

Dec. 15, 1953

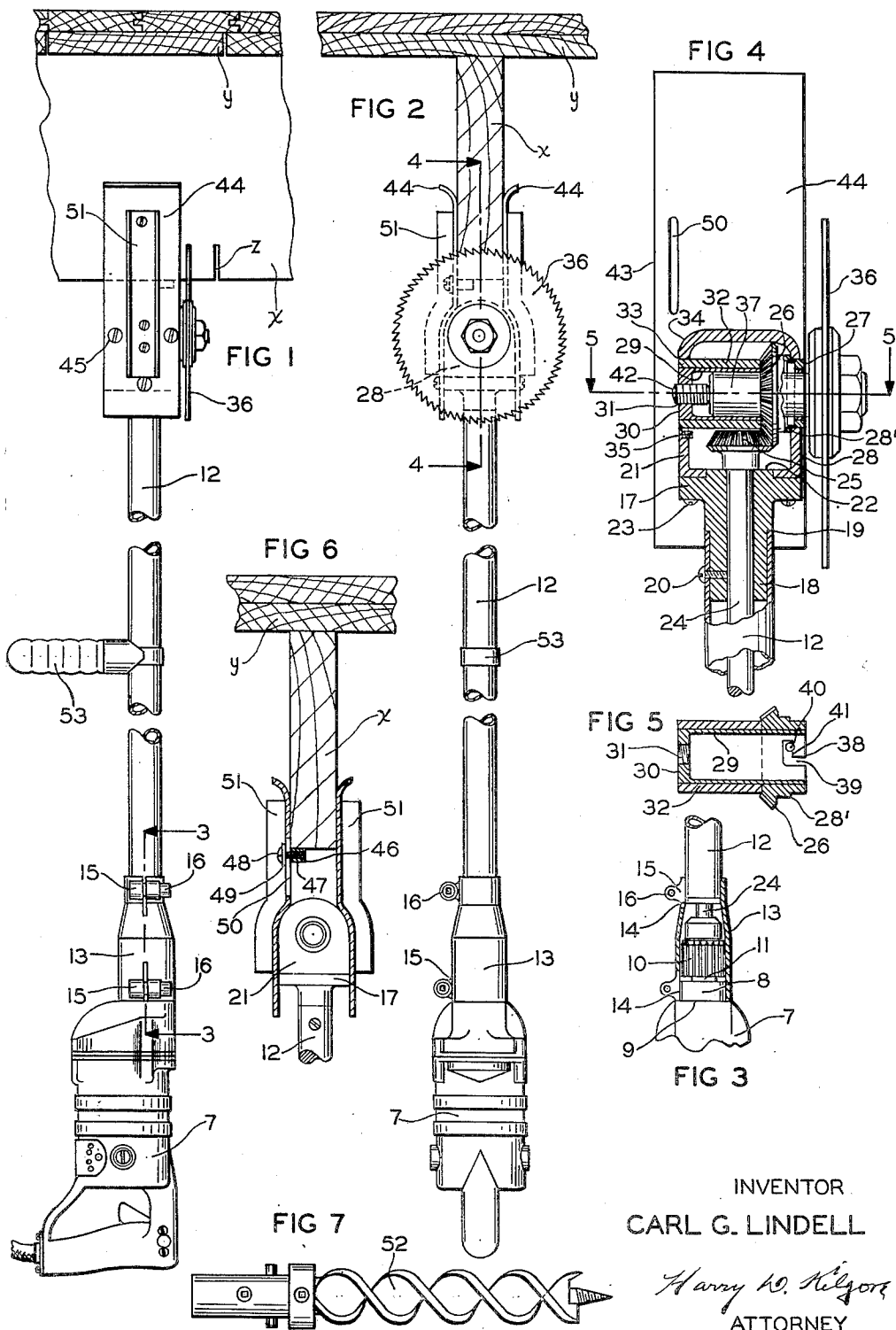
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2,662,562

