Jan. 10, 1956 W. H. DURST 2,729,923

JOINTER SHARPENER

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Fig. 1.

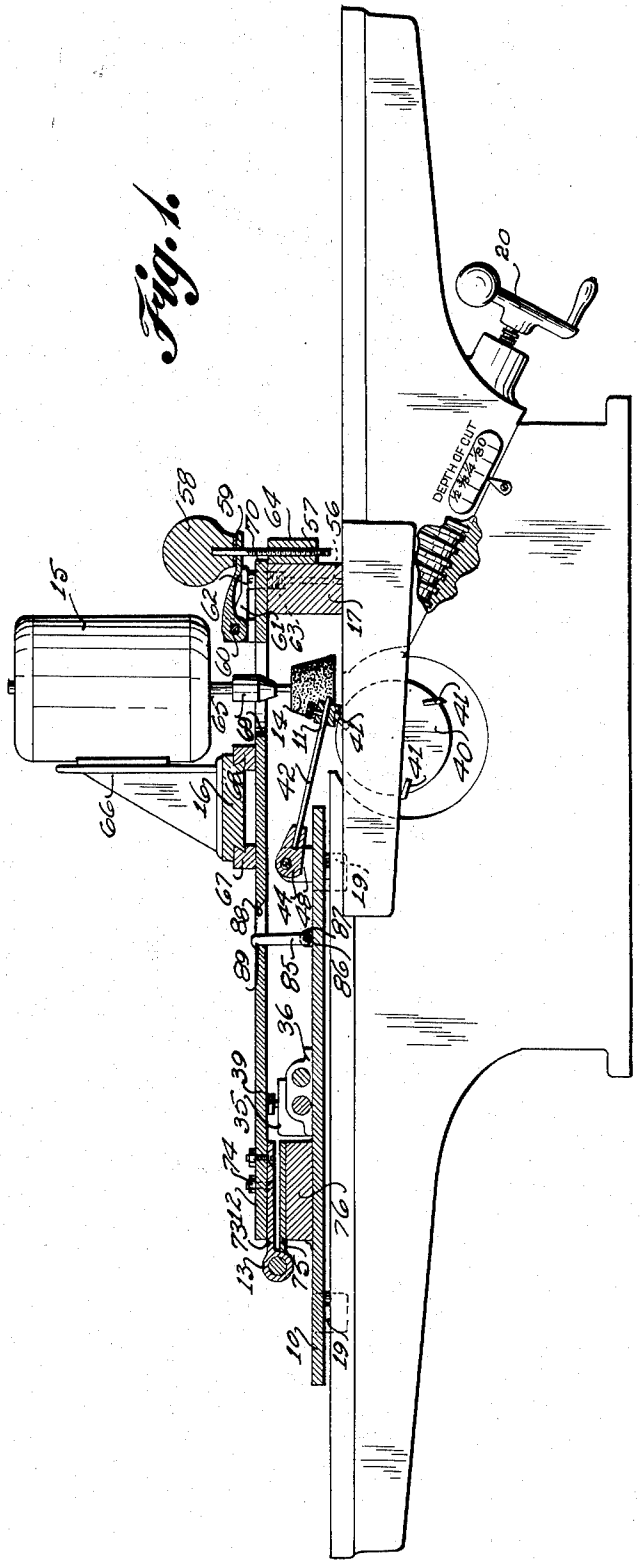
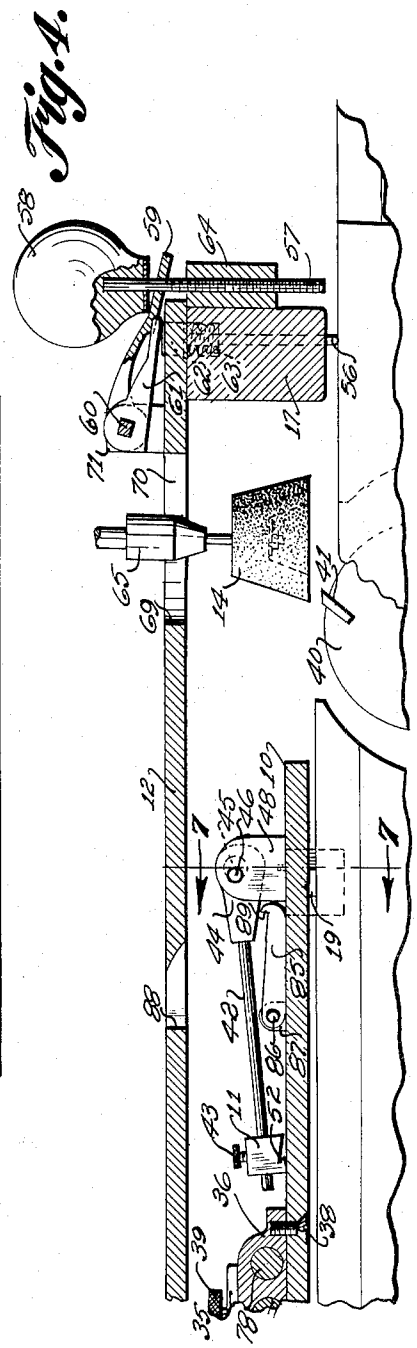


