P. H. LECKINGER.

DRILL PRESS.

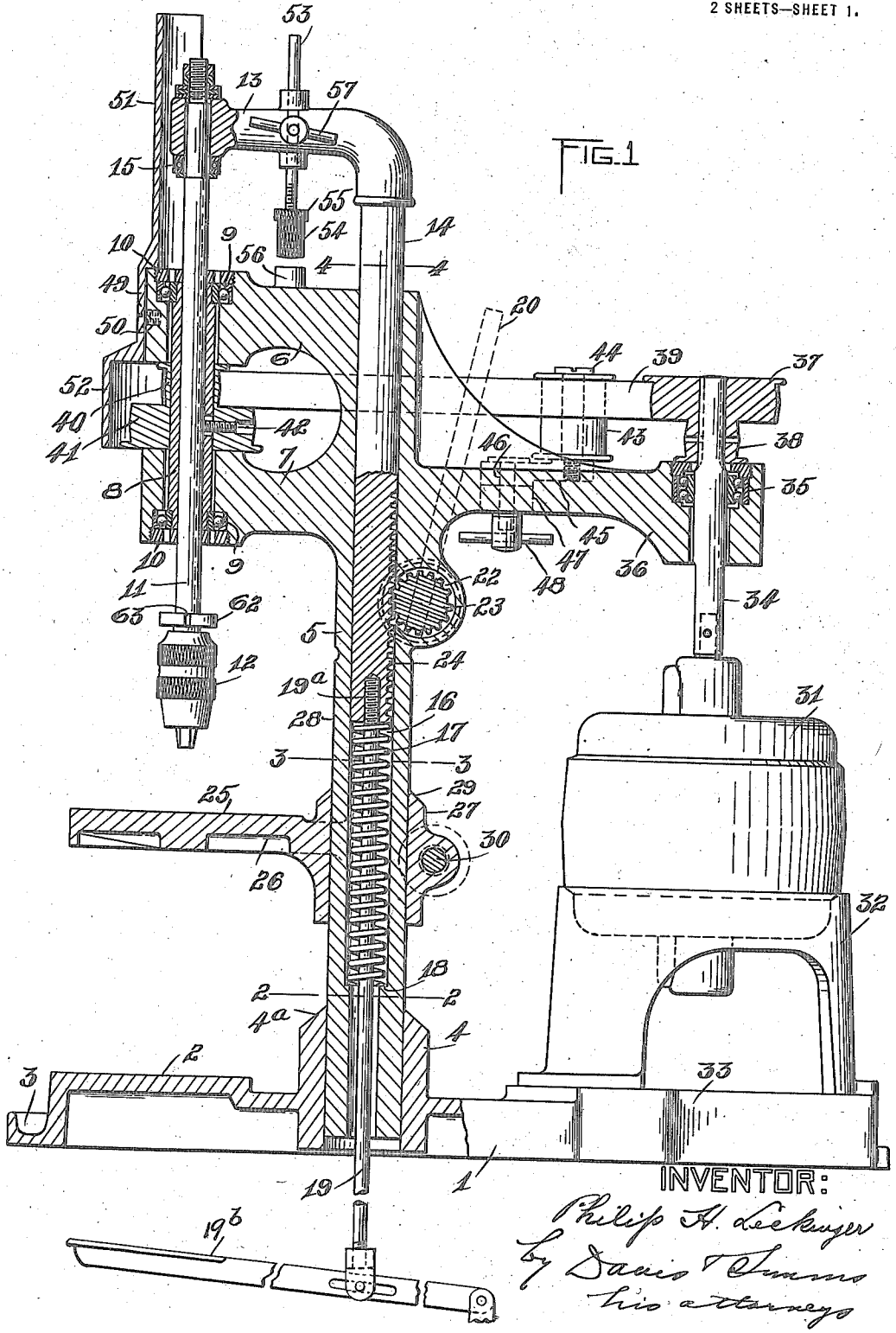
APPLICATION FILED JULY 3, 1919.

