(No Model.)

W. H. GRAY.

CHIP BREAKER FOR WOOD PLANING MACHINES.

No. 362,619. Patented May 10, 1887.

Fig. 1.

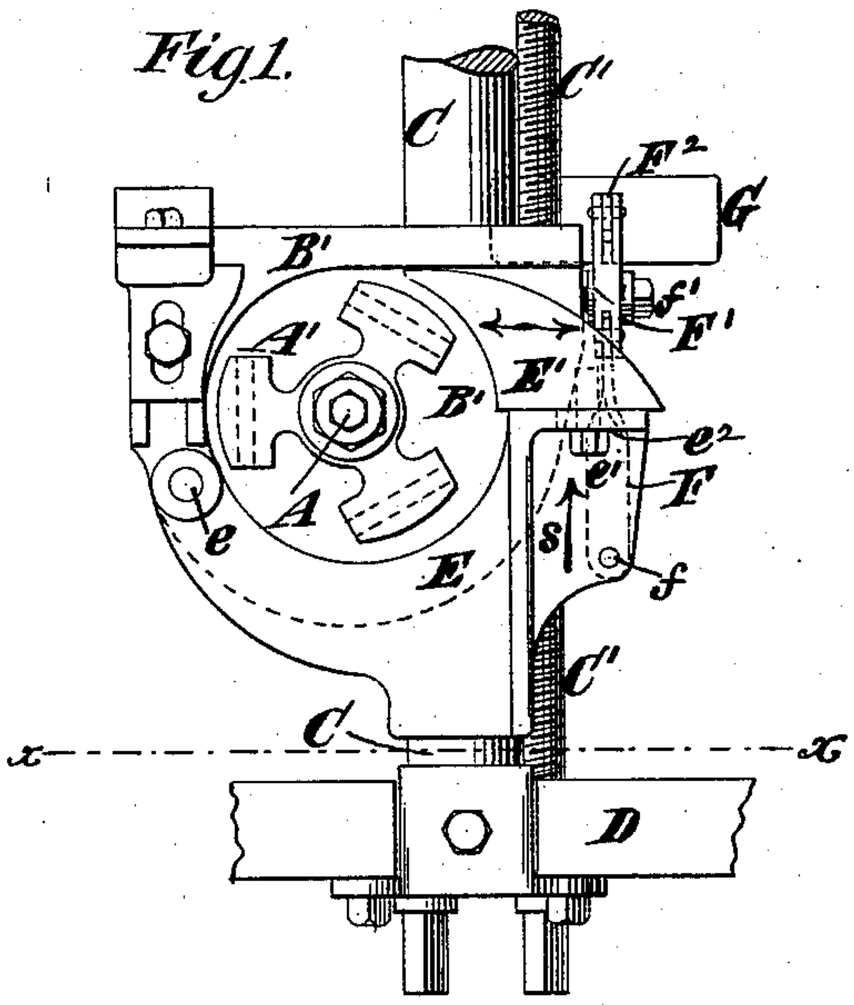


Fig. 2.