Fig. 4.



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Fig. 2.

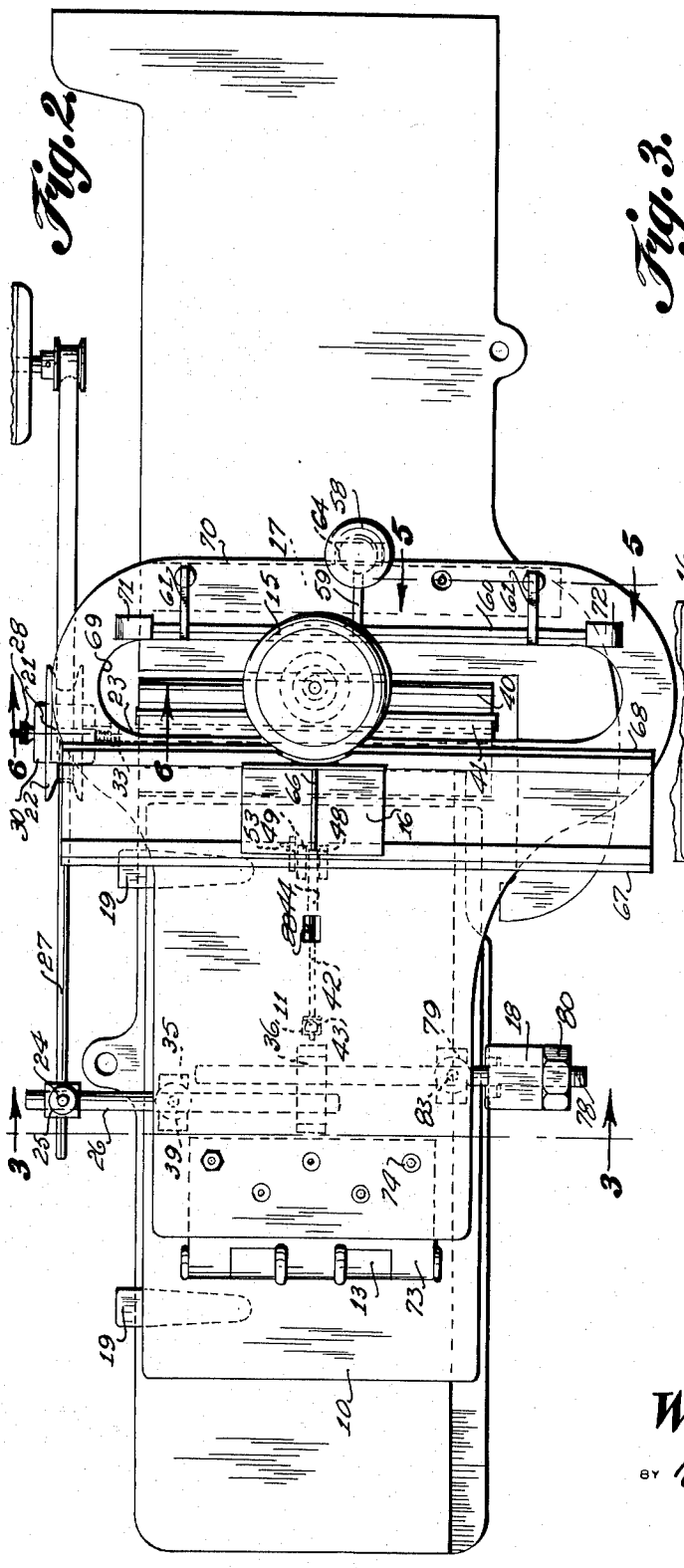
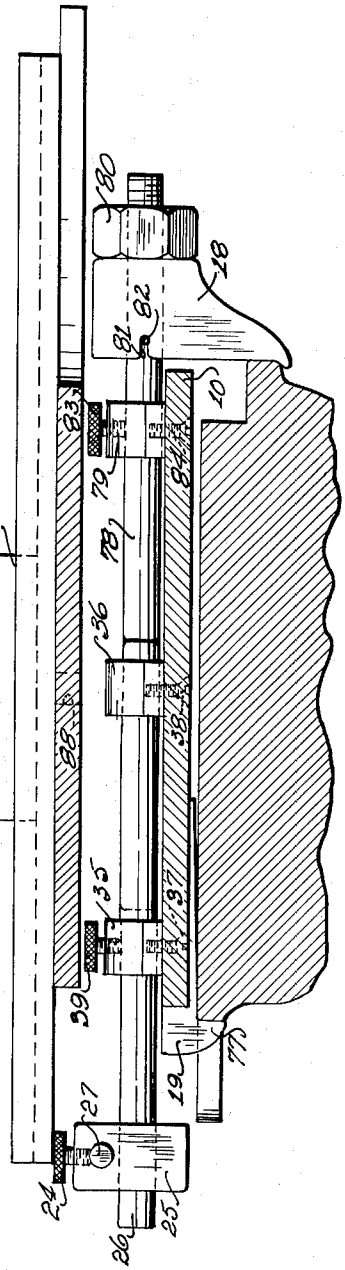


