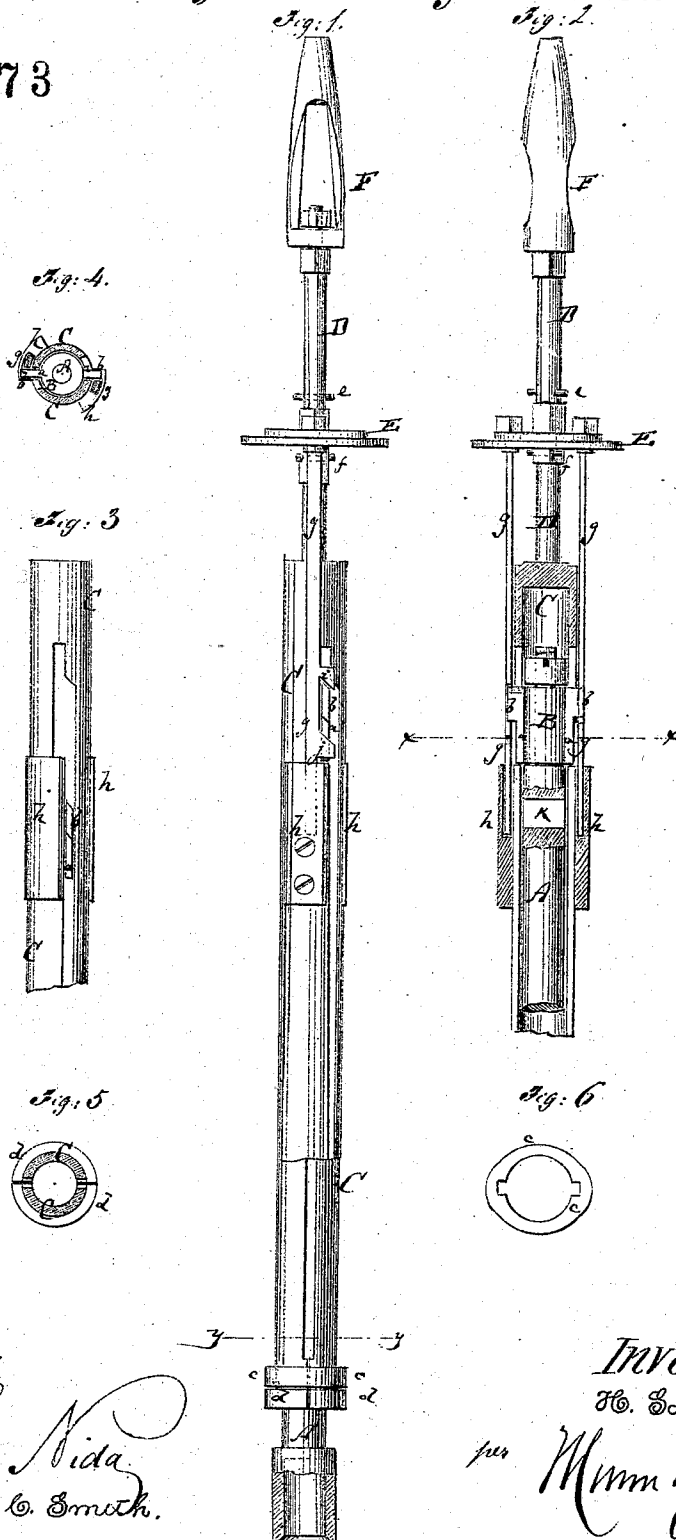


PATENTED AUG. 1 1871

H. Sontag's Boring Instrument.

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Witnesses:

Chas. Nida
Wm H. C. Smith.

Inventor:

H. Sontag.

per Wm H. C. Smith.

Attorneys.

UNITED STATES PATENT OFFICE.

HUGO SONTAG, OF OSNABRÜCK, GERMANY.

IMPROVEMENT IN JAR MOVEMENTS FOR ROCK-DRILLS.

Specification forming part of Letters Patent No. 117,573, dated August 1, 1871.

