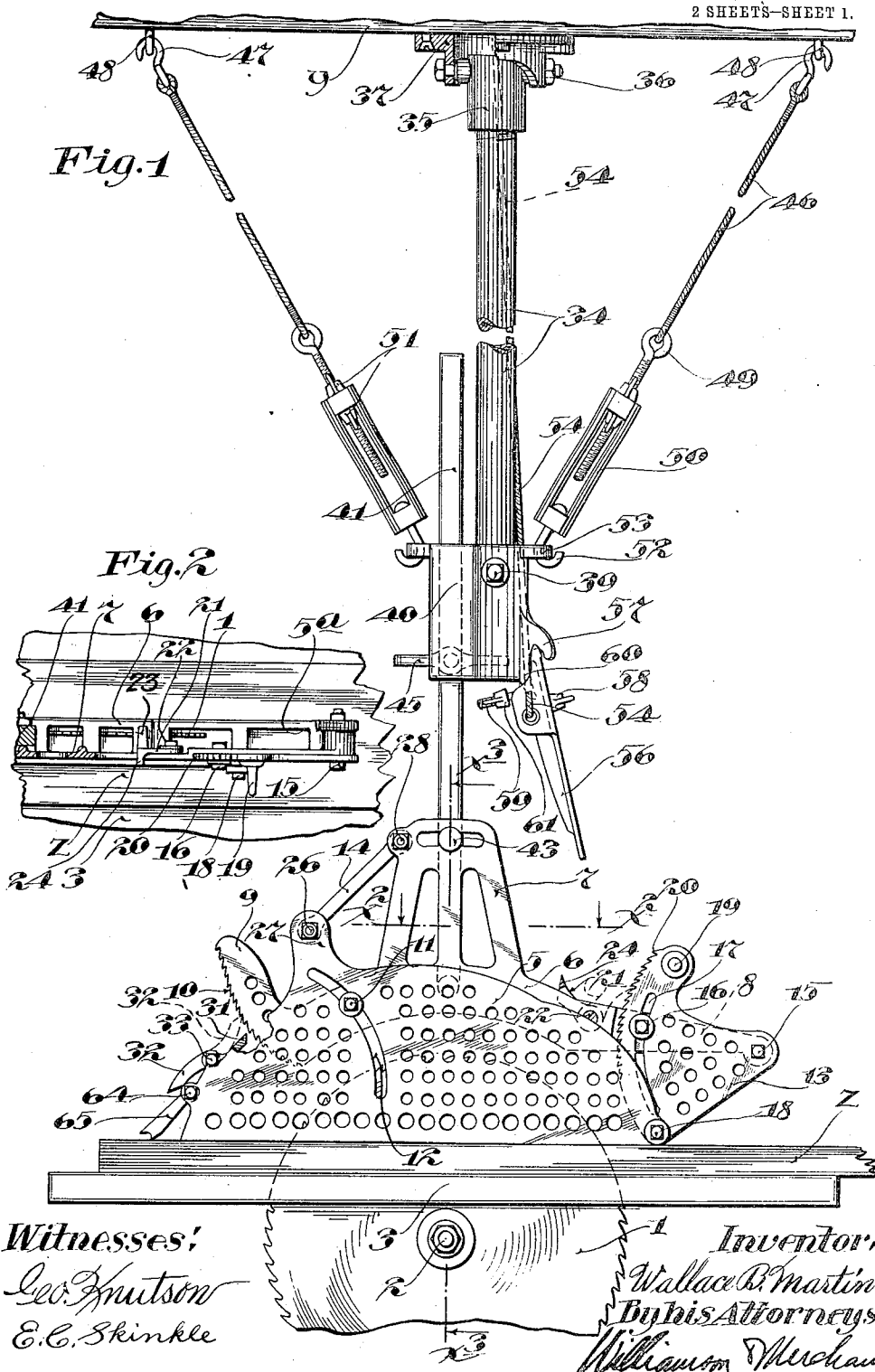


W. B. MARTIN.
 GUARD FOR CIRCULAR SAWS.
 APPLICATION FILED AUG. 20, 1913.

1,125,364.

