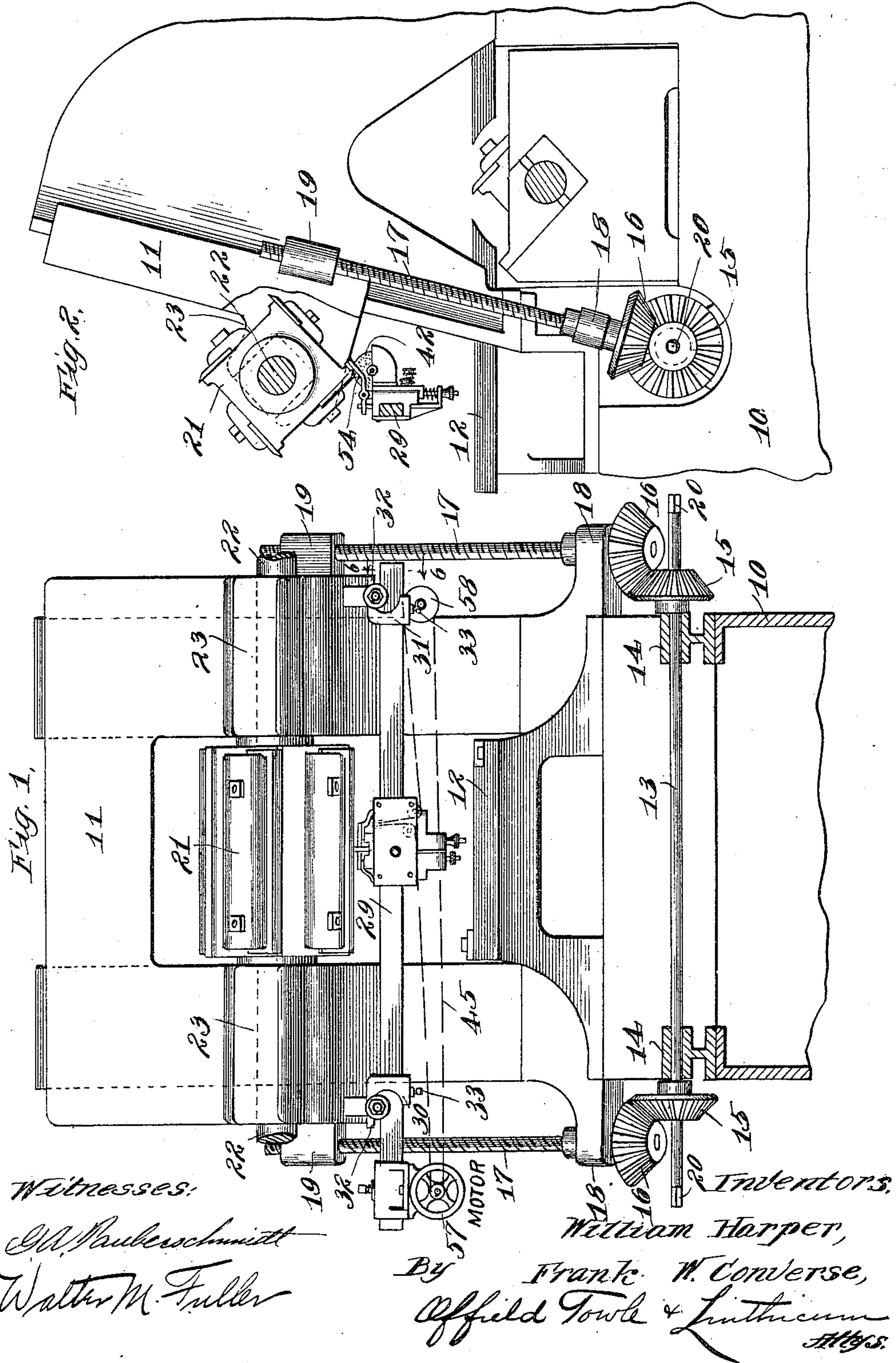


W. HARPER & F. W. CONVERSE.
 PLANER KNIFE SHARPENER.
 APPLICATION FILED SEPT. 18, 1908.

993,366.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

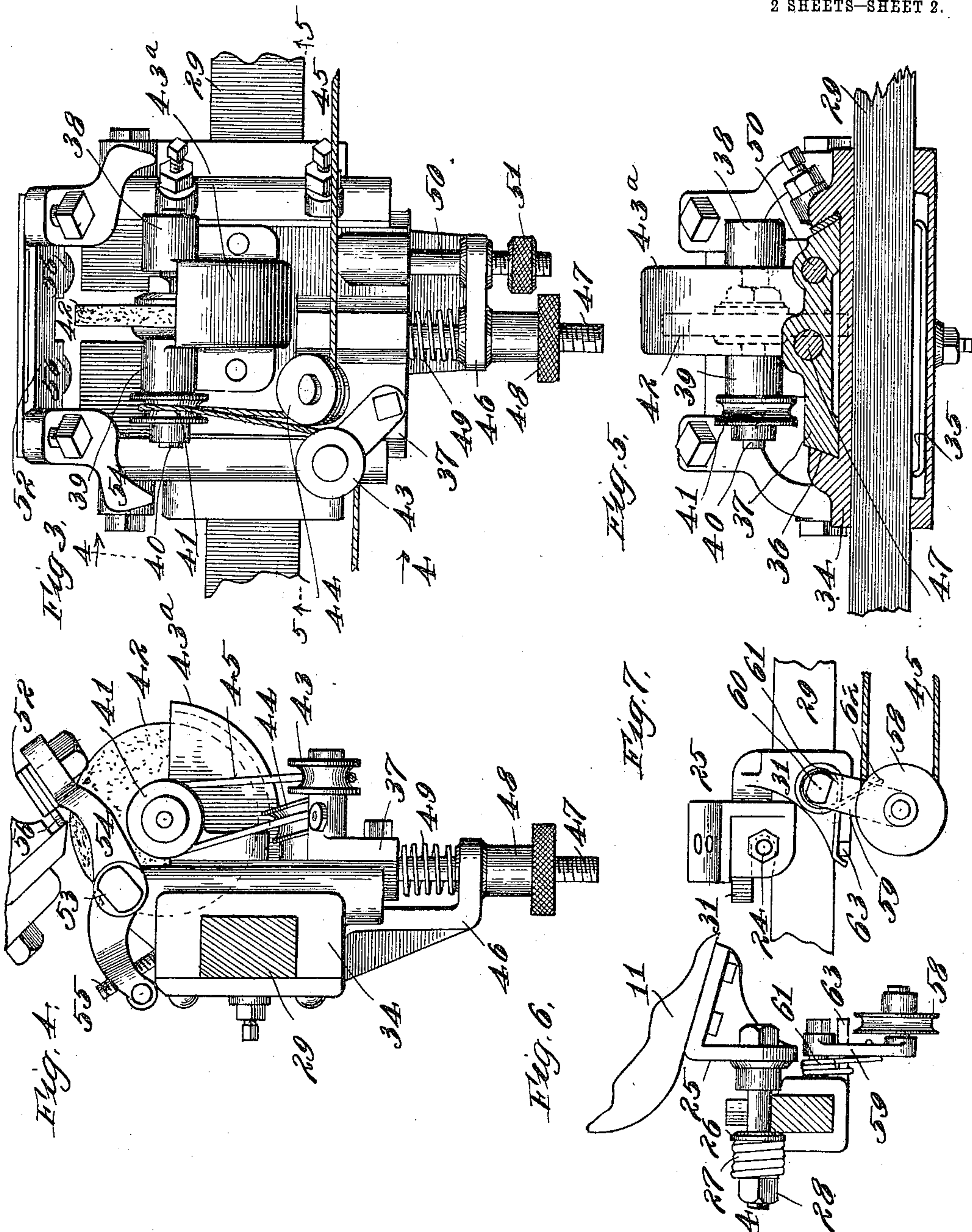


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Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM HARPER AND FRANK WILLARD CONVERSE, OF BELOIT, WISCONSIN, ASSIGNORS TO THE BERLIN MACHINE WORKS, OF BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN.

