

No. 874,355.

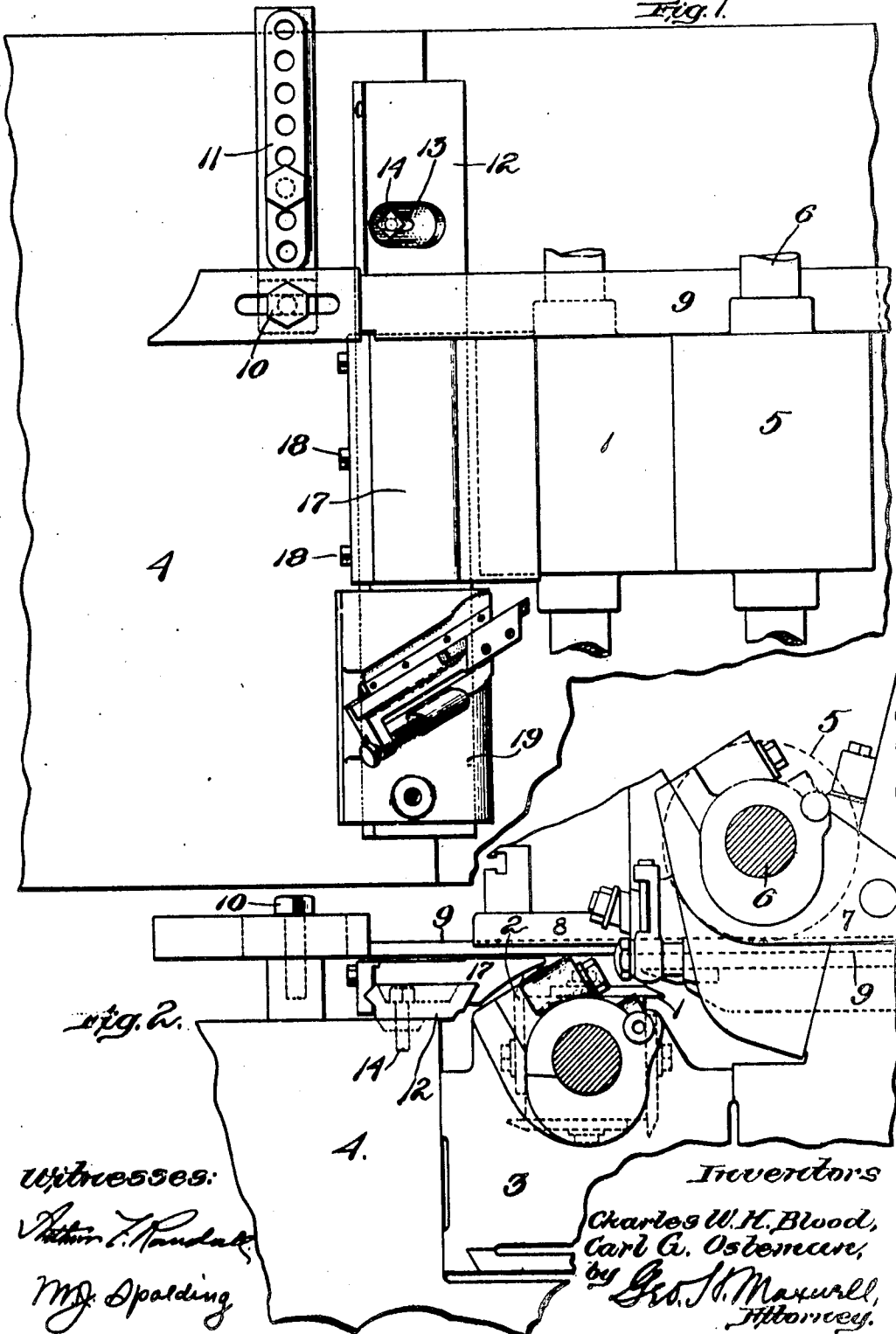
PATENTED DEC. 17, 1907.

C. W. H. BLOOD & C. G. OSTEMAN.
KNIFE JOINTER FOR THE BOTTOM CUTTER HEADS OF WOOD PLANERS.

APPLICATION FILED OCT. 15, 1906.

2 SHEETS-SHEET 1.

Fig. 1.



Witnesses:

Arthur T. Randall

Wm. Spaulding

Inventors

Charles W. H. Blood,
Carl G. Osteman,

by Geo. H. Maxwell,
Attorney.

