

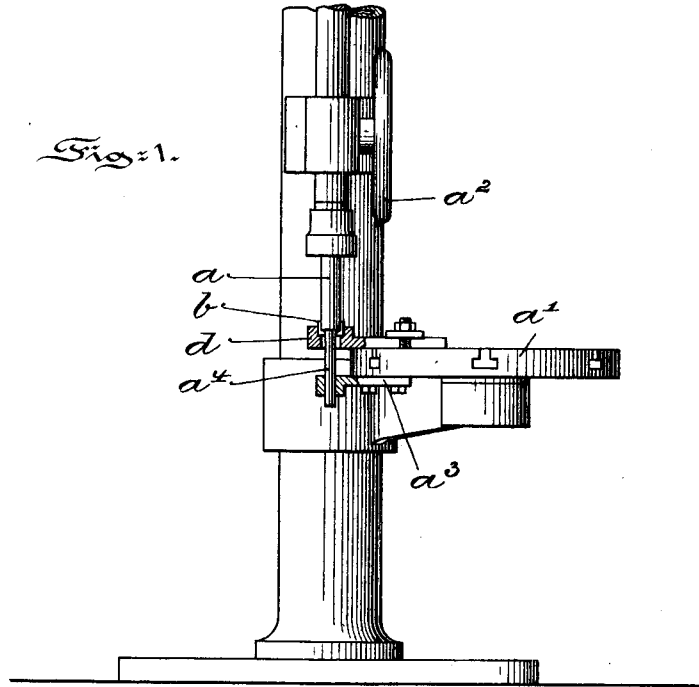
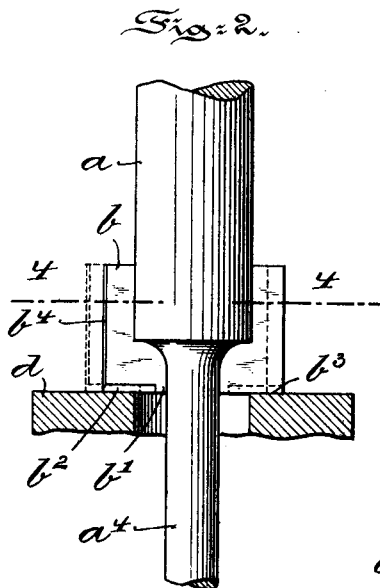
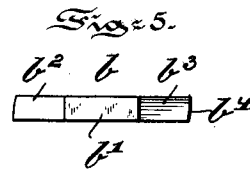
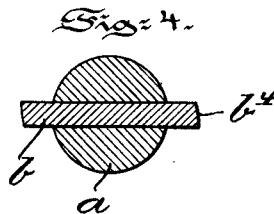
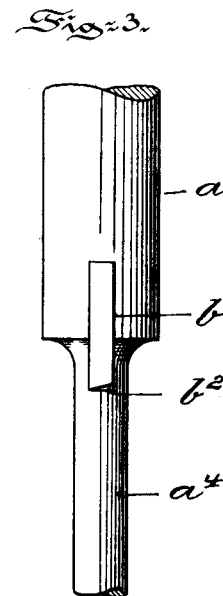
No. 675,841.

Patented June 4, 1901.

W. D. RICHTER.
DRILLING MACHINE.

(Application filed Mar. 28, 1901.)

(No Model.)



Witnesses:
Wilhelm Vogt
Thomas M. Smith

Inventor:
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UNITED STATES PATENT OFFICE.

WOLFGANG D. RICHTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
TO DOMESTIC MACHINERY WORKS, OF SAME PLACE.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 675,841, dated June 4, 1901.

Application filed March 28, 1901. Serial No. 53,173. (No model.)

To all whom it may concern:

Be it known that I, WOLFGANG D. RICHTER, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification.

My invention has relation to a drill to be operated mechanically; and in such connection it relates to the construction and arrangement of the tool and of its operating-spindle.