Patented Jan. 19, 1915.

2 SHEETS—SHEET 1.



Witnesses:
 Geo. Knutson
 E. C. Skinkle

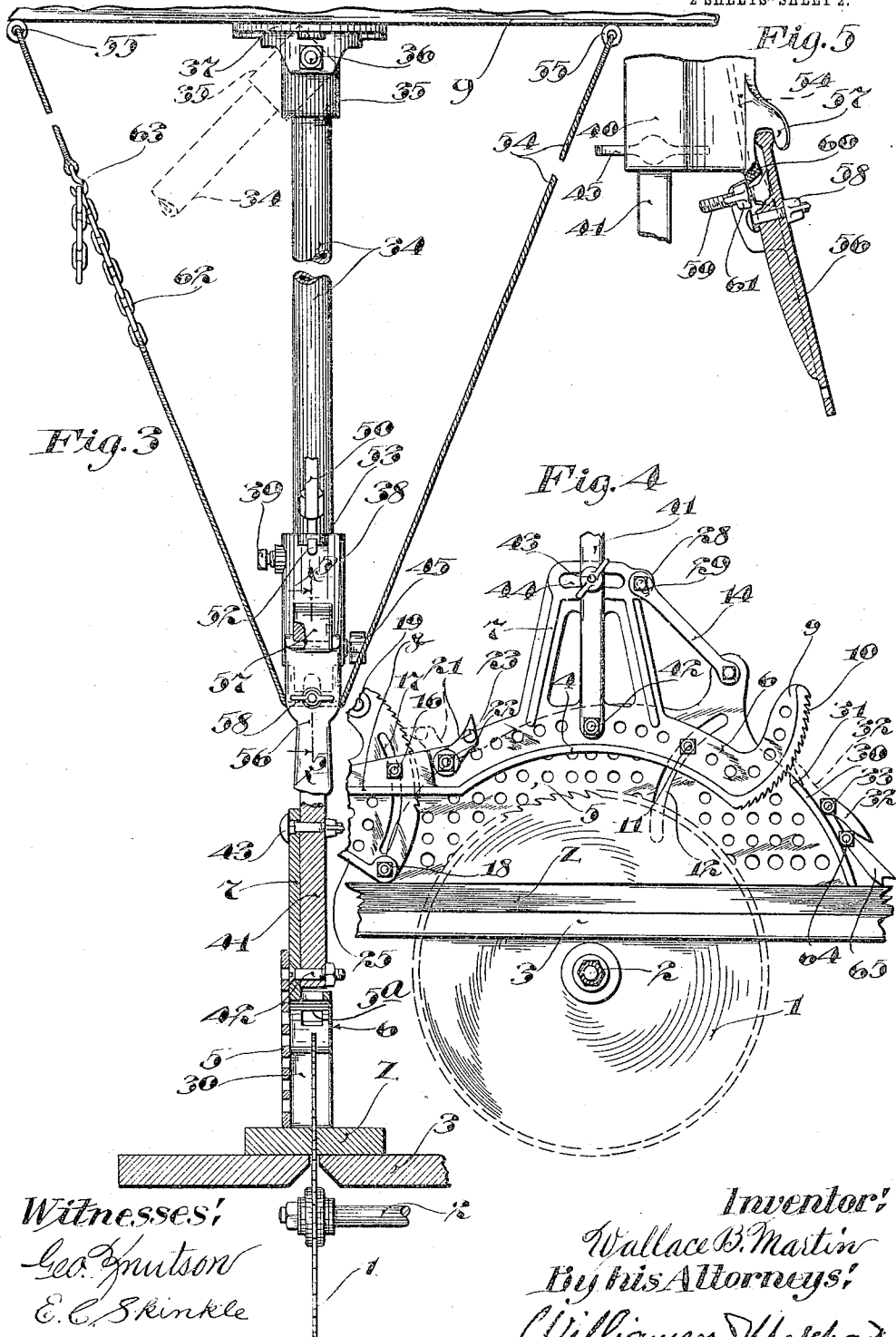
Inventor:
 Wallace B. Martin
 By his Attorneys:
 William M. Merchaud

W. B. MARTIN.
GUARD FOR CIRCULAR SAWS.
APPLICATION FILED AUG. 20, 1913.

1,125,364.

