W. HARPER.

PLANER KNIFE JOINTER.

APPLICATION FILED SEPT. 18, 1908.

993,367.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

Fig. 2.

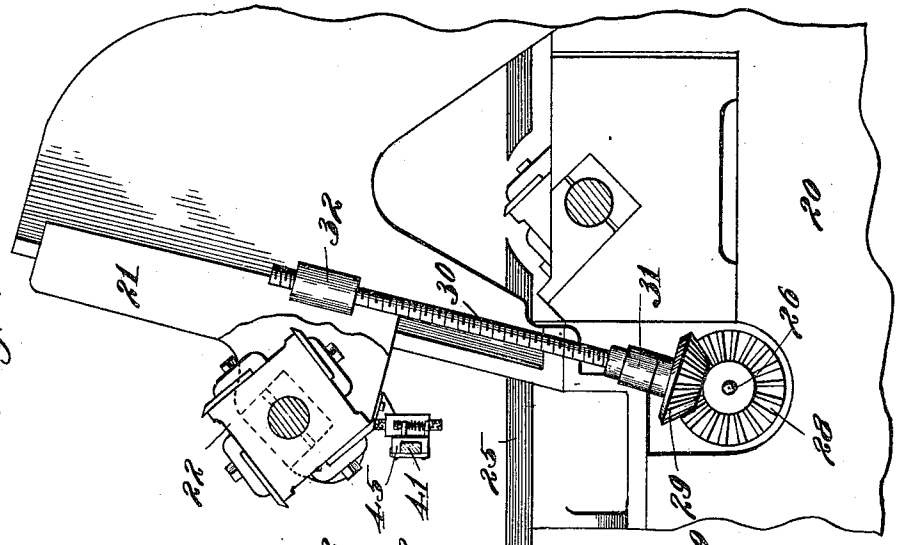
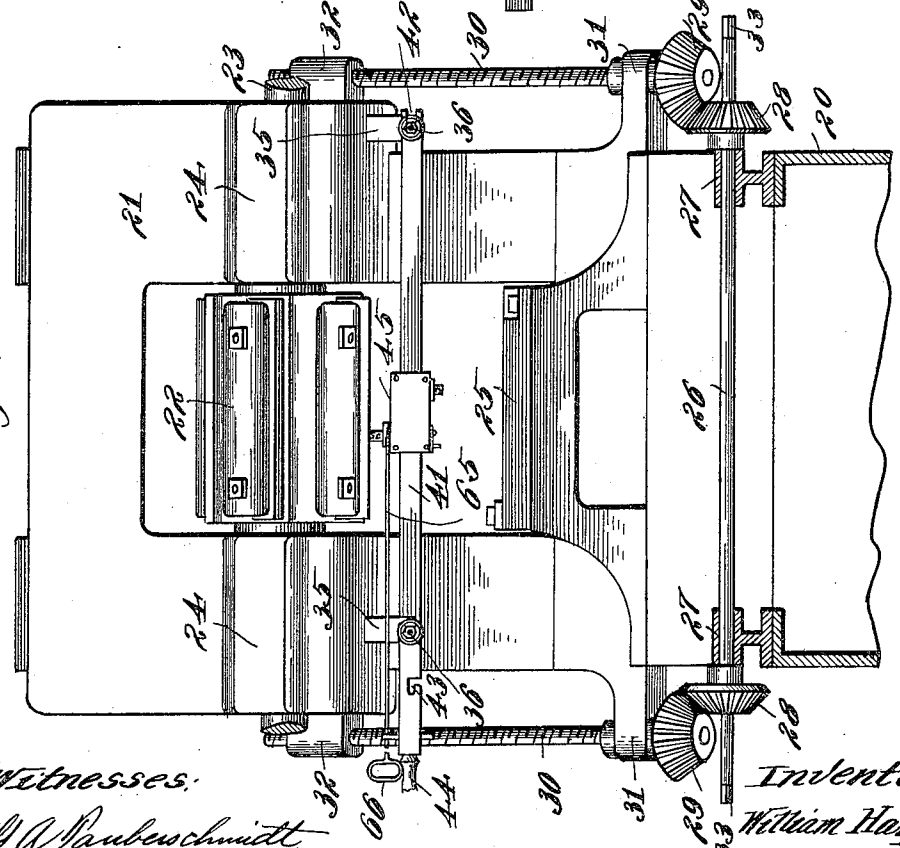


Fig. 1.



