

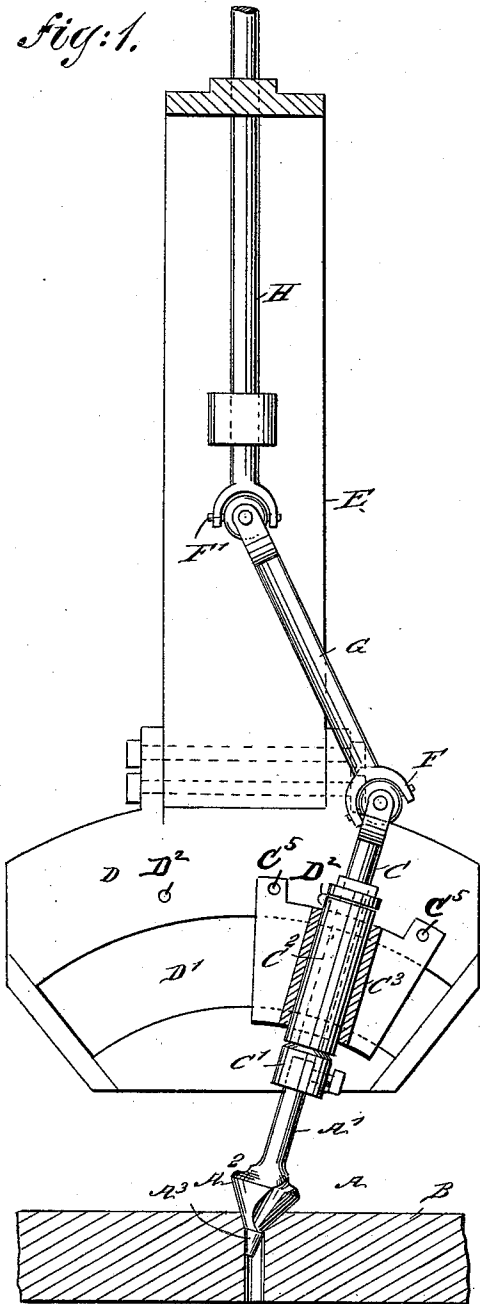
(No Model.)

L. CHURCHILL.
MACHINE FOR DRILLING COUNTERSINKS.

No. 542,925.

Patented July 16, 1895.

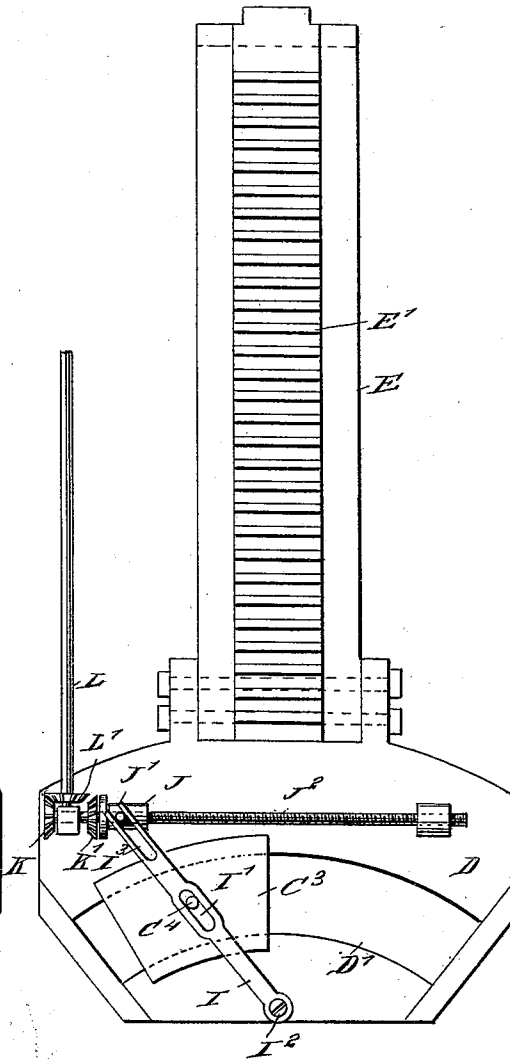
Fig: 1.



WITNESSES: B¹

Chas. Kiera
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Fig: 2.



INVENTOR

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UNITED STATES PATENT OFFICE.

LEMUEL CHURCHILL, OF THREE OAKS, MICHIGAN.

MACHINE FOR DRILLING COUNTERSINKS.

SPECIFICATION forming part of Letters Patent No. 542,925, dated July 16, 1895.

Application filed November 23, 1894. Serial No. 529,704. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL CHURCHILL, of Three Oaks, in the county of Berrien and State of Michigan, have invented a new and Improved Machine for Drilling Countersinks, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved drilling-machine more especially designed for forming oblong countersinks for the reception of elliptical bolt-heads and other devices.

The invention consists principally of a drilling-tool formed with a cutting-head having a smooth non-cutting point extending beyond the cutting-edges of the head and forming a fulcrum for the tool.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the views.

