W. KNIGHT.

Drill-Chucks.

No. 149,936. Patented April 21, 1874.

Fig. 1.

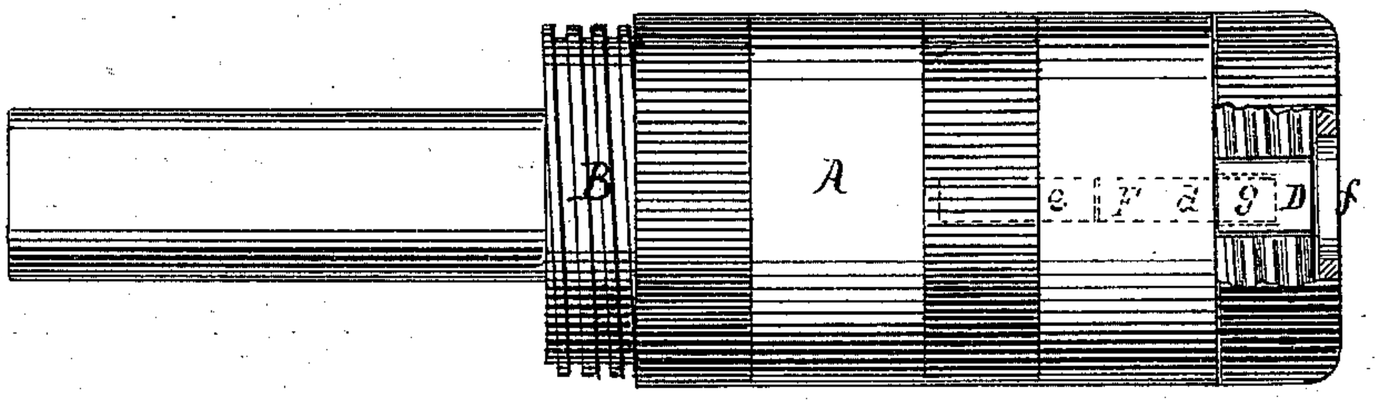


Fig. 2.

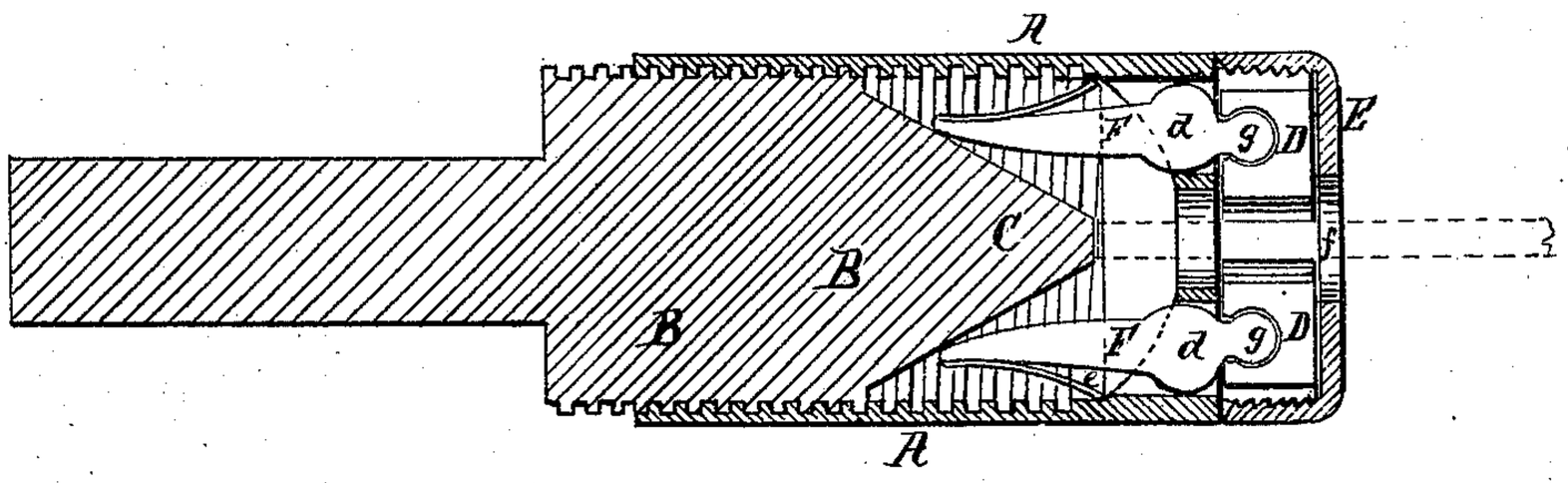
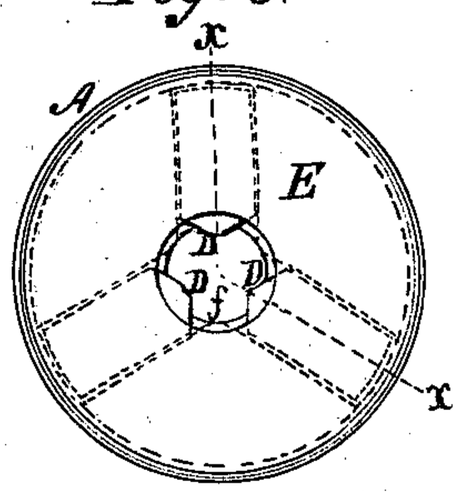


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLARD KNIGHT, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN DRILL-CHUCKS.

