

[54] **CIRCULAR SAW WITH IMPROVED  
MOVABLE GUARD CONSTRUCTION**

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[22] Filed: **Dec. 10, 1971**

[21] Appl. No.: **206,639**

[52] U.S. Cl. .... **143/159 H**

[51] Int. Cl. .... **B27g 19/04**

[58] Field of Search ..... **143/159 H, 159 R;  
30/391**

[56] **References Cited**

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[57] **ABSTRACT**

The adjustably mounted base plate carries a first abutment formation adjacent the trailing end of the slot which is formed therein to receive the circular saw blade. The lower blade guard has a second abutment formation thereon adjacent its work-engaging forward end. The second abutment formation is brought into abutting engagement with the first abutment formation upon movement of the lower blade guard toward its open position whereby the lower blade guard exposes only the blade teeth which extend through the slot in the base plate irrespective of the angular disposition of the latter. A manually operated retracting mechanism for the lower blade guard includes linkage operated by a handle mounted on the side of the fixed blade guard which is adjacent the tool motor.

**5 Claims, 6 Drawing Figures**

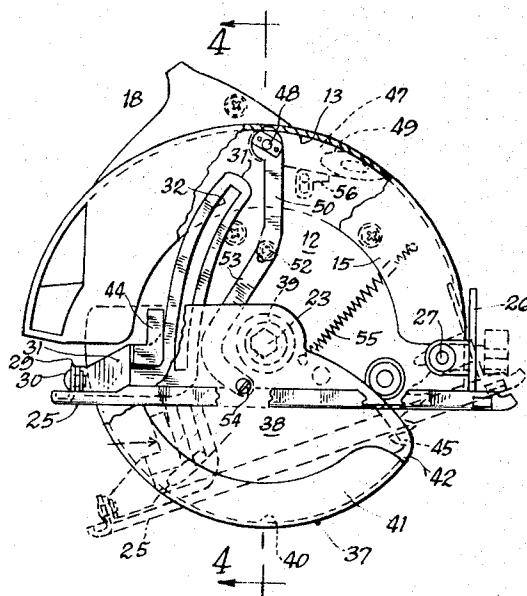


FIG. 1

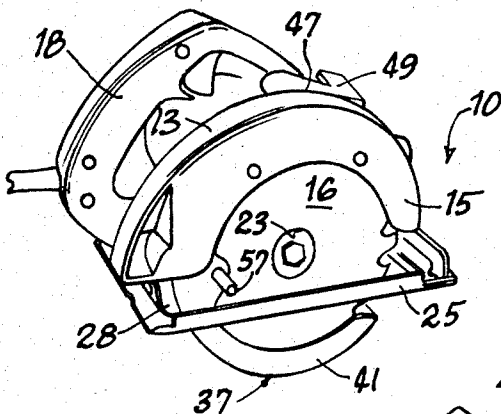


FIG. 2

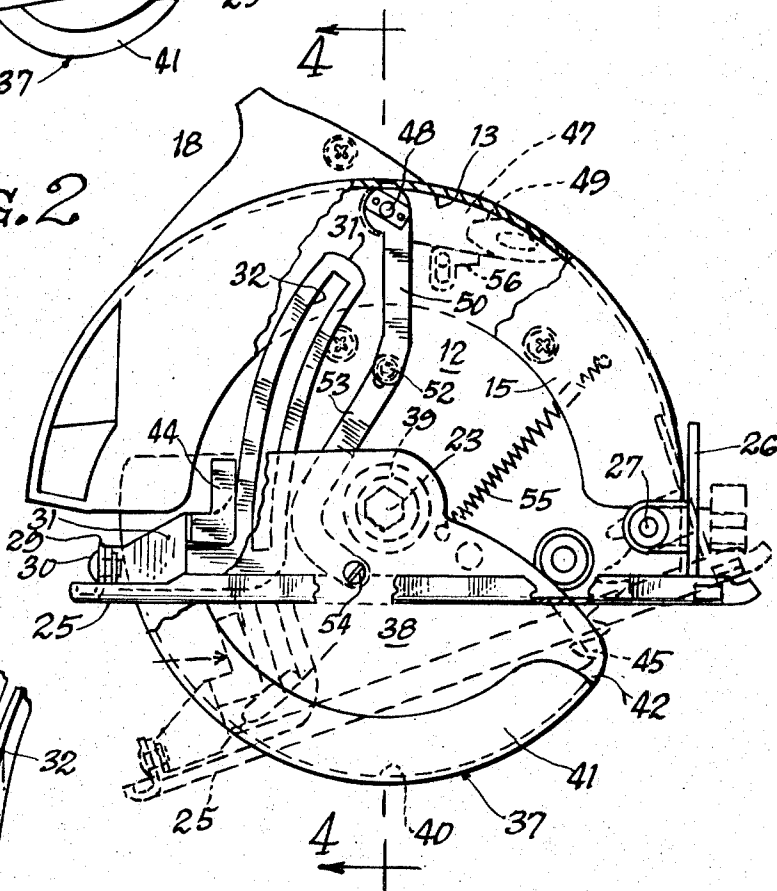


FIG. 3