SAW ATTACHMENT FOR ELECTRIC HAND DRILLS

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2 Sheets-Sheet 1



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FIG 8

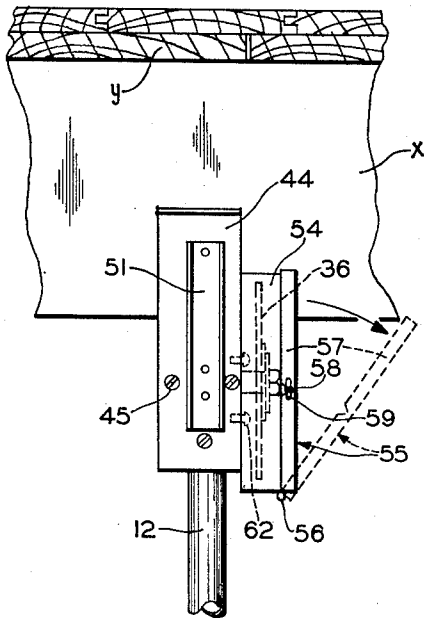


FIG 9

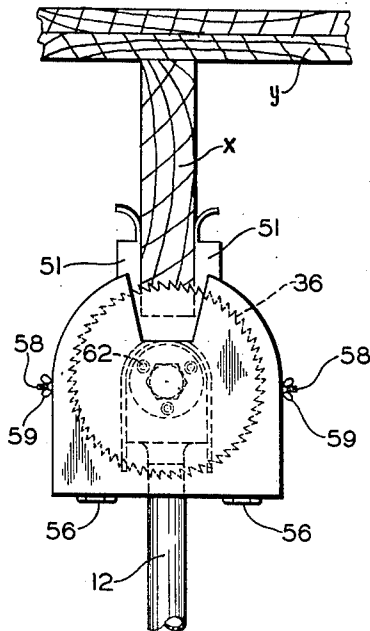


FIG 10

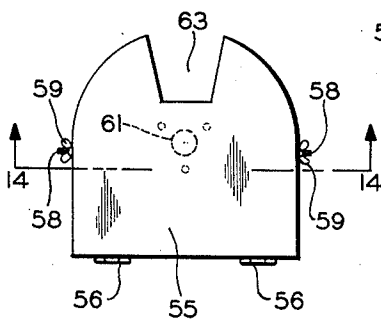


FIG 11

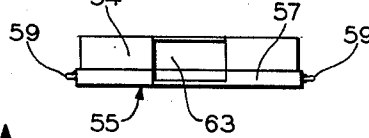


FIG 13

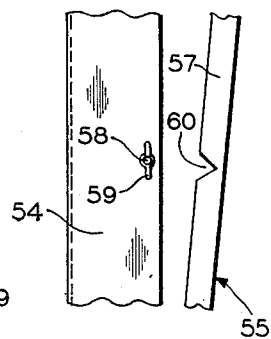


FIG 12

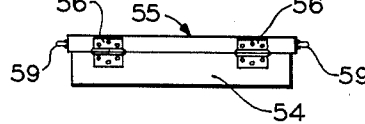
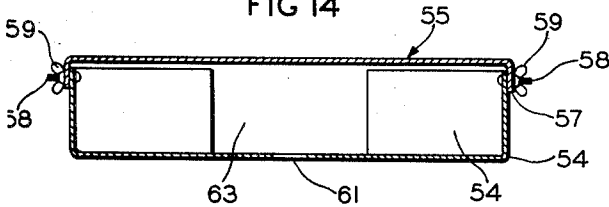


FIG 14



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SAW ATTACHMENT FOR ELECTRIC
HAND DRILLS

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2 Claims. (Cl. 143—43)

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My present invention relates to improvements in cutting attachments for hand drills of the type disclosed in my pending United States application for patent for "Boring Attachment for a Hand Drill," filed December 9, 1946, under Serial No. 714,979, now Patent No. 2,571,589.

It is well known that in installing electric wires, it is now mandatory in a great many instances, by city ordinance or otherwise, to place electric wires in rigid conduits in place of flexible casings as hereto has been the general practice. These flexible casings were installed by threading the same through holes bored in timbers or other parts. In installing rigid conduits in buildings, it is necessary to cut notches in the joist, studding or other parts to receive the conduits.

It is, of course, evident that the invention is equally well adapted for use in plumbing and heating installations wherein it is necessary to notch joists and studdings to receive pipe.

An object of this invention is to provide a novel saw attachment for a hand drill.

Another object of this invention is to provide a novel guide for positioning the saw relative to a timber to be cut thereby.

Still another object of this invention is to provide means that controls the depth to which the saw is to cut.

A further object of this invention is to provide a novel coupling for attaching a driven shaft casing to a hand drill.

Other objects of this invention will be apparent from the following description, reference being had to the drawing.

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

In the accompanying drawing, which illustrates the invention, like characters indicate like parts throughout the several views.

