in the shears grinder or sharpener and in the construction, combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawings, wherein like reference numerals refer to like parts wherever they occur,

Fig. 1 is a plan view of a shears sharpening machine embodying my invention;

Fig. 2 is a front elevation thereof;

Fig. 3 is a left-hand end view of the machine;

Fig. 4 is a right-hand end view of the machine;

Fig. 5 is a vertical longitudinal section on the line 5—5 in Fig. 1;

Figs. 6, 7, 8 and 9 are enlarged fragmentary cross-sections on the line 6—6, 7—7, 8—8 and 9—9, respectively, in Fig. 2; and

Fig. 10 is a rear view of the shears supporting carriage.

My shears sharpening or grinding machine comprises a base 1 provided at one end with a housing 2 containing intermeshing driving and driven gears 3 and 4 fixed to vertically spaced horizontally disposed driving and driven shafts 5 and 6, respectively, journaled in the end walls of said housing. The driving shaft 5 is rotated preferably by means of a crank 7 fixed thereto clear of the adjacent end of the base 1; and the driven shaft 6 has a grinding wheel 8 of carborundum or other suitable material fixed thereto exteriorly of said housing.

The shears that are to be sharpened comprise two blades 9 having handles 10 and beveled cutting edges 11 and pivoted together intermediate their ends by a pivot screw 12. The shears are mounted in a carriage A with the cutting edge of the blade that is to be sharpened disposed parallel to the axis of the grinding wheel 8 and in position to engage the peripheral surface of said wheel and with the other blade disposed crosswise of the grinding wheel axis. The shears supporting carriage A is mounted for sliding movement longitudinally of the grinding wheel axis on a rod 14, one end of which rests in an opening provided therefor in one end of a horizontal bar or bracket 15 that is disposed crosswise of the grinding wheel axis and is supported by a post or upright 16 fixed to the base 1 at the left-hand end thereof. The bar 15 is provided with an elongated slot 18 and is clamped to the post 16 by means of a screw 19 having a thumb nut 20, whereby said bar and the rod 14 carried thereby may be adjusted transversely of the grinding wheel axis. The opposite end of the carriage supporting rod 14 is supported in a horizontal bracket 21 that is secured to the adjacent end face of the gear housing 2 by means of a screw 22, which passes through an elongated notch or slot 23 in said bracket and registering holes provided therefor in the end walls of said housing and is provided with a thumb nut 24 for clamping said bracket to said housing in its desired position of adjustment transversely of the grinding wheel axis. This bracket limits the movement of the carriage A in the direction of the grinding wheel, movement of said carriage in the opposite direction being limited by a collar 25 that is sleeved on the rod 14 and is held in the desired position of its sliding movement by means of a set screw 26.

The shears supporting carriage A comprises two upright end sections or plates 27, 28 that are spaced apart longitudinally of the rod 14 and are rigidly connected intermediate between their upper and lower ends by a web member or cross bar 29. The plate 27 at the left-hand end of the carriage has an enlarged upper end portion 30 with a groove 31 thereon that extends from front to back thereof and is large enough to accommodate the crossed shank portions of the shears in the position thereof hereinbefore described. The shank of the blade that is to be sharpened is clamped in the groove 31 by means of a suitable thumb screw 32; and the shank of the other blade is also clamped in said groove preferably by means of a separate thumb screw 33. The rear end of the enlarged upper end 30 of the end plate 27 of the carriage is provided above and below the groove 31 with alined notches 34 having enlarged inner end portions in which is centered the pivot screw 12 of the shears. The plate 28 at the right-hand end of the carriage is also provided with an enlarged upper end portion 35 having a groove 36 in its rear end adapted to receive the end portion of the blade that is to be sharpened. Movement of this portion of the blade, due to the pressure thereof, against the grinding wheel is prevented by means of a screw 37 which is threaded through the upper end 35 of the plate 28 into the groove 36 in abutting relation to the rear edge of the blade, this screw being held in the desired

position of adjustment by means of a coiled spring 38, which is sleeved thereon between the head thereof and the front face of said upper end of said plate.

The end plates 27, 28 of the slidable shears supporting carriage A are each provided at their lower ends with a series of notches 39 adapted to straddle the carriage supporting rod. By means of these notches, the beveled edge of the blade that is to be sharpened may be positioned at the desired angle to the grinding wheel. This angle may also be varied by adjusting the carriage rod supporting brackets 15 and 21 transversely of the grinding wheel axis.

