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Levine

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[54] **DRILL PRESS**

[76] Inventor: **Aaron J. Levine,** 3147 North Cambridge Ave., Chicago, Ill. 60657

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[52] **U.S. Cl.**..... **408/14,** 408/16, 408/88, 408/135, 408/136, 408/236, 200/157

[51] **Int. Cl... B23b 39/12,** B23b 47/00, B23b 49/00

[58] **Field of Search**..... 408/14, 16, 88, 89, 90, 408/91, 135, 136, 87, 234, 235, 236; 200/157

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Primary Examiner—Francis S. Husar
Attorney, Agent, or Firm—Hill, Gross, Simpson, Van Santen, Steadman, Chiara & Simpson

[57] **ABSTRACT**

A drill press which comprises a stand with an upright and a movable drill controllable by a handle including a switch which allows the drill to be run at variable speeds as well as to be reversed and in which the stand is provided with a pair of arcuate slots aligned with the drill so that the drill will not hit into the drill stand and provided with adjustable limits for controlling the upper and lower limits of the drill movement as well as adjusting means for moving the entire drill assembly relative to the upright of the stand.

6 Claims, 6 Drawing Figures

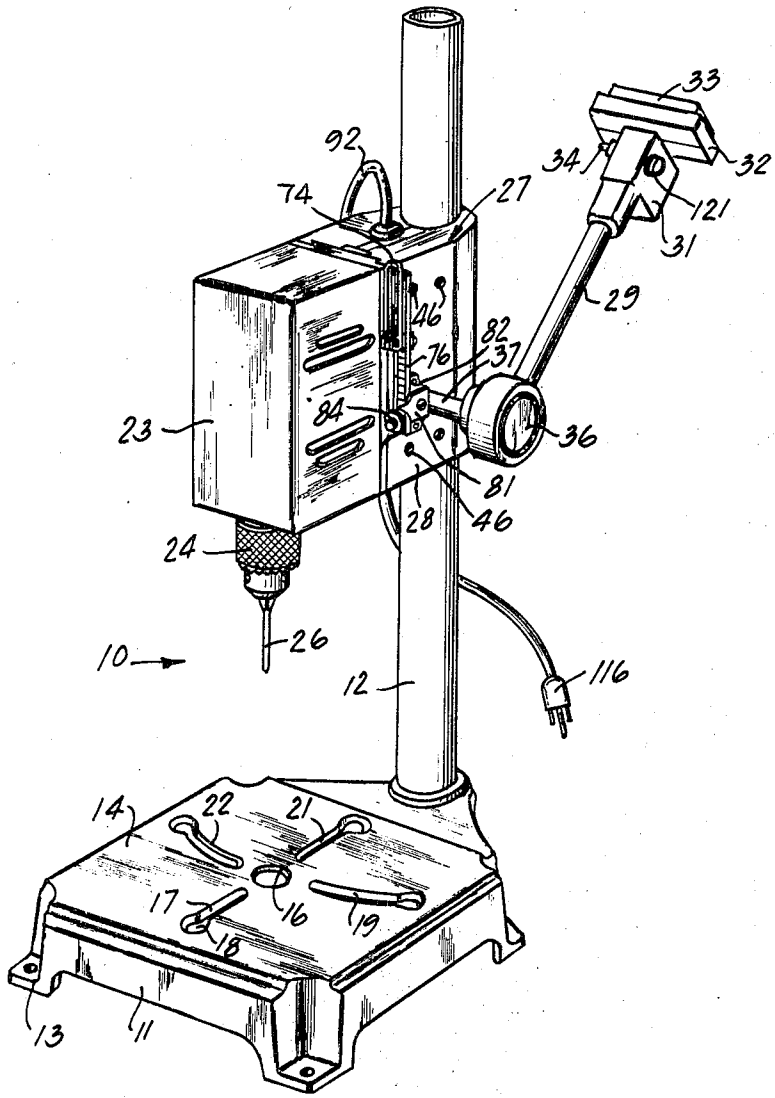
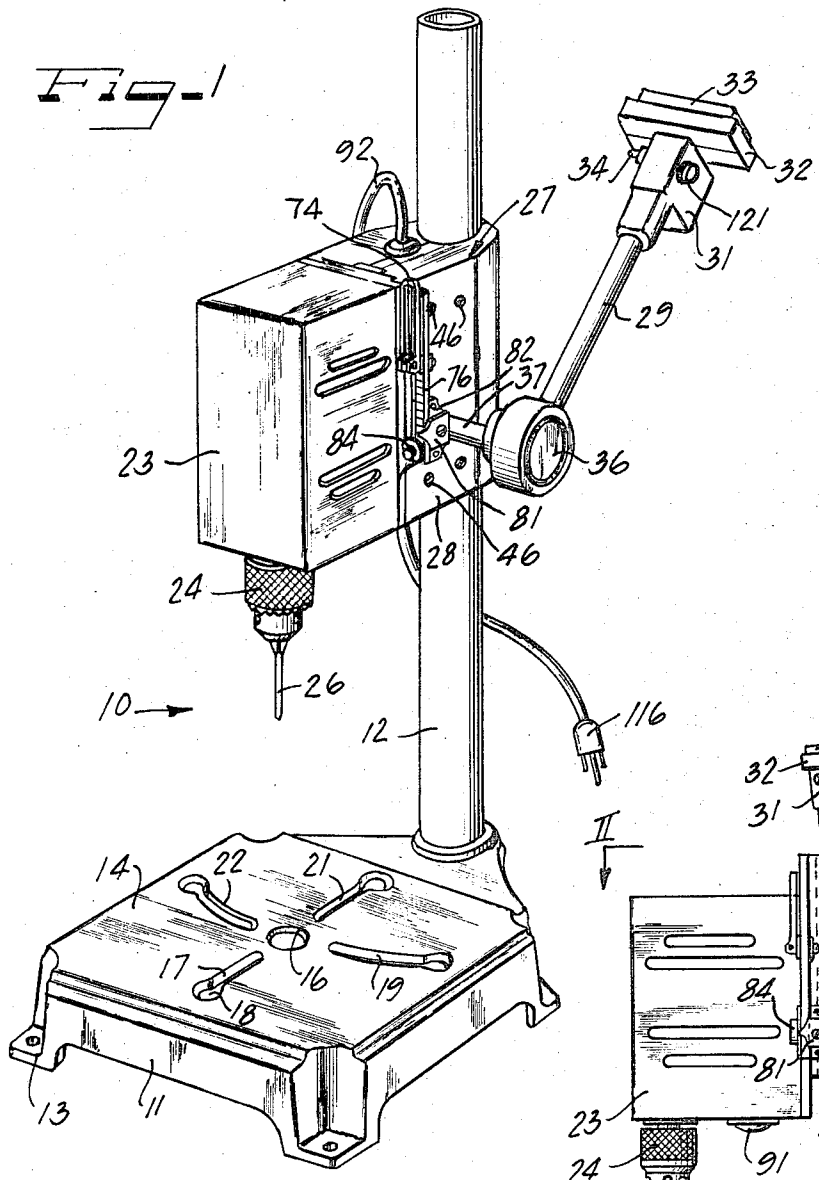