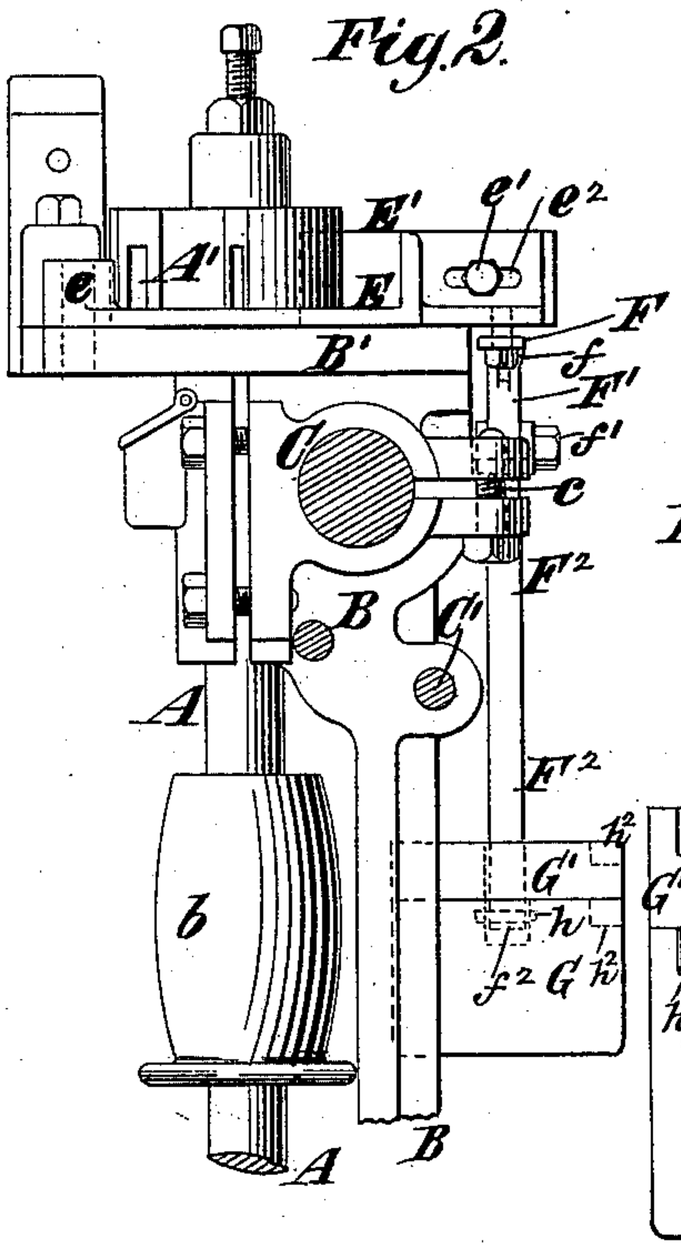


Fig. 3.