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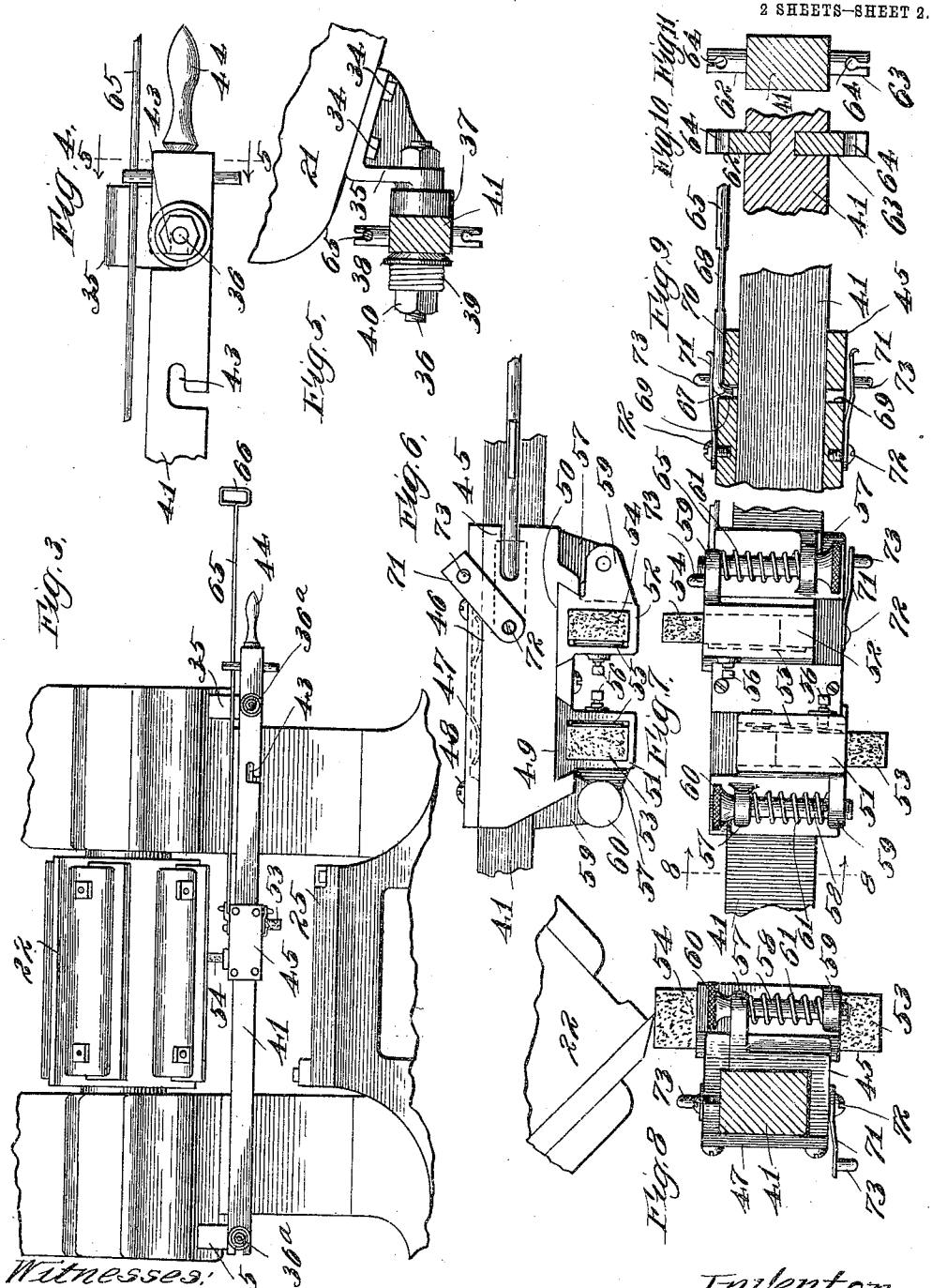

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UNITED STATES PATENT OFFICE.

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PLANER-KNIFE JOINTER.

993,367. Specification of Letters Patent. Patented May 30, 1911.

Application filed September 18, 1908. Serial No. 453,627.