Fig. 3.



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JOINTER SHARPENER

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Fig. 6.

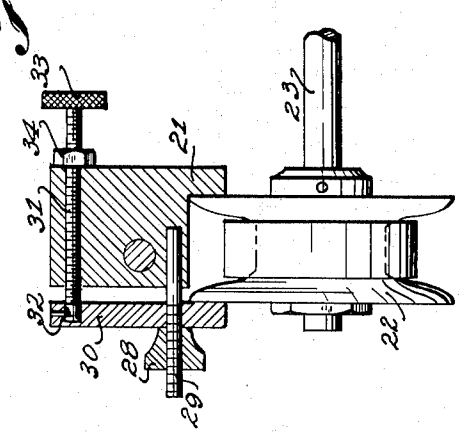


Fig. 7.

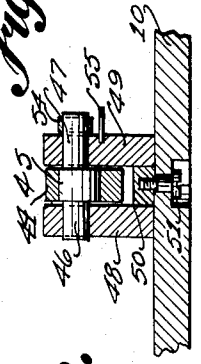


Fig. 10.

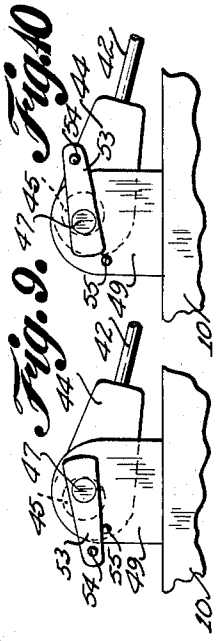


Fig. 9.

Fig. 8.