Referring to the drawing:

Fig. 1 is a side elevational view of the invention and also showing in section a fragment of a floor structure that has been sawed by the attachment;

Fig. 2 is a front elevational view of the invention as shown in Fig. 1;

Fig. 3 is a fragmentary detail view partly in elevation and partly in section taken on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary view partly in elevation and partly in section taken on the line 4—4 of Fig. 2, on an enlarged scale;

Fig. 5 is a fragmentary detail view in section taken substantially on the line 5—5 of Fig. 4;

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Fig. 6 is a view corresponding to the upper portion of the invention as shown in Fig. 2, with the exception that some parts are removed and further showing adjustable means for varying the depth of a cut to be made by the saw;

Fig. 7 is an elevational view of a bit;

Fig. 8 is a view corresponding to the upper portion of Fig. 1, and further showing a combined saw guard and sawdust collector attached to the housing;

Fig. 9 is a front elevational view of the parts shown in Fig. 8;

Fig. 10 is a rear elevational view of the combined saw guard and sawdust collector removed from the attachment;

Figs. 11 and 12 are top and bottom plan views, respectively, of the combined saw guard and sawdust collector;

Fig. 13 is a fragmentary detail view in side elevation of the combined saw guard and sawdust collector with the cover partly open; and

Fig. 14 is a view in transverse section taken on the line 14—14 of Fig. 10 on an enlarged scale.

The numeral 7 indicates a conventional hand drill, as an entirety, with the exception of the annular outer end portion of its housing 8, of reduced diameter and having at its inner end a stop shoulder 9. A chuck 10 is attached to the drive shaft 11 of the drill 7.

A long driven shaft casing 12 is attached at one end to the drill 7 by a novel coupling 13 and is of an external diameter somewhat more than the diameter of the housing end portion 8. The coupling 13 is in the form of a sleeve, one end portion of which is telescoped onto the housing end portion 8 against the stop shoulder 9 and its other end portion is of a reduced diameter and telescoped onto the respective end portion of the shaft casing 12. Each end portion of the coupling 13 is longitudinally slit at 14 and integral with each end portion is a pair of laterally spaced ears 15 between which the slit extends. A screw 16 extends loosely through one of the ears 15 and has screw-threaded engagement with the other thereof. Obviously, by tightening the screws 16, the end portions of the coupling 13 will be contracted and frictionally clamped onto the housing end portion 8 and the shaft casing 12. This coupling 13 affords a housing for the chuck 10.

On the other end of the shaft casing 12 is a flat rectangular base 17 having at its center a depending tubular shank 18, the outer end portion of which is of slightly decreased diameter and at the inner end thereof is a stop shoulder 19. This shank 18 extends into the respective end portion of the shaft casing 12 with a snug

fit and the outer end of said casing is in engagement with the stop shoulder 19. A screw 20 detachably secures the shaft casing 12 to the shank 18.

A housing 21 is removably mounted on the base 17 and held centered thereon by an annular boss 22 on said base which snugly fits in a round hole in the bottom of the housing 21. The housing 21 is further detachably secured to the base 17 by screws 23.

Extending axially through the casing 12 is a long driven shaft 24, the lower end portion of which is held by the chuck 10 for rotation therewith. On the upper end of the shaft 24 is a bevel pinion 25 within the housing 21. This pinion 25 meshes with a bevel gear 26 having a relatively long hub 27 journaled on the front member 28 of the housing 21. Extending axially through the gear 26 and its hub 27 is a sleeve bearing 29. The rear end of the bearing 29 is closed by an end member 30 and formed therein, at the axis thereof, is a hole 31.

The rear end portion of the bearing 29 and its end member 30 are journaled in a bronze bushing 32, the end portion of which extends through a hole 33 in rear member 34 of the housing 21 and is rigidly held by a pressed fit with said member. The bushing 32 is further secured to the housing member 30 by the head of a screw 35 having threaded engagement with the housing member 34. The head of this screw 35 impinges the outer end of the bushing 32, see Fig. 4, and prevents outward axial movement thereof. The bushing 32, at its inner end, affords a stop for the gear 26.

A circular saw 36 is mounted on an arbor 37 that extends axially into the bearing 29 from the front end thereof. The saw arbor 37 is detachably secured to the hub 27 of the gear to be rotated thereby by a pair of diametrically opposite joints 38. Each joint 38 includes an L-shaped slot 39, in the front end portion of the hub 27 of the gear 26 and the sleeve bearing 29, and the end portions of a pin 40 that extends transversely through the arbor 37. The forward edge portions of the hub 27 and the bearing 29, at the lateral portions of the slots 39, are notched at 41 and into which the pin 40 extends. The pin 40 is positively held in the notches 41 by a screw 42 which extends through the hole 33, has threaded engagement with the housing member 34 and impinges the rear end of the arbor 37 and prevents axial movement of said arbor in the bearing 29. A shoulder 28' on the gear hub 27 engages the inner side of the housing member 28 and prevents outward axial movement.