Fig-1


92
74
27
33
34
32
121
31
29
46
82
76
37
84
36
23
81
28
46
24
26
10
12
116
14
22
21
17
16
19
18
13
11

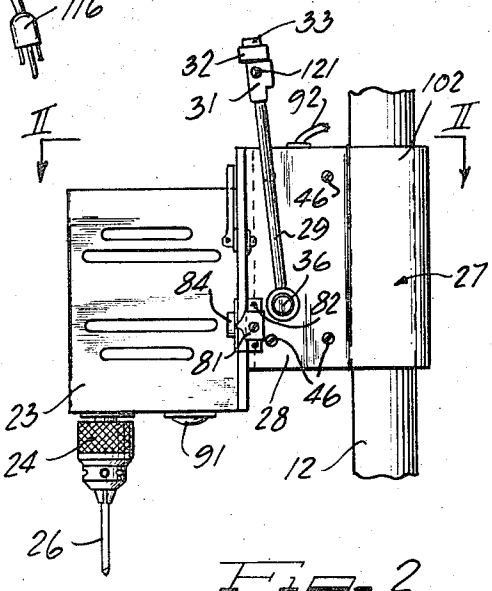

33
32
121
31
92
102
II
II
46
29
36
27
84
82
81
46
23
28
24
91
12
26

Fig-2

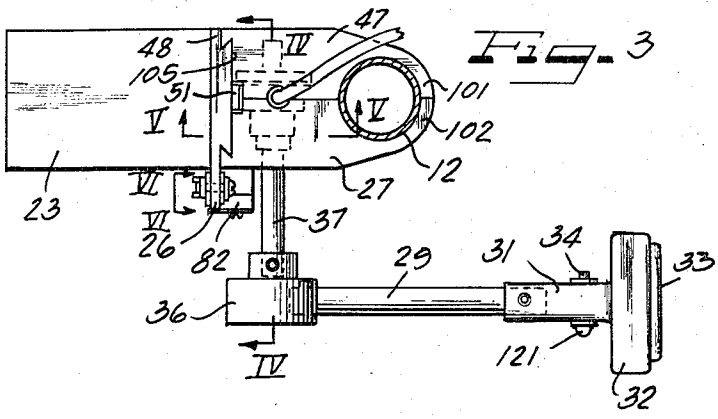


Fig. 3

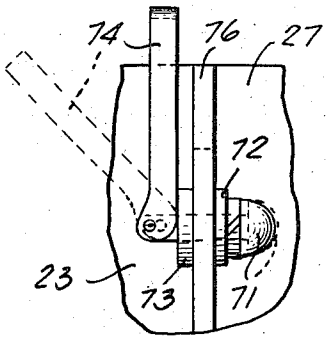


Fig. 6

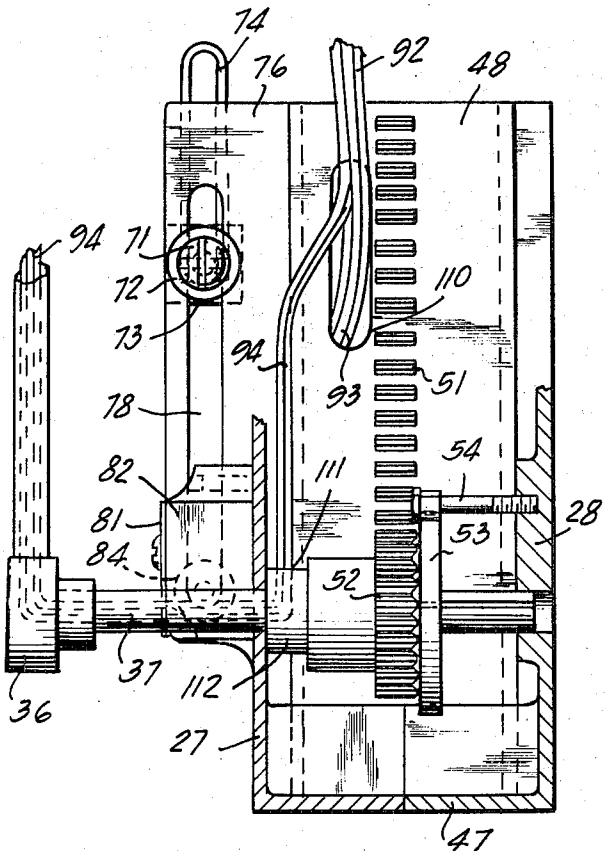


Fig. 4

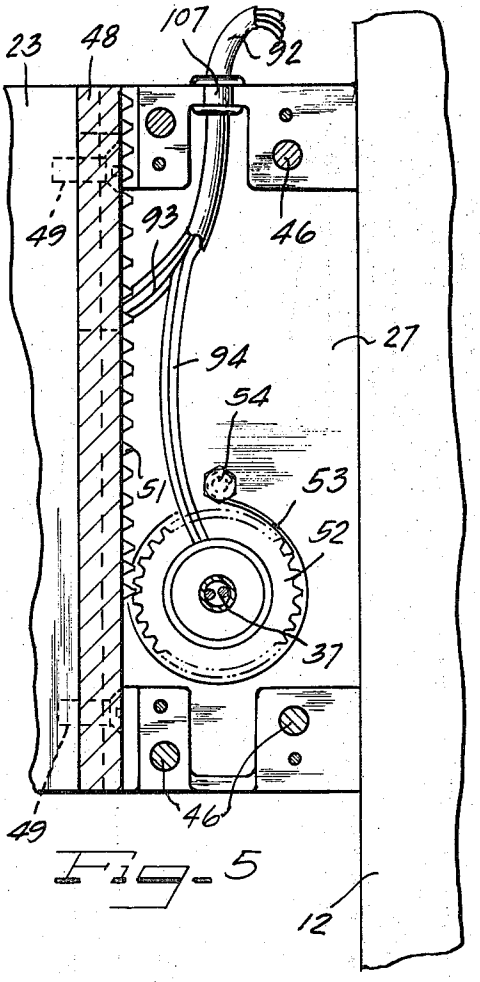


Fig. 5

DRILL PRESS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to drill presses and in particular to a novel small drill press.