Figure 1 is a front elevation of the improvement as applied and with parts in section, and Fig. 2 is a rear view of the same.

The improved machine for drilling countersinks is provided with a drilling-tool A having a shank A' and a head A², provided with cutting-edges and preferably made conical, as is plainly illustrated in Fig. 1. The apex of this head A² is made in the shape of a point A³, having a smooth non-cutting surface to engage the drilled opening B' in the article B, to be formed with a countersink at the upper end of the said opening B'. The point A³ is preferably made conical, so as to form a fulcrum for the drilling-tool A as the latter is oscillated in the manner hereinafter more fully described.

The shank A' of the drilling-tool A is secured in a socket C' of a drill-shaft C, mounted to turn in a sleeve C², mounted to slide and to turn in bearings formed in a block C³, mounted to slide in a segmental slot D', formed in the frame D. The upper end of the latter is provided with a bar E, formed on its rear face with rack-teeth E', adapted to be engaged by a gear-wheel forming part of a drilling-machine of ordinary construc-

tion, to raise and lower the frame D, so as to bring the cutting-edges into proper position relative to the article B to be drilled.

The upper end of the drill-shaft C is connected by a universal joint F with a link G, connected by a universal joint F' with the main shaft H, turning in suitable bearings in the bar E, and driven from a suitable source.

On the back of the block C³ is secured a pin C⁴, extending into an elongated slot I' of a lever I, fulcrumed at its lower end at I² on the frame D. The free end of the lever I is formed with a slot I³, engaging a pin J' projecting from a nut J, through which passes a screw-rod J², disposed horizontally and mounted to turn in suitable bearings arranged on the frame D.

On the screw-rod J² are secured the beveled gear-wheels K and K', adapted to alternately mesh with a gear-wheel L', secured on a shaft L having a rotary motion, so that the screw-rod J² is alternately rotated in opposite directions to move the nut J forward and backward on the said screw-rod. This forward and backward movement of the nut J causes a forward and backward sliding of the block C³ on the frame D by the action of the nut J on the lever I.

Now, when the machine is set in motion the screw-rod J² and the shaft H are rotated simultaneously, so that the drill-shaft C and the drilling-tool A carried thereby are rotated from the said shaft H, and at the same time a forward and backward sliding motion is given to the block C from the screw-rod J², as above described. Now it will be seen that this oscillating motion of the block C³ imparts an oscillating motion to the drilling-tool A at the time the latter is rotated, so that the cutting-head A² drills an oblong countersink in the article B at the upper end of the opening B', it being understood that the point A³ forms the fulcrum for the cutter-head and also a guide as the latter is moved from one side to the other. When it is desired to use the machine for ordinary vertical drilling, then the block C³ is secured by bolts to the frame D, the block then being in the top of the slot with the drill-shaft C in alignment with the main drive-shaft H. The bolts are passed through registering-apertures C⁵ D² in the block and frame to fasten the block in posi-

tion. The screw-shaft J² is then set out of action by stopping-shaft L.

I do not limit myself to the particular mechanism described for imparting rotary oscillating motions to the drilling-tool, as the same may be varied without deviating from my invention.

The device can be used separately or in the form of an attachment for a drilling-machine of any approved construction.

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

1. A machine for drilling countersinks, provided with a drilling tool formed with a conical cutting head, and a smooth non-cutting conical point extending from the apex of the said cutting head and forming a fulcrum for the tool, substantially as shown and described.

2. In a machine for drilling countersinks, the combination of a revoluble drilling tool having its lower end fulcrumed in the hole to be countersunk, and means for oscillating the tool, substantially as described.

3. In a machine for drilling countersinks, the combination of a drilling tool having a projection beyond its head to serve as a fulcrum for the tool, and means for swinging the tool from side to side, substantially as described.

4. In a machine for drilling countersinks, the combination with a supporting frame,

of a slide block mounted thereon, a sleeve mounted to turn and slide in the slide block, a drill shaft mounted to turn in the sleeve, and carrying a tool having its lower end fulcrumed in the hole to be countersunk and means for reciprocating the slide block, substantially as described.

5. In a machine for drilling countersinks, the combination with a supporting frame, a block fitted to slide on the frame, and a drill shaft mounted in the said block, of a screw rod, gear wheels on the said rod, a rotary shaft, a gear wheel on the said shaft adapted to alternately mesh with the gear wheels of the screw rod, a nut on the screw rod, and a lever connected with the said block and nut, substantially as described.

6. In a machine for drilling countersinks, the combination with a supporting frame having a segmental slot, and a block fitted to slide in the said block, of a drill shaft mounted in the block, and carrying a tool having its lower end fulcrumed in the hole to be countersunk a driveshaft, a link having a universal joint connection with the drill shaft and drive shaft, and means for reciprocating the block in the slot of the supporting frame, substantially as described.

LEMUEL CHURCHILL.

Witnesses:

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