G. W. HAYDEN.
Drill-Chuck.

No. 206,320. Patented July 23, 1878.

Fig. 1

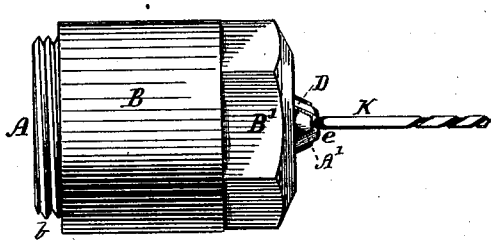


Fig. 2

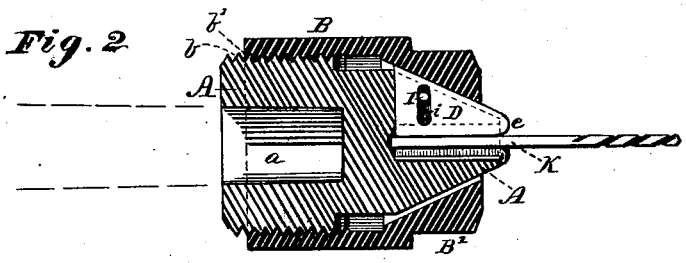


Fig. 3

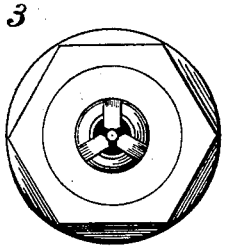


Fig. 4

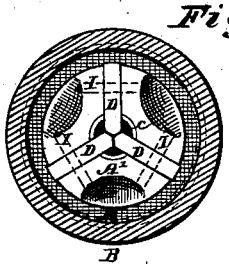
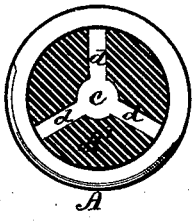


Fig. 5



Witnesses.
Lester J. Peare
Charles A. Vail

Inventor
George W. Hayden
per Chas. H. Burleigh
Atty.

UNITED STATES PATENT OFFICE.

GEORGE W. HAYDEN, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN DRILL-CHUCKS.

Specification forming part of Letters Patent No. **206,320**, dated July 23, 1878; application filed March 13, 1878.

To all whom it may concern:

Be it known that I, GEORGE W. HAYDEN, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Drill-Chucks; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a side view of my improved drill-chuck. Fig. 2 is a longitudinal central section. Fig. 3 is a front-end view. Fig. 4 is a transverse section through the outer sleeve, showing the front end of the central body and jaws. Fig. 5 is a transverse section of the body at the rear ends of the jaws.

This invention relates to that class of drill-chucks wherein the drill-holding jaws are made with inclined surfaces, and are forced inward by means of other inclined surfaces moving in contact therewith by the action of a screw-threaded sleeve or rotating head, in which said jaws are supported; and my invention consists in the peculiar chuck, and in the arrangement of the several parts of the chuck, as hereinafter described, whereby a simple, durable, convenient, and efficient tool is provided, as more fully set forth in the following description and claim.

In the drawings, A denotes the body or hub of the chuck, made in cylindrical form, with a forward conical extension, A′, and having a central opening, *a*, to fit onto the lathe-spindle when the chuck is used, and an external screw-thread, *b*, to receive the operating sleeve or cylinder B.

The forward conical portion, A′, is made with a central cylindrical opening, *c*, slightly larger than the drill-shanks, and is slotted or planed out with three radial spaces, *d*, to receive the jaws D, the rear ends of the slots being formed perpendicular to the axis of the central opening, *c*.

The jaws D are thin plates of metal of proper thickness to fit into the spaces *d*. Their inner and rear edges form a right angle or square, while their outer edges are inclined downward toward the front, and correspond with the conical form of the body A′, and their extreme front ends are rounded over, as shown at *e*. The square rear ends of the jaws D rest against the back ends of the slots *d*, as shown, and each jaw is provided with a slot, *i*, parallel with its rear end, said jaws being loosely retained within their respective spaces by means of pins I, which pass through the body A′ and slots *i* in the manner shown. The length of the slot *i* permits the jaw to move inward and outward, but not to such an extent as to carry the face of the jaw past the central axis.

The operating cylinder or sleeve B has an internal thread, *b′*, to fit the thread *b* of the body A, and an inner funnel-shaped front end or internal conical surface to correspond with the inclined outer edges of the jaws D, which rest against said conical surface, and about which the sleeve is revolved, the jaws being pressed inward by the action of the conical surfaces as the sleeve is drawn back by the screw-threads *b b′*. The front exterior of the sleeve B is made in the form of a nut, B′, to permit of an ordinary wrench being used thereon, if desired.

The drill-shank K is inserted in the central opening, *c*, and is centered and held in place by the inner faces of the jaws, the full length of which rests against the sides of the drill-shank parallel with its axis, while the right-angular form at their rear ends insures their square and equal action, so that the drill will stand in line with the axis of the chuck.

It will also be observed that the jaws are supported firmly and squarely within the body A′, which extends nearly or quite to their forward ends, *e*, while it embraces their sides along their inner edges throughout their length, parallel to and quite near to the holding-faces, so that there can be no liability of the jaws twisting or moving out of proper parallel position by the torsional strain of the drill.

The jaws D being thus firmly held in the body-extension A′, and the operating-sleeve B being arranged to revolve freely around their exterior, as shown, the screw-threads cannot be forced on or off by any strain of the drilling mechanism, and the sleeve B can easily be removed, even when the drill is firmly clogged with chips.

This chuck is quite simple, and can be manufactured cheaply. It is very strong, neat,

and compact, and is not liable to get out of order by severe usage or careless handling.

I am aware that chucks having three jaws operated by inclined surfaces are well known, and I do not make claim, broadly, to such features otherwise than embraced in the construction and organization hereinbefore described.

Having described my improved drill-chuck, what I claim as my invention, and desire to secure by Letters Patent, is—

The improved drill-chuck consisting of the body or hub A, having conical projection A′, with radial slots *d* and central opening, *c*, the jaws D, made with rectangular rear corners, inclined top edges, and slots *i*, the jaw-retaining pins I, and operating-sleeve B, having wrench-nut end B′ and internal conical surface, all constructed, combined, and operating in the peculiar manner herein shown and described.

Witness my hand this 7th day of March, A. D. 1878.

GEORGE W. HAYDEN.

Witnesses:
CHAS. H. BURLEIGH,
LESTER J. PEASE.