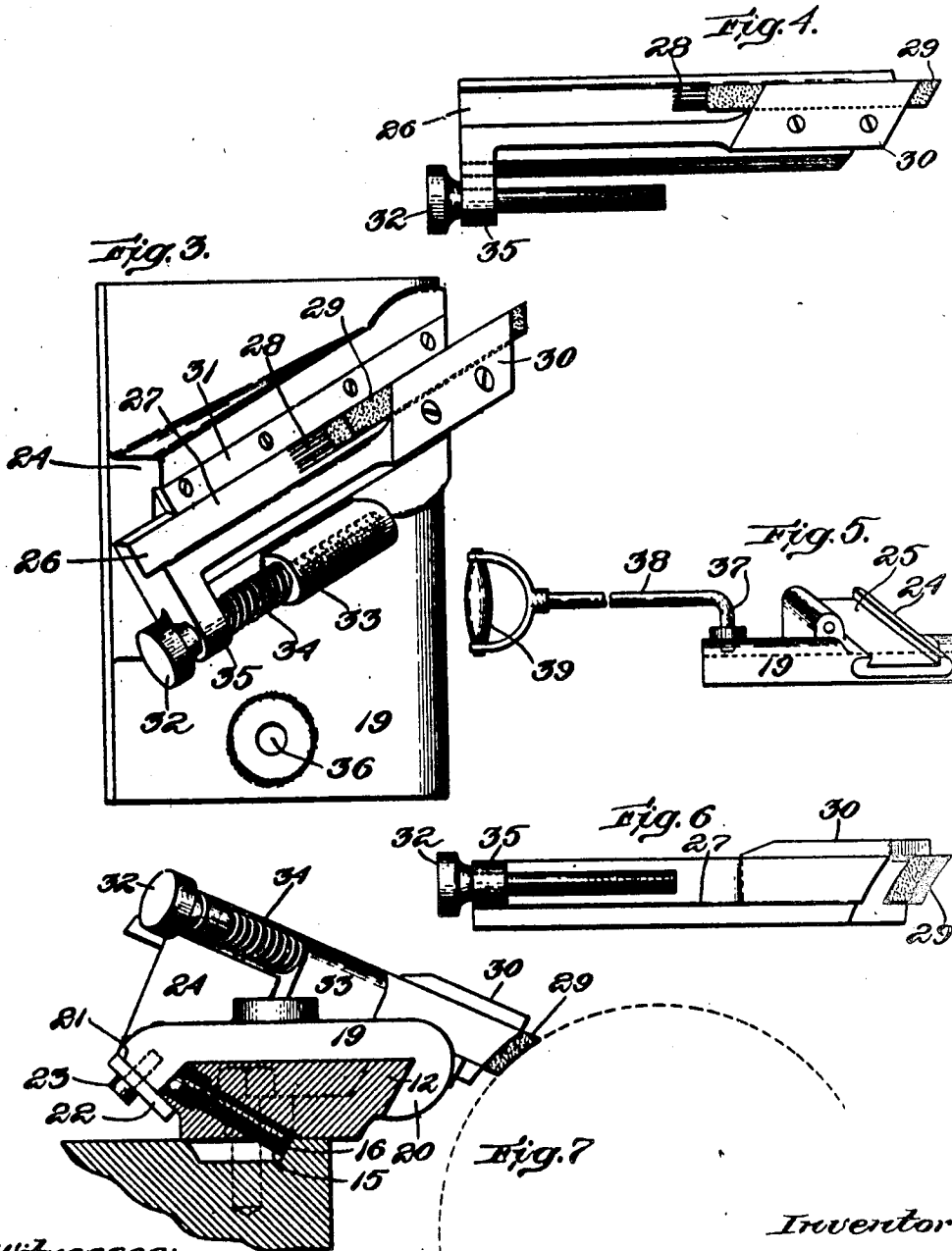
No. 874,355.

PATENTED DEC. 17, 1907.

C. W. H. BLOOD & O. G. OSTEMAN.
KNIFE JOINTER FOR THE BOTTOM CUTTER HEADS OF WOOD PLANERS.

APPLICATION FILED OCT. 15, 1906.

2 SHEETS—SHEET 2.



Witnesses:

Charles F. Randall
Mr. J. Spalding

Inventors

Charles W. H. Blood,
Carl G. Osteman,
by Geo. H. Maxwell
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES W. H. BLOOD AND CARL G. OSTEMAN, OF BOSTON, MASSACHUSETTS, ASSIGNORS
TO S. A. WOODS MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

KNIFE-JOINTER FOR THE BOTTOM CUTTER-HEADS OF WOOD-PLANERS.

No. 874,355.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed October 15, 1906. Serial No. 338,964.