1,433,387.

Patented Oct. 24, 1922.

2 SHEETS—SHEET 1.

FIG. 1



INVENTOR:

Philip H. Leckinger

by Davis & Simms

his attorneys

P. H. LECKINGER.

DRILL PRESS.

APPLICATION FILED JULY 3, 1919.

1,433,387.

Patented Oct. 24, 1922.

2 SHEETS—SHEET 2.

FIG. 2

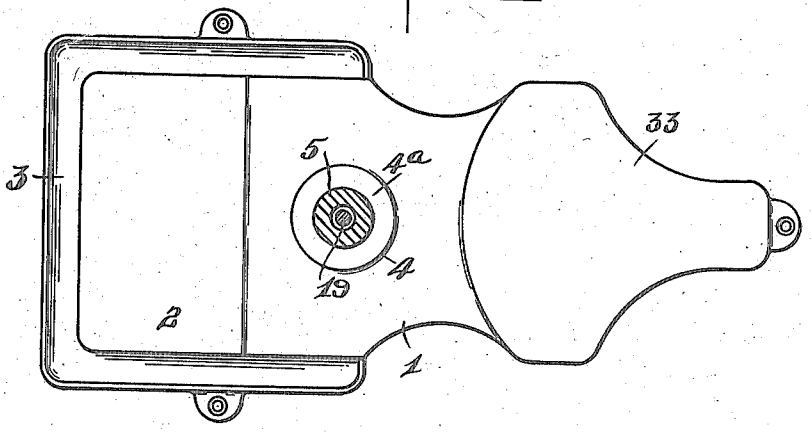
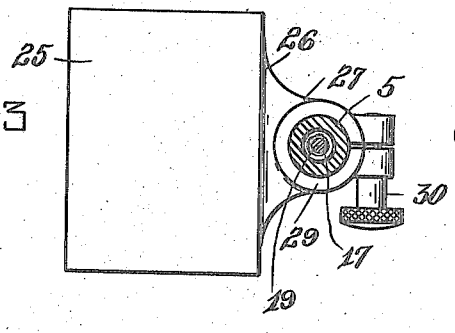


FIG. 3



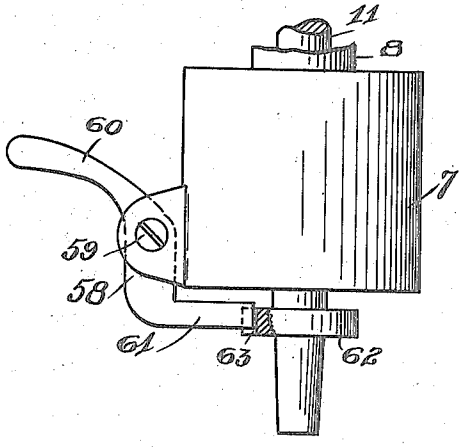


FIG. 5

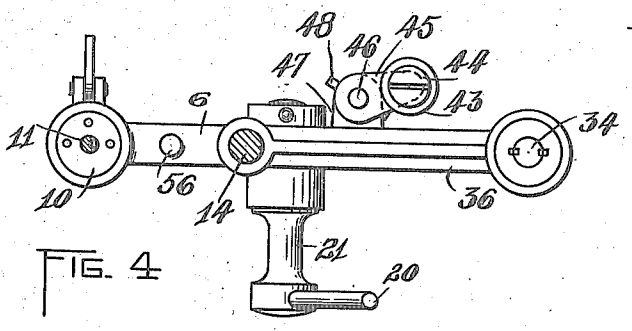


FIG. 4

INVENTOR.

Philip H. Leckinger

BY

Davis & Simmons

his ATTORNEYS.

Patented Oct. 24, 1922. 1,433,387

UNITED STATES PATENT OFFICE.

PHILIP H. LECKINGER, OF ROCHESTER, NEW YORK, ASSIGNOR TO HIGH SPEED HAMMER COMPANY, INC., OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

DRILL PRESS.

