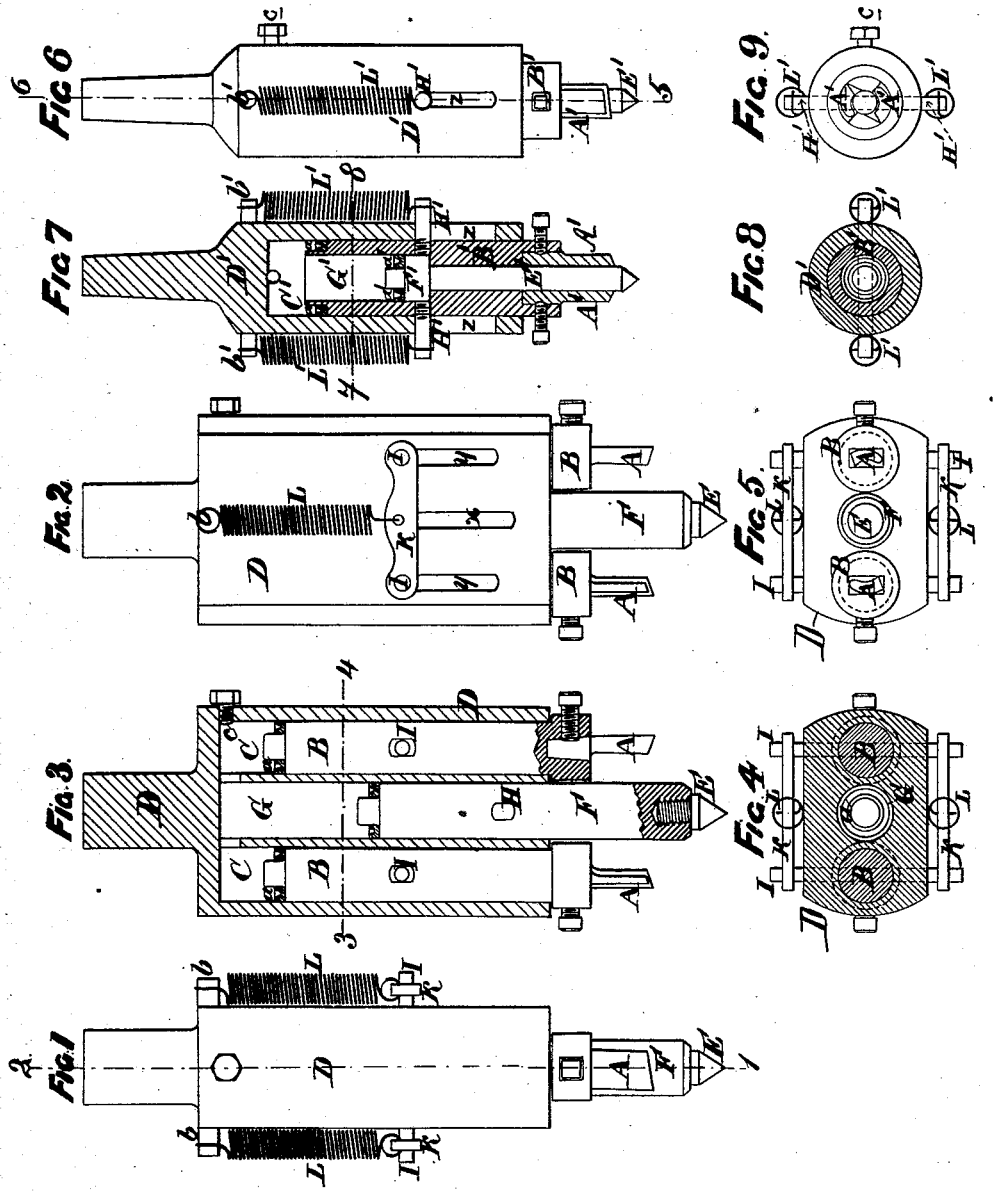
J. McKAY.

Drilling-Apparatus.