Patented Jan. 19, 1915.

2 SHEETS—SHEET 2.



Witnesses:
Geo. Nutson
E. C. Skinkle

Inventor:
Wallace B. Martin
By his Attorneys:
Williamson Merchant

UNITED STATES PATENT OFFICE.

WALLACE B. MARTIN, OF ST. PAUL, MINNESOTA.

GUARD FOR CIRCULAR SAWS.

1,125,364.

Specification of Letters Patent.

Patented Jan. 19, 1915.

Application filed August 20, 1913. Serial No. 785,706.

To all whom it may concern:

Be it known that I, WALLACE B. MARTIN, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Guards for Circular Saws; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved guard adapted for use in connection with rotary cutting heads of various kinds of machines, but is especially designed for circular saws.

To the above ends, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:—Figure 1 is a left side elevation of the improved guard working in connection with a circular saw, some parts being broken away and some of the exposed parts being shown in section; Fig. 2 is a detail view partly in plan and partly in horizontal section, taken on the line $x^2 x^2$ of Fig. 1; Fig. 3 is a view partly in front elevation and partly in vertical section, taken on the line $x^3 x^3$ of Fig. 1; Fig. 4 is a right side elevation of the parts shown in Fig. 1, some parts being broken away; and Fig. 5 is a detail view partly in side elevation and partly in vertical section taken on the line $x^5 x^5$ of Fig. 3.

For the purpose of illustrating the improved guard in working position, an ordinary circular saw 1 is mounted on a rotary power driven spindle 2 and works upward through a slot in a work table 3 in the customary manner. These parts may be of the standard or any desired construction.

Referring now to the improved guard, the same is in the form of a two part hood comprising an arch plate 4 which extends upward and on each side of the saw 1 and a vertically extended guard plate 5 which covers

the left side of said saw. The arch plate 4 is provided with a plurality of transverse openings 5^a through which the work may be viewed as the same is fed to the saw. Integrally formed with the left hand longitudinal edge portion of the arch plate 4 is a vertically extended flange 6 having, at its intermediate portion, an upwardly projecting extension 7. Integrally formed on the forward end of the arch plate 4 and flange 6 and laterally offset from the guard plate 5 is a horizontal extension 8. A segmental extension 9 is integrally formed with the rear end of the arch plate 4 and the flange 6 and is provided, on its periphery, with a plurality of wide ratchet teeth 10.

The guard plate 5 is in the form of a segment working against and parallel with the outer face of the flange 6 and with its horizontal edge extended parallel with the upper face of the work table 3. A washer equipped stud 11 is anchored to the arch plate flange 6 and works through a segmental slot 12 formed in the guard plate 5 for holding said guard plate in its proper relation with respect to the arch plate 4. The guard plate 5 is suspended with respect to the arch plate 4 for limited vertical and endwise movements by a segmental lifting plate 13 and a link 14.

The lifting plate 13 works vertically between the guard plate 5 and the extension 8 and is pivotally secured to said extension, at its axis, by a nut equipped bolt 15, for limited swinging movement. A washer equipped stud 16 anchored to the extension 8 works through a segmental slot 17 formed in the lifting plate 13 for holding said plate in proper position with respect to said extension. A nut equipped bolt 18 pivotally connects the lower outer edge portion of the lifting plate 13 to the guard plate 5 and a laterally projecting finger piece 19 is secured to the opposite portion of said lifting plate 13, for raising said guard plate, at will. On the periphery of the lifting plate 13 is formed a plurality of ratchet teeth 20 and a cooperating lock dog 21 is pivotally secured at 22 to the arch plate flange 6. This lock dog 21 is provided with a laterally projecting finger piece 23 and a

stop projection 24 arranged to engage the arch plate flange 6, to support said lock dog 21 in an inoperative position. As shown, the lifting plate 13 has integrally
5 formed with its lower oblique edge a laterally projecting cam flange 25 which is engaged by the board Z as the same is fed to the saw, to lift the guard plate 5 and permit said board to pass thereunder.