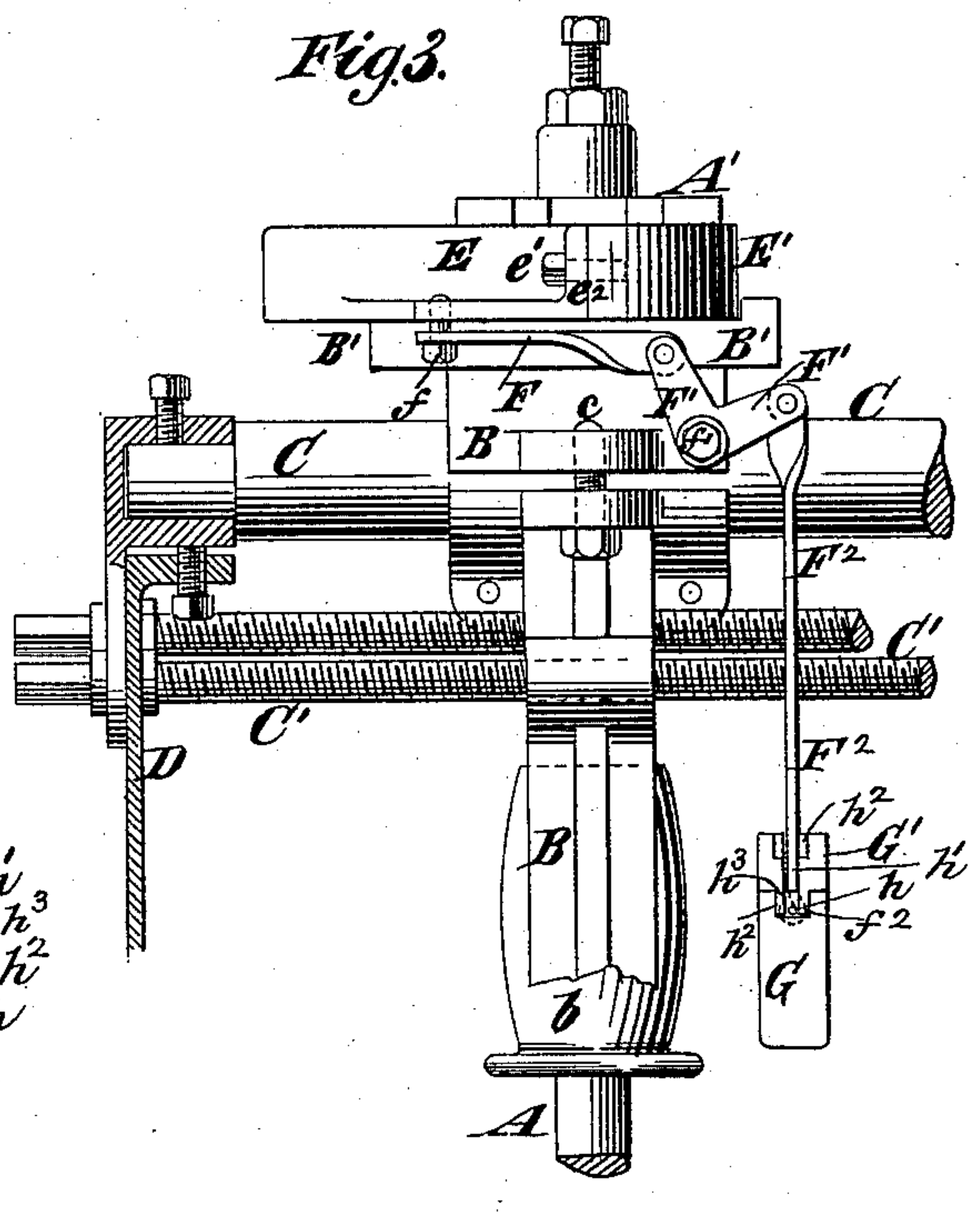


Fig. 4.

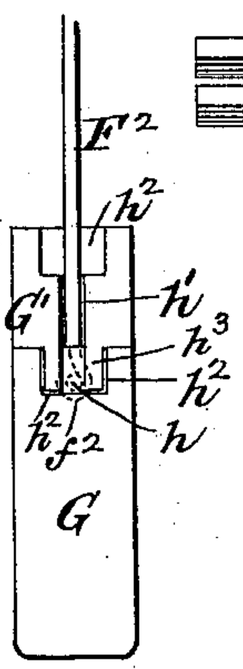


Fig. 5.

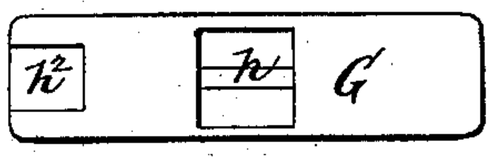
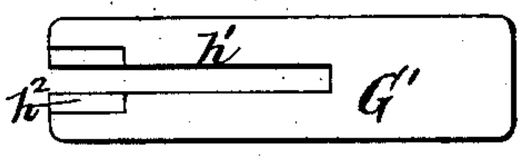


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CHIP-BREAKER FOR WOOD-PLANING MACHINES.

SPECIFICATION forming part of Letters Patent No. 362,619, dated May 10, 1887.

Application filed November 19, 1886. Serial No, 219,361. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. GRAY, of Brooklyn, (Green Point,) in the county of Kings and State of New York, have invented a new and useful Improvement in Chip-Breakers for Wood-Planing Machines, of which the following is a specification.

My invention is applicable to the chip-breaker which is employed in connection with the side cutter-head of a wood-planing machine, and which is loaded to cause it to press against the lumber; and one feature of my invention relates to a chip-breaker loaded either by a spring or weight, while another feature of my invention relates to a chip-breaker loaded only by a weight.

One feature of my invention consists in the combination, with a side cutter-head and spindle and cutter-head plate of a wood-planing machine, of a pivoted chip-breaker swinging horizontally on the table and loaded to cause it to press against the lumber, and having a renewable shoe, which alone can make contact with the lumber, the chip-breaker and shoe having flat contact-surfaces bearing one on another, and a bolt or screw inserted through a slot transversely to the contact-surfaces of the chip-breaker and shoe, whereby provision is afforded for securing the shoe immovably to the chip-breaker when in operation, and for the adjustment of the shoe relatively to the chip-breaker.

In United States Patent No. 315,406, granted to Gray and Hutchinson, there is shown a horizontally-swinging chip-breaker, which is loaded by means of a weight in order to cause it to press against the lumber, such means of loading the chip-breaker being preferable to a spring, because the weighted chip-breaker exerts a uniform pressure throughout its whole range of movement, while the spring-loaded chip-breaker exerts a greater or increasing pressure as it is pressed back when the side cutter-head is taking a thick cut.

