

J. D. McCLELLAND, JR.
 RECIPROCATING AND ROTARY PRESS.
 APPLICATION FILED NOV. 5, 1910.

995,271.

Patented June 13, 1911.

2 SHEETS—SHEET 1.

Fig. 2.

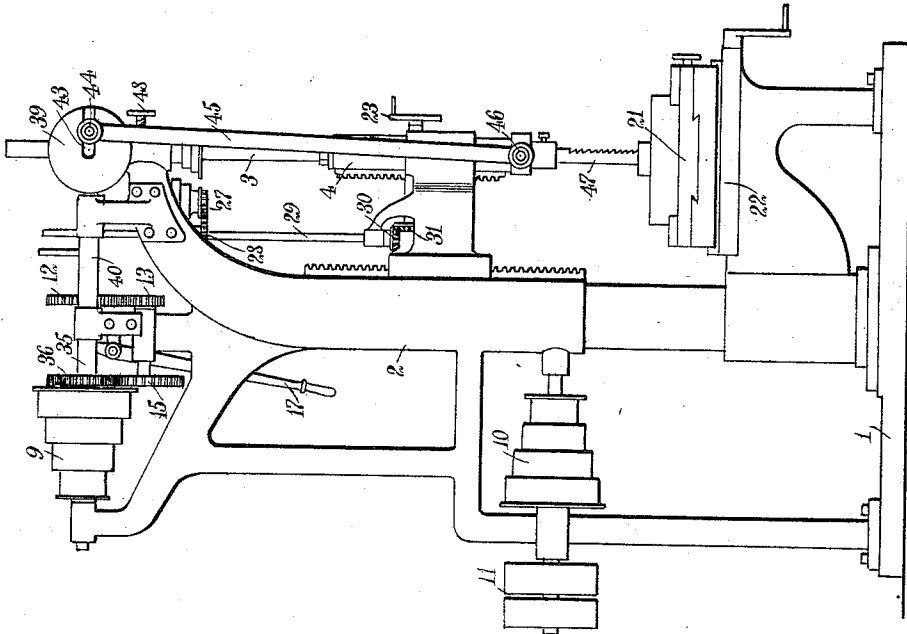
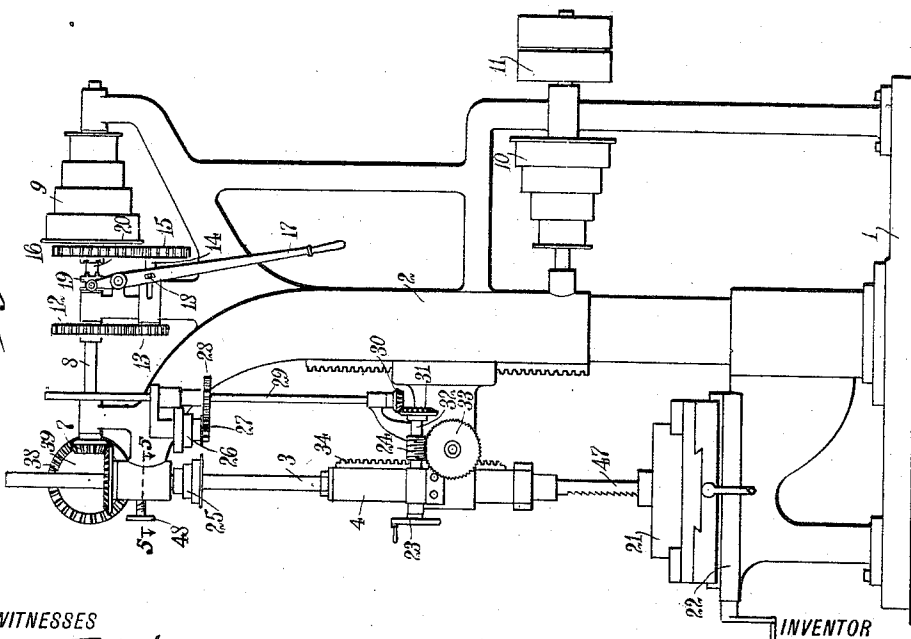


Fig. 1.