10 The link 14 extends substantially parallel with a line through connections 15 and 18 of the lifting plate 13, and its lower end is pivotally secured, by a nut equipped bolt 26, to an upwardly projecting ear 27 integrally
15 formed with the rear peripheral edge of the guard plate 5. A nut equipped bolt 28, projecting through a longitudinally extended slot 29 in the upper end of the link 14, pivotally connects said link to the rear upper portion of the extension 7. As will presently
20 appear, the purpose of the slot 29 is to permit a shortening of the operative length of the link 14 between its pivotal connections 26 and 28, by an endwise upward thrust thereon.
25

Integrally formed with the rear peripheral edge of the guard plate 5 is a laterally projecting flange 30 terminating, at its upper edge, in a bevel tooth or pawl 31 for
30 operation with the ratchet teeth 10, but normally out of engagement therewith. A lock dog 32 is pivotally secured at 33 to the guard plate 5 for coöperation with the ratchet teeth 10.

35 The improved guard is suspended from a ceiling or overhead support Y for pendulum-like movement, transversely of the saw 1 by a depending hanger shaft 34, as shown in the form of a pipe. This shaft 34 is provided, at its upper end, with a cap 35, pivotally secured by a bolt 36 to a socket 37
40 which is rigidly secured to the ceiling by screws or other suitable means. A vertically adjustable head 38 is telescoped onto the lower end of the hanger shaft 34 and is secured in different adjustments thereon by a set screw 39 having screw threaded engagement with a boss on said head and with
45 its inner end impinging against said hanger shaft. Integrally formed with the head 38, on one side thereof, is a sleeve 40 which extends parallel with the opening through said head and is preferably rectangular in cross section. Slidably mounted within the
50 sleeve 40 is a bar 41, to the lower end of which the arch plate 4 is pivotally secured by a nut equipped bolt 42. This pivot bolt 42 extends through the arch plate flange 6, substantially at its longitudinal and transverse center, and its head is countersunk therein, out of the way of the guard plate 5. Obviously, this pivotal connection 42 permits angular rocking adjustment of the ends of the arch plate 4 toward and from the saw

1. By this adjustment, the lower horizontal edge of the guard plate 5 may be set parallel with or in its proper relation to the top of the table 3. A thumb nut equipped clamping bolt 43 is passed through a perforation in the bar 41 and through a segmental slot
65 44 formed in the upper end portion of the extension 7, to secure the arch plate 4 in different set adjustments transversely of said bar. A hand set screw 45 has screw threaded engagement with the sleeve 40 and the
70 75 inner end thereof impinges against the bar 41, to support said bar in different vertical adjustments with respect to said sleeve 40. In cross section, the bar 41 is the same shape as the passageway through the sleeve 40 and
80 is held thereby against rotation.

The lower end of the hanger shaft 34 is rigidly held against lateral movement longitudinally of the improved guard by a pair of upwardly diverging cables 46, having
85 attached to their upper ends hooks 47 that are secured to the ceiling Y by eyes 48. To the lower ends of each cable 46 is secured a comparatively long screw threaded eye bolt 49, attached to one end of a turn buckle 50 by
90 a pair of opposing clamping thumb nuts 51. In the other end of each of these turn buckles 50 is swiveled a hook 52. These hooks 52 are detachably secured to a pair of opposite and horizontally projecting ears 53
95 formed, respectively, with the upper ends of the head 38 and the sleeve 40. Obviously, the cables 46 permit swinging movement of the hanger shaft 34 transversely of the saw 1.
100

