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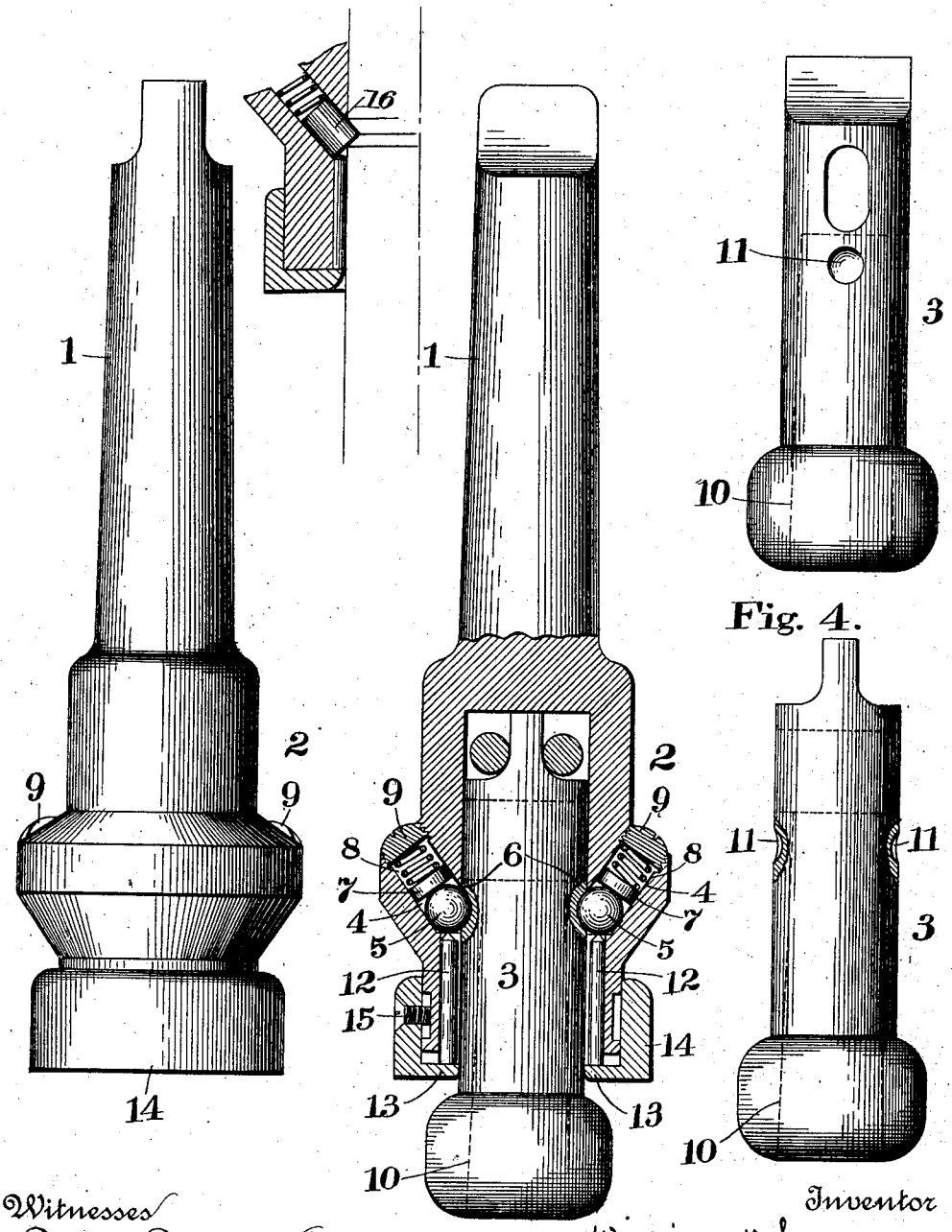
DRILL CHUCK.

APPLICATION FILED JAN. 28, 1903.

NO MODEL.

Fig. 1. Fig. 5. Fig. 2. Fig. 3.



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UNITED STATES PATENT OFFICE.

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DRILL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 751,345, dated February 2, 1904.

Application filed January 28, 1903. Serial No. 140,882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SAUNDERS, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Drill-Chucks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to drill-chucks.

The object of the invention is to provide simple and effective means not liable to get out of order or become defective by reason of wear of parts whereby a tool-holder may by little manipulation of parts be attached to and be detached from a drill-spindle.

Further, the object of the invention is to provide a drill-chuck of such construction that the secure seating of the parts by which the tool-holder is attached to the spindle will be accomplished quickly under all conditions.

With these objects in view the invention consists of a drill-chuck comprising a socket for a tool-holder formed with or attached to the lower end of a drill-spindle, inclined passages communicating with the interior of the socket, engaging or locking pieces arranged in the passages and adapted to engage indentations in the tool-holder, and means for removing the locking-pieces from the indentations.