To all whom it may concern:

Be it known that we, CHARLES W. H. BLOOD and CARL G. OSTEMAN, citizens of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Knife-Jointers for the Bottom Cutter-Heads of Wood-Planers, of which the following description, in connection with the accompanying drawings, is a specification, like letters in the drawings representing like parts.

In high speed work such as is required of the best grade of wood planers, modern requirements demand that the work shall be smooth and that the lining or marking of the rapidly rotating cutter knives on the wood shall be eliminated. This is accomplished by what is called "jointing the knives", and has heretofore been considered practically impossible to accomplish, various expedients for setting and sharpening the knives in the cutter-head having been proposed.

Our present invention accomplishes the desired object of jointing the knives or bringing their cutting edges into absolutely uniform alinement, by providing a heavy transverse guideway, adjusted into absolutely correct position parallel to the line of desired cut, and a reciprocating sharpener arranged to engage and sharpen the knives when the cutter-head is running at top speed, thereby removing all variations and inaccuracies which may be due to the running of the cutter-head as well as those due to the movement or imperfections of mounting or adjustment of the knives, etc. We have found that in practice our mechanism secures the desired result.

The constructional details thereof will be fully pointed out in the course of the following description, taken in connection with the accompanying drawings and the invention will be further defined in the appended claims.

In the drawings, Figure 1 is a top plan view of a portion of a wood planer provided with our invention; Fig. 2 is a transverse sectional view showing various details of our attachment in end elevation; Fig. 3 is a top plan view of the sharpening or grinding attachment which we prefer to employ; Fig. 4 shows the emery holder in top plan; Fig. 5 is an edge view of the supporting plate or carrier for the emery holder, looking at the right-hand side of Fig. 3; Fig. 6 is a view

similar to Fig. 4, showing the parts in side elevation; and Fig. 7 is a sectional view showing the grinding attachment in end elevation.

It will be understood that the bottom cutter-head 1 and its knives 2 and carrier 3, 60 mounted in the bed 4 of the wood planer, may be of any usual or preferred construction, as, in fact, may be the entire wood planer, the top rotary cutter being indicated at 5 journaled at 6 in a vertically adjustable carrier 7 and provided with a usual overhanging top plate 8 for holding the work against the bottom cutter-head. The work is guided by a long side bar 9, which may be of usual construction, being herein shown as 70 adjustably secured at 10 to a laterally adjustable block 11 supported in the bed 4.

In carrying out our invention we provide a transverse bottom guide bar 12 dove-tailed in cross-section, as clearly shown in Figs. 2 75 and 7, and provided with slots 13 for adjustment on bolts 14 toward and from the cutter-head, and provided with oblique bolts 15 for bearing against shoulders 16 in the bed for permitting the bar 12 to be brought into absolutely accurate parallelism with the cutter-head. The guiding surfaces of this bar are 80 trued with the utmost accuracy, so as to guide the grinding attachment exactly as required. This guide-way is normally protected opposite the bottom cutter-head by suitable means, herein shown as the bar-after-the-cut 17, which is normally held fast by set bolts 18 capable of being loosened for permitting said bar 17 to be adjusted lengthwise of the guide bar 12. On the bar 12 is 85 mounted a grinder carriage consisting of a sliding base plate 19 having an obliquely depending edge 20 fitting accurately against the adjacent dove-tailed way 12 and provided at its opposite end with an oblique edge 21 against which is retained a sustaining gib 22 by screws 23. Projecting from the upper side of this plate 19 is an integral block 24 having a dove-tailed slide-way 25 100 set to extend obliquely forward and downward, as clearly shown in Figs. 3 and 5, for receiving an emery holder 26, shown best in Figs. 3, 4 and 7, having a recess 27 extending lengthwise thereof and preferably roughened, as indicated at 28, to hold a stick of emery 29 clamped in place by an adjustable plate 30. Said holder 26 bears against a wear plate or gib 31 at one edge, and is longitudinally adjustable by a thumb screw 32 110

having its inner end threaded into a boss or projection 33 of the block 24, all possible lost motion or looseness being prevented by a spring or other suitable means 34 bearing
 5 between said boss 33 and an ear 35 of the holder 26 in which said screw 32 is mounted. At its forward end the sliding base plate 19 has a notch or recess 36 for snugly receiving the projecting down-turned end 37 of an
 10 operating handle or arm 38 provided at its outer end with a hand-hold 39.

We have described our preferred mechanism in all its constructional details in order that the same may be thoroughly understood, but we do not intend to limit our
 15 invention to these constructional details, as will be apparent from certain of the claims, where our invention is broadly defined.

