May 6, 1958 B. I. WILSON ET AL 2,833,166

CHAIN SAW GRINDER

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Fig. 1

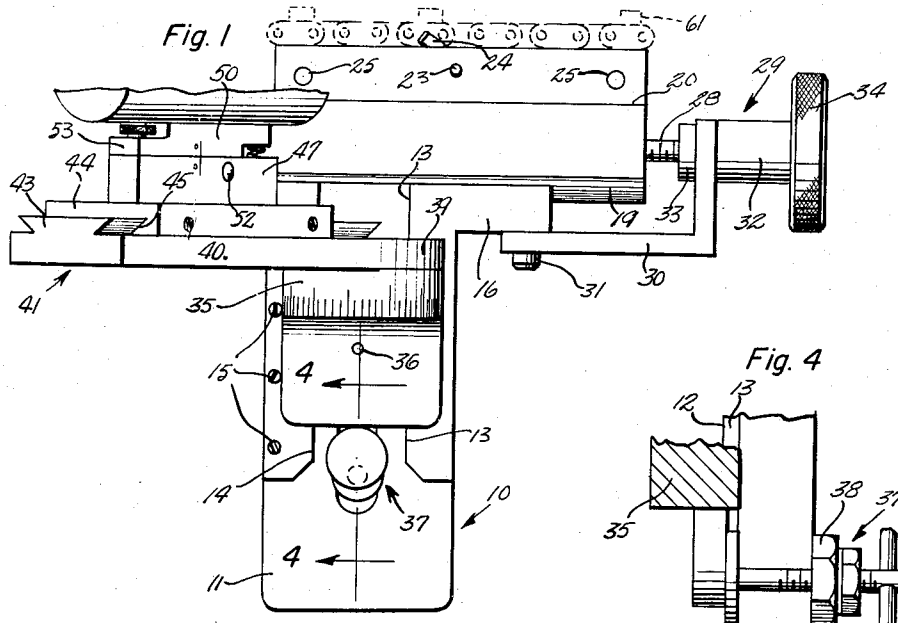
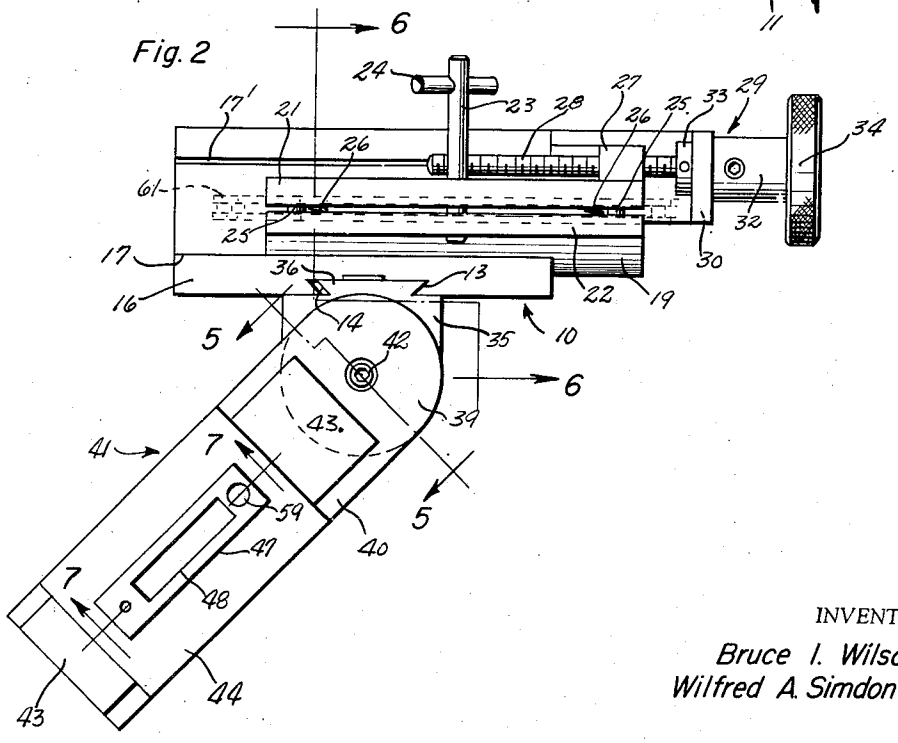


