

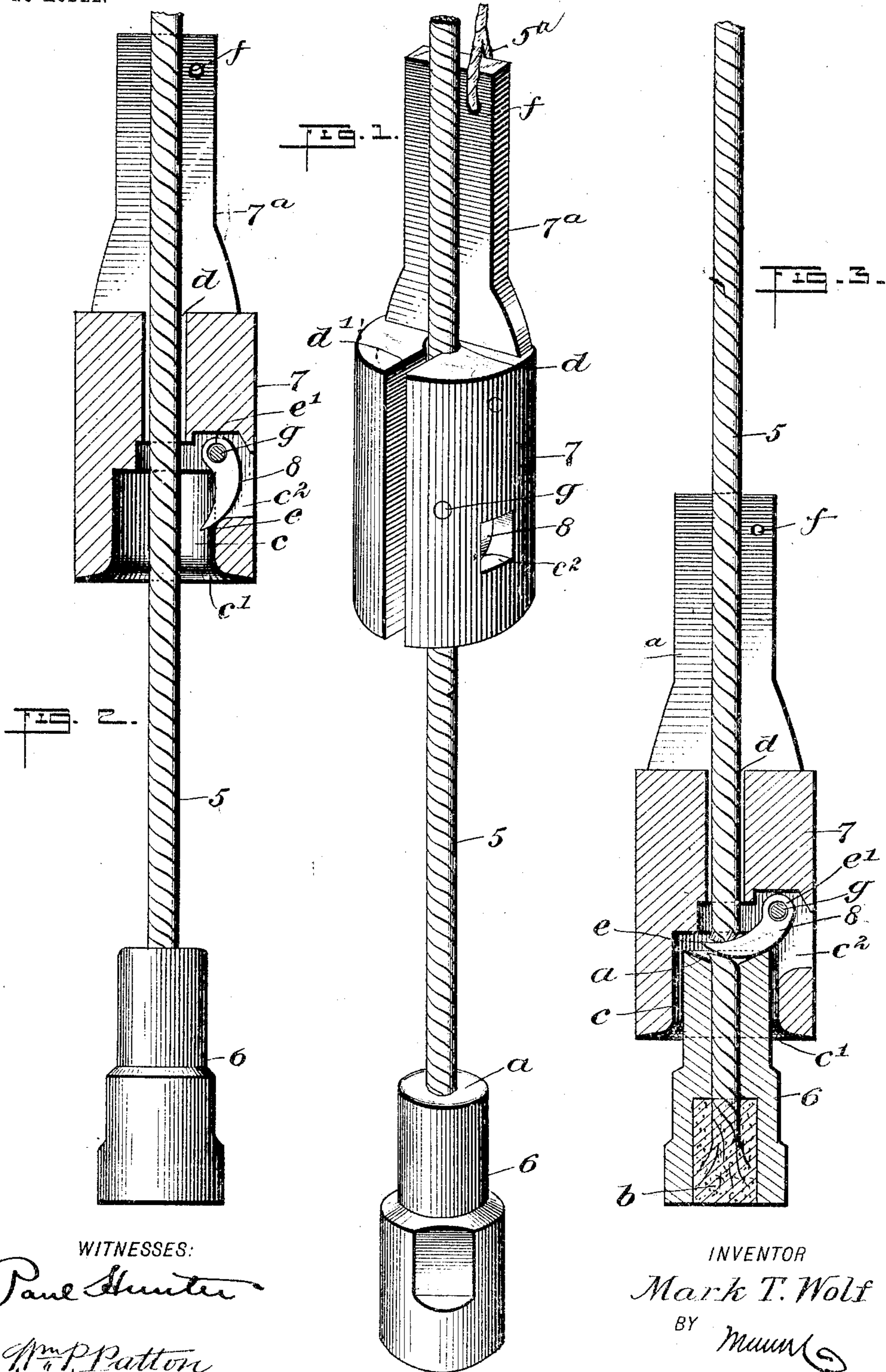
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M. T. WOLF.  
WIRE ROPE CUTTER.

APPLICATION FILED NOV. 3, 1903.

NO MODEL.



WITNESSES:

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## UNITED STATES PATENT OFFICE.

MARK TWAIN WOLF, OF WASHINGTON, PENNSYLVANIA.

## WIRE-ROPE CUTTER.

SPECIFICATION forming part of Letters Patent No. 756,760, dated April 5, 1904.

Application filed November 3, 1903. Serial No. 179,728. (No model.)

*To all whom it may concern:*

Be it known that I, MARK TWAIN WOLF, a citizen of the United States, and a resident of Washington, in the county of Washington and State of Pennsylvania, have invented a new and Improved Wire-Rope Cutter, of which the following is a full, clear, and exact description.

This invention relates to the means employed for drilling deep wells to obtain water, gas, or oil.

The drilling of deep wells requires the use of a wire rope that is wrapped upon a large bull-wheel and at its free end is secured a drill-holder wherein is secured a suitable drill, which by reciprocal movement of the pendent portion of the wire rope is caused to impinge upon the rock, gravel, or earth and bore the well-hole. It is necessary from time to time to withdraw the drill from the well-bore to remove material that has been cut by the drill and also to sharpen the cutting edges of the drill.