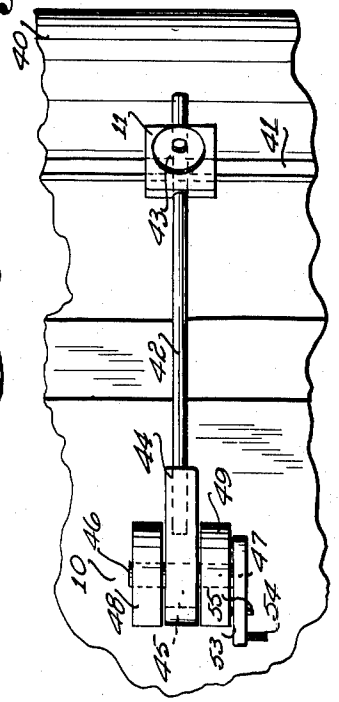
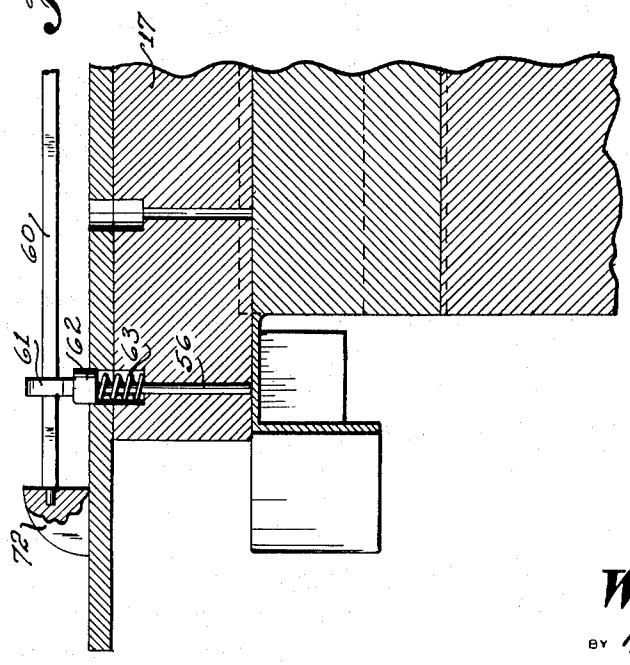


Fig. 5.



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JOINTER SHARPENER

Walter H. Durst, Seattle, Wash.

Application May 1, 1953, Serial No. 352,353

2 Claims. (Cl. 51—173)

This invention relates to grinding and sharpening devices particularly adapted for sharpening cutter knives or blades of jointer cutter heads, and in particular an attachment adapted to be positioned on the bed in which a motor driven grinding wheel is mounted to travel transversely across the bed of the jointer for, selectively, grinding the cutter knives with the knives in position in the jointer.

The purpose of this invention is to provide a sharpening attachment with which all of the cutter knives of a cutter head may be ground to the same angle and to the same distance from the center while in position in the machine.

Although machines have been provided for sharpening cutter blades of large jointers the conventional method of grinding cutter knives or blades of small jointers and the like is to remove the cutter heads from the machine and the blades are removed from the cutter head, and in reassembling the cutter heads it is difficult to accurately position the cutters whereby a smooth easy cut is obtained. With this thought in mind this invention contemplates an attachment adapted to be clamped on the bed of a jointer having a cutter head therein in which a grinding wheel carried by the attachment is adapted to be moved across the cutting edges of the cutters with the wheel rotating so that one cutter after another may readily be sharpened.

The object of this invention is, therefore, to provide means for mounting a grinding wheel on the bed of a jointer whereby the grinding wheel may be moved longitudinally of the cutter blades as it is rotated and wherein the grinding wheel remains in operative position until all of the blades of the cutter head are sharpened.

Another object of the invention is to provide a grinding attachment for sharpening cutter blades of cutter heads with the blades in position in which the attachment may be mounted upon the bed of a jointer without changing and also without making permanent connections to the bed.

A further object of the invention is to provide an attachment for grinding cutter blades of cutter heads, particularly of jointers with the heads in position in which the attachment is of a comparatively simple and economical construction.

With these and other objects and advantages in view the invention embodies a base plate adapted to be clamped to the bed of a jointer, a gauge block pivotally mounted on the base plate and positioned to engage cutter knives of a cutter head mounted in the bed of a jointer, a carrier plate hinged to the base plate and positioned in spaced relation to the base plate, a pair of rails mounted on the carrier plate and positioned to extend transversely across the bed of the jointer, adjusting and thumb screws for clamping the parts in operative positions, and a grinding wheel carried by a motor mounted to travel in the rails of the carrier plate whereby the grinding wheel is positioned to engage sharp edges of cutter knives of a cutter head in the jointer.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a side elevational view showing a jointer with the cutter knife grinding attachment positioned thereon and showing a longitudinal section through the attachment.