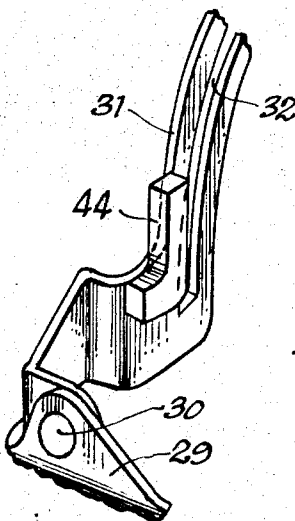


FIG. 4

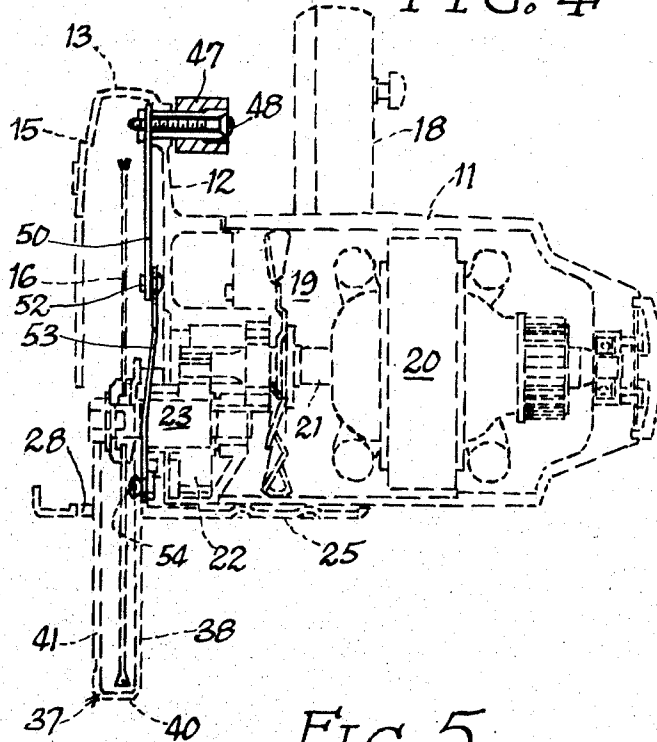


FIG. 6

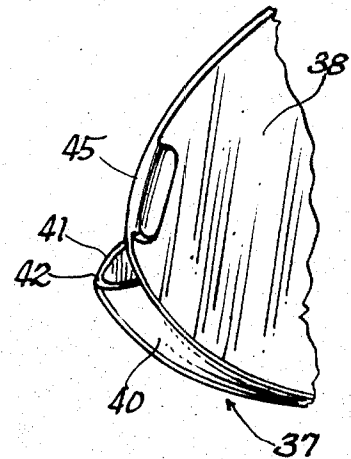
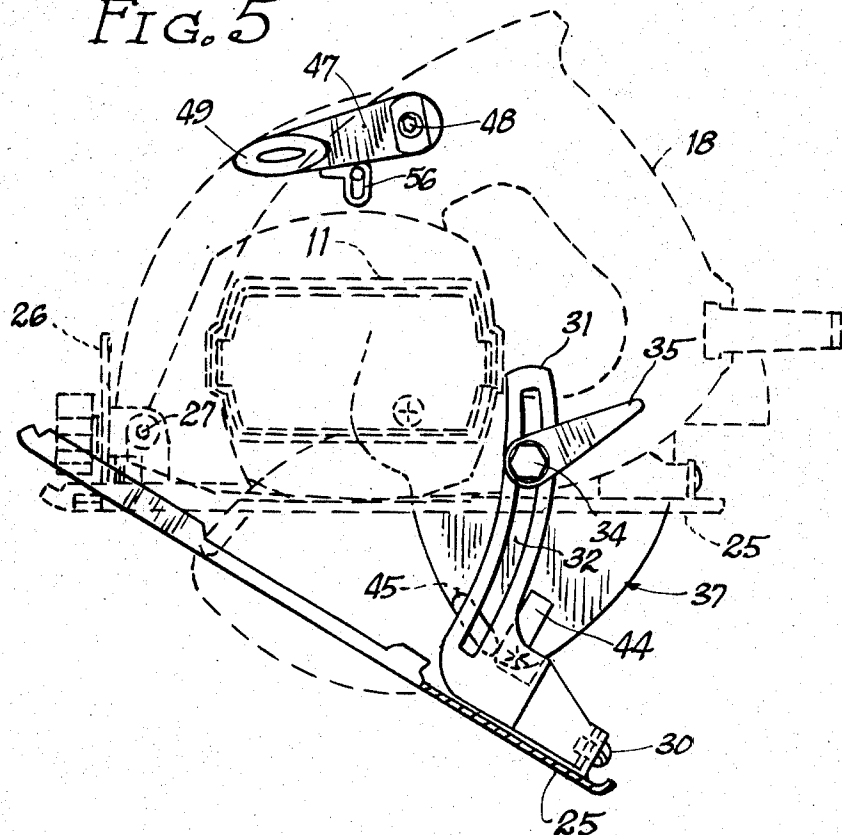


FIG. 5



# CIRCULAR SAW WITH IMPROVED MOVABLE GUARD CONSTRUCTION

## BACKGROUND OF THE INVENTION

### 1. The Field of the Invention

The field of the invention relates to portable, power operated circular saws. More particularly, the invention relates to new and improved mechanism for the retractable lower blade guard of such a saw.

### 2. The Prior Art

It is known in the prior art to provide a circular saw with an adjustable base plate. Such base plate is pivotally connected at its forward end to the saw housing for swinging movement about an axis parallel with the axis of rotation of the blade mounting shaft. The base plate may be adjustably mounted in any desired position between a so-called normal position and a position inclined with respect thereto. A circular saw of this type has a lower or movable blade guard which, in the closed position thereof, cooperates with an upper or fixed blade guard to enclose substantially all of the teeth on the circular blade. If such lower blade guard is swung to its fully open or retracted position and if the base plate is positioned in one of its inclined positions, the teeth on the circular saw blade between the base plate and the blade guards will be exposed. These exposed teeth are above the work and consequently present a potentially dangerous condition to the operator of the tool.

Circular saws of this type have been provided with manually operated retracting mechanisms for the lower blade guard. Many of such retracting mechanisms can be operated only by placing of the user's fingers in the approximate vicinity of the saw blade, thereby presenting a hazardous situation.

## SUMMARY AND OBJECTS OF THE INVENTION

A primary object of the present invention is the provision of a portable, power operated circular saw of the type described, which saw embodies new and improved safety features.

Another object of the present invention is the provision of a circular saw of the type described having cooperating abutment means on the base plate and lower blade guard so that irrespective of the position of the base plate the only teeth on the circular blade which are exposed are those extending through and beneath the slot in the base plate.

Still another object of the present invention is the provision of a circular saw of the type described having a retracting mechanism for the lower blade guard which embodies safety features, one such feature residing in the location of the operating lever of the retracting mechanism in an area quite remote from the exposed portion of the saw blade.

