No. 613,369. Patented Nov. 1, 1898.

W. L. HIRLINGER.

DRILL CLUTCH.

(Application filed Oct. 23, 1897.)

(No Model.)

Fig. 1.

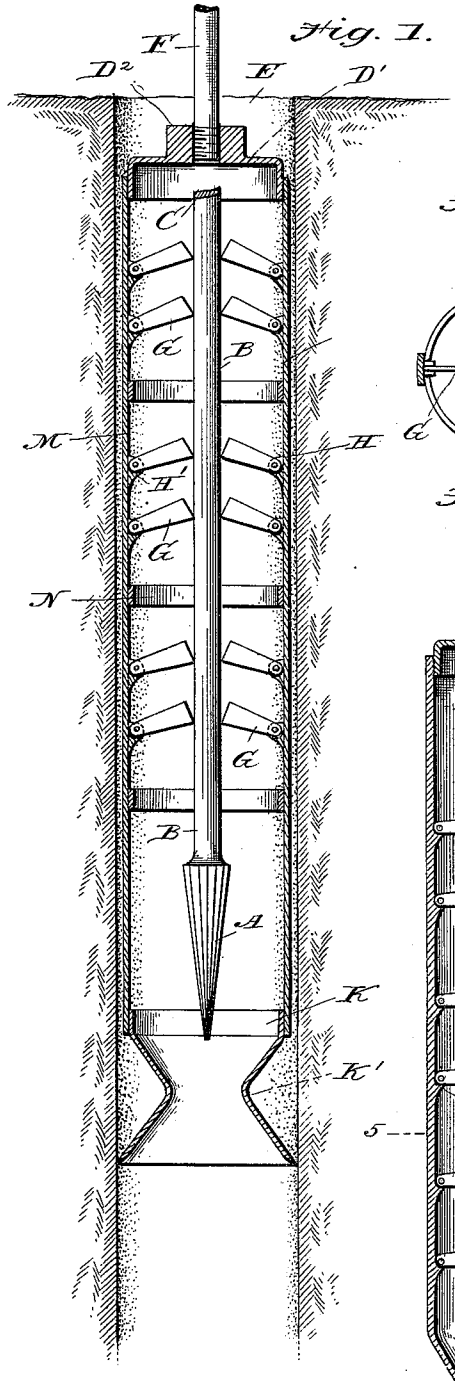


Fig. 2.

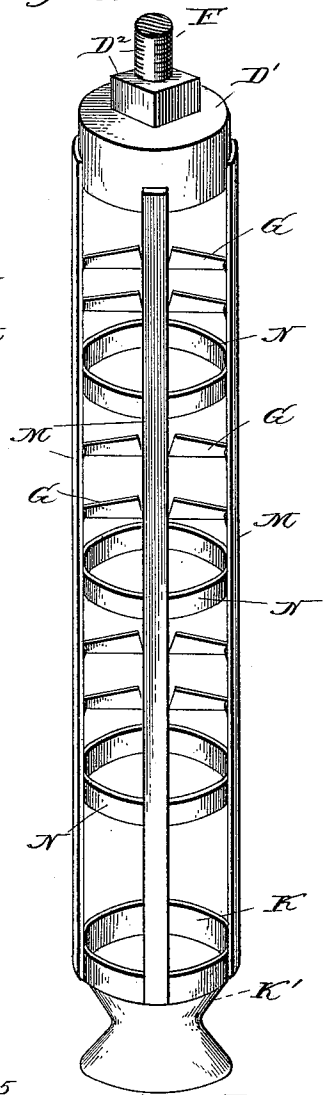


Fig. 3.

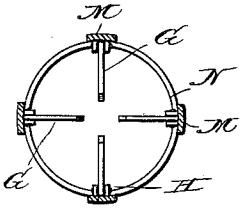


Fig. 4.