In use, the planer is set in operation at
 20 high speed, and when the cutter-head has attained its top speed and normal movement, the operator inserts the actuator 38 in the grinding carriage and shoves said carriage back past the bottom cutter-head, the
 25 bar 17 having first been loosened so that it is shoved forward out of interference with the grinding carriage. The operator carefully adjusts the grinding edge of the emery 29 until it is brought into the correct arc or
 30 path of movement of the cutting edges of the respective knives 2 of the cutter-head 1. He then continues to move the carriage back and forth until the knives are all brought into absolutely the same path of rotation.
 35 The operator performs this same operation whenever he notices that the machine is not giving smooth work. By having the emery or other grinding material set obliquely with its forward end extending forwardly and
 40 downwardly and mounted low down on the machine, the knives of the bottom cutter-head may be readily and accurately jointed, even though the machine is operating on very thin stock, as the forwardly and down-
 45 wardly projecting end of the stick of emery or other grinding material can readily project under the top head construction without disturbing the adjustment of the same and can run under the long guide 9.

50 In Fig. 2 the overhanging head plate 8 of the upper cutter-head 5 and its carriage 7 is shown as adjusted down close to the bar-after-the-cut 17 for holding thin stock in proper position, and the oblique arrangement of my sharpener as best shown in Fig.
 55 7, enables the operator readily to true the knives 2 when said head plate is adjusted down thus for thin stock.

By having the grinding carriage operate
 60 in connection with the bar-after-the-cut 17 the transverse way 12 is protected at all times from dirt, pitch or other substances which would otherwise interfere with accuracy of grinding.

65 While we prefer to provide the grinding

carriage separate from the bar 17, as this construction has many points of decided advantage, the grinder may in some instances be formed as a part of the bar 17. Among the advantages of having the grinder used in
 70 connection with the bar 17 is that we get a low down location at a point where the bar 12 or guideway for the grinder can be adjusted readily and with extreme accuracy into permanent parallelism with the bottom
 75 cutter-head, said guideway may readily be protected from all extraneous and injurious substances which would interfere with the proper movement and delicacy of operation of the grinding carriage, and the latter may
 80 at the same time be left at one end of said guideway ready for instant use and yet not in the way of the operator or of the work. If the emery is mounted on the end of the bar 17 the construction is less convenient,
 85 and therefore we prefer to provide an independent carriage 19 as explained.

It will be understood that the grinding effect of the sharpening apparatus is usually exceedingly slight, as the deflection or inac-
 90 curacy of alinement in the cutter-head knives which causes the lining or almost imperceptible marking of the work (which it is the object of our invention to overcome and render smooth) is so slight that usually it
 95 cannot be discovered at all when the cutter-head is not running. It is only by having perfect alinement of movement of the grinding carriage and by moving the latter slowly back and forth and permitting the perfectly
 100 adjusted forward end of the emery stick 29 to just touch the edges of the cutters that the inaccuracy of alinement of the latter can be detected and remedied. By having the emery in the form of a pencil 29 and arranged to
 105 project obliquely downward and forward as shown, the operator is enabled to observe easily and critically the work, and also the sharpening edge of the emery maintains itself more readily true to a fine edge and
 110 point. In this class of devices the running speed is exceedingly high, so that the grinding effect is much different when the machine is under speed than it would be if the grinding took place with the cutter-head sta-
 115 tionary. In fact, the high speed requirements are such that perfect work can only be obtained by grinding the knives at top speed, and hence in order to enable the operator to inspect with safety the progress of the work
 120 I have found it necessary to provide this means for maintaining as nearly as possible a grinding point as distinguished from a long and wide grinding surface, and projecting said point forward obliquely so that the op-
 125 erator can readily see the results and what is needed. But by our apparatus the operator can quickly and easily bring all the cutter edges into perfect alinement with each other, so that, when running at top speed, they will
 130

engage and dress the work down to one and the same smooth plane.

We regard the location of the grinder and its relation to the rapidly rotating cutter-head as an important feature of our invention, because on account of this the required delicacy of detecting and grinding is made possible with a degree of accuracy which we have not been able to accomplish otherwise.

Having described our invention, what we claim as new and desire to secure by Letters Patent is,

1. A wood planer, comprising a bed, a bottom cutter-head mounted in said bed, a guide bar fixedly mounted transversely of the bed of the machine at one side of said cutter-head parallel to the axis thereof and below the path of the lumber being planed, longitudinally movable grinding means including a carriage mounted to move lengthwise on said bar, having a grinding surface projecting in the path of movement of the cutter-head knives, and means extending over the guiding surface of said bar normally in line with and below said path of the lumber for protecting the guiding surface of said bar when the grinding means is not in use, and movable along said bar out of the way when the grinding means is operated.