For securing the hanger shaft 34 against oscillatory movement, while the device is in an operative position, a cable 54 is anchored, at its ends, to eyes 55 secured to the ceiling Y on opposite sides of the hanger shaft 34
105 and in a direct line with the swinging movement of said hanger shaft. The depending intermediate portion of the cable 54 is adjustably secured to the head 38 by a depending lever 56, detachably fulcrumed, at its
110 upper end, to a relatively wide downwardly projecting hook lug 57 which is integrally formed on the lower end of the head 38 opposite from the sleeve 40. As shown, the fulcrumed end of the lever 56 is bifurcated
115 and the prongs thereof embrace the sides of the hook lug 57 and hold said lever against edgewise movement. The cable 54 is frictionally clamped in different longitudinal adjustments on the inner face of the lever 56
120 by a thumb nut equipped bolt 58. This bolt 58 is passed through the intermediate portion of the lever 56, and its head is arranged to engage the cable 54 and clamp the same onto said lever. The lever 56 is positively
125 locked to the head 38 in an operative position by a screw threaded stud 59, integrally formed with the lever 56 between its ful-

crumpled end and the bolt 58. This stud 59 works between the prongs of a depending bifurcated lug 60, integrally formed with the head 38 immediately below the hook 57. The screw stud 59 is provided with a thumb nut 61 arranged to engage the inner face of the lug 60 as a base of resistance and draw the lever 56 into a locked position against the outer face of said lug. As best shown in Figs. 1 and 5, the pull of the cable 54 on the lever 56 is past a dead center and thus independent of the thumb nut 61 and stud 59.

Interposed in the left hand section of the cable 54, with respect to Fig. 3, is a short chain 62 attached, at its lower end, to the main section of the cable 54 and adjustably secured, at its other end, to a hook 63 attached to the short or upper section of the cable 54. Obviously, by inserting the hook 63 in different links of the chain 62, the desired tension may be placed on the cable 54.

Pivotaly secured at 64 to the rear end of the guard plate 5 is a depending double toothed dog 65 which prevents any tendency of the board being sawed to kick back. The free or toothed end of this dog 65 normally rides over the upper surface of the board Z.

The operation and different adjustments of the improved guard may be briefly described as follows: By longitudinally adjusting the bar 41 in the sleeve 40, the arch plate 4 may be secured in a position to support the guard plate 5, when in its normal or lowermost position, with its lower longitudinal edge parallel with but just out of contact with the upper face of the saw table 3. The clamping bolt 43 and slot 44 in the extension 7 permit the arch plate 4 to be set in different angular adjustments with respect to the table top, in order that the lower longitudinal edge of the suspended guard plate 5 may be properly adjusted with respect to said table top. The cables 46 rigidly hold the arch plate 4 against endwise movement and the cable 54 and lever 56 rigidly hold the arch plate 4 against lateral movement and also permit the said arch plate to be secured in its proper relation over the saw 1. By releasing the lever 56 from the head 38, the entire device is free for swinging movement, so that the same may be moved to and from operative positions. When in an inoperative position the entire device extends in an oblique position, as indicated by dotted lines in Fig. 3, and may be supported in this position by securing one of the cables 46 over the hook 63. To release the lever 56 from engagement with the hook 57, it is first necessary to loosen the thumb nut 61 sufficiently to permit the stud 59 to move out from between the prongs of the bifurcated lug 60. Then, by moving the free or long end of the lever 56 upward, the same may be

moved out of engagement with the hook 57, thereby leaving the improved guard free for swinging movement.

In feeding the board Z to the saw, the forward end thereof first engages the cam flange 25, thus rocking the lifting plate 13 on its pivot 15. It is highly important to note that the cam flange 25 and link 14 incline rearwardly and downwardly and, as the same are lifted during the movement of the board Z, the guard plate 5 recedes in the direction of movement of the board, as the same is fed to the saw, and at the same time is raised. This receding movement of the guard plate 5, during its lifting movement, is very important for the reason that it takes very little power to lift said guard plate a sufficient distance to permit the board Z to pass thereunder. After the board Z has passed from under the guard plate 5, the same again immediately returns to its normal position, under the action of gravity.

In case a number of boards of the same thickness are to be sawed, the lock dog 21 may be turned into engagement with the ratchet teeth 20, and the first board passing under the guard plate 5 will raise the same to the required height. After this board has passed from under the guard plate 5, the dog 21 will hold the guard plate 5 against return movement so that it will not be necessary to lift the guard plate 5 during the sawing of the remaining boards. In case a thicker board is fed to the saw, the lock dog 21 will slip over the ratchet teeth 20, thereby permitting the guard plate 5 to move to the required height.