WITNESSES

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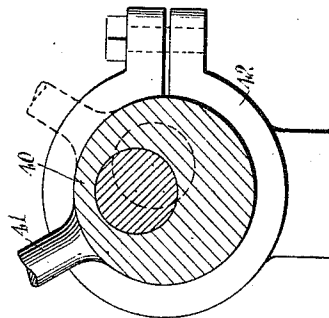
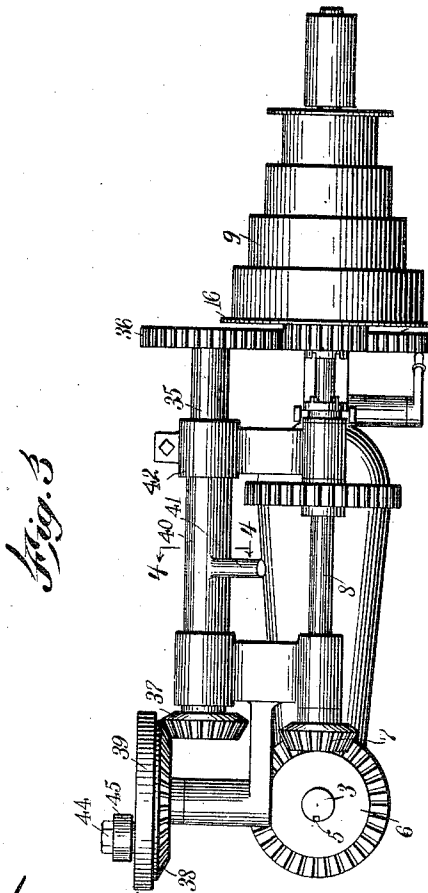
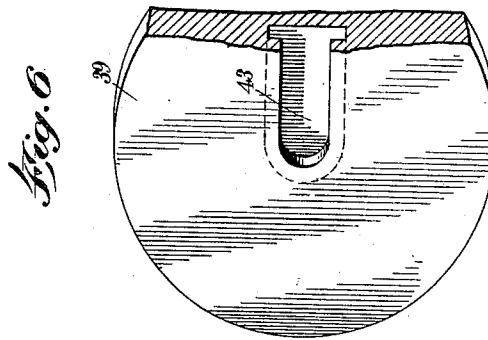
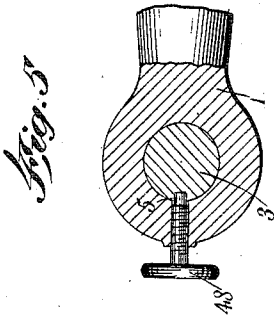
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JAMES D. McCLELLAND, JR., OF MOUNT VERNON, NEW YORK.

RECIPROCATING AND ROTARY PRESS.

995,271.

Specification of Letters Patent. Patented June 13, 1911.

Application filed November 5, 1910. Serial No. 590,817.

To all whom it may concern:

Be it known that I, JAMES D. McCLELLAND, JR., a citizen of the United States, and a resident of Mount Vernon, in the county of Westchester and State of New York, have invented a new and Improved Reciprocating and Rotary Press, of which the following is a full, clear, and exact description.

This invention relates to a machine drill, which can be used either as a drill press for performing drilling operations on the work, or as a reciprocating press for performing such operations as forming mortise and tenon joints, key-seating, face-planing or the like. An object of this invention is to provide a device which will be simple in construction, inexpensive to manufacture, readily accessible, and easily controlled.

A further object of this invention is to provide a machine tool which can be readily changed so as to operate either as a drill press or a reciprocating press, by connecting one or the other portion thereof in driving relation with the main drive.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a side view in elevation; Fig. 2 is a side view in elevation taken from the opposite side to the view illustrated in Fig. 1; Fig. 3 is a top plan view; Fig. 4 is a detail section on the line 4—4 of Fig. 3, showing the eccentric sleeve for throwing the reciprocating mechanism into and out of driving relation with the main drive; Fig. 5 is a horizontal section on the line 5—5 of Fig. 1; and Fig. 6 is a fragmentary view of the adjustable plate for the reciprocating mechanism, partly broken away to show the structure.