In operation, the shears that are to be sharpened are clamped in the carriage A in the manner shown and hereinbefore described. The carriage is then placed on the supporting rod 14 by engaging the corresponding notch of each end plate of the carriage with said rod, the particular notches that are placed in engagement with the rod depending on the bevel that is desired for the cutting edge of the blade. The grinding wheel is then rotated while the carriage is slid back and forth along the supporting rod to bring the entire length of the cutting edge of the blade into engagement with the grinding wheel. The blade is prevented from sliding off the grinding wheel by means of the adjustable collar 25, while the bracket 21 serves to prevent the other blade from engaging the end face of the grinding wheel.

The hereinbefore described shears sharpener has several important advantages. It enables the shears to be readily clamped in proper position on the supporting carriage and it enables an unskilled operator to obtain any desired bevel on the cutting edge with a minimum expenditure of time and effort. By engaging the same notches with the supporting rod each time the shears are sharpened, the same beveled cutting edge may be retained. The notches 34 serve as a guide for properly positioning the shears in the carriage; and they also provide clearance for both ends of the pivot screw 12.

Obviously, the hereinbefore described arrangement admits of considerable modification without departing from the invention. Therefore, I do not wish to be limited to the precise construction shown and described.

What I claim is:

1. A sharpener for tools having beveled cutting edges comprising a rotatable grinding wheel, a single rod disposed alongside of said wheel parallel to the axis thereof, a quick detachable tool supporting carriage supported on said rod for sliding movement thereon and for swinging movement thereon transversely of said axis, and means whereby said carriage may be supported on said rod at any one of a plurality of different portions of the carriage to thereby vary the angle of the tool with respect to said grinding wheel.

2. A sharpener for bevel edged tools comprising a rotatable grinding wheel, a single rod disposed alongside of said wheel parallel to the axis thereof, and a carriage having a tool supporting upper end portion and a series of notches in its lower end spaced apart crosswise of said rod and each adapted to be selectively engaged with said rod to vary the angle at which the tool is held to said grinding wheel.

3. A sharpener for shears having beveled cutting edges comprising a rotatable grinding wheel, a carriage mounted for movement in a direction parallel to the grinding wheel axis, means for mounting said shears in said carriage with the cutting edge of one blade disposed parallel to the grinding wheel axis and means for adjusting said carriage to bring the beveled cutting edge of said blade tangent to the peripheral surface of said grinding wheel, said means comprising a single rod for slidably supporting said carriage and a series of notches formed in said carriage and spaced apart crosswise of said rod for selective engagement therewith.

4. A sharpener for shears having beveled cutting edges comprising a rotatable grinding wheel, a carriage mounted for movement in a direction parallel to the grinding wheel axis, means for mounting said shears in said carriage with the cutting edge of one blade disposed parallel to the grinding wheel axis, and means for adjusting said carriage to bring the beveled cutting edge of said blade tangent to the peripheral surface of said grinding wheel, said means comprising a single rod for slidably supporting said carriage and a series of notches formed in said carriage and spaced-apart crosswise of said rod for selective rocking engagement therewith, and adjustable means on said rod for limiting the sliding movement of the carriage away from said grinding wheel.

5. A shears sharpener comprising a rotatable grinding wheel, a shears supporting carriage, a single rod for slidably supporting said carriage for movement in a direction parallel to the grinding wheel axis, said carriage having a series of notches formed therein and spaced apart crosswise of said rod for selective engagement thereby, and means for adjusting said rod transversely of the grinding wheel axis.

6. A shears sharpener comprising a rotatable grinding wheel, a carriage, a single rod for slidably supporting said carriage for movement in a direction parallel to the grinding wheel axis, said carriage having a series of notches formed therein and spaced apart crosswises of said rod for selective engagement therewith, said carriage being provided in its grinding wheel opposing side with a groove adapted to receive both blades of said shears, means for clamping said blades in said groove, said carriage having a second groove disposed in alinement with said first mentioned groove and adapted to receive the blade that is to be sharpened, and an adjustable abutment in said second groove for the rear edge of said blade.

7. A quick detachable shears supporting carriage for a shears sharpener of the kind described, said carriage having a series of notches formed in the lower end thereof adapted for selective engagement with a single support therefor, the upper end of said carriage being provided with a groove adapted to receive both blades of the shears, means for clamping said blades in said groove, said carriage having a second groove disposed in alinement with said first mentioned groove and adapted to receive the free end portion of the blade that is to be sharpened, and a set screw threaded into said second groove and adapted to serve as an adjustable abutment for the rear edge of said blade.

ROBERT McMILLEN.