2. Description of the Prior Art

Drill presses of the prior art have normally been expensive and bulky structures which are normally beyond the means of the small home workshop owner due to the size and weight of the devices. Such prior art drill presses have been provided with metal bases against which the drill can be accidentally pressed resulting in the drill's breaking or becoming dull.

SUMMARY OF THE INVENTION

The present invention relates to an inexpensive drill press comprising a metal stand formed with arcuate slots aligned with the drill and wherein the stand has an upright upon which the drill is movably mounted and controllable by a pivoted handle which further includes a speed control switch that allows the speed and direction of the drill to be controlled. Means for illuminating the workpiece are provided and limit stop means are provided so as to limit the downward motion and upper motion of the drill so as to control vertical motion relative to the workpiece.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure, and in which:

ON THE DRAWINGS

FIG. 1 is a perspective view of the drill press of this invention;

FIG. 2 is a partial side view of the drill press;

FIG. 3 is a top sectional view of the invention;

FIG. 4 is a sectional view taken along line IV—IV of FIG. 3;

FIG. 5 is a sectional view taken along line V—V of FIG. 3; and

FIG. 6 is an enlarged detail view of the stop mechanism of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a drill press **10** of this invention which includes a stand member **11** which has feet **13** and a base plate **14.** Adjacent one side of the stand a cylindrical upright support **12** is mounted. In the base **14** are formed a plurality of openings with a circular opening **16** under the normal position of the drill and with a pair of arcuate slots **19** and **22** formed on either side of the opening **16** and having radii such that the drill bit **26** of the drill will pass through the slots **19** and **22** rather than engaging the base **14** so as to break or dull the drill. A couple of slots **17** and **21** extend in the transverse direction relative to slots **19** and **22.** All of the slots **17,19,21** and **22** are formed with enlarged openings **18** at their ends remote from the opening **16.**

A motor support assembly **27** is slidably mounted on the upright **12** and is formed with semi-circular mating portions **101** and **102** which engage the upright **12.**

Locking means comprising bolts and screws **46** extend between the two halves of the support unit **27** such that when the locking means **46** are tightened the support member **27** will be locked to the upright **12** at a preset position.

A motor and drill unit **23** is mounted for vertical movement relative to the support housing **27** and carries an electrical drive motor, not shown therein. The motor is geared to a drill chuck **24** which receives a drill bit **26** therein.

The portion of the housing **27** between the upright **12** and the motor and drill unit **23** is designated by numeral **28** and is hollow. A handle drive shaft **37** is rotatably supported in the portion **28** of the support unit **27** as shown in FIGS. **1,2,3,4** and **5.** A coupling member **36** is connected to the outer end of the shaft **37** and a pivot arm **29** extends at right angles to the shaft **37** from the hub **36.** A switch and handle unit comprises the housing **31.** The fixed finger rest **32** and the switch portion **33** are connected to the end of pivot arm **29** as best shown in FIGS. **1** and **3.** A lock pin **34** is also mounted in the housing **31** so as to lock the variable speed button **33** in any desired position.

As best shown in FIGS. **3** and **4,** the motor housing unit **23** is formed with a dovetail member **48** which is received in a guide slot **105** of support member **27** so as to allow the motor unit **23** to move up and down relative to the upright **12.** A rack **51** is mounted on the rear of the dovetail member **48** and mates with a drive gear **52** carried on shaft **37.** A coil spring **53** is attached to the shaft **37** and to a lock pin **54** so as to bias the motor and drill housing unit **23** in the up position to counterbalance the weight of the motor and drill unit and to return it to the up position when the handle **32** is released.

A power supply cord **92** passes through an opening surrounded by a grommet **107** in the upper end of member **27** and is connected to a suitable power supply, as for example, 110 volt AC. A power line **93** extends from the power line **92** through an opening **110** of the housing **23** and is connected to the motor and to illumination light **91** mounted on the bottom portion of the motor unit **23** so as to illuminate the workpiece. It is to be realized, of course, that the power line **93** within the housing **23** has slack so that as the housing **23** moves relative to the support **27,** it has adequate slack to allow such movement.