No. 163,503. Patented May 18, 1875.



Witnesses, Harry Smith
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UNITED STATES PATENT OFFICE.

JOHN McKAY, OF NEWCASTLE-ON-TYNE, ENGLAND.

IMPROVEMENT IN DRILLING APPARATUS.

Specification forming part of Letters Patent No. **163,503**, dated May 18, 1875; application filed February 23, 1875.

To all whom it may concern:

Be it known that I, JOHN McKAY, of Newcastle-on-Tyne, Northumberland county, England, have invented certain Improvements in Head-Stocks for Drilling-Machines, of which the following is a specification:

The object of my invention is to so construct the head-stock of a drilling or boring machine as to bore or drill holes with great accuracy and speed; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a side view of my improved head-stock; Fig. 2, a front view; Fig. 3, a sectional view; Fig. 4, a sectional plan; Fig. 5, an inverted plan view; and Figs. 6, 7, 8, and 9, views illustrating a modification of my invention.

In the center of the head-stock D is a longitudinal chamber, G, in which the ram F of the pivot-pin E is arranged to slide. At equal distances from the center of this chamber, and in a parallel line, are bored two chambers, C C, in each of which is arranged to slide a ram, B, carrying at its lower end a cutter, A, Fig. 3. These chambers C G C communicate with each other at the top, and are filled through the aperture *c* with water or other suitable liquid. Each of these rams B B and F are provided with packing *a*, so as to present a water-tight joint. A pin, H, projects horizontally through the ram F, and through slots *x* in the side of the head-stock, so as to prevent the said ram from turning in the chamber G.

The same object may be attained by making the chamber G and ram H of square or angular section.

Through each of the rams B, and through slots *y* in each side of the head-stock, projects a pin, I, these pins being connected together by the bar K.

Springs L, connected at one end to projections *b* on the head-stock, and at the other to the bars K, control the action of the rams B.

The plate, tube, or other article to be drilled is so arranged, in respect to the head-stock, that the pivot-pin E will rest on the plate in the center of the intended hole to be bored. The head-stock is then rotated and a downward pressure applied, so that the ram F will recede into the chamber G, forcing the liquid into each of the chambers C, when the cutters A will descend onto the plate, and, rotating round the center point E, will accurately bore the required hole.

When the pressure is removed from the head-stock, the springs L will draw back the cutters, which, through the medium of the liquid in the communicating chambers, will return the ram F and pivot-pin E back again to their normal positions, Fig. 3.

A modification of my invention is shown in Figs. 6, 7, 8, and 9, in which the head-stock has one central chamber, C′, in which is arranged to slide the ram B′, carrying the cutters A A′, which are arranged at equal distances from the center-pin E′, round which they rotate. Through the center of this ram B′ extends a chamber, G′, in the upper enlarged portion of which slides the ram F′, the lower portion of this ram terminating in the pivot-pin E′. Into each side of this ram B′ is screwed a pin, H′, these pins extending through slots *z*, and being under the control of the springs L′. Packing-rings *a′* secure water-tight joints for the rams B′ and F′.

When pressure is applied to the head-stock D′, the pin E′, coming in contact with the article to be bored, will recede with its ram F′ into the chamber G′, when the displacement of the liquid in the chambers will consequently force the ram B′ and cutters A′ down onto the material to be operated on, with the result described above.

I claim as my invention—

1. The combination, in a head-stock for drilling and boring machines, of the center-pin E, adapted to a chamber, G, with the cutter-rams B, adapted to chambers C, the said chambers communicating with each other, and containing liquid, as and for the purpose set forth.

2. The combination of the center-pin E and its ram F, and the rams B, carrying the cutters A, and under the control of springs L, with the communicating chambers C G C, containing liquid, as specified.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN McKAY.

Witnesses:

WM. DAGGETT,
Newcastle-upon-Tyne, Notary Public.

CHARLES BLAGBURN,
Newcastle-upon-Tyne, Consulting Engineer.