2. A wood planer, comprising a bed, a bottom cutter-head mounted in said bed, a transverse guide bar extending transversely of the bed at one side of the cutter-head, a bar-after-the-cut for supporting the lumber being planed, longitudinally movable on said guide bar, said guide bar being longer than the cutter-head, a grinding carriage mounted on said guide bar and normally occupying a projecting end thereof beyond the cutter-head at one end of said bar-after-the-cut and movable lengthwise of said bar in front of the cutter-head when the latter is to be sharpened and the bar-after-the-cut has been slid out of the way on said guide bar, and a grinding device mounted on and movable with said carriage for reciprocation in the path of movement of the cutting edges of the cutter-head.

3. A wood planer, comprising a bottom cutter-head, a guideway mounted parallel thereto on the bed of the machine, a grinding carriage mounted to reciprocate on said bar, and a pencil-like grinding device mounted on said carriage and having its grinding point extending obliquely downward toward said cutter-head.

4. A wood planer, comprising a bottom cutter-head, a guideway mounted parallel thereto on the bed of the machine, a grinding carriage mounted to reciprocate on said bar, and a pencil-like grinding device mounted on said carriage and having its grinding point extending obliquely forward and downward toward said cutter-head.

5. A wood planer, comprising a bottom

cutter-head and opposite overhanging head plate for guiding the upper side of the work being dressed by said cutter-head, and a reciprocable grinding device mounted at one side of said cutter-head parallel thereto and movable into the path of movement of the cutting edges thereof beneath said overhanging head plate when the latter is adjusted down for thin stock.

6. A wood planer, comprising a bottom cutter-head, a long guide extending lengthwise of the machine and over said cutter-head, and a transversely reciprocable grinding device movable longitudinally of said cutter-head in the path of movement of the cutting edges thereof, said grinding device having a projecting grinding surface movable beneath said long guide when said grinding device is reciprocated during the operation of the machine.

7. The combination with a bottom cutter-head and a transverse guide bar close and parallel to said cutter-head, of a grinding carriage consisting of a sliding base plate having longitudinal ways on its under side to travel lengthwise of said guide bar, a block projecting from its upper side containing a slide way extending obliquely downward transversely of the base plate, an emery holder fitting said oblique transverse slide way, having a recess and clamping means for removably holding a stick of emery, and means for accurately adjusting said emery holder and emery forward and backward in said slide way.

8. The combination with a bottom cutter-head and a transverse guide bar close and parallel to said cutter-head, of a grinding carriage consisting of a sliding base plate having longitudinal ways on its under side to travel lengthwise of said guide bar, a block projecting from its upper side containing a slide way extending obliquely downward and forward transversely of the base plate and substantially coincident with the top edge of said plate next to the cutter-head, an emery holder fitting said oblique transverse slide way, having a recess and clamping means for removably holding a stick of emery, and means for accurately adjusting said emery holder and emery forward and backward in said slide way.

9. The combination with a bottom cutter-head and a transverse guide bar close and parallel to said cutter-head, of a grinding carriage consisting of a sliding base plate having longitudinal ways on its under side to travel lengthwise of said guide bar, a block projecting from its upper side containing a slide way extending obliquely downward transversely of the base plate, an emery holder fitting said oblique transverse slide way, having a recess and clamping means for removably holding a stick of emery, and means for accurately adjusting said emery holder and emery forward

and backward in said slide way consisting of a boss at one side of said transverse slide way, an ear projecting from said holder to overhang the end of said boss, a thumb-screw operating through said ear and threaded into said boss, and a spring carried by said screw, having its opposite ends in engagement respectively with the boss and ear.

10. The combination with a bottom cutter-head and a transverse guide bar close and parallel to said cutter-head, of a grinding carriage consisting of a sliding base plate having longitudinal ways on its under side to travel lengthwise of said guide bar, a block projecting from its upper side containing a slide way extending obliquely downward transversely of the base plate, an emery holder fitting said oblique transverse slide way, the latter con-

taining a removable wear plate overhanging one edge of said holder for maintaining the latter in accurate position, said holder having a longitudinal recess for receiving a stick of emery, an adjustable clamping plate overhanging said recess close to the lower end of the holder for clamping the lower end of the stick of emery, and slow motion means for positively adjusting said holder toward and from the cutter-head.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

CHARLES W. H. BLOOD.
CARL G. OSTEMAN.

Witnesses:

LESTER E. PRATT,
EDMUND A. ROTHWELL.