These and other objects and advantages of the present invention will become apparent from the following specification disclosing a preferred embodiment shown in the accompanying drawings.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a circular saw embodying the present invention;

FIG. 2 is an enlarged side elevational view of the saw of FIG. 1, with certain parts being broken away for better illustration of the invention;

FIG. 3 is an enlarged, fragmentary view of the adjustment arm mounted on the base plate, which arm in turn mounts one of the abutment formations;

FIG. 4 is a section taken along the line 4—4 of FIG. 2, all parts being shown in broken lines except for the lower blade guard retracting mechanism;

FIG. 5 is a side elevational view of the circular saw as seen from the side opposite the side shown in FIG. 2; and

FIG. 6 is an enlarged, fragmentary perspective view of the forward end of the lower blade guard showing the other abutment formation.

## DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to the drawings, a portable, power operated circular saw, generally designated 10, which embodies the present invention, includes a frame or housing 11 having a fixed upper blade guard defined by a generally semicircular plate 12, an integral arcuate web 13 and an integral generally semiannular flange 15. This plate, web and flange cooperate to enclose the teeth on the upper portion of a circular saw blade 16.

The frame supports the usual handle 18. The housing also defines a space 19 receiving an electric motor 20 of suitable construction, such motor including a shaft 21 having teeth at the outer end thereof in engagement with the teeth on a gear 22. This gear is mounted on a shaft 23, which shaft mounts the circular saw blade 16.

A generally rectangular, planar base plate 25 has a bracket 26 at the forward end thereof. This bracket is pivotally connected with a pin 27, the latter being suitably supported on the frame 11 in parallel relationship with the blade mounting shaft 23 thereby mounting the base plate for swinging movement back and forth between a normal position, shown in solid lines in FIG. 2, and an inclined position shown in broken lines in that figure of the drawings.

The base plate 25 includes an elongated slot 28 for receiving a portion of the circular blade 16 therethrough. The base plate also includes an upstanding bracket 29 adjacent the trailing end of the slot 28, which bracket is pivotally engaged, as by means of a pin 30, to an adjustment arm 31. The adjustment arm includes an arcuate slot 32 slidably receiving the stem of an adjustment fastener 34, such fastener including an operating lever 35. It will be understood that the lever 35 is operated to control frictional engagement between the fastener 34 and the arm 31 thereby releasably to secure the base plate in either the normal or inclined positions shown or in any selected position therebetween to achieve the desired depth of cut. As is conventional in the art, the base plate is also mounted by adjustment means (not shown) for pivoting movement about its longitudinal axis to perform bevel sawing.

A lower blade guard, generally designated 37, includes a plate 38 having a circular opening receiving a bearing ring 39, the latter being concentric with the blade mounting shaft 23 and mounting the lower blade guard 37 for rotation about such shaft. The lower blade guard includes an arcuate web 40 integral with the plate 38 and an arcuately extending flange 41 which in turn is integral with the web 40.

The lower blade guard 37 is illustrated in the closed position thereof in FIG. 2 with the rearward portion thereof being nested within the rearward portion of the

upper blade guard. In such closed position, the lower blade guard cooperates with the upper blade guard to enclose substantially all of the teeth on the circular blade 16 — only a few teeth between the base plate 25 (when the same is in its normal position) and the work engaging or forward end 42 of the lower blade guard are exposed.

An abutment formation 44 is welded or otherwise secured to the adjustment arm 31 as best illustrated in FIG. 3. Another abutment formation 45 is integrally formed on the plate 38 of the lower blade guard adjacent the forward end 42 of the latter. These abutment formations are arranged such that the formation 45 will be brought into abutting engagement with the formation 44 during movement (clockwise as seen in FIG. 2) of the lower blade guard 37 from its closed position toward its open or retracted position. This engagement between the abutment formations prevents further movement of the lower blade guard toward its open position.

It will be seen that irrespective of the position of the base plate, it will be possible to retract the lower blade guard to an extent exposing only the teeth on the circular saw 16 which extend through the slot 28 beneath the base plate 25. Since abutting engagement of the formations 44, 45 limits opening movement of the lower blade guard 37 and since the formation 44 is carried by the base plate adjacent the trailing end of the slot 28, it will not be possible to retract the lower blade guard to an extent such that the saw teeth above the base plate are exposed, and this result will be obtained in all positions of the base plate.