PLANER-KNIFE SHARPENER.

993,366.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed September 18, 1908. Serial No. 453,593.

To all whom it may concern:

Be it known that we, WILLIAM HARPER and FRANK W. CONVERSE, citizens of the United States, both residing at Beloit, in the county of Rock and State of Wisconsin, have jointly invented certain new and useful Improvements in Planer-Knife Sharpeners, of which the following is a specification.

Our invention concerns devices for sharpening the knives of planer heads or cylinders, whereby their edges will be exactly parallel to the horizontal plane surface of the platen regardless of improper alinement or uneven wear of the bearings for the cylinder shaft. Accordingly, we mount the sharpener on the frame of the machine and sharpen the knives while they are in planing or operative position, the sharpener desirably having a rotary emery or similar wheel slidable on a supporting bar and driven by an electric or other motor also preferably mounted on the bar.

On the accompanying drawings, which form a part of this specification, and to which reference should be made in connection with the following detailed description, we have illustrated a desirable embodiment of our invention, like reference characters referring to the same parts throughout the various views.

On these drawings,—Figure 1 is a vertical section through a planer of the ordinary construction, showing our knife-sharpening device applied thereto; Fig. 2 is a side elevation, certain parts being in section and others broken away, of the central portion of a planer having mounted thereon our sharpening mechanism; Fig. 3 is a side elevation of the sharpener illustrating a portion of the bar on which it is mounted; Fig. 4 is a section on line 4—4 of Fig. 3, as viewed in the direction indicated by the arrows; Fig. 5 is a horizontal section on line 5—5 of Fig. 3, as viewed in the direction indicated by the arrows; Fig. 6 is a section on line 6—6 of Fig. 1; and Fig. 7 is a side elevation of the construction shown in Fig. 6, the portion of the yoke shown in Fig. 6 being omitted.

Referring to the drawings it will be noticed that in Figs. 1 and 2 we have illustrated portions of an ordinary wood planer having the usual base or frame 10 on which a supporting-yoke 11 is adjustable toward and from the platen 12 by means of a transverse shaft 13 rotatable in a pair of bearings 14 on the frame 10, and equipped at each end with a bevel pinion 15, each of which meshes with the teeth of another bevel gear 16 on the lower end of a screw-shaft 17 having a bearing at 18 and a screw-threaded connection with the side or lateral ear 19 on the yoke. By applying a wrench or handle to either of the squared ends 20 of the shaft 13 and rotating the same the yoke may be adjusted substantially-vertically in parallel relation to the top horizontal surface of the platen 12. The yoke 11 carries and supports the usual knife-equipped cylinder 21, the shaft 22 of which is rotatable in the bearings 23, 23. Our improved grinding mechanism is preferably supported on this adjustable yoke by means of a pair of supporting studs or posts 24, each secured to a bracket 25 bolted or otherwise secured to the under surface of the yoke 11. Each stud or rod 24 has slidably mounted thereon a bevel washer 26 yieldingly pressed toward the bracket by a compression spring 27, the tension or action of which may be regulated and adjusted by turning the nut 28 against which one end of the spring bears. The grinder or sharpener proper is slidably mounted on a transverse supporting bar 29 detachably secured to the supporting studs or posts 24 by means of a pair of jaw members 30 and 31 slidably mounted on the bar and each equipped with an outwardly-projecting jaw or finger 32 adapted to extend over one of the posts 24 to support the bar, the under surface of each of these jaws being slightly inclined so as to secure a wedge action on the studs or posts. These jaw members 30 and 31 may be readily fixed in supporting and operative position by the set-screws 33 adapted to bear against the under surface of the supporting bar 29.