Application filed July 3, 1919. Serial No. 308,442.

To all whom it may concern:

Be it known that I, PHILIP H. LECKINGER, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Drill Presses, of which the following is a specification.

The present invention relates to drill presses and an object thereof is to provide a strong and compact structure of light weight which may be mounted upon a work bench. Another object of the invention is to provide an improved drill press which may be operated by hand or foot power Still another object of the invention is to provide a frame which will support an electric motor thereon in such a manner that the driving connection between the motor and tool spindle is of the simplest construction. Still another object of the invention is to provide for protecting the guide surface on which the work table is adjustable. A further object of the invention is to provide a guard for the tool carrying spindle and its driving pulley. A still further object of the invention is to provide a depth gage of simple construction.

To these and other ends the invention consists of certain parts and combinations of parts all of which will be hereinafter described, the novel features being pointed out in the appended claims.

In the drawings:—

Fig. 1 is a view in central vertical section through a machine embodying the present invention, parts of the machine being shown in side elevation;

Fig. 2 is a section on the line 2—2, Fig. 1;

Fig. 3 is a section on the line 3—3, Fig. 1;

Fig. 4 is a section on the line 4—4, Fig. 1; and

Fig. 5 is a detail view of the spindle lock.

Referring particularly to the embodiment of the invention herein shown, 1 indicates a cast base frame formed with a planed surface 2 to provide a work support and with a groove or channel 3 on three sides of said planed surface 2 to act as an oil trap. To one side of the planed surface 2 the base is provided with an upstanding or projecting socket 4 in which the lower end of a guide and supporting frame 5 is fitted. This socket projects above the planed surface 2 and has its upper end bevelled at 4^a.

The guide and supporting frame has at its upper end two arms 6 and 7 spaced apart and connected by a sleeve 8, said sleeve being mounted at its upper and lower end in two ball bearings 9 arranged in pockets, one of which opens at the top of the arm 6 and the other of which opens at the bottom of the arm 7, two screw disks 10 being employed for closing said pockets and holding said bearings therein while at the same time acting to sustain the sleeve 8 against axial or longitudinal movement. A spindle 11 is secured to the sleeve 8 so as to turn therewith while at the same time said spindle is adapted for longitudinal movement in the sleeve, the opposite ends of the spindle projecting from the opposite ends of the sleeve. On the lower projecting end of the spindle a tool chuck or holder 12 is mounted while the upper end of the spindle is journaled in a laterally extending arm 13 on a vertically movable frame or slide 14 which operates within the supporting frame, a thrust bearing 15 being interposed between a shoulder on the spindle 11 and the arm 13 of the slide 14.

The vertical adjustment of the slide 14 may be obtained by providing the supporting frame with a vertically extending bore or opening 16 in which the vertical portion of the slide 14 operates. In this bore 16 below the lower end of the slide 14 a helical spring 17 may be arranged, the lower end of this spring seating at 18 while the upper end abuts the lower end of the slide 14. This spring tends normally to elevate the slide and consequently elevate the tool holder or chuck 12. Movement of the slide may be effected either through a treadle or a hand operated lever. The treadle, not shown, connects with the slide through a rod 19 which extends through the opening or bore of the supporting frame, and through the helical spring 17 at its upper end and has screw threaded engagement at 19^a with the wall of the screw threaded opening in the lower end of the slide. The lever movement of the slide may be effected by a lever 20 which extends laterally from the projecting end 21 of a shaft journaled in a bore or opening 22, this bore 22 extending horizontally and intersecting the opening 16. The shaft at the intersecting portion is provided with a gear 23 which meshes with a rack 24 formed on the slide 14. It is ap-

parent that the swinging of the lever arm 20 will turn the gear 23 and lower the slide 14 to feed the chuck 12. This feeding movement may also be effected as before mentioned through the rod 13. In both instances the spring 17 will be compressed and will tend to elevate the slide and chuck when the slide 14 is released.