A further object of my invention is to provide for applying a weight to the chip-breaker in a more simple manner, or by more simple connections than those employed for the purpose in the patent above referred to; and to this end my invention consists in the combination, with the side cutter-head and spindle and a cutter-head plate of a wood-planing machine, of a pivoted chip-breaker movable horizontally on the head-plate, a rod or analogous connection attached to the chip-breaker near its free end and extending from the chip-breaker inward in the same direction as the movement of the chip-breaker toward the lumber, and a weight, whereby, through the said connection, a direct pull is exerted on the chip-breaker in a direction to press it against the lumber. For applying the weight to the aforesaid rod or connection I prefer to employ a bell-crank lever having a horizontal pivot and having the weight applied directly upon a rod which depends from one arm of the lever.

In the accompanying drawings, Figure 1 is a plan of a portion of the side frame of a planing-machine, together with the side cutter-head, its supports, and the chip-breaker embodying my invention. Fig. 2 is a vertical section lengthwise of the machine upon about the plane of the dotted line *x x*, Fig. 1. Fig. 3 is an end view including a partial section of the main frame, looking toward the left hand of Fig. 1. Fig. 4 is an elevation of the weights and a portion of the rod whereby they are connected with the chip-breaker. Fig. 5 is a plan of the principal weight employed; and Fig. 6 is an inverted plan of a supplemental weight, one or more of which may be employed to weight the chip-breaker to the desired degree.

Similar letters of reference designate corresponding parts in all the figures.

I have here shown only such parts of a machine as embody my invention; but the location of the side cutter-heads relatively to the remaining portions of the machine will be clearly understood from the patent above mentioned, granted to Gray and Hutchinson.

A designates one of the side cutter-spindles, the upper portion only of which is shown, and which is provided with a pulley, *b*, for receiving a driving-belt. The spindle A is journaled in the spindle-carrying frame B, which at its upper end is supported by a transverse bar, C, along which it may be moved by a screw, C′, in a direction transverse to the length of the machine. The spindle-carrying frame B is

provided near its lower end with a suitable guide, (not shown,) and when it is desired to move it in a direction transverse to the machine the clamping screw or bolt *c* is loosened, thereby freeing the frame B from the bar C and permitting the movement of said frame along the bar C by the operation of the screw C′. After bringing the frame and spindle to proper position it may be there securely clamped by means of the bolt *c*. The bar C is supported at its opposite ends in the two side frames of the machine in a well-understood manner, a portion only of one side frame, D, being here represented.

The spindle carrying frame B is surmounted by a head-plate, B′, and upon the upper end of the spindle A, and above the head-plate, is a cutter-head, A′.

E designates a chip-breaker, which, as here represented, consists of a horizontally-swinging segmental lever pivoted to the head-plate B′ at the point *e* and adapted to swing in a horizontal plane upon the upper surface of the head-plate B′. The inner periphery or edge of this lever is a segment or arc of a circle struck from a radius slightly greater than the radius of the edges of the knives or cutters upon the cutter-head A′. At its free end, or the end opposite the pivot *e*, the chip-breaker E is provided with a renewable shoe, E′, which is made separate from the chip-breaker, and which, when worn out by friction against the lumber, may be renewed at small cost without the necessity of discarding the whole chip-breaker. Being made separate from the chip-breaker proper, this shoe E′ may be formed of chilled cast-iron, hardened steel, or other metal best calculated to resist wear by friction. It is also desirable that the portion of the chip-breaker which bears upon the lumber should be adjustable toward and from the cutter-head and relatively to the main portion of the chip-breaker. In this example of my invention the renewable shoe E′ is secured to the main portion of the chip-breaker by a bolt, *e′*, passing through a slot, e^2, in the main portion of the chip-breaker, as best shown in Figs. 1 and 2, and this means of securing the renewable shoe E′ provides for adjusting it in either of the directions indicated by the double-headed arrow in Fig. 1, so that its point may be brought into desired relation with the cutters upon the side cutter-head, A′.

The body E of the chip-breaker and the renewable shoe E′ have flat contact-surfaces bearing one on another, and by the bolt or screw *e′*, which is inserted at right angles to these surfaces, the shoe E′ during operation is secured rigidly and immovably to the chip-breaker, although the slot e^2 provides for adjustment of the shoe when the screw *e′* is loosened and while the parts are inoperative.

In order to produce the desired pressure of the chip-breaker upon the lumber, I have represented a weighted connection, F, attached at *f* to the chip-breaker near its free end, and extending inward in the same direction as the movement of the chip-breaker toward the lumber. This connection F exerts by tension a direct pull or draft upon the chip-breaker toward the lumber, or in the direction indicated by the arrow *s* in Fig. 1.