The grinder proper is mounted on a

bracket or member 34 slidable longitudinally on the bar and equipped with an internal spring 35 bearing against one face of the bar and acting to prevent the support or member 34 from vibration. On one face this block 34 has an undercut vertical groove 36, slidable and adjustable in which we provide a grinder-block 37 having at its upper end the pair of bearings 38 and 39, rotatable in which is a grinder-shaft 40 equipped with a grooved operating pulley 41 and having between the bearings a grinding wheel 42 of emery or other suitable material, the wheel being partially incased by a housing 43^a supported on the sliding block 37. Also suitably mounted on the block 37 are a pair of grooved guide sheaves or small pulleys 43 and 44, coöperating with which is a cord or driving belt 45 which passes around the pulley 41 to operate the grinding wheel, and is driven by mechanism described hereinafter.

The block or support 34 is equipped on its lower portion with a depending bracket 46 slidable through an aperture of which is a screw-threaded rod 47 fixed at its inner end and to the adjustable block 37, the threaded rod having a knurled nut 48 below the bracket 46, and above the latter, and interposed between its top face and the bottom face of the block 37, we place a coil expansion-spring 49 which yieldingly holds the grinding wheel up to its work, the travel of the block 37 being limited by the engagement of the nut 48 with the bracket 46. The sliding block 37 is also provided with another threaded rod or post 50 fixed thereto and extending through another aperture of the bracket 46, the threaded portion of this rod or shaft having thereon a supplemental stop or gage-nut 51, by the use of which the edges of all the knives may be made uniform.

A slotted stop bar 52 is hinged on the support 34 at 53 by means of a pair of side arms 54 which extend beyond the fulcrum or hinge-pin 53 and are provided with adjustable limiting or stop screws 55, a pair of rollers 56 rotatably mounted in the groove of the bar 52 projecting out of the same at one side and being adapted to be engaged by the faces of the knives during the grinding operation, as is indicated in Fig. 4.

On the outer end of the transverse grinder-supporting bar 29 we position an electric or other motor 57 around the driving pulley of which the belt or cable 45 passes, while at the other end of the bar this cable or belt encircles a guiding pulley 58 rotatably-mounted on the lower end of an arm 59, hinged at 60 to the jaw member 31, and spring-pressed away from the motor 57 by a spring 61 encircling the hinge-pin or stud, and bearing at its opposite ends

against the arm 59 at 62 and against a projection 63 on the jaw member 31.

The operation of this device is substantially as follows: The planer cylinder 21 is turned around until the knife thereof to be ground or acted upon by the grinding wheel 52 comes in contact with the stop or gage rollers 56, as is shown in Fig. 4. The adjustable grinder-plate or block 37 is then fed upwardly by the manipulation of nut 48 sufficiently to act on the edge of the knife and sharpen the same, the emery or other wheel 42 being rotated by the belt 45, driven by the electric or other motor 57, and passing around the pulleys 43, 41, 44 and 58. The support or bracket 34 is pushed along the bar 29 to grind all portions of the knife edge, as will be readily understood, the knife when being sharpened being in planing or operative position, and since the bar 29 is supported by the studs or posts 24 in exact parallelism with the top horizontal surface of the platen, the knife edges will be ground exactly parallel to the platen, so that after the grinder has been removed the cylinder will be capable of producing boards or lumber of uniform thickness, regardless of the uneven wearing of the bearings of the cylinder shaft or the improper position thereof. The grinding wheel 42 may be fed up gradually to put the proper edge on the knife, the upward travel of the wheel and its sliding block 37 being limited by the stop or gage-nut 51. It will be observed that the spring-actuated pulley 58 at all times maintains the operating belt 45 taut so that an effective and efficient operation of the grinding wheel is secured. When the next knife on the cylinder is to be ground, the one already operated upon can pass by the stop or gage rollers 56, since the bar 52 can be swung temporarily out of the way on the fulcrums or hinge-pins 53. After all the knives have been ground and sharpened the bar 29 and the parts supported thereby may be readily removed from the studs 24 by loosening one or more of the set-screws 33 and sliding one or both of the jaw members 30 and 31 on the bar so as to permit detachment of the entire grinding mechanism from the studs or posts.