To all whom it may concern:

Be it known that I, HUGO SONTAG, of Osnabrück, Germany, have invented a new and Improved Boring Instrument; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

Figure 1 represents a side view, partly in section, of my improved boring instrument. Fig. 2 is a detail longitudinal section of the upper part of the same. Fig. 3 is a detail side view of the upper part of the shell. Fig. 4 is a transverse section of the same on the line *x x*, Fig. 2. Fig. 5 is a transverse section of the same on the line *y y*, Fig. 1. Fig. 6 is a detail top view of the ring by which the lower part of the shell is held closed.

Similar letters of reference indicate corresponding parts.

My invention relates to jar movements of drills; and consists in certain improvements thereon, which will first be described in connection with all that is necessary to a full understanding thereof and then clearly pointed out in the claims.

A in the drawing represents the drill-shank, made in form of a cylindrical rod of suitable length. Its upper end is swiveled in a sleeve, B, which has projecting wings *a a*, every wing having further projecting ears *b*. The shank A is fitted into a tubular shell, C, which is slotted vertically to admit the wings *a a* of the sleeve. In fact, the shell C may be composed of two semi-cylindrical parts, or slit at the lower end in such manner that the sleeve B and shank can be admitted and withdrawn from below by drawing the two half shells far enough apart at the lower end to let the wings enter or be moved from said slots. The lower ends of the shell are held together by a ring, *c*, which embraces the shell and rests on a shoulder, *d*, of the same. This ring has notches upon the inner side to admit the wings, whenever it is moved up past the sleeve, to let the shank be taken off. When it is used for locking the lower part of the shell it is turned on the shoulder so as to bring said

notches out of line of said wings. The tube or shell C is suspended, and at its upper end rigidly affixed to a rod, D, which is suspended from a rope or swiveled in a link, F, that is in a suitable manner connected with the raising and lowering apparatus. On the rod D is arranged a vertically-adjustable plate or valve, E, whose motion up and down is confined between shoulders or pins *e f*. This is connected with a rope or chain extending to the outside of the well, and by which the plate *e* and parts attached thereto are lifted. From said valve are suspended two rods, *g g*, which extend down along the sides of the shell into projecting lateral enlargements *h* of the same. Each rod *g* has, near the upper end of the slot in the shell, two projecting ears, *i* and *j*. The upper ear *i* has its lower, the lower ear *j* its upper end inclined, as shown. The upper and lower ends of the ears *b* are also inclined parallel to the ends of said gears *i j*, and the upper ends of the slots of the shell are further inclined in the same direction. The upper end of each slot in the shell is enlarged laterally, the enlargements being in part covered by the ears *i j*. Whenever the drill touches bottom and the shell is let down the ears *b* will strike the upper ends of the slots of the shell, and will, on the inclined edges, be moved aside in the enlargement of the slots. The wings will thereby also be carried into said enlargements and rest on the upper ends of the projections *h* of the shell.

The mode of operation is as follows: The drill is dropped into the rock, the tripping mechanism then made to unlock the tubular shell, and the shell made to act as a hammer and strike a blow upon the bit-socket. The drill is then withdrawn and the same repeated; but if the bit becomes stuck and resists withdrawal the tripping mechanism is made to unlock the shell, which is drawn up, creating a jar that loosens the drill in its seat and allows it to be removed.

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

1. The drill-shank A, sleeve B, and slotted tubular shell C, combined to operate in the manner described.
2. A drill-shell C, having elastic prongs, com-

bined with a sliding ring, *c*, which rests upon a shoulder, *d*, to lock the shank and shell together, and is moved up therefrom to allow them to be separated.

3. The wings *a a* on a sliding and swiveled sleeve, *B*, combined with the incline and recess on upper end of slotted shell, and the projection *h* to lock the shank and shell, as described.

4. The sliding-plate *E* and rods having inclined ears *i j*, combined with the ears *b* on the wings of swiveled sleeve *B* to form a tripping device for unlocking the shank and shell, as described.

HUGO SONTAG.

Witnesses:

ADOLPH HOTOGO,
H. KNAPP.