To all whom it may concern:

Be it known that I, WILLIAM HARPER, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Planer-Knife Jointers, of which the following is a specification.

Even though the knives of a planer cylinder are adjusted or positioned exactly parallel to the planer-platen when in planing or operative position and while the cylinder is stationary or rotating at a slow speed, nevertheless the planer will ordinarily not perform or turn out entirely satisfactory work, because when the cylinder with its cutting knives is rotated at the high speed of normal operation the cylinder and its shaft do not turn about the real axis of the shaft, but rather seek a center of their own varying slightly in position from the real shaft axis, due probably to the impossibility of exactly balancing the cylinder. This invention provides for the jointing of such planer-knives in exact parallelism with the platen surface while the knife-equipped cylinder is revolving at full speed, that is, while rotating under ordinary working conditions. After being thus treated, the knives of the planer are capable of producing lumber of exact and uniform thickness, the edges of all the knives being parallel to and at the same distance from the top horizontal surface of the platen.

On the accompanying drawings, which form a part of this specification, I have illustrated a preferred and desirable jointer embodying this invention, and in the various views like reference characters refer to the same parts.

On the drawings—Figure 1 is a vertical section of a planer of the usual and ordinary construction equipped with one of my improved jointing mechanisms; Fig. 2 is a fragmentary side elevation of the central portion of the planer shown in Fig. 1, certain parts being sectioned, and a portion of the yoke supporting the upper planer-head being broken away; Fig. 3 illustrates my jointer applied to another planer-head, indicating its capability of reversal without affecting the adjustment of any of its parts; Fig. 4 is a face view of one of the supporting brackets and studs adapted to hold the jointer-bar in place; Fig. 5 is a section on line 5—5 of Fig. 4, as viewed in the direction indicated by the arrows, and illustrates also a fragmentary portion of the yoke of the machine; Fig. 6 is a top plan view of my improved double-ended or reversible jointing device, showing a portion of its supporting bar; Fig. 7 is a front view of the construction illustrated in Fig. 6; Fig. 8 is a section on line 8—8 of Fig. 7, showing in addition a portion of the planer-head; and Figs. 9, 10 and 11 are detail sections illustrating the manner of attaching the operating rod to the jointer and of supporting the same.

Referring to the drawings, it will be noticed that the planer shown has the usual base or lower frame 20 on which is mounted the yoke 21 carrying the upper planer cylinder 22, the shaft 23 of which is rotatable in suitable bearings 24, 24, the yoke and the cylinder carried thereby being vertically-adjustable in parallel relation to the platen 25 on the base or frame of the machine by means of a transverse shaft 26 rotatable in a pair of bearings 27 on the bottom frame, and equipped at each end with a bevel pinion 28, the teeth of which mesh with those of another bevel gear 29 on the lower end of an upright screw-shaft 30, revoluble at its lower end in a bearing 31 on the frame, and having a threaded connection at its upper end with a threaded lateral extension or ear 32 on the side of the yoke. The shaft 26 at its opposite ends is also angular or square in cross-section at 33 whereby to enable the same to be turned by a wrench applied thereto. Obviously, as the shaft 26 is rotated, the yoke 21 and its cylinder and knives can be adjusted away from or toward the work-supporting platen 25.

The construction so far described is of the usual and ordinary character, my present invention residing solely in the jointing mechanism described hereinafter.

On the lower portion or under surface of each of the legs of the substantial yoke 21, I fasten by means of bolts, screws, or other suitable devices 34, a bracket 35 equipped with a forwardly-extended post or stud 36 having an integral collar 37 in front of the bracket and also supplied with a beveled sliding washer or collar 38 pressed toward the bracket by a coil spring 39, coöperating with which I employ a nut 40 on the thread-

ed end of the stud and adapted to regulate the pressure and action of the spring and washer.