Specification forming part of Letters Patent No. **149,936**, dated April 21, 1874; application filed July 5, 1873.

To all whom it may concern:

Be it known that I, WILLARD KNIGHT, of the city of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Drill-Chucks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, which forms a part of this specification.

Heretofore the particular style of drill-chucks to which my present invention relates have been made with sliding jaws, which were caused to open and close by actuating-levers, said levers being pivoted at their centers to the clutch-carrier, their lower ends bearing upon a conical projection on the chuck-head. This construction will be found in the Brooks drill-chuck, patented in 1865. In such chucks the pivots through the levers necessarily receive the whole strain exerted by the jaws in holding the drill, and hence they are constantly bending or breaking, and causing much trouble and annoyance. I remedy this difficulty by so forming the sockets through the upper end of the clutch-carrier, and so arranging therein the actuating-levers, that the latter, when closing the jaws and holding the drill, will be caused to bear bodily against the outer walls of the said sockets, which at once become their fulcrums; and hence no rivets at all need be employed, and a strong, reliable, and durable drill-chuck be produced, as will be hereinafter more fully explained.

In the accompanying drawing, Figure 1 is a side view of a drill-chuck provided with my improvement, a portion being broken out to disclose an end view of one of the sliding clutches. Fig. 2 is a central longitudinal section of the said chuck, taken on the plane of the line *x x*, Fig. 3; and Fig. 3 is an end view of the same.

A designates the clutch-carrier, which is preferably of a cylindrical form, and which, in the present instance, is provided with an internal screw-thread to engage with a screw-thread on the periphery of the chuck-head B. I will, however, here remark that the clutch-carrier may be provided with a screw-thread on its periphery to engage with a thread formed on the inside of a wall extending outward from the base of the chuck-head. The chuck-head B is provided with a conical extension or projection, C, as is clearly shown in Fig. 2. D D D designate the sliding clutches, which rest and slide in recesses formed in the outer end of the clutch-carrier. These sliding clutches are provided with suitable biting-edges, and their line of motion is toward and from a common center, and they are prevented from dropping out of their said recesses by a cap, E, which, in the present instance, screws down upon the outer end of the clutch-carrier; but such cap, or an equivalent plate, may be otherwise secured, if desired. It is preferable to use a cap or plate which can be easily removed for permitting access to the sliding clutches for replacing them in case of breakage or damage. F F F designate the clutch-actuating levers. The upper end of each lever is provided with a head, *g*, which is slid into a correspondingly-shaped recess in the under side or face of a sliding clutch, D, so that it cannot drop out, as will be clearly understood by reference to Figs. 1 and 2. These levers E extend through apertures in the clutch-carrier, and they are provided with enlarged or swelled portions *d*, which bear or rock against the walls of the said apertures; and the lower ends of these levers bear against the conical projections C, and are provided with springs *e*, of any suitable construction, for forcing the lower ends of the levers toward each other for the purpose of opening or moving back the clutches as the diameter of the conical projection C decreases between them, by the unscrewing of the clutch-carrier. The drill is inserted through the opening *f* in the screw-cap E, and its shank may, if desired, rest upon the end of the conical projection C.

The operation of the chuck will be readily understood by reference to Fig. 2 of the drawing. The sliding clutches D D D are caused to approach each other by the spreading apart of the lower ends of the levers F F F, which is caused by the increasing diameter of the conical projection C, against which they ride, being interposed between them by the screwing of the clutch-carrier on the chuck-head; and they are caused to recede from each other by

the springs pressing the said lower ends of the levers toward each other as the conical projection is withdrawn from between them by the clutch-carrier being unscrewed from the chuck-head.

It will be observed that by my present invention I dispense with the use of rivets altogether, and thereby produce a very strong and durable chuck.

The clutch-actuating levers bear or rock against a solid wall, and hence a much stronger chuck is produced than where rivets, which are constantly breaking or bending, are employed. And, moreover, the fact that the jaws approach each other by a sliding motion, instead of turning on a fulcrum-pin, enables them to have a much deeper bite or hold upon the drill, and hence the drill will be held securely and steadily without any device or mechanism for centering it, though the end of the conical projection C will serve such office if it be so desired.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, substantially as shown and described, of the clutch-carrier A, chuck-head B C, clutches D, and actuating-levers F, the latter being provided with enlarged portions *d*, and with heads *g* fitting in sockets in said clutches, and operating as herein set forth.

WILLARD KNIGHT.

Witnesses:

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