Figure 2 is a plan view of a jointer also showing the cutter knife grinding attachment thereon.

Figure 3 is a cross section taken on line 3—3 of Fig. 2 with the parts shown on an enlarged scale illustrating the method of clamping the attachment on the bed of the machine.

Figure 4 is a view showing a longitudinal section through part of the grinding attachment also with the parts shown on an enlarged scale and with portions of the parts broken away.

Figure 5 is a detail showing a section taken on line 5—5 of Fig. 2 illustrating the mounting of locating pins in the attachment and showing the mounting of the cutter head in the machine.

Figure 6 is a detail showing a section taken on line 6—6 of Fig. 2 showing the driving pulley of the cutter head and illustrating a clamp for securing the cutter head in position.

Figure 7 is a detail showing a section taken on line 7—7 of Fig. 4 illustrating the mounting of the indexes block on the base plate of the attachment.

Figure 8 is a plan view also showing the indexes block mounting and illustrating the position of the gauge block on a cutter knife with part of the cutter head broken away.

Figure 9 is a detail showing the eccentric mounting of the indexes block arm showing the pin of the eccentric mounting in the forward position.

Figure 10 is a detail similar to that shown in Fig. 9 showing the position of the eccentric pin reversed.

Referring now to the drawings wherein like reference characters denote corresponding parts the improved jointer knife grinding attachment of this invention includes a base plate **10**, an indexer block **11** pivotally mounted on the base plate, a carrier plate **12** pivotally connected to the base plate with a hinge **13**, a grinding wheel **14** carried by a motor **15** mounted on a slider **16** that is positioned to travel in parallel rails and a feed mechanism stop block **17**.

The base plate **10** is clamped securely to the rear or outfeed end of the jointer by clamping members **18** and **19** whereby the machine is anchored securely to the jointer in which the blades are to be sharpened.

The carrier plate **12** is positioned substantially parallel to the base plate **10** and the front end of the plate, which is carried by the block **17** rests upon the front or infeed end of the jointer bed.

The base plate is positioned on the rear jointer bed with the front edge spaced inwardly from the front edge of the jointer bed in which position it is secured with the clamp elements. With the base plate in position the lower front jointer infeed bed is lowered by the conventional crank **20** of the machine to the desired elevation, such as one-eighth inch on steps of cut gauge.

With the carrier plate swung back about the hinge **13** the cutter head clamping mechanism is adjusted whereby a clamp block **21** is centered over a driving pulley **22** on a shaft **23** and with the block centered over the pulley a thumb screw **24** of a set collar **25** on a shaft **26** is tightened to secure a rod **27** on which the block **21** is positioned in place.

The clamp block **21** is clamped in position with a knurled nut **28** that is threaded on a stud **29**, extended from the block, and the nut **28** clamps a plate **30** against the outer flange of the pulley **22**. The clamp block **21**

is provided with an adjusting screw **31** that is threaded through the upper part of the block, and as shown in Fig. 6, the screw **31** is fitted into a slot **32** in the upper edge of the plate **30**. The adjusting screw **31** is also provided with a knurled head **33** and a lock nut **34**. The shaft **26** is secured in bearings **35** and **36** on the base plate **10**, the bearings being secured to the plate with screws **37** and **38**, respectively, and the shaft being secured in the bearings **35** with a thumb screw **39**.

Before tightening the screws of the clamp block **21**, rotate the cutter head **40** of the jointer until the bevel on one of the knives **41** is in the same plane as that of the infeed jointer bed with the bed set at a depth of ⅛ inch by the bell crank **20** using a short straight edge across the infeed jointer bed and cutter knife, then tighten the screws of the clamp block **21** thereby securing the cutter knife in the correct position for sharpening.

With the parts in these positions swing the cutter head indexer block assembly from the position shown in Fig. 4 to that shown in Fig. 1 whereby the block is at a right angle to the cutter knife.

The block **11** is adjustably mounted on a rod **42**, being held in position with a thumb screw **43** and a base **44** of the rod **42** is pivotally mounted on a hub **45**, from the sides of which eccentrically positioned pins **46** and **47** extend. The pins **46** and **47** are pivotally mounted in plates **48** and **49**, respectively, which extend upwardly from the base **50** and the base **50** is secured to the base plate **10** with a screw **51**.