Fig. 4

Fig. 2



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Fig. 3

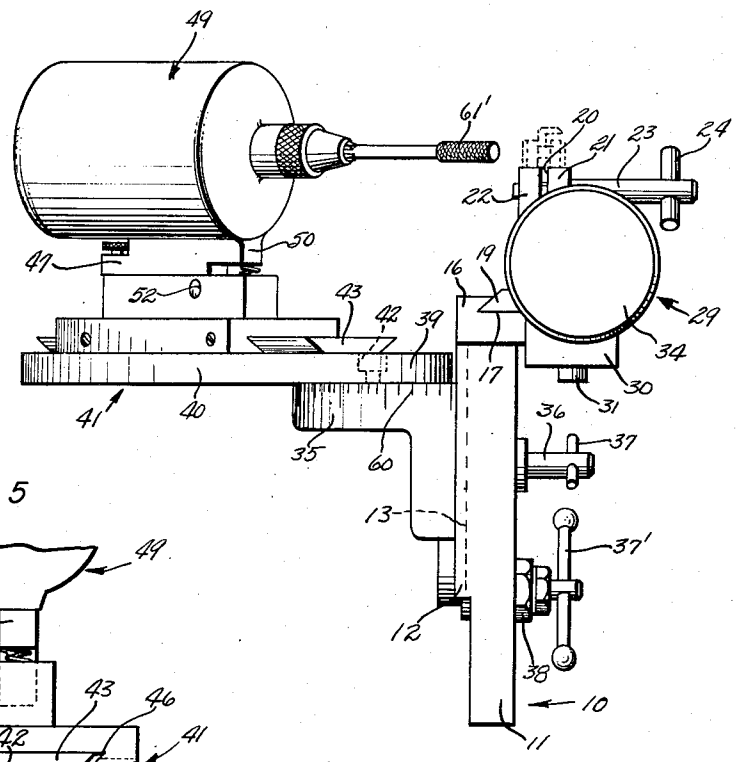


Fig. 5

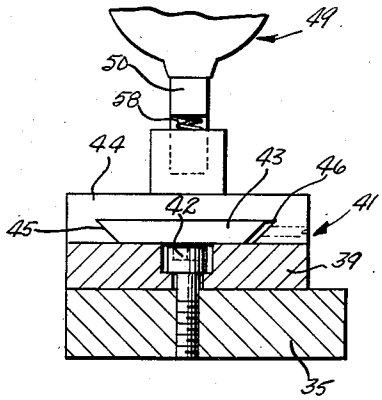


Fig. 6

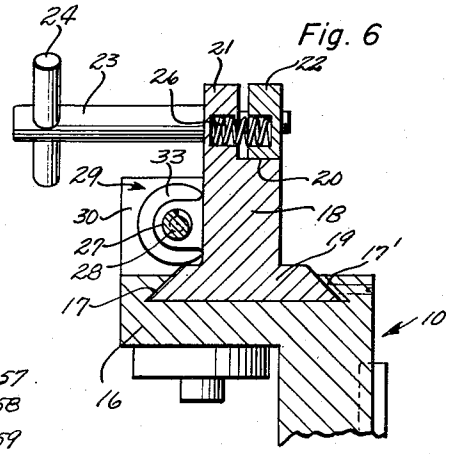
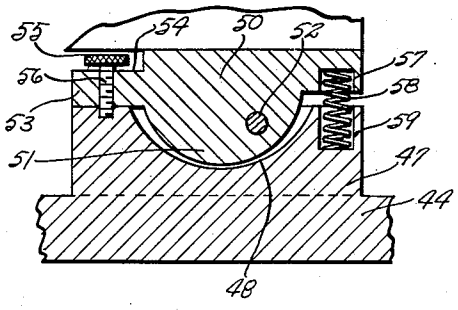


Fig. 7



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CHAIN SAW GRINDER

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7 Claims. (Cl. 76—41)

This invention relates to chain saw grinders.

It is an object of the present invention to provide a chain saw grinder wherein the chain is held in a vise which can be advanced a definite amount into the path of the grinding wheel to remove stock and reservice teeth uniform to each other, the device sharpening the chain back to factory tolerances without disassembling of the chain teeth.

Other objects of the invention are to provide a chain saw grinder bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a front elevational view of a preferred embodiment of the present invention;

Fig. 2 is a top plan view thereof showing the grinding motor removed;

Fig. 3 is an end elevational view looking from the right of Fig. 1;

Fig. 4 is a fragmentary vertical sectional view taken along the line 4—4 of Fig. 1;

Fig. 5 is a vertical sectional view taken along the line 5—5 of Fig. 2;

Fig. 6 is a vertical sectional view taken along the line 6—6 of Fig. 2; and

Fig. 7 is a vertical sectional view taken along the line 7—7 of Fig. 2.

Referring now more in detail to the drawing, **10** indicates generally a body frame having a flat rectangular lower portion **11** adapted to be mounted in a vise or the like, the upper portion being thickened laterally as at **12** and being provided with a vertically extending ways **13** of substantially trapezoidal shape and including the gib **14** and the gib adjusting screws **15**.