Further, the invention consists of various novel details of construction whereby the objects of the invention are attained and the effectiveness of the device insured.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a drill-spindle having my improved clutch thereon. Fig. 2 is a view partly in section showing the construction and arrangement of the working parts of the clutch. Fig. 3 is a side view of the tool-holder employed in connection with my clutch, and Fig. 4 is a front view of the tool-holder. Fig. 5 is an illustration of a modification of the invention.

In the drawings, 1 represents a drill-spindle, which as to its upper end may be of the usual form of such parts as usually made, adapting it for attachment to the spindle or plunger of the tool. At the lower end of the spindle 1 is the receptacle 2, adapted to receive the tool-holder and which forms the main body or shell of the clutch. This receptacle or shell may be formed integral with the spindle 1 or may be made in a separate piece and attached to the spindle in any suitable way. The interior of the shell 2 is bored out, forming an opening to receive the tool-holder 3.

Arranged in opposite sides of the portion 2 of the clutch are the ways or passages 4, having the reduced lower ends 6, which extend downward and inward from the outside to the inside of the shell at an acute angle, and in these ways are placed and adapted to move up and down therein the locking-pieces by which the tool-holder is connected to the shell 2. In the present embodiment of the invention the principal portions of the locking devices consist of spheres 5, of metal, and of diameters corresponding to those of the interiors of the ways or passages 4 and of a greater diameter than those of the reduced lower ends 6, by which the ways or passages are connected with the interior of the shell.

The spheres are normally held at the lower ends of the respective ways with a portion protruding into the interior of the shell. As a convenient means of effecting this I arrange above the spheres the plates 7, which bear against the respective spheres, and the springs 8, bearing against the plates at their lower ends and abutting against screw-plugs 9, introduced into the upper end of each way or passage at their upper ends.

The tool-holder 3, having the usual opening 10 to receive the shank of a tool, has on its outer face the indentations 11, each of a size and shape to receive and closely confine that portion of one of the locking-pieces 5 which normally protrudes into the interior of the shell. The location of the indentations is such that when the tool-holder is seated in the

shell 2 the indentations 11 will be in line with the contracted lower ends of the ways 4.

As a convenient means for raising the locking-pieces I provide the pins 12, each bearing at its upper end against one of the locking-pieces and resting at its lower end on the flange 13 of the vertically-movable sleeve 14. The pins are each located in a passage bored in the wall of the shell parallel to the inner face of the latter, and the sleeve is retained in proper operative position by a set-screw or pin 15, projecting from the inner face of the sleeve into a circumferential groove on the outer face of the shell.

While I have particularly described the means for locking the tool-holder to the shell as consisting of the spheres 5, it will be clear from an understanding of the invention that I may substitute for the means described pins held in place by springs and having their lower ends of a size to project a short distance through the openings 6 to engage the indentations in the holder.

The ends of the pins adapted to bear against the holder may be of any suitable shape—as, for instance, as shown in Fig. 5, in which the modified form is shown. In this figure pins 16, having plane lower ends adapted to have their edges brought into an angular opening in the holder, are shown as a substitute for the spheres heretofore described.

From the foregoing, the facility with which the tool may rigidly be secured in place in the shell and released when desired will be apparent. In introducing the holder the sleeve is moved upward against the tension of the springs 8, forcing the pins 12 against the lower surfaces of the locking-pieces and moving them upward in the ways to leave the opening in the shell unobstructed. When the upper end of the tool-holder bears against the upper end of the opening in the shell, the indentations in the tool-holder are in line with the reduced lower ends of the ways or passages, and when the sleeve is released the springs 8 will force the locking-pieces downward to the lower ends of the respective ways and cause them to protrude into the indentations 11 and will also return the sleeve to its normal position.

The ways in which the locking-pieces are located being at an angle, as shown, the movement of the latter to locking positions will be aided by their own gravity in assuming and retaining a position in the lower ends of the ways, and when in this position each will enter one of the indentations in the tool-holder, thus securely retaining the holder in place.

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

1. A drill-chuck comprising a socket, inclined ways communicating with the interior of the socket, locking-pieces arranged in the ways and adapted to protrude into the socket and means for removing the locking-pieces from the socket comprising longitudinally-movable pins bearing against the pieces, substantially as described.

2. A drill-chuck comprising a socket, inclined ways or passages communicating with the interior of the socket, locking-pieces arranged in the ways and adapted to protrude into the socket, springs interposed between the locking-pieces and the outer ends of the ways or passages, and means for removing the locking-pieces from the interior of the socket comprising longitudinally-movable pins bearing against the pieces, substantially as described.

3. A drill-chuck comprising a socket, inclined ways communicating with the interior of the socket, locking-pieces located in the ways and having their lower ends normally projecting into the interior of the socket, a vertically-movable collar, and pins bearing at their lower ends on the collar and at their upper ends against the locking-pieces, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. SAUNDERS.

Witnesses:

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