A jointer-supporting bar 41, preferably rectangular in cross-section, is adapted to be temporarily applied to and supported by the pair of studs 36, the bar having at one end a slot 42 and being equipped near its other end with one or more right-angle slots 43, the extreme end of the bar being provided with a manipulating-handle 44 which facilitates the placing of the bar on the studs and its removal therefrom. Slidable on this bar I use a jointer-supporting block or member 45, held from vibrating on the bar 41 by an internal leaf-spring 46 bearing against one face of the bar, the spring being received in a cavity or recess on the inner face of a cover-plate 47 held to the sliding block or member 45 by screws 48. The opposite face of this sliding block is supplied with a pair of parallel undercut grooves 49 and 50 receiving and guiding the jointers 51 and 52, respectively, each equipped with a jointing-bar or body 53 and 54, respectively, of emery or similar material, the blocks or bars 53 and 54 projecting from opposite sides of the sliding support 45. To hold these blocks of emery in place small leaf-springs 55 are placed at their sides within the jointers 51 and 52, the bearing of these springs on the blocks of emery being controlled by adjustable screws 56 passing through the sides of the jointers. At one side of the jointer 51 the member 45 is supplied with an outstanding ear 57 in a circular aperture of which a cylindrical portion of a screw 58 has a bearing, the other end of the screw engaging a screw-threaded hole in the lateral extension 59 projecting outwardly from the jointer 51. To facilitate the turning of this screw which is adapted to adjust the jointer 51 transversely of the members 41 and 45, I provide the same with a manually-turned knurled head 60 which bears across the outer face of the ear 57 and limits the sliding of the jointer 51, which movement is impelled by a coil expansion spring 61 encircling the screw and bearing at its opposite ends against the inner face of the ear 57 and the adjacent face of the lateral extension 59. By turning this screw by means of its head 60 the position of the jointer 51 and jointer-block or bar of emery 53 may be readily regulated and adjusted, and at the same time the jointer and its jointing body of emery 53 may yield toward the bar 41, that is, away from the planer knives on which it is adapted to act. The other adjustable jointer 52 is supplied with a like but oppositely-arranged adjusting and yielding mechanism, and I have supplied the parts thereof with the same reference characters which I have employed in connection with the parts of the adjusting device for the jointer 51.

For sliding or moving the jointer supporting block or member 45 on its bar 41, I provide the latter at one end with the oppositely-extended pins 62 and 63, respectively, each equipped on its end with a circular undercut groove 64 adapted to receive and guide an actuating-rod 65 cylindrical for the greater portion of its length and provided at its end with a handle 66. The inner end of this rod 65 is bent downwardly or to one side at 67, and near this end the rod is flattened on opposite faces to provide a portion 68 of reduced thickness and adapted to pass through the restricted entrances of either of the undercut grooves 64. On its opposite faces the sliding block 45 has a pair of recesses or cavities 69 adapted to receive the bent end 67 of the operating rod 65, the adjacent cylindrical portion of the rod lying in a substantially semi-cylindrical groove 70 on the opposite faces of the sliding block 65 and leading from its end to the holes or cavities 69. To prevent displacement or disengagement of the bent end of the rod with the block 45, I provide adjacent to each hole 69 a swinging spring-retainer 71 pivoted on a screw 72 and provided with an operating handle 73, this spring being adapted to be swung around over the end of the rod to maintain it in place, as is indicated in Fig. 9.

The operation of this improved jointer is practically as follows: Assuming that the knives of the planer head are sharp and have their edges in exact parallelism when in planing position, with the top surface of the platen, I place the jointer-supporting bar 41 on the pair of studs or posts 36 (as illustrated in Fig. 1) which it will be understood are at the same distance above the platen surface. When thus in place the slot 42 at one end of the bar co-acts with one of the studs 36, while one of the right-angle slots 43 near the other end of the bar receives the other stud 36, the bar being held parallel to the platen, as will be readily understood. If the operating rod 65 is not already attached to the sliding jointer support 45, the same is applied to the device by passing the part 68 of reduced cross-section into the slot 64 through its restricted entrance on the top of the bar 41, the rod being then pushed longitudinally through the aperture 64 from which it is prevented from disengagement owing to the undercut character of the groove or slot. The bent end 67 is placed in the hole 69 on the top of the block or sliding member 45, a spring-retainer 67 being swung over the rod to hold it in place and prevent its dislodgment, as is indicated in Fig. 9. The cylinder 22 equipped with the knives and its shaft 23 is then revolved at full speed, during which action the operator, by grasping the handle 66 of the connecting or operating rod 65, causes the jointer to

slide on the bar 41, during which movement of the same one of the blocks of emery 53 or 54 on the top of the same engages and wears down the edge of one or more of the cylinder knives, which during their rotation approach the platen more than the remaining knives, whereby the edges of all the knives after the jointing has been accomplished will when they are in planing position be in exact parallelism with the horizontal face of the platen when the cylinder is rotating at normal high speed. As will be readily understood, the block of emery can be adjusted toward and from the knives by manipulating or turning one of the adjusting screws 58 by means of its knurled head 60.