The upper end of the frame is integrally formed with the shelf **16** at right angles thereto, the ends of the shelf extending beyond the vertical edges of the frame. It will be noted (Fig. 1) that the ways **13** extend upwardly to the upper surface of the shelf **16**. The shelf **16** is provided with the way **17** of trapezoidal shape (Fig. 6) which extends from end to end, the gib **17'** being provided therefor. A rectangular plate **18** is integrally formed at its lower end with the laterally enlarged portion of trapezoidal shape **19** adapted to slide within the way **17**, the upper edge of the plate **18** having the rectangular cutout **20** which defines the stationary jaw **21**, Fig. 6. A movable jaw **22** is positioned within the cutout **20** and is adapted for cooperative movement with the stationary jaw **21** by means of the lock screw **23** having the handle portion **24**. Dowels **25** align the moveable jaw **22** laterally with the stationary jaw **21** while the springs **26** positioned within laterally aligned cylindrical openings on the inner faces of the jaws **21** and **22** at

opposite ends serve to make the vise self-opening when the lock screw **23** is released.

As shown in Fig. 2, the jaw **21** at one end is integrally formed with the laterally extending, internally threaded member **27** within which is screwed the externally threaded portion **28** of the feed mechanism indicated generally at **29**. An L-shaped bracket **30** is mounted on the undersurface of the shelf **16** at one end thereof by means of the fastening means **31** and rotatably mounts the feed mechanism **29** against longitudinal displacement intermediate the smooth cylindrical portion **32** thereof and the collar **33**. The feed mechanism **29** also includes the enlarged, externally knurled operating knob **34** and upon rotation of the same, it will be obvious that the vise will move longitudinally the desired amount within the way **17**.

A supporting angle bracket **35** is integrally formed on its rear vertical face with the trapezoidal shaped extension slidable vertically within the way **13**, the vertical position of the bracket being locked by the lock screw **36** having the handle portion **37'** (Fig. 3).

The vertical adjustment of the supporting bracket **35** is effected by the cam assembly indicated generally at **37** and locked at the proper height for co-action by the lock screw **36**, the cam assembly **37** including the cam lock nut **38** which allows for raising and lowering the cam assembly **37** in the frame **10** for making the grinder universal for all chains.

The bracket **35** rotatably mounts the semicircular end portion **39** of the rectangular plate **40** of the compound slide indicated generally at **41** by means of the countersunk rivet **42**, the upper surface of the plate **40** outwardly of the rivet **42** being integrally formed with the trapezoidal shaped extension **43**.

A carrier is provided and includes the base plate **44** formed on its undersurface with the way **45** having the gib **46** and within which is slidably positioned the extension **43**, to permit the necessary movement of the carrier, the plate **44** being integrally formed at the center thereof with the vertical mounting plate **47** having a longitudinally extending substantially semicircular opening **48**.

An electric motor grinder indicated generally at **49** is provided on its undersurface with the depending vertical plate **50** integrally formed with the semicircular depending extension **51** which is pivotally mounted within the semicircular opening **48** by means of the pin **52** and adapted for free movement therewithin with one end **53** of the plate **50** resting on the upper surface of the plate **47** (Fig. 7). The plate **50** above the end **53** is provided with the cutout **54** which receives therewithin the externally knurled head **55** of the tilt adjustment screw **56** (Fig. 7). The other end of the plate **50** is vertically spaced above the upper surface of the plate **47** and is provided with the cylindrical bore **57** which receives therewithin the upper end of the coil spring **58**, the lower end of which is received within the cylindrical bore **59** provided in the plate **47**. The outer faces of plates **50** and **47** will be provided with suitable markings, not shown, to indicate the horizontal plane, while the bracket **35** is calibrated as at **60** to indicate the angular position of the plate **40** and the compound slide **41**. By means of this construction, the electric motor grinder **49** may be tilted for grinding.

In operation, the frame **10** holds or supports all the other members and allows for vertical and horizontal adjustments. The cooperating vise jaws **21** and **22** actuated by the screw **23** will hold the chain **61** rigid and will allow for the precise horizontal adjustment of the same controlled by the feed mechanism **29**. The bracket **35** allows for the vertical adjustment of the compound slide **41** controlled by the cam assembly **37** and locked

at the proper height by the lock screw **36**. The pivot **42** allows the proper angular adjustment which may be set at any number of degrees for the proper cooperative action of the grinding wheel to the teeth of the chain **61**. The carrier **44, 47** allows the grinding wheel to be traversed back and forth through the tooth of the chain **61**.

The above grinder has been in operation for field testing and research work and has been tested for nearly a year and has proved entirely satisfactory in all respects. The tilt mechanism will permit the sharpening of the chains in planes other than the horizontal and represents a decided advantage. The device will permit the jointing and grinding of the depth gauges by grinding them axially.