The work may be supported beneath the chuck either upon the planed surface 2 on the base frame or upon a planed surface 25 on a table 26 which projects from a split sleeve 27 operating upon a cylindrically formed guide surface 28 on the supporting frame 5. The upper end of the sleeve 27 projects above the planed surface 25 and is bevelled at 29, the purpose of this construction is to prevent work supported on the table being moved against the guide surface 28 and injuring the latter. The bevelled upper end of the sleeve or collar 27 acts to shed any filings which may fall upon the upper end of the sleeve or collar. This result is also present in the socket 4 and its bevelled end with reference to the planed surface 2. A screw 30 connects the two portions of the sleeve or collar on opposite sides of the slide in order to draw the collar or sleeve in firm engagement with the cylindrically formed guide 28.

Turning of the chuck may be effected by an electric motor 31 which is preferably supported with its shaft upright upon a hollow support 32 resting upon an extension 33 of the base. A shaft 34 is secured to the motor shaft and is mounted in the self-aligning ball bearings 35 in an arm 36 which projects from the rear side of the supporting frame 5. About this arm the shaft 34 is provided with two pulleys 37 and 38 about either of which a belt 39 is adapted to be passed, said belt also passing about the pulleys 40 and 41 which are secured to the sleeve 8 between the arms 6 and 7 of the supporting frame. A set screw 42 passes through the pulley 41 to secure the latter to the sleeve 8 and to engage within a longitudinally extending groove in the spindle 11 so as to permit the spindle to be moved longitudinally in the sleeve while at the same time causing the pulleys 40 and 41 with the sleeve 8 to turn with the shaft 11.

For the belt 39 there may be provided a tightener in the form of an idle pulley 43 mounted on a spindle 44 which projects upwardly from an arm 45 that is mounted to swing on the arm 36 of the supporting frame 5. This swinging of the arm may be obtained by a bolt 46 extending through the arm 45 and a perforated projection 47 on the supporting frame, a thumb nut 48 being arranged on the lower end of the bolt 46 for the purpose of securing the arm 45 in its adjusted position. For the purpose of protecting the user of the machine against injury from the exposed parts of the spindle 11 there may be provided a guard 49 which is secured to the free end of the arm 6 by a screw bolt 50 and has a portion 51 projecting upwardly above the arm 6 about the spindle 11 and a portion 52 projecting downwardly from the arm 6 about the pulleys 40 and 41, the downwardly projecting portion being spaced from the arm 7 so that the belt 39 may be readily removed.

The machine may also be provided with a depth gage which in this instance comprises a rod 53 slidably mounted on the arm 13 of the slide 14 and having at its lower end a cap 54 screw threaded thereon, said cap being held in its adjusted position by a clamp nut 55. This cap 54 is adapted to cooperate with the planed upper face of the projection 56 which extends upwardly from the arm 6 below the arm 13 of the slide 14. Rough adjustment of this depth gage is secured by releasing the slide rod 53 by means of the set screw 57 which is afterwards employed for clamping the slide rod 53 in adjusted position. Fine adjustment is obtained by turning the screw cap 54 on the rod 53 and securing the cap in its adjusted position by the nut 55.

The machine may also be provided with a spindle lock for holding the spindle against turning while the chuck is being adjusted to fit tools to or to remove such tools. This spindle lock comprises in this instance a lever 58 pivoted at 59 to the arm 7 and having an operating portion 60 by which the locking portion 61 may be moved into and out of connection with the locking collar or ring 62 formed on the spindle. This locking collar or ring 62 is situated directly above the chuck 12 and is adapted when the spindle is moved to its uppermost position to be brought opposite the locking end 61 of the lever 58 so that said locking end 61 may enter a notch or groove 63 formed in the collar 62, thus holding the spindle against turning so that the chuck may be manipulated to insert or remove a tool without the hands of the operator being required to hold the spindle against turning.