It sometimes occurs that owing to the accumulation of borings or the nature of the same the drill becomes wedged tight in the well-bore, and to remove it the drill-holder must be released from the rope, so that a grapple may be sent down, which by impact may release the tool or a charge of explosive be lowered and detonated over the drill, so as to loosen it before the grapple is lowered.

The object of this invention is to provide a novel simple cutting device that may be conveniently lowered in the well-bore and by its impact on the drill-holder be caused to cut the wire rope that has been connected with the drill, and thus permit the removal of the rope. To this end the invention consists in the novel construction and combination of parts, as is hereinafter described, and indicated in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view showing the improved cutter applied upon a wire rope and slidably engaged therewith and a socket on

the end of the rope for coupling it with a drill or the like. Fig. 2 is a transverse sectional view through the head-block, and Fig. 3 is a transverse sectional view showing the device adjusted to cut the rope loose from the socket or drill-coupling.

In the drawings, that show the construction and application of the invention, 5 indicates a wire rope such as is usually employed for actuating drilling-tools in the formation of a deep well, and 6 represents the rope-socket or coupling that is affixed upon the extremity of the rope. As shown, the coupling is in the form of a cylindrical block that may be reduced in diameter toward the normal upper end and said end may be cupped, as shown at *a* in Fig. 3. The coupling-block is axially perforated for the reception of the end portion of the rope 5, and, as shown, the end of the rope is usually secured in the coupling-block by counterboring the lower end portion of the axial perforation and filling the counterbore with soft metal, as indicated at *b* in Fig. 3.

The rope-cutter consists of a weighty head-block 7, which is preferably cylindrical externally and is furnished with an arm 7<sup>a</sup>, that extends from one end of the block and at one side of the same. The head-block 7 is centrally and longitudinally perforated, as at *d*, from the normal upper end to receive the rope 5, and to permit the insertion of the rope the block is longitudinally slotted from the axial perforation *d* outwardly through its peripheral surface, as shown at *d'*. The arm 7<sup>a</sup> is so relatively located and proportioned in thickness that it extends at one side of the perforation *d* in a plane parallel therewith, and thus permits the rope to have clearance therefrom. The lower end of the head-block 7 is counterbored concentrically to the perforation *d*, thus producing a circularly-walled chamber *c* of sufficient diameter and depth to loosely receive the upper portion of the coupling 6, and to facilitate the insertion of the latter within the chamber *c* the lower defining edge thereof is rounded and the end wall slightly concaved, as shown at *c'* in Fig. 3. At and near the bottom of the cupped

chamber *c* a laterally-extended slot is formed, as indicated at *c*<sup>2</sup> in Fig. 3, and said slot may have parallel side walls receiving loosely a cutter-blade 8. As shown, the cutter-blade 8 is curved in the body, so as to render its upper surface concave and the lower surface convex, these upper and lower walls of the cutter-blade converging toward one end to produce a thin cutting edge *e* thereon.

The cutter-blade 8 fits loosely between the side walls of the lateral slot *c*<sup>2</sup>, and at its end that is located therein a peripherally-rounded enlargement *e*' is formed that is centrally perforated to receive the pivot *g*, which also engages aligned perforations in the side walls of the slot. The lateral slot *c*<sup>2</sup> is of such depth that the curved cutter-blade 8, that normally rests on the lower defining wall of the slot, will have clearance at the cutting edge *e* from the wire rope 5, as shown in Fig. 2.

The arm 7<sup>a</sup> may have sufficient length to adapt it to serve as an auxiliary weight for the head-block 7 and in service should have a cord 5<sup>a</sup> attached thereto in the perforation *f* and that is carried down with the cutter device and enables it to be raised after the cutter has been used.

In applying the device it is slipped upon the wire rope that is held from movement by obstruction in the well and left to slide down upon said rope freely. The weight upon the head-block and arm thereon, together with the acquired momentum, causes the head-block to engage the upper end of the coupling-block 6, that slides into the chamber *c* and with great force impinges the convex lower surface of the cutter-blade 8 upon the concave upper end of the coupling-block 6, thus rocking the cutter-blade upward and toward the rope 5,

so that the edge *e* of the cutter-blade will be caused to sever the rope.

In case the cutter-blade fails to completely sever the rope in one operation the head-block and arm then may be raised a sufficient height by means of the cord 5<sup>a</sup> and the block be again dropped to repeat the cutting impinge of the blade edge *e* upon the wire rope 5, which will release the rope from the drill or the like—that is, a fixture in the well—and thus permit the employment of suitable means for the removal of the drill on the coupling-head 6.

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

1. A wire-rope cutter, comprising a heavy head-block adapted to slide on the rope to be cut, having a chamber in its lower portion extended laterally and through the lower end, and a cutter-blade pivoted in the lateral extension of the chamber, said blade being rocked into engagement with the rope by impinge on a stationary object.

2. A wire-rope cutter, comprising a heavy head-block having a central longitudinal perforation therein, slotted outwardly for insertion of the wire rope, a chamber in the lower end of the head-block, having a lateral slot extended therefrom, a cutter-blade pivoted by one end in said slot and having its opposite end tapered to produce a cutting edge thereon, and an arm extended at one side of the head-block at its upper end.

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

MARK TWAIN WOLF.

Witnesses:

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