In case it is desirable to lock the guard plate 5 in a pre-determined raised position and against either upward or downward movements, both the lock dogs 21 and 32 are moved, respectively, into engagement with the ratchet teeth 20 and 10. When the lock dog 32 is in engagement with the ratchet teeth 10, the rear end of the guard plate is positively held against upward movement, and thereby prevents any kick-back of the boards being fed to the saw. The causes of the so-called kick-backs are well known and also the dangers of the same. When the lock dog 32 is out of engagement with the ratchet teeth 10, the tooth 31 will automatically engage the ratchet teeth 10 by a slight forward lifting movement of the rear end of the guard plate 5. This movement of the guard plate will put an end thrust on the link 14 and the slot 29 formed therein will permit sufficient shortening of the operative length of said link to allow the tooth 31 to be carried into engagement with the ratchet teeth 10, thereby positively locking the rear end of said guard plate 5 against upward movement caused by the lifting of the board Z from the table 3.

It is important to note that the horizontal portions of the extensions 8 and 9 and the cam flange 25 form continuations of the arch plate 4 which, together with said arch plate, completely cover the cutting edge of the saw 1 above the table 3.

What I claim is:—

1. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections supporting said guard plate from said arch plate for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, and automatic means, operative under a lifting movement of said guard plate, for locking the same against upward movement.

2. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate, supporting said guard plate from said arch plate, for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, and means operative at will actuated by an upward movement of said guard plate for locking the same in different vertical adjustments.

3. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate, supporting said guard plate from said arch plate, for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, and means operative at will actuated by an upward movement of said guard plate for locking the same in different vertical adjustments, but with freedom for further upward movement away from the saw.

4. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate, supporting said guard plate from said arch plate, for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, and a pair of reversely acting one-way locks, operative at will, one of which is actuated by a lifting movement of said guard plate operative, at will, for locking said guard plate in different vertical adjustments in respect to said arch plate.

5. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate, supporting said guard plate from said arch plate for vertical movement and a receding movement in the direction of movement of

the work as the same is fed to the saw, and automatic means, operative under a forward lifting movement, of said guard plate, for locking the same against upward movement.

6. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate, supporting said guard plate from said arch plate, for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, and a pawl and ratchet device actuated by an upward lifting movement of said guard plate, operative at will for locking the same in different further upward adjustments but with freedom for vertical movement away from the saw.

7. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate, supporting said guard plate from said arch plate, for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, and a pair of reversely acting pawl and ratchet devices for locking said guard plate in different vertical adjustments, one of said pawl and ratchet devices being arranged to be actuated by an upward lifting movement of said guard plate.

8. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a link, supporting said guard plate from said arch plate, for vertical movement and a receding movement in the direction of movement of the work as the same is fed to the saw, said link having a limited endwise movement for shortening its operative length under an end thrust thereon, and automatic means rendered operative under the shortening action of said link, to lock said guard plate against upward movement.

9. A guard of the kind described comprising a hood made up of a relatively fixed arch plate and a relatively movable guard plate, connections, including a lifting plate and a link, supporting, respectively, the front and rear ends of said guard plate from said arch plate, for vertical movement and for receding movement in the direction of movement of the work as the same is fed to the saw, said link having a limited endwise movement for shortening its operative length under an end thrust thereon, automatic means rendered operative under the shortening action of said link, to lock said guard plate against upward movement, and a pawl and ratchet device for locking said guard plate in different vertical adjust-

ments but with freedom for vertical movement away from said saw.

10. The combination with a work table and a support thereabove, of a hood made up of an arch plate and a guard plate, said arch plate being mounted on said support for angular adjustment in the plane of the saw, and said guard plate being supported from said arch plate for vertical swinging

movement, and a receding movement in the direction of the movement of the work as the same is fed to the saw.

In testimony whereof I affix my signature in presence of two witnesses.

WALLACE B. MARTIN.

Witnesses:

EDITH E. HANNA,

HARRY D. KILGORE.

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