A manually operated retracting mechanism for the lower blade guard includes an operating lever 47 pivotally mounted to the plate 12 of the upper blade guard, as by means of a pin 48. It is noted that this operating lever is mounted on the side of the upper blade guard which is adjacent the housing 11 enclosing the motor 20. The distal end of this lever includes a finger engaging portion 49.

A first link 50 has one end thereof secured to the pin 48 for movement in unison with the operating lever 47. The link 50, which is disposed within the upper blade guard, has the other end thereof pivotally connected, as by means of a pin 52, to one end of another link 53. The link 53 has the other end thereof pivotally engaged with the lower blade guard 37, as by means of a pin 54. A spring 55 has one end thereof engaged with the plate 38 of the lower blade guard and the other end thereof connected to the plate 12 of the upper blade guard; the spring 55 acts to urge the lower blade guard 37 in a counterclockwise direction (FIG. 2) to the closed position illustrated in that figure.

It will be apparent that when the operating lever 47 is lifted, the lower blade guard is swung toward its open position until such time as the abutment formation 45 is brought into engagement with the abutment formation 44. As noted in FIG. 2, the lever 53 is bent intermediate the ends thereof partially encircling the blade mounting shaft 23 such that the respective ends of this link are disposed generally above and beneath the blade mounting shaft when the lower blade guard is in its closed position. This configuration of the link 53 improves the mechanical advantage of the links thereby facilitating manual retraction of the lower blade guard.

A stop 56 is mounted on the plate 12 of the upper blade guard to limit movement of the operating lever 47 and thereby prevent possible bending or jamming of the links 50, 53 during return movement of the operating lever 47. Since the operating lever is positioned in remote relationship from the portion of the circular blade which is exposed to contact the work, there is little or no danger of the operator's hand coming into engagement with the saw teeth when operating the retracting mechanism. As is conventional in the art, a pin 57 is provided on the lower blade guard as an alternate means for retracting the same.

We claim:

1. In a portable, power operated circular saw of the type having a powered blade mounting shaft and a frame including a fixed blade guard adapted to enclose the teeth on the upper portion of a circular blade mounted on said shaft, a base plate having an elongated slot for receiving a portion of the circular blade therethrough, pivot means securing said base plate to said frame adjacent the leading end of the former for pivoting movement about an axis parallel with the axis of rotation of said shaft back and forth between a normal position and an inclined position, and adjustment means for securing said base plate in said positions and in any location therebetween, the improvement comprising:

- a. a first abutment formation on said base plate adjacent the trailing end of said slot;
- b. a lower blade guard mounted on said frame for swinging movement back and forth between a closed position and an open position, which lower blade guard in the closed position thereof cooperates with said upper blade guard to enclose substantially all of the teeth on the blade; and
- c. said lower blade guard having a work engaging forward end and a second abutment formation thereon which is adjacent said forward end, said second abutment formation being brought into abutting engagement with said first abutment formation upon movement of said lower blade guard from the closed position thereof toward the open position thereof whereby the lower blade guard exposes only the blade teeth which extend through said slot and beneath said base plate irrespective of the location of the base plate between said positions thereof.

2. The improvement according to claim 1 further defined by:

- a. said adjustment means including an adjustment arm mounted on said base plate adjacent the trailing end of said slot, said first abutment formation being integral with said arm; and
- b. said second abutment formation being integral with said lower blade guard.

3. The improvement according to claim 1 further defined by a manually operated retracting mechanism for said lower blade guard, said mechanism comprising:

- a. an operating lever pivotally mounted on the side of said fixed blade guard which is adjacent the power means for rotating said shaft;
- b. connecting means engaged with said lever and said lower blade guard for moving the latter between said positions thereof in response to movement of said lever; and

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c. biasing means engaged with said frame and said lower blade guard for urging the latter toward said closed position thereof.

4. The improvement according to claim 3 wherein said connecting means includes a pair of links, one link being secured at one end thereof to said lever for movement in unison with the latter, the other link having one of its ends pivotally connected with the other end of said one link and having its other end pivotally con-

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nected with said lower blade guard.

5. The improvement according to claim 4 wherein said other link is bent intermediate the ends thereof and has its respective ends disposed generally above and below said shaft when said lower blade guard is in said closed position thereof thereby to increase the mechanical advantage of said links for facilitating manual operation of said retracting mechanism.

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