As here represented, the weight G is applied to the connection F through a bell-crank lever, F′, which is fulcrumed at *f′*, and with the two arms of which are connected the rod or connection F and the downwardly-extending rod F^2, on which the weight G is suspended. The downwardly-extending rod F^2 may have at the lower end a hook, f^2, which engages a wrist, *h*, formed in the weight G, and above the weight G, upon the rod F^2, may be applied one or more supplemental weights, G′, one being here represented, in order to give the desired weight. The supplemental weights G′ are slotted inward from the end, as shown at *h′* in Figs. 4 and 6, so as to pass over the rod F^2 and the main weight G, and each of the supplemental weights G′ has in its upper surface a recess, h^2, which is adapted to receive a corresponding projection, h^3, formed on the under side of the weight which is superposed above it. The supplemental weights G′ may be first slipped upon the rod F^2 and then dropped downward, so that their projections h^3 will engage the recesses h^2 in the weights immediately below, and the supplemental weights will be thereby held in place.

I am aware that a presser or chip-breaker for the upper cutter-head, having a horizontal axis, has been made in sections or blocks arranged side by side across the machine, and which individually accommodate themselves to the uneven lumber, and such pressers are shown in United States Patents to Wells, No. 167,145, dated August 24, 1875, and Patterson, No. 188,259, dated March 13, 1877. In the Wells patent the point portion of each section is a pivoted shoe, which, while the machine is operative, is self-adjusting relatively to the block on which it is pivoted. In the Patterson patent the several sections of the presser or chip-breaker have a sliding fit on a cross-bar, and are pressed down by springs, and have each an adjustable shoe dovetailed upon its face and adjustable by a screw which extends parallel with the face of the shoe. I do not desire to include in my invention either of the devices above described, and in so far as my invention relates to a renewable shoe it is limited to a chip-breaker, E, pivoted to swing horizontally on the head-plate B′, and having a renewable shoe which alone can make contact with the lumber, and which during operation is secured immovably to the body of the chip-breaker, the two having flat contact-surfaces bearing one on another and secured solidly together by a screw inserted transversely to such surfaces.

In view of the patent to Gray and Hutchinson, above referred to, I do not here claim, broadly, the use of a weight for loading the chip-breaker E, and desire to restrict my invention to a chip-breaker having attached

near its free end a weighted connection, F, which extends inward in the same direction as the movement of the chip-breaker toward the lumber, and produces a direct pull on the chip-breaker toward the lumber. When this means is employed, the weight can be arranged low down in the machine, and hangs vertically, and all the parts and connections for weighting the chip-breaker are arranged below the cutter-head plate B′, and out of the way.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the side cutter-head, a spindle and cutter-head plate of a wood-planing machine, of a pivoted chip-breaker, E, swinging horizontally on the head-plate and loaded to cause it to press against the lumber, and having a renewable shoe, E′, which alone can make contact with the lumber, the chip-breaker and shoe having flat contact-surfaces bearing one on another, and a bolt or screw, e', inserted through a slot, e^2, transversely to the contact-surfaces of the chip-breaker and shoe, whereby provision is afforded for securing the shoe immovably to the chip-breaker when in operation and for the adjustment of the shoe relatively to the chip-breaker, substantially as herein described.

2. The combination, with the side cutter-head and spindle and a cutter-head plate of a wood-planing machine, of a pivoted chip-breaker movable horizontally on the plate, a connection, as rod F, attached to the chip-breaker near its free end and extending from the chip-breaker inward in the direction of movement of the chip-breaker toward the lumber, and a weight whereby through said connection a direct pull is exerted on the chip-breaker in a direction to press it against the lumber, substantially as herein described.

3. The combination, with the side cutter-head, A′, and spindle A, and the cutter-head plate B′, of the chip-breaker E, pivoted at *e* to the head-plate and movable horizontally thereon, the rod F, connected with the chip-breaker near its free end and extending in the direction of movement of the chip-breaker toward the lumber, the bell-crank lever F′, having a horizontal pivot, and with one arm of which the rod is connected, and the vertical weighted rod F^2, connected with the other arm of the bell-crank lever, substantially as herein described.

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Witnesses:
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