The chain **61** is placed in the vise with the compound slide **41** set at the proper angle to the left or right depending upon which teeth in the chain we are grinding, the link rivet of the tooth we are grinding is placed over the lock screw and the vice is locked. With the motor running and in position full ahead to contact the tooth, the tooth is advanced to the grinding wheel until there is a slight grinding spark and then advanced 0.003 or 0.005 more or one-eighth of a turn of the feed wheel **34** with the grinding wheel out of the tooth and the grinder **49** is run back and forth by hand a few strokes and we are ready to proceed to the next tooth. If the chain has been hand filed, and the angle is off, which is usually the case, it is necessary to repeat the 0.003 to 0.005 inch advance once or twice more before moving to the next tooth. The above assumes that the grinder, compound slide and support have been properly elevated with the elevating cam assembly **37** so as to initially position the stone or grinding wheel **61'** above the level of the cutting tooth.

The above chain grinder has been designed in considering the fact that all hand file chains have to be ground considerably to get them back to factory specifications, and this grinding can be done with ease with the present invention.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What we claim as new and desire to protect by Letters Patent of the United States is:

1. A chain saw grinder comprising a body frame, a horizontal shelf at the upper end of said frame, vise means adapted to grip the chain therewithin, means slidably mounting said vise means on said shelf, means for adjusting said vise means on said shelf, a support, means slidably mounting said support upon said frame for vertical movement, means for adjusting the position of said support, means for locking the support at the adjusted position, an elongated plate pivotally mounted upon said support and extending outwardly from said vise, a carrier, means slidably mounting said carrier on said plate for longitudinal movement thereon, an electric grinder, and means for mounting said electric grinder on said carrier for adjustment about a horizontal axis, said vise means comprising a vertical plate having a cutout along the upper edge at one side and defining a stationary jaw, removable jaw positioned within said cutout and adapted for cooperative action with said stationary jaw, means for drawing said stationary and movable jaws together, spring means for urging said jaws apart, dowel means for aligning said stationary and movable jaws laterally with each other during movement, and said means for slidably mounting said vise means on said shelf comprising said shelf having a trapezoidally shaped way extending from end to end, said plate at the lower end being integrally formed with a lateral enlargement of substantially trapezoidal shape adapted to move within said way, and gib means at one side of said way.

2. A chain saw grinder according to claim 2, said means for adjusting the position of said vise means comprising said plate at one end having a lateral extension having an internally threaded bore, an L-shaped bracket secured to the end of said shelf, a feed mechanism including an externally threaded shank screw threaded through said extension, said feed mechanism including a cylindrical portion abutting the outer face of said bracket, a collar abutting the inner face of said bracket and secured to said externally threaded portion and an enlarged manually operable knob whereby upon rotation of said knob said vise means will move longitudinally of said shelf to the desired position.

3. A chain saw grinder according to claim 2, said means for mounting said support on said body frame comprising said body frame being formed with a vertically extending way of substantially trapezoidal cross section, gib means at one side of said way, said support on the inner face thereof being formed with an extension of substantially trapezoidal cross section slidable within said way, means for locking said support comprising lock screw means.

4. A chain saw grinder according to claim 3, said means for adjusting the vertical position of said support comprising cam assembly means, said cam assembly means being adjustable within said body frame.

5. A chain saw grinder according to claim 4, said means for slidably mounting said carrier on said plate comprising said plate on the upper surface thereof being integrally formed with a longitudinally extending trapezoidal cross section, said carrier including a base plate having a way on the undersurface thereof of trapezoidal cross section receiving said extension therewithin, gib means at one side of said way, said carrier including a vertical plate extending upwardly from said base plate at right angles thereto.

6. A chain saw grinder according to claim 5, said means for mounting said electric grinder on said carrier comprising said vertical plate having an elongated opening of substantially semicircular shape, a depending plate secured to the bottom of said electric grinder, said depending plate at the center thereof being integrally formed with a depending semicircular portion pivotally mounted within said semicircular opening and adapted for rotational movement therewithin, one end of said depending plate resting on the upper surface of said vertical carrier plate and having a cutout portion thereabove, a tilt screw having an enlarged head within said cutout and screw threaded downwardly through said plate and carrier, the other end of said depending plate being vertically spaced from the upper surface of said vertical carrier plate, said depending plate and carrier plate having vertically aligned openings, and a coil spring positioned within said vertically aligned openings.

7. A chain saw grinder according to claim 6, including cooperating indicia on said depending plate and carrier to indicate when the grinder is in a horizontal position, and cooperating indicia carried by said support and the end of said plate pivotally mounted thereon whereby to indicate the angulation of the grinder.

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