To position and hold the saw 36 relative to a joist x , on which is laid a floor y , the housing 21 is provided with a guide 43 in the form of a pair of upstanding plates 44. These guide plates 44 are secured one to each side of the housing 21 by screws 45. The guide plates 44, above the housing 21, are laterally spaced apart to receive the joist x therebetween and their upper end portions are outwardly curved to facilitate the entrance of said joist therebetween. In Fig. 1, a cut z has been made in the joist x by the saw 36 and said saw is in a second cut in said joist. At the completion of the two cuts in the joist x , the stock between said cuts is knocked out with a hammer to leave a passageway for a conduit.

The depth of a cut made by the saw 36 may be varied, at will, by an adjustable stop 46. This stop 46, as shown in Fig. 6, is a rectangular block

47 on the inner side of one of the guide plates 44 and clamped thereagainst by a screw 48. The screw 48 extends through a washer 49 on the outer side of the respective guide plate 44, through a vertical slot 50 in said plate and has threaded engagement with the stop 46. Obviously, by lifting the device to feed the saw 36 to its work, the stop 46 will be brought into contact with the lower edge of the joist x and limits the depth of the cut made by the same. In some instances, the stop 46 may be removed and, in which case, the top of the housing 21 will act as a stop.

On the outer side of each guide plate 44 is a reinforcing member 51 in the form of a channel; however, in actual manufacture, this reinforcement will be formed as an integral part of the guide plate 44. Also, in actual manufacture, suitable guards will be provided for the saw 36.

When a flexible conduit is to be used, the saw 36 may be removed and the bit 52, shown in Fig. 7, substituted therefor for boring holes through which the conduit will be threaded. A handle 53 is attached to the shaft casing 12.

Figs. 8 to 14, inclusive, show a combined guard for the saw 36 and a collector for sawdust cut by the saw. This combined saw guard and sawdust collector is in the form of a receptacle 54 that is rectangular in cross-section. The front member of the receptacle 54 affords a cover 55 attached to the bottom member of the receptacle 54 by hinges 56 for outwardly swinging movement. The cover 55 is provided with a capping flange 57 that snugly fits over the receptacle 54. To hold the cover 55 closed, there is secured to the sides of the receptacle 54 a pair of screw studs 58 provided with wing nuts 59. In the sides of the capping flange 57 are V-notches 60 through which the screw studs 58 extend and the wing nuts 59 impinge said capping flange and hold the cover 55 closed.

The saw 36 is encased in the receptacle 54 and the back member of said receptacle extends between the housing front member 28 and the saw 36 and said back member has a hole 61 therein for the saw arbor 37. This receptacle 54 is secured to the front member 28 of the housing 21 by screws 62. The tops of the receptacle 54, the cover 55 and the capping flange 57 are semi-circular and the centers thereof are at the axis of the saw 36. A notch 63 having upwardly diverging sides is formed in the back member of the receptacle 54, the cover 55 and the capping flange 57 to receive the joist x as the saw 36 is fed thereto in making a cut therein.

Obviously, sawdust cut by the saw 36 will be precipitated into the receptacle 54 and this prevents the same from falling on the operator holding the attachment and particularly into his eyes as he is looking up to watch the work. Sawdust accumulated in the combined saw guard and sawdust collector may be emptied simply by inverting the attachment and thus permitting the sawdust therein to flow therefrom through the open notch 63.

From what has been said, it will be understood that the invention described is capable of various modifications as to details of construction and arrangement within the scope of the invention herein disclosed and claimed.

What I claim is:

1. An upright elongated shaft, a housing fixed on the upper end of the shaft, an arbor journaled in the housing perpendicular to the projected axis of the shaft, a circular saw mounted on the arbor outwardly of the housing, means for driving the arbor, a pair of wide side plates

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secured to the housing perpendicular to the plane of the saw and spaced inwardly thereof, said plates projecting materially above the saw and laterally spaced equi-distances from the projected axis of the shaft, the plates above the housing being transversely flat, and parallel with their extreme upper end portions turned outwardly, and a stop member projecting between the side plates above the housing and attached to one of the side plates for adjustment longitudinally thereof.

2. An upright elongated shaft, a housing fixed on the upper end of the shaft, an arbor journaled in the housing perpendicular to the projected axis of the shaft, a circular saw mounted on the arbor outwardly of the housing, means for driving the arbor, a pair of wide side plates secured to the housing perpendicular to the plane of the saw and spaced inwardly thereof, said plates projecting materially above the saw and laterally spaced equi-distances from the projected axis of the shaft, the plates above the housing being transversely flat and parallel with their extreme upper end portions turned outwardly, and a box-like dust receptacle encasing the saw with its side between the housing and the saw secured to the housing, the outer side

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of the receptacle being hinged to open and normally held closed, said receptacle being completely closed except for a transverse notch in its upper end portion to expose the cutting portion of the saw.

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