Referring more particularly to the separate parts of the device, 1 represents the base plate, having the usual adjustable standard 2, which, together with the various overhangs thereon, comprises the frame of the machine. Rotatably and slidingly mounted in the frame, there is provided a vertical shaft 3, to which is secured a sleeve 4, adapted to carry the tool used in the metal-working operation. This sleeve is so connected

to the shaft 3 that it may be disconnected and permitted to slide relative to the shaft 3, if desired. The shaft 3 is provided with a keyway 5, by means of which a bevel gear 6 is splined thereon, so that the shaft 3 is free to move vertically and yet receive a rotary motion from the gear 6. The gear 6 meshes with a corresponding bevel gear 7 on a shaft 8. This shaft 8 may be driven directly or indirectly from a step-pulley 9, which in turn is connected in any suitable manner, as by means of a shiftable belt, to a step-pulley 10 on the main drive 11. Any suitable means for accomplishing this driving connection may be used. In this case, the shaft 8 is shown as provided with a gear 12, which meshes with a gear 13 secured to a shaft 14, which is also provided with a gear 15. This latter gear meshes with a smaller gear 16 secured to the step-pulley 9 and loosely mounted on the shaft 8.

As illustrated in Fig. 1, the drive to the vertical shaft 3 is from the step pulley 9 through the gears 16, 15, 13 and 12 to the shaft 8, and thus through the gears 7 and 6 to the shaft 3. This drive is indirect, and causes the drill shaft 3 to rotate at a slow speed. If it is desired to disconnect the drill shaft 3 from driving relation with the step-pulley 9, a lever 17 is thrown from the position occupied in Fig. 1 to a substantially vertical position, whereby it swings the shaft 14 by means of a pin-and-slot connection 18 toward the sleeve, thus throwing the gears 13 and 15, which are carried on the shaft 14, out of engagement with the gears 12 and 16. A further movement of the lower end of the lever 17 toward the left will throw the upper end thereof toward the right and carry with it a clutch 19 splined on the shaft 8, into engagement with a clutch 20 on the gear 16. When this occurs, the step pulley 9 will be connected in direct driving relation with the shaft 8, and thus rotate the vertical drill shaft 3 at a high speed.

The sleeve 4, carrying the tools, such as a drill-bit, can be fed downwardly onto the work secured in the chuck-block 21, which may be of any suitable character, on the bed-plate 22, either by a hand-wheel 23 driving a worm 24, or mechanically from the drill shaft 3. Such a connection is shown by the step pulleys 25 and 26, which drive a gear 27 meshing with a gear 28 on a shaft 29. The latter is provided with a

bevel gear 30, meshing with a gear 31 on a shaft 32, to which the worm 24 is secured. This worm 24 feeds the sleeve 4 and the shaft 3 in the usual manner, as by means of a worm wheel 33, which drives a pinion, meshing with a rack 34 on the sleeve 24.

When the lever 17 is in an intermediate position, and thus when the drill shaft 3 is disconnected from the drive 9, both as to its rotary motion and its vertical motion, in place of the slow downward feed thereof, the sleeve and the drill shaft 3 with it, if desired, can be reciprocated as rapidly as need be, to perform such operations as key-seating, face-planing, forming mortise and tenon joints, and so on, in a manner which will now be described.

Disposed in parallel relation with the shaft 8, there is provided a shaft 35, provided adjacent one end of a gear 36, which is adapted to mesh with the gear 16, and adjacent the opposite end with a bevel gear 37, which is adapted to mesh with a bevel gear 38, connected in driving relation with a slotted plate 39. The shaft 38, as will be seen by reference to Figs. 3 and 4, is rotatably mounted in a sleeve 40, having an operating handle 41. This sleeve 40 is rotatably mounted in a bearing 42, so that by swinging the handle 41 in one direction, it will bring the gear 36 into mesh with the gear 16, and by swinging it in the opposite direction, it will throw the gear 36 out of mesh with the gear 16.

The plate 39 is provided with a slot 43, in which is adjustably mounted a crank pin 44, which is adapted to secure thereto, at an adjustable distance from the center of the plate 39, one end of a connecting rod 45. This connecting rod 45 is secured at its opposite end to the sleeve 4, as at 46, so that it will translate the rotary motion of the plate 39 into reciprocating motion of the sleeve 4, and if desired, the drill shaft 3. In such an event, the sleeve 4 is provided with a suitable tool, such as that indicated by the saw 47, for performing an operation necessitating the repeated reciprocating motion.