The speed of the motor is controlled by a power line **94** which passes through an opening **111** formed in hub **112** non-rotatably on shaft **37.** The shaft **37** is hollow from the hub **112** to the handle **31** and the electrical conductor **94** extends through the hub **112,** the shaft **37,** the hub **36** and the lever arm **29** to the switch unit **31** where it is connected to the speed control **33** and the locking means **34.** Locking means **34** may, of course, be a mechanical lock for the switch contact **33.**

The motor and drill housing **23** includes an upper and lower limit member **76** which is formed with a slot **78.** A bracket **82** is attached to the member **27** adjacent the member **76** and carries an indicia pointer **81.** An adjustable locking pin **84** extends through the slot **78** of the member **76** below the bracket **82** and the indicia **81** and engages the bracket **82** to limit the upper motion of the motor housing **23** relative to the member **27.**

A downward motion limiting pin is mounted in the slot **78** of the member **76** above the bracket **82** and can

be adjusted vertically relative to the slot **78** with a cam lever arm **74** which is pivotally connected to one end of a pin shaft **71** which extends through the slot **78** and carries washers **72** and **73** on opposite sides of the slot **78.** Thus by moving the cam arm **74** to the unlocked position, the lock pin **71** may be moved vertically in the slot to limit the downward motion of the motor housing **23** as desired.

In operation, the support unit **27** is moved relative to the base **14** to the desired vertical position by loosening the locking nuts **46** and sliding the support unit **27** to the desired position. Then the limit means **71** and **84** are adjusted relative to the bracket **82** and the indicia **81** to the desired position so as to limit the upper and lower motion of the motor unit **23.** The power plug **116** of the power cable **92** is, of course, connected to a suitable power source. The workpiece is placed beneath the drill bit **26** and the switch plate **33** is closed by a gripping of the operator's hand relative to the handle **32** so as to control the speed as a function of the amount the switch **33** is depressed. Then the shaft **37** is rotated by the handle **32** driving the drill bit **26** and the motor unit **23** downwardly relative to the support member **27** through the action of the gear **52** and the rack **51** causing the dovetail **48** of the motor unit **23** to slide in the groove **105** of the housing **27.** The light **91** illuminates the workpiece and is supplied power from the cable **92.** After the workpiece has been drilled by the drill **26,** the handle **32** may be released to allow the switch **33** to return to the off position and the motor housing **23** will return to the up position due to the action of the spring **53.** The lock button **34** may be utilized to lock the motor speed control switch **33** in any desired position and can be released by depressing it a second time. A reversing switch **121** may also be provided on the handle **31** to cause the drill to reverse as for example, when backing it out of certain workpieces or when used for tapping and backing the tap from the threaded opening.

It is seen that this invention provides a new and novel drill which can be controlled in speed and direction and which can be moved vertically and angularly relative to the support **12.** Although the invention has been described with respect to preferred embodiments, it is not to be so limited as changes and modifications may be made therein which are within the full intended scope as defined by the appended claims.

I claim as my invention:

1. A drill press comprising, a stand with an upright support, a motor support member adjustably mounted on said upright support, a motor and drill housing unit mounted for vertical motion relative to said motor support member, a pivot drive arm rotatably attached to said motor support member, a finger control switch mounted at the end of said pivot drive arm away from said motor support member to control the speed of said motor, said stand formed with arcuate shaped slots aligned with said drill as the motor support member is rotated to different positions relative to said upright support.

2. A drill press comprising, a stand with an upright support, a motor support member adjustably mounted on said upright support, a motor and drill housing unit mounted for vertical motion relative to said motor support member, a pivot drive arm rotatably attached to said motor support member, a finger control switch mounted at the end of said pivot drive arm away from said motor support member to control the speed of said motor, a rack mounted on said motor and drill housing, a drive shaft rotatably supported by said motor support member and connected to said pivot drive arm, a drive gear mounted on said drive shaft and engageable with said rack, spring biasing means connected to said drive shaft to bias said motor and drill housing in the upward direction, upper and lower limit means for limiting the vertical motion of said motor and drill housing unit relative to said motor support member, said upper and lower limit means comprises a member with a vertical slot attached to said motor and drill housing, a bracket attached to said motor support member adjacent said member with a slot, and a pair of limit members adjustably mounted in said slot and engageable with said bracket to limit the motion of said motor and drill unit.

3. A drill press according to claim **2** wherein one of said limit members is formed with a locking pin and a cam arm to lock said pin in said slot.

4. A drill press according to claim **2** including a light mounted on said motor and drill housing to illuminate a workpiece.

5. A drill press according to claim **2** wherein said finger control switch comprises a movable finger member and a handle member.

6. A drill press according to claim **5** including a locking means for locking said finger control switch.

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