No. 845,191. PATENTED FEB. 26, 1907.

A. Y. PEARL.

BORING MACHINE.

APPLICATION FILED MAY 11, 1905.

2 SHEETS—SHEET 1.

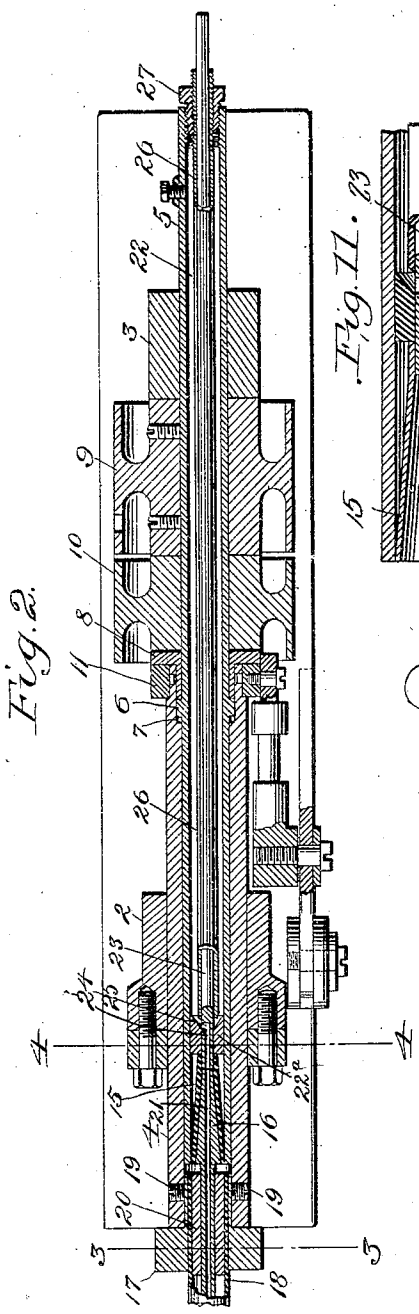

Fig. 2.

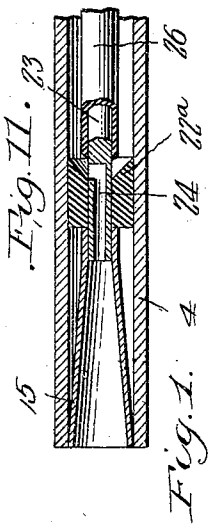

Fig. 11.

Fig. 1.

WITNESSES:

C. C. Burdine.

W. H. Simms

INVENTOR

A. Y. Pearl

BY Knight Bros

Attorneys

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2 SHEETS—SHEET 2.

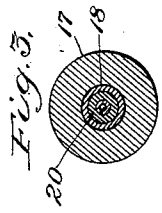

Fig. 3.

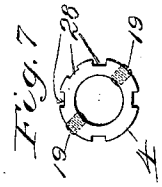

Fig. 7.

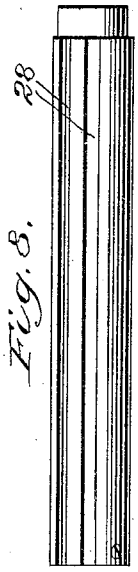

Fig. 8.

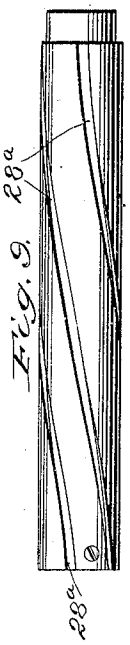

Fig. 9.

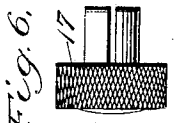

Fig. 6.

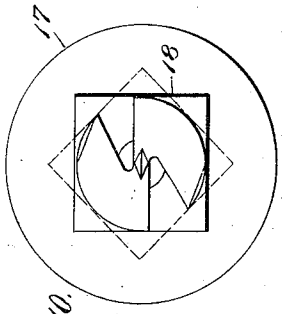

Fig. 10.