Our invention not being limited to the precise and exact structural features herein shown and described, it is to be understood that many minor changes may be made in this embodiment of our construction without departure from the substance and essence of our invention.

We claim:

1. The combination of a planer having a frame, a platen and a planer-cylinder equipped with knives, a pair of studs

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mounted on said frame, a bar, a plurality of jaw members slidable on said bar and adapted to engage said studs, a grinder slidable on said bar and adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, substantially as described.

2. The combination of a planer having a frame, a platen, and a planer-cylinder equipped with knives, a grinder-support, means comprising studs and jaw members adapted to engage therewith for securing said grinder support on said frame, a rotary grinder slidable on said support, means to prevent vibrations of the grinder and a motor for rotating said grinder also mounted on said support, said grinder being adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, substantially as described.

3. The combination of a planer having a frame, a platen, and a planer-cylinder equipped with knives, a grinder-support mounted on said frame, a rotary grinder slidable on said support, a driving motor on said support, a belt connection between said motor and grinder, permitting said grinder to move toward and from the motor, a belt-tightener for said belt, said grinder being adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, and means for yieldingly maintaining said grinder in position, substantially as described.

4. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from and in parallel relation to said platen, a rotary cylinder equipped with knives mounted on said support, a grinder-support also mounted on said cylinder-support, and a grinder movable on said support and adapted to grind the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, substantially as described.

5. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from and in parallel relation with said platen, a rotary cylinder equipped with knives on said support, a grinder-support on said cylinder-support, and a grinder movable on said support and adjustable relatively to said support toward and from the knives of said cylinder, and adapted to sharpen the edges of the knives while the knives are in that portion of their rotation

in which they meet the work and in parallelism with the surface of said platen, substantially as described.

6. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from and in parallel relation with said platen, a rotary cylinder equipped with knives mounted on said support, a grinder-support mounted on said cylinder-support, a rotary grinder movable on said support and adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, and means to rotate said grinder, substantially as described.

7. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from and in parallel relation with said platen, a rotary cylinder equipped with knives mounted on said support, a pair of studs on said cylinder-support, a bar suspended from said studs, and a grinder slidable on said bar and adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, substantially as described.

8. In a planer, the combination with a frame, of a platen, a cylinder-support adjustable toward and from and in parallel relation with said platen, a rotary cylinder equipped with knives mounted on said support, studs on said cylinder-support, a bar detachably secured to said studs, a rotary grinder slidable on said bar and adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, yielding means for holding said grinder in grinding position and a motor on said bar to drive said grinder, substantially as described.

9. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from and in parallel relation with said platen, a rotary cylinder equipped with knives mounted on said support, a pair of studs on said cylinder-support, a bar detachably secured to said studs, a rotary grinder slidable on said bar and adapted to sharpen the edges of the knives while the knives are in that portion of their rotation in which they meet the work and in parallelism with the surface of said platen, a device for adjusting the position of the grinder, and yielding means for holding said grinder in adjusted position, a driving motor on said bar, a belt connecting said motor to said grinder, and a belt-tightener acting on said belt, substantially as described.

10. In a planer, the combination of a

frame, a platen, a cylinder-support adjustable toward and from and in parallel relation with said platen, a rotary cylinder equipped with knives mounted on said support, a driving motor on said support, a connection between said motor and grinder, a pair of studs on said support, a bar detachably secured to said studs, a rotary grinder slidable on said bar and adapted to sharpen the edges of the knives while they are in that portion of their rotation in which they meet the work, means for preventing vibration of the grinder, and yielding means

for holding the grinder in grinding position, substantially as described.

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