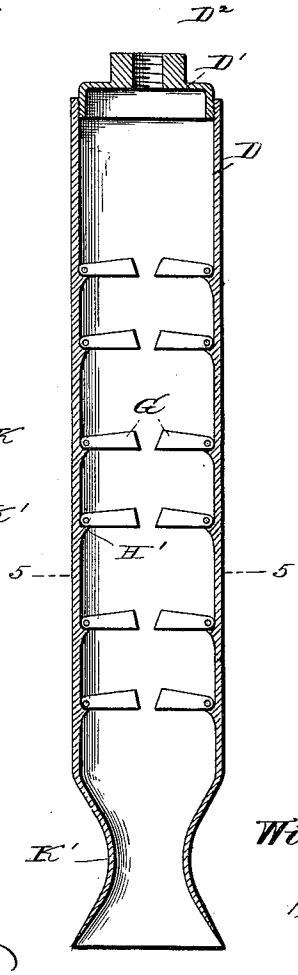
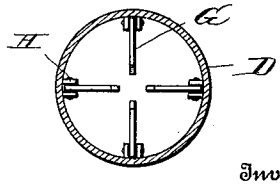


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM L. HIRLINGER, OF LUZERNE, PENNSYLVANIA.

DRILL-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 613,369, dated November 1, 1898.

Application filed October 23, 1897. Serial No. 656,207. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. HIRLINGER, residing at Luzerne, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Drill-Clutch, of which the following is a specification.

This invention relates to improvements in drill-clutches, and has for its object to provide means whereby the broken shank of a lost drill may be clutched and drawn from the bore notwithstanding the depth reached by the drill.

My device may be used for drawing out broken piping, rods, or other connectional parts between the drill or driving head and the surface of the ground. The greatest difficulty has been heretofore encountered because of the fact that the upper end of the broken drill-shank or pipe has a tendency to rest against the vertical wall of the bore or well, so that the grapple cannot be made to encircle the same. This difficulty is overcome in my improved extractor.

My invention further consists in the peculiar construction, arrangement, and combination of parts constituting the whole, which are more fully set forth in the specification and claim following.

In the drawings herewith, forming part of this specification, in which like parts are indicated by similar letters of reference, Figure 1 is a vertical sectional view of a bore, showing the application of my improved clutch. Fig. 2 is a perspective view of the clutch removed from the well. Fig. 3 is a horizontal section of the construction shown in Fig. 2. Fig. 4 shows a vertical section of a modified construction of the clutch-casing. Fig. 5 is a cross-section on line 5 5 of Fig. 4.

Referring to the drawings by letters, A is a drill having a shank B broken at C.

D is a frame composed of upright bars M and securing-hoops N, said frame being adapted to be projected into the bore E, which has been reamed out around the drill-bore.

D′ is the upper cap or top of the frame, provided with a screw-threaded lug D^2, by which the operating rod or piping F may be attached. G represents a series of radial clutches pivoted within ears or projections H formed in horizontal equidistant sets of four upon the inner surface of the bars M, each of said projections being provided with a shoulder H′, serving to prevent the lowering of the clutches beyond a horizontal plane.

In the lower end of the frame is secured a sleeve K, which is of the shape of two frustums of cones joined together at their smaller ends, forming a contracted central opening at K′, the purpose of this construction being to form a guide for the upper end of the broken shaft (which will ordinarily lie against the side of the bore) to cause it to center properly between the clutches G when the casing is brought down over it.

In Figs. 4 and 5 I have shown a modification in which a cylinder D^4 is substituted for the skeleton frame and the lower end shaped similarly to the sleeve K, before described. In this construction there is no necessity for the hoops N.

The inner ends of the clutches G are beveled or inclined as shown, the beveled edge being adapted to bite into the surface of the drill-shank. Said clutches G should be made of case-hardened steel, at least harder than the drill-shank.

The operation of my improved clutch is as follows: When a drill-shank or any portion of the operating-shaft has been broken, the upper end of the same should be drawn out and the cylinder or frame attached and projected into the larger bore which has been made down to where the shank is lodged. When the flared end or sleeve K reaches the broken shank or shaft, the latter will be thrown toward the center. The frame or cylinder is lowered as far as possible, the clutches G being projected downwardly over the shank, slightly raising the clutches. The cylinder or frame is then drawn upwardly, which will cause the clutches G to bite into the shank or shaft and hold the same, and all are drawn out together.

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

A clutch for broken drill-shanks, comprising a skeleton cylinder composed of vertical bars secured in position by interior hoops, a cap for said cylinder provided with means for adjustment to the drill-rod, a bottom nozzle or end for said cylinder consisting of a sleeve in the form of two vertically-arranged conic

frustums, joined together at their smaller ends, and a series of clutches pivoted to the inside of the cylinder and projecting toward the center thereof, each of said clutches being arranged to normally maintain a horizontal position, their inner ends being located at a distance apart less than the diameter of the broken drill-shank, and the clutches being free to rise upon contact of the broken shank with their under sides, substantially as described.

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