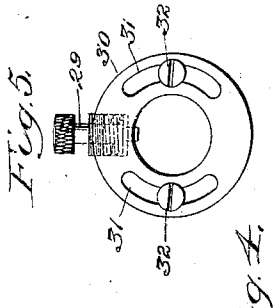

Fig. 5.

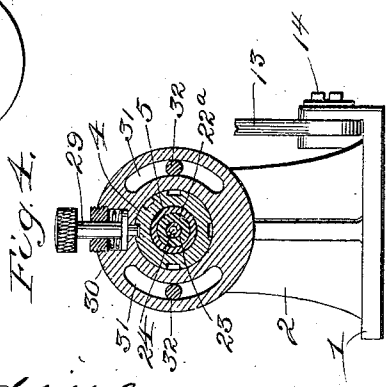

Fig. 4.

WITNESSES:

W. L. Bindine.

H. H. Simms

INVENTOR

A. Y. Pearl

BY Knight Bros

Attorneys.

UNITED STATES PATENT OFFICE.

AZARIAH Y. PEARL, OF NEW YORK, N. Y

BORING-MACHINE.

No. 845,191. Specification of Letters Patent. Patented Feb. 26, 1907.

Application filed May 11, 1905. Serial No. 259,931.

To all whom it may concern:

Be it known that I, AZARIAH Y. PEARL, a citizen of the United States, residing in New York, in the county of New York, borough of Manhattan, and State of New York, have invented a new and useful Improvement in Boring-Machines, of which the following is a specification.

This invention relates to boring-machines, and more particularly to machines constructed to hold and operate augers adapted to cut rectangular or other angular shaped holes in wood or metal.

The invention has for its object to provide means for holding the outer casing of the tool against rotation, means for rotating the spindle of the tool, means for feeding a lubricant to the tool, means for controlling the feed of the lubricant, means for adjusting the position of the outer casing of the tool to cause it to cut at various angles, means for advancing the tool without destroying its support or angular adjustment, and means for driving out the tool.

Other and further objects will appear in the following description and will be more particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the machine with a square auger mounted therein. Fig. 2 is a horizontal central section of the machine. Fig. 3 is a section on the line 3 3, Fig. 2. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 is a detail front elevation of the grooved sleeve. Fig. 6 is a detail of the auger-casing clamp or chuck. Figs. 7 and 8 are respectively an end and a side view of one embodiment of my grooved sleeve. Fig. 9 is a side view of another embodiment of my grooved sleeve, and Fig. 10 is a view showing in dotted lines one adjustment of the auger. Fig. 11 is an enlarged detail view of the parts at the end of the machine where the tool is secured.

Referring more particularly to the drawings, 1 indicates a base having a pair of uprights or standards 2 and 3 thereon, one of the standards 2 carrying an axially-movable sleeve 4, held normally against rotation by a means hereinafter more fully described. Within the other standard 3 is journaled one end of a hollow drive-shaft 5, the other end of the drive-shaft being journaled within the sleeve 4 and extending therein to a point a slight distance from one end thereof. The hollow shaft 5 has an annular ring 6, which is fitted into the enlarged bore 7 in one end of the sleeve 4, being held therein by a ring 8, so as to permit the hollow shaft to rotate relatively to the sleeve. Upon the hollow shaft between the ring 8 and the standard 3 is fixedly secured a drive-pulley 9, and between the drive-pulley and the ring is loosely journaled an idler 10.

Fixedly secured to the sleeve 4 is a ring 11, which is connected by a link 12 with lever 13, pivoted at 14 to the base, and which when moved in the direction of the arrow, Fig. 1, causes the sleeve and the shaft to move axially toward the work, the drive-pulley to be moved to the drive-belt, and the idler away from the drive-belt.

Within one end of the hollow shaft is fitted a non-circular tapering sleeve 15, in which is adapted to be secured the tapering end of the spindle 16 of the auger, while within the adjacent end of the sleeve 4 is fitted an auger-casing clamp or chuck 17 in the form of a split collar, the auger-casing 18 being held therein by axial screws 19 on the sleeve 4 engaging the split portion and clamping it against the casing.