The operation of the machine will be apparent. The tool being arranged within the chuck 12, either one of two speeds may be obtained by shifting the belt 39 on the pulleys 37, 38, 40 and 41. The work is mounted either upon the planed surface 2 on the base or the planed surface 25 on the table 26, the table 26 being shifted out of the way when the base surface 2 is to be used as a work support. The chuck 12 with tool is moved toward the work through the hand lever 20 or through a treadle connected with the rod 19.

A drill press constructed in accordance with this invention is adapted to be arranged upon the ordinary work bench to be operated

by hand or foot power. The supporting frame provides a light and durable structure and the motor is supported on the base frame and connected to the tool carrying spindle by driving connection of the simplest form. A guard is provided which protects the driving pulley of the tool carrying spindle and at the same time offers a protection against the tool carrying spindle. The depth gage is of simple construction and is so mounted as not to interfere with the operation of the machine.

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

1. A drill press comprising a base frame, a supporting frame having an upright guiding portion rising from the base frame and having also two arms projecting from one side thereof, and one arm projecting from the opposite side thereof, a sleeve journaled in the two arms, a pulley on the sleeve between the two arms, a tool carrying spindle mounted to turn with the sleeve and to move axially therein, a vertically arranged shaft supported on the other arm of the supporting frame, a pulley arranged on the shaft and having a driving connection with the pulley on the sleeve, a slide mounted on the supporting frame and connected with the spindle, and a table adjustable on the upright guide portion of the supporting frame.

2. A drill press comprising a base frame, a supporting frame having a hollow guide portion rising from the base frame and provided with two arms, one projecting from one side thereof, and the other arm projecting from the opposite side thereof, an upright shaft journaled in the last mentioned arm, a sleeve journaled in the first two named arms, driving connection between the shaft and the sleeve, a slide movable in the hollow guide portion provided at its upper end with an arm, a tool carrying spindle carried by said arm and movable axially in the sleeve, said spindle being journaled on the arm and being connected with the sleeve to turn with the latter, and a table adjustable on the guide portion of the supporting frame.

3. A drill press comprising a base having a motor supporting portion and a work supporting portion, a supporting frame rising from the base between said motor supporting portion and work supporting portion and provided with three arms, two on one side thereof and one on the opposite side, a motor supported on the motor supporting portion of the base frame and having an upright shaft mounted in one of the arms, a self-aligning bearing for said upright motor shaft, a sleeve mounted to turn in the other two arms of the supporting frame, driving connection between the motor shaft and the sleeve, a vertically movable slide on the supporting frame, and a spindle journaled on said slide and adapted to move vertically therewith, said spindle operating axially within the sleeve but being connected to the sleeve to turn with the latter.

4. A drill press comprising a base frame having a work supporting portion and a motor supporting portion, a supporting frame having a hollow guide portion rising from the base frame between the work supporting portion and the motor supporting portion, said supporting frame having one arm projecting from one side thereof over the motor supporting portion and two arms projecting from the opposite sides thereof over the work supporting portion, a motor supported on the motor supporting portion, a shaft connected to said motor and extending vertically through the arm over the motor supporting portion of the base frame, a hollow sleeve journaled in the two arms over the work supporting portion, driving connection between the motor shaft and the sleeve, a slide operating in the hollow guide portion of the supporting frame and provided with an arm at its upper end, a tool carrying spindle journaled in said arm and operating axially through the sleeve but connected to the sleeve to turn therewith, and a table mounted on the vertical guide portion of the supporting frame.

5. A drill press comprising a supporting frame having two arms one above the other, the upper one of which is provided with a pocket in its top side and the lower one of which is provided with a pocket on its under side, a sleeve turning in the arms, bearings for the sleeve arranged in the pockets, discs closing said pockets and holding the bearings therein, said discs also cooperating with the sleeve to hold the latter to its bearings, a tool spindle turning with the sleeve and movable axially therein, and a driving member connected to the sleeve between the arms.

PHILIP H. LECKINGER.