For the purpose of preventing the rotation of the vertical drill shaft 3 when the sleeve 4 is connected in driving relation with the main drive, there is provided a lock 48, which may be of any suitable form, and in this case is shown in the form of a screw-threaded pin adapted to engage, at its inner ends, in the keyway 5 in the shaft 3, thereby absolutely preventing the rotation of the shaft 3.

The operation of the device will be readily understood when taken in connection with the above description.

If it is desired to use the machine tool as a drill or boring tool, the sleeve 4 is provided with the proper bit or drill, and the

shaft 3 connected in driving relation with the main drive, either directly through the gears 16, 15, 13 and 12, or directly through the clutch 19. The tool can be fed into the work held in the chuck 21, either by the hand wheel 23, or automatically from the driving connection to the shaft 3.

If it is desired to use the machine tool for slotting, planing, key-seating, or the like, the lever 17 is thrown into an intermediate position, where the drill shaft 3 is disconnected from the main drive, and the locking pin 48 adjusted into the keyway 5, so as to prevent the shaft 3 from rotating. The reciprocating mechanism for the shaft 3 and the sleeve 4 can be then thrown into driving relation with the main drive, by shifting the eccentric sleeve 40. The extent of this reciprocation can be varied by adjusting the crank pin 44 in the slot 43.

While I have shown one embodiment of my invention, I do not wish to be limited to the specific details thereof, but desire to be protected in various changes, alterations and modifications which may come within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. The combination with a tool-operating shaft, of a bevel gear on said shaft, a bevel gear meshing with said first-mentioned bevel gear, a shaft adapted to drive said last-mentioned bevel gear, a gear on said last-mentioned shaft, a gear meshing with said last-mentioned gear, an eccentrically-mounted shaft supporting said last-mentioned gear, means for manipulating said eccentrically-mounted shaft, a slotted plate, driving connections between said eccentrically-mounted shaft and said slotted plate, and a connecting rod between said slotted plate and said tool-operating shaft.

2. The combination with a tool-operating shaft, of rotating means for said shaft, a main drive, driving connections between said main drive and said rotating means, a frame, reciprocating means for said shaft, driving connections between said reciprocating means and said main drive, means for alternately controlling the connection of said reciprocating means or said rotating means to said main drive, said shaft having a slot therein extending lengthwise thereof, and a lock engaging said slot in said tool-operating shaft, adapted to permit the reciprocating motion of said shaft and to prevent the rotating motion of said shaft.

3. The combination with a rotatable tool operating shaft, of means for feeding said shaft, reciprocating means for said shaft comprising a connecting rod connected to said shaft, a plate for driving said connecting rod, and means for driving said plate, said plate having a slot therein and a crank

pin adjustably mounted in said shaft and adapted to adjustably connect said connecting rod to said plate so as to vary the extent of movement of said shaft, rotating means for said shaft, a main drive, driving connections between said main drive and said rotating means, driving connections between said main drive and said means for driving said plate, a shiftable clutch for controlling the driving ratio of one of said driving connections, eccentric means for controlling the operation of the other of said driving connections, said shaft having a slot therein extending lengthwise thereof, and a lock engaging said slot in said tool operating shaft adapted to permit the reciprocating motion of said shaft and to prevent the rotating motion of said shaft.

4. The combination with a standard, of a pair of horizontally disposed shafts mounted at the top of said standards, coöperating gears on said shafts whereby the one can be

driven from the other, means for throwing said gears into and out of engagement, a vertical rotatable tool shaft, driving connections between one of said first-mentioned shafts and said tool shaft whereby the former is adapted to rotate the latter, driving connections between the other of said first-mentioned shafts and said tool shaft whereby the former is adapted to reciprocate the latter, said tool shaft having a vertical slot therein, a lock for engaging said slot to prevent the rotation of said tool shaft, and means for feeding said tool shaft during the rotation thereof.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES D. McCLELLAND, JR.

Witnesses:

H. WHITING,

PHILIP D. ROLLHAUS.

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