The auger (herein shown for the purpose of illustration only) is of the type illustrated in my former patents, No. 505,844, October 3, 1893, No. 565,500, dated August 11, 1896, and No. 606,575, dated June 28, 1898; and an application filed by me October 13, 1904, Serial No. 153,263, the spindle 16 being journaled at one end in a brass 20, secured within the casing 18, and being provided with a lubricating-channel 21 to convey a lubricating-fluid to the working parts. The shaft 5 is made hollow, thereby providing a lubricating-chamber 22, and within the shaft adjacent the tapering sleeve 15 is secured a block 22^a, having a central bore. Extending through the hollow shaft is a rod 23, the inner end of which is provided with a conduit or duct 24, having a lateral portion 25, and is fitted within the central bore or opening leading to the spindle clamp or sleeve 15. The greater portion of this rod is slidably mounted in a tube 26, which is threaded in a bushing 27, in turn threaded into the end of the hollow shaft 5.

The sleeve 4 may be turned so as to make an angular bore at various angles, as shown in Fig. 10. This is accomplished by providing the sleeve with a series of straight grooves 28, as shown in Figs. 7 and 8, or a series of spiral grooves 28^a, as shown in Fig. 9, when it is desired to make a spiral bore. Within

these grooves is adapted to fit a spring-pressed and releasable spline 29, carried by a collar 30, secured to the upright 2, the collar being provided with arc-shaped slots 31, in which work clamping-screws 32 to hold the collar, and consequently the sleeve 4, in positions other than those provided for by the grooves 28 or 28[a].

The operation of the invention is as follows: The machine being in the position shown in Figs. 1 and 2, the lever 13 is moved in the direction of the arrow, Fig. 1, thereby causing the tool to be advanced to the work and the drive-pulley 9 to be thrown in connection with the drive-belt. The spindle 16 now begins to rotate with the shaft 5, and the casing 18 is held stationary. Oil passes from the chamber 22 through ducts 24 and 25 to the conduit in the spindle and is supplied to the working parts of the tool from this point. If more oil is supplied than is necessary, the sleeve 26 is advanced by turning it or by turning bushing 27, so that duct 25 is closed to the chamber 22. As the spindle 16 advances it carries therewith the casing 18, sleeve 4, and shaft 5 by reason of the annular ring 6 connecting the shaft 5 and the sleeve 4. After the hole has been cut the proper depth and it is desired to make a bore in the same place or in another at an angle to the first one, as shown in dotted lines in Fig. 10, it is not necessary to turn the work, as the tool-casing 18 may be turned. This is accomplished by withdrawing spline 29 from the groove 28 in which it rests, turning sleeve 4, so that another groove is beneath the spline, and permitting the spline to enter the same, or if there is no groove that provides the proper adjustment the collar 30 may be turned through the medium of the slots 31. After the second bore has been made the tool is withdrawn, as before, and if it is desired to remove the tool from the machine the screws 19 are loosened and the end of rod 23 is struck, thereby causing its other end to engage the end of spindle 16, driving the tool from the machine and closing the discharge of the oil-chamber.

By this machine it will be seen that a mortise or recess can be made at any angle of alinement on the wood or metal without changing the work to be operated upon, or to make several different cuts of various shapes and have them extend to any depth required, and the guiding of the tool is at a point removed from the cutting edges. The tool as it advances runs true, and the box or bearing is at all times as near as possible to the point where the work is to be done. A supply of lubricating fluid is provided at a point where it can be fed to the points of friction in the cutting-tool, and the feed may be regulated in such manner that only the proper amount will be used and only at the place desired.

The power is applied to the machine in such a manner that the drive-shaft will only revolve when the tool-spindle is advancing and remains idle at all other times, so that work may be set to its proper place and the hands be employed around the knives without danger of being cut.

I am aware that various changes may be made in my invention without departing from the spirit thereof, and therefore claim any construction within the scope of the following claims.