The lower surface of the indexer block **11** is provided with a notch **52**, the horizontally disposed surface of which is parallel to the beveled surface of the blade **41** with the parts in the position shown in Fig. 1.

The eccentrically positioned pin **47** is provided with an extended end and a gauge lever **53** is mounted on the end, as illustrated in Figs. 9 and 10, and this lever which is provided with a handle **54** is positioned to engage a stop pin **55** with the block **11** positioned over a cutting blade of the cutter head. This indexer block assembly pivots on the base **50** and screw **51**, so that it can swing around over the base plate where it is out of the way during the sharpening operation.

In setting the block **11** the position of the block on the rod **42** is adjusted until the notch **52** fits exactly over the front edge of the cutter head knife with the gauge lever **53** in engagement with the stop pin **55**. With the block **11** in this position the thumb screw **43** is tightened to secure the parts accurately in position. This indexer assembly makes it possible to bring the next cutter knife into the correct position for sharpening. After setting the block **11** the gauge lever **53** is turned over to the position shown in Fig. 10 whereby the block **11** is moved forward so that the notch **52** is released from the cutter knife, cutting edge. This assembly may then be moved back to the position shown in Fig. 4 and the gauge lever **53** returned to the position shown in Fig. 9.

With the parts in this position the carrier plate **12** is moved to the forward position shown in Fig. 1 whereby the feed mechanism stop block **17** rests upon the front or infeed bed of the jointer. In this operation care should be taken to be sure that the grinding wheel **14** is elevated to such a position that it clears the cutter knife **41**. Also in this operation care should be taken that the feed pins **56** are positioned upwardly in the block **17** whereby they do not engage the jointer bed. The positions of the pins **56** are adjusted by turning the adjusting screw **57** with a knob **58**, the lower end of the knob engaging the end of a lever **59** on a shaft **60** which also carries fingers **61** that engage heads **62** of the pins **56**. The pins **56** are resiliently urged upwardly by springs **63** and the screw **57** is threaded in a block **64** extended from the rear surface of the block **17**.

With the parts in this position the feed crank **20** is turned to the depth whereby the jointer bed is lowered until the base plate **10** and carrier plate **12** are parallel, in which position both plates are parallel with the bed plate of the jointer. In this position the jointer infeed bed is one-quarter of an inch lower than the jointer outfeed bed, whereby the depth of the cut gauge on the jointer will read one-quarter of an inch.

With the parts in these positions the chuck **65** on the motor shaft is loosened and the grinder wheel adjusted until it comes lightly in contact with the cutter knife **41**. The grinder wheel should be accurately positioned by moving the motor back and forth without the motor running to be sure that the grinding wheel is not too close to the cutter knife and after running the grinding wheel back and forth over the blade or knife the motor chuck is tightened.

The motor is adjustably mounted on a bracket **66** on the slider **16** and the slider is mounted to travel in parallel rails **67** and **68** which are mounted on the carrier plate **12**. By this means the motor is free to slide transversely of the jointer bed with the grinding wheel **14** extending through a transversely positioned opening **69** in a section **70** at the end of the plate **12**.

The block **17** extends from the under surface of the section **70** of the plate **12** and the rocker shaft **60** is journaled in bearings **71** and **72** extended upwardly from the upper surface of the plate.

The plate **12** is secured to the upper plate **73** of the hinge **13** with bolts **74** and the lower plate **75** of the hinge is secured to a spacing block **76** that is positioned on the base plate **10**, the block **76** being secured to the hinge and base plate, preferably by welding.

The clamp elements for securing the base plate **10** to the rear or outfeed end of the jointer bed includes the lugs **19** which are preferably welded to the base plate and which are provided with extensions **77** that grip the edge of the bed of the jointer and these extensions are held against the edge of the bed by the clamp blocks **18** which are slidably mounted on shafts **78** which extend through a bearing **79** and into the bearing **36**, and the block **18** is secured against the bed of the machine with a nut **80** threaded on the end of the shaft **78**. The clamp block **18** is provided with slots **81** that are positioned to receive pins **82** for locating the clamp blocks in relation to the bed of the jointer. The bearing **79** is provided with a thumb screw **83** for securing the shaft **78** in position and the bearing is secured to the base plate with screws **84**.