Heretofore in this class of machines the tool-spindle having a centrally-arranged slot in which the tool was adapted to be secured was either hollow above the tool to permit of the insertion and adjustment of a bolt or screw for locking the tool to the spindle or else the slot of the tool-spindle was cut wider than the width of the tool to permit of the entrance of wedges to properly secure the tool when centered to the spindle. In other words, it has been thought necessary in machines of this character to center the tool manually and then lock the tool in the spindle.

The principal object of my invention is to provide in a drilling-machine, in conjunction with a rotating spindle having a range of vertical movement, a self-centering tool fitted into a slot diametrically traversing the spindle, said tool having a range of transverse movement in the slot to permit of its self-centering during the drilling operation and said tool not locked to the spindle.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a front elevational view of a portion of a drilling-machine, illustrating a tool-spindle and tool in operative position with respect to the work. Fig. 2 is an enlarged detail view of the lower end of the drill-spindle and of the tool, the work to be drilled being shown in section. Fig. 3 is a side elevational view of the spindle and tool. Fig. 4 is a cross-sectional view on the line 4 4 of Fig. 2, and Fig. 5 is a plan view of the cutting edge of the tool.

Referring to the drawings, *a* represents the

tool-spindle, adapted to be rotated by suitable means (not shown) and to be fed vertically toward or away from the table *a'* of the machine by well-known mechanism (not shown) controlled by the hand-wheel *a²*. The table *a'* has a bracket or extension *a³*, having an opening for the reception and guidance of the reduced end *a⁴* of the spindle. The body *a* and reduced end *a⁴* of the spindle are diametrically slotted for the reception of the tool *b*; but otherwise the spindle is solid. The tool *b* snugly fits in the slot of the spindle, so as to have no vertical play and but a slight transverse movement therein. The cutting face or edge of the tool *b* has a central flat portion *b'* and oppositely-beveled end portions *b²* and *b³*. The sides *b⁴* of the tool *b* are not flattened, but rounded on an arc of a circle corresponding to the circular opening to be drilled. The cutting edges of the tool *b* are the beveled portions *b²* and *b³*, which are not only oppositely beveled, but also of corresponding length and project a corresponding distance from the medial line of the tool.

Referring now to Fig. 2, if the tool *b* be loosely inserted in the slot of the spindle *a*, as indicated in dotted lines, with the center of the tool projecting to one side of the center of the spindle, a larger portion of the cutting-surface *b²* will engage the face of the work *d* to be drilled than the surface *b³* will engage. The friction in excess upon that end of the tool carrying the surface *b²* over the opposite end *b³* will instantly cause the tool to shift in the slot of the spindle *a* as the spindle begins to rotate. If shifted too far in this direction, the bight of the cutting-surface *b³* causes the tool to shift in an opposite direction and so on until the tool centers itself. In the drilling of the material *d* the tendency to chatter if the tool *b* were fixed to the spindle and not properly centered results simply in the proper centering of the tool, since the excess of friction on one cutting-surface will shift the tool in the slot until the friction of both cutting-surfaces is equal. The hole bored will therefore be more quickly and smoothly drilled, and the preliminary work of centering the tool and locking or wedging it in the spindle is avoided. Again, by not hollowing out the spindle for

the reception of a tightening bolt or screw and by not excessively widening the slot in the spindle to permit of the use of wedges the spindle will be immeasurably strengthened
5 and will not so readily break as was heretofore the case.

Having thus described the nature and object of my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 In a machine of the character described, a spindle having a solid body diametrically slotted for the reception of a tool, means for rotating said spindle, and means for feeding the spindle toward and away from the work,

in combination with a tool adapted to fit 15 snugly in the slot of the spindle and free to move transversely therein, said tool having on its under or cutting edge two oppositely-beveled cutting-surfaces, substantially as and for the purposes described. 20

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WOLFGANG D. RICHTER.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.