What I claim is—

1. In a boring-machine for operating tools for boring angular-shaped holes, the combination with an axially-movable tool-spindle drive-shaft, of a support-carrying means for holding a tool-casing against rotation while permitting its axial movement, and means for holding the tool-casing in various angular positions.

2. In a boring-machine for operating tools for boring polygonal holes, the combination of an axially-movable tool-spindle driving-shaft, a support, a sleeve turnable in said support and provided with a plurality of longitudinal guides, means carried by the support and with which any one of the guides is adapted to engage when the sleeve is turned to the proper position means causing the sleeve to move axially, means causing the shaft to move therewith, and means for securing a polygonal cutting-casing of a boring-tool to the sleeve to cause the casing to assume the angular position of the sleeve.

3. In a boring-machine for operating tools for boring polygonal holes, the combination of an axially-movable tool-spindle driving-shaft, a support, a sleeve turnable in said support and provided with a plurality of longitudinal grooves, a releasable projection adapted to enter any one of the grooves, means causing the sleeve to move axially, means causing the shaft to move therewith, and means for securing the polygonal cutting-casing of a boring-tool to said sleeve to cause the casing to assume the angular position of the sleeve.

4. In a boring-machine for operating tools for boring polygonal holes, the combination of an axially-movable tool-spindle driving-shaft, a support, a collar rotatably adjustable on the support and carrying a projection, a sleeve provided with a longitudinal groove in which the projection fits to turn with the collar, means causing the sleeve to move axially, means causing the shaft to move therewith, and means for securing a polygonal cutting-casing of a boring-tool to the sleeve.

5. In a boring-machine for operating tools for boring polygonal holes, the combination of the axially-movable tool-spindle driving-shaft, a support, a sleeve turnable in said support, means for holding the sleeve in dif-

ferent positions of angular adjustment to which it may be turned, means for causing the sleeve and the shaft to move together axially, and means for securing a polygonal cutting-casing of a boring-tool to the sleeve to cause the tool to assume the angular position of the sleeve.

6. In a boring-machine for operating tools for boring polygonal holes, the combination of an axially-movable tool-spindle driving-shaft having a lubricant-chamber, a support-carrying means for holding a tool-casing against rotation while permitting its axial movement a rod extending through the shaft and having a duct through which a lubricant is fed from the chamber to the tool, and a tube surrounding the rod and adjustable to cut off the supply through the duct.

7. In a boring-machine for operating tools for boring polygonal holes, the combination of an axially-movable tool-spindle driving-shaft having a lubricant-chamber, a support-carrying means for holding a tool-casing against rotation while permitting its axial movement, and a rod extending through said shaft, having a duct through which the lubricant is fed from the chamber to the tool-spindle, and being movable to cut off the feed.

8. The combination of an axially-movable hollow drive-shaft, a support-carrying means for holding a tool-casing against rotation while permitting its axial movement, means for securing a tool-spindle to one end of the shaft, a lubricant-chamber formed within the hollow shaft and having a discharge in alinement with the longitudinal axis of the tool-spindle, and a rod also in alinement with the longitudinal axis of the tool-spindle and having a duct movable into and out of the lubricant-chamber.

9. The combination of an axially-movable hollow shaft, an axially-movable sleeve in which the shaft is journaled, connections for causing the sleeve and the spindle to move axially together, means for holding the sleeve against rotation with the shaft, and permitting the sleeve to be adjusted to various positions, means for securing a tool-casing to the sleeve, means for securing a tool-spindle to the shaft, a lubricant-chamber within the shaft, a rod controlling the flow of lubricant from the lubricant-chamber and adapted to engage the tool-spindle to drive it out of the machine, a fixed and loose pulley on the drive-shaft, and a lever connected with the sleeve to move the tool to and from the work.

The foregoing specification signed at No. 11 Pine street, New York city, this 9th day of May, 1905.

AZARIAH Y. PEARL.

In presence of—
E. T. HUBBALL,
H. P. DRUMMOND.