The device is provided with a latch **85** which is pivotally mounted by a pin **86** in a bearing **87** on the upper surface of the base plate and, as shown in Fig. 1, this latch is positioned to extend through an opening **88** in the carrier plate **12** with a projection **89** on the end extended over the edge of the plate for retaining the plate in the position shown in Fig. 1 for transportation. When not in use the latch **85** is turned to a position upon the base plate **10**, parallel to the plate.

Operation

With the parts positioned as hereinbefore described an operator, gripping the motor with his left hand slides the motor back and forth and after determining that the grinding wheel is lightly touching the cutter blade or knife the motor is started and as grinding proceeds the motor is moved back and forth with the left hand and, with the right hand, the operator turns the ball crank **20** on the jointer thereby slowly lowering the infeed bed of the jointer until the cutter knife is sharpened. This should not require much grinding and the crank **20** should be turned very slowly to permit the grinding wheel to have ample time to do a thorough grinding job.

After grinding the motor should be turned off and the carrier plate lifted to facilitate inspecting the knife and should further grinding be required ball crank located is rotated to adjust the position of the cutter head

whereby the grinding operation may be repeated. This operation may be repeated several times if found necessary and after the first blade is finished the ball crank **20** should not be turned in the grinding operation of additional blades. By this means all blades may be ground so that the cutting edge of each blade is exactly the same distance from the center.

In changing from one blade to another the clamp block **21** is loosened from the pulley **22** and each blade is set with the notch **52** of the block **11** being positioned over the cutting edge of the blade.

In setting the machine for grinding the second cutter knife the carrier plate **12** is held in a vertical position and the knob **58** is turned whereby the pins **56** extend from the block **17** about one-quarter of an inch or to such positions that when the ends of the pins rest upon the jointer infeed bed the grinding wheels **14** clears the cutter knife.

In sharpening the second cutter knife instead of turning the ball crank **20** the position of the grinding wheel is adjusted by turning the knob **58** whereby the feed mechanism pins **56** recede up into the block **17** allowing the block to come to rest upon the jointer bed, whereby the grinding of the second cutter knife finishes the knife to the same distance from the center as that of the first knife.

This operation is repeated for following knives.

It will be understood that modifications, within the scope of the appended claims, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. In a cutter knife sharpening attachment for use on a jointer having a bed, a base plate, a clamp for securing the base plate to the bed of the jointer, a carrier plate hinged to and positioned above the base plate in parallel longitudinal alignment with said baseplate, a feed mechanism block carried by an extended end of the carrier plate, adjusting means in

said feed mechanism block for adjusting the elevation of the carrier plate in relation to the bed of the machine, parallel rails mounted on said carrier plate and extended transversely across the base plate, a motor mounted to slide in said rails and a grinding wheel carried by the motor and positioned to engage the cutter knives of said jointer.

2. In a cutter knife sharpening attachment for a jointer having a bed, a base plate, means for clamping the base plate in position on the bed of the jointer, a carrier plate hinged to and positioned above the base plate in parallel longitudinal alignment with said base plate, a feed mechanism block carried by an extended end of the carrier plate and positioned to space the carrier plate from the bed of the jointer, resiliently held pins extended through said feed mechanism block, arms carried by a rocker shaft pivotally mounted on the carrier plate and positioned to engage the pins in the feed mechanism block, an adjusting screw for actuating the rocker shaft to adjust the pins of the feed mechanism block, an indexer block adjustably mounted on the base plate, a motor slidably mounted on the carrier plate and positioned to travel transversely across the base plate, and a grinding wheel carried by the motor and positioned to engage cutter knives of the jointer.

References Cited in the file of this patent

UNITED STATES PATENTS

831,541	Davis	Sept. 25, 1906
900,284	Kahle	Oct. 6, 1908
1,038,500	Foley	Sept. 10, 1912
1,085,876	Redden	Feb. 3, 1914
2,347,800	Sjostrand	May 2, 1944
2,549,147	Walters	Apr. 17, 1951
2,620,606	Dvorak	Dec. 9, 1952

FOREIGN PATENTS

804,070	Germany	Apr. 16, 1951