If it is desired to joint the edges of the knives of another planer cylinder, either another upper cylinder or a lower cylinder, the bar 41 can be applied to the studs 36ª of this second machine, which studs are preferably a different distance apart from those of the first machine, as is indicated in Figs. 1 and 3, so that another one of the right-angle slots will be employed, the bar 41 being reversed so as to bring the other or opposite jointer on the top side of the bar, this jointer being the one which can now be used on the second upper cylinder to put the edges of its knives in condition. If the jointing mechanism is to be used for a lower cylinder this reversal of the bar may not be necessary, but in any case a different jointer and its block of emery would be employed for the second cylinder so as not to disturb the adjustment of the jointer which had been previously used in connection with the first cylinder. Owing to the fact that the studs are different distances apart on the two machines or the two parts of the machine, it is impossible to apply the bar thereto in such a manner that the jointer used with the first cylinder could be employed to act upon the edges of the second. The two jointers mounted on the same sliding member are, therefore, independently adjustable and adapted to joint the edges of the knives of different cylinders. Of course, it would not be absolutely necessary to detach and again connect the operating rod 65 to the sliding block 45 whenever the jointing mechanism is reversed, though it would doubtless be preferable to do so.

My invention not being limited to the exact features of construction herein set forth in detail, it will be readily understood that the jointing mechanism illustrated and described may be considerably modified without departure from the substance and essence of the invention.

I claim—

1. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from said platen in parallel relation thereto, a planer-cylinder equipped with knives mounted on said cylinder-support, a jointer-support adapted to be mounted on said cylinder-support, and a jointer movable on said jointer-support and capable during rotation of the cylinder and the knives of jointing the edges of said knives in parallelism with the surface of the platen while such knives are in that portion of their rotation in which they meet the work, substantially as described.

2. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from said platen in parallel relation thereto, a planer-cylinder equipped with knives mounted on said cylinder-support, a pair of studs on said cylinder-support, a supporting bar detachably mounted on said studs, and a jointer slidable on said bar longitudinally of said knives and capable during rotation of the cylinder of jointing the edges of said knives in parallelism with the surface of the platen during that portion of the rotation of such knives in which they meet the work, substantially as described.

3. In a planer, the combination of a frame, a platen, a cylinder-support adjustable toward and from said platen in parallel relation thereto, a planer-cylinder equipped with knives mounted on said cylinder-support, a slotted bar detachably mounted on such studs, and a jointer slidable on said bar longitudinally of said knives and capable during rotation of said cylinder of jointing the edges of said knives in parallelism with the surface of the platen while the knives are in that portion of their rotation in which they meet the work, substantially as described.

4. In a reversible tool for acting on the edges of knives of planer-cylinders during rotation of such knives, the combination of a support equipped with different means for attaching the same to planer frames in position for action on the knives of different planer-cylinders, and a double-ended tool movable on said support and adapted to joint the edges of the knives during their rotation and in that portion of their rotation in which they meet the work, substantially as described.

5. In a reversible tool for acting on the edges of knives of planer-cylinders, the combination of a slotted bar, the slots of which are adapted to receive studs and be supported thereby, different slots being used when the bar is mounted for action on different cylinders, and a double-ended tool slidable on said bar and adapted to joint the edges of the cylinder knives during their rotation and in that portion of their rotation in which they meet the work, substantially as described.

6. In a reversible jointer, the combination of a jointer-support having different means

for attaching the same to planer frames in proximity to different cylinders, and a double-ended jointer slidable on said support and adapted and capable of jointing the edges of said knives during their rotation and in that portion of such rotation in which they meet their work, substantially as described.

7. In a reversible jointer, the combination of a jointer-support having different means for attaching the same to planer frames in proximity to different cylinders, a double-ended jointer slidable on said support, and jointing elements in said jointer extended in opposite directions therefrom and independently adjustable, said jointer being adapted to joint the edges of the knives of the cylinder during rotation of the latter and while in that portion of its rotation in which they meet the work, substantially as described.

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