

No. 727,759.

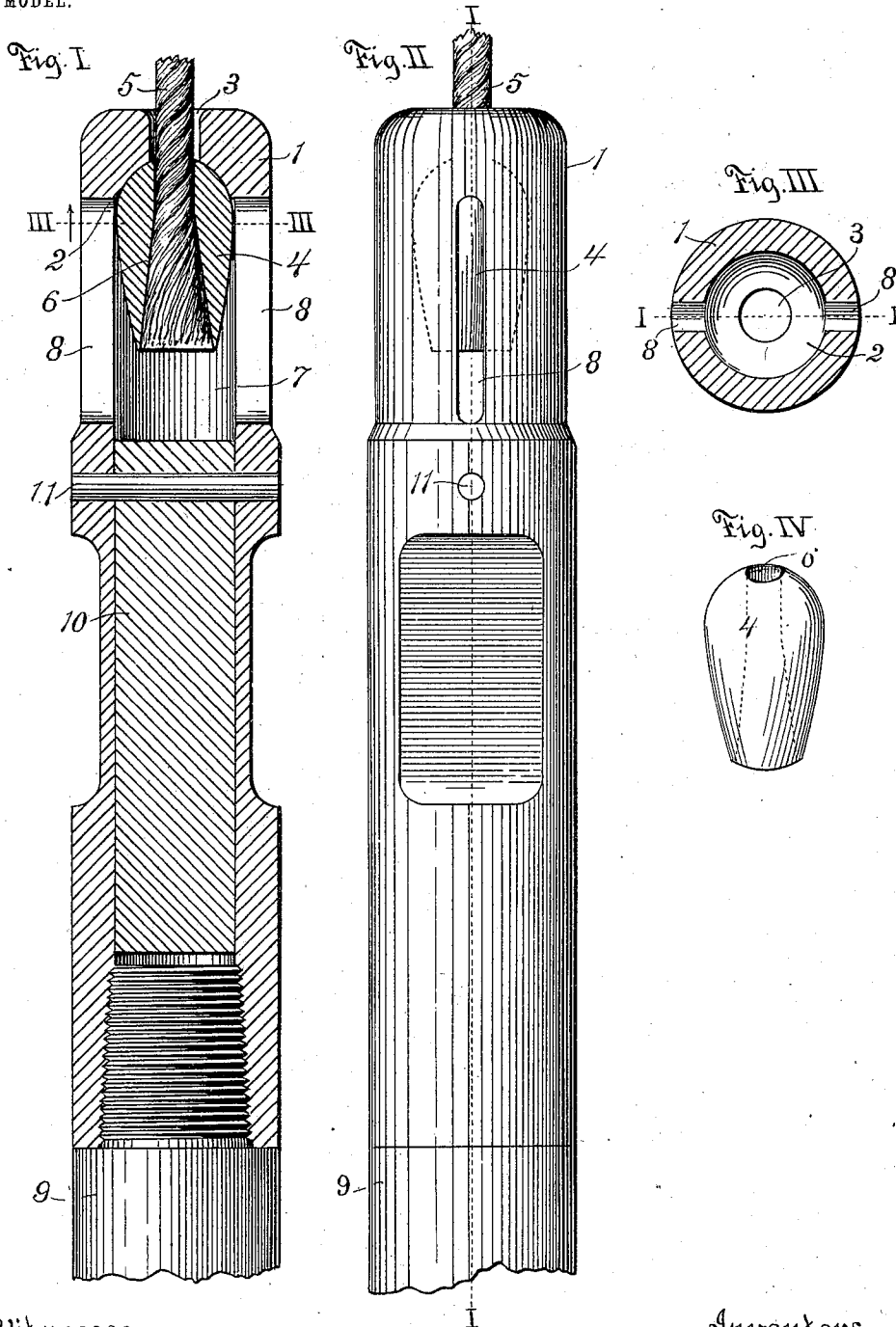
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E. DOUBLE & F. J. KARTEN.

WIRE ROPE SOCKET FOR WELL DRILLING TOOLS.

APPLICATION FILED MAR. 27, 1902.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD DOUBLE AND FRANK J. KARTEN, OF LOS ANGELES, CALIFORNIA.

WIRE-ROPE SOCKET FOR WELL-DRILLING TOOLS.

SPECIFICATION forming part of Letters Patent No. 727,759, dated May 12, 1903.

Application filed March 27, 1902. Serial No. 100,304. (No model.)

To all whom it may concern:

Be it known that we, EDWARD DOUBLE and FRANK JOSEPH KARTEN, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Wire-Rope Socket for Well-Drilling Tools, of which the following is a specification.

An object of this invention is to avoid the crystallization and consequent breaking of wire cables at the top of well-drilling tools.

A further object is to provide a superior loose joint to allow the tool to be turned by the twisting and untwisting of the wire cable in the operation of drilling and to allow lateral movement of the rope relative to the tool and to protect the rope from engagement with the tool, and thereby avoid bending the rope at either the tool or the joint member to which the rope is fastened.

This invention comprises the combination, with a wire cable and a well-drilling tool, of a loose limited universal joint which has a longitudinal movement and connects the rope with the tool.

The accompanying drawings illustrate this invention.

Figure I is a vertical longitudinal section of the invention on line I I, Fig. II. Fragments of the drill and wire rope are shown. Fig. II is a side elevation of the invention viewed from either the right or left of Fig. I. Fig. III is a section on line III III, Fig. I, omitting the joint member and showing the socket in the other member. Fig. IV is a perspective view of the joint member which forms the ball of the ball-and-socket joint by which the rope is connected with the tool.

This invention comprises a member 1, having an inverted concave socket 2 and a perforation 3 extending up from said socket, a perforated joint member 4, the upper end of which is rounded and forms a universal joint with said socketed member, and a wire rope 5, fastened in said joint member and extending through the perforation 3 of the socketed member and being of less diameter than such perforation, so as not to engage the walls thereof. The joint member 4 may be perforated, as shown in Fig. I, and the perforation 6 thereof may be downwardly flaring, and the wire rope may be fastened in said downwardly-flaring

perforation by spreading the strands thereof and filling the space with molten metal in the ordinary way of securing ropes. 7 designates a way in the member 1 below the perforation 3 therein, and 8 designates lateral openings from said way, the purpose being to allow the joint member 4 to move up and down freely in response to the relative movements of the wire rope and the tool 9 carried thereby, the purpose of the lateral openings 8 being to allow the earthy matter which may accumulate in the way 7 to be forced out of said way at the downward movement of the joint member. The joint member 4 is elongated vertically and may be semispherical or partially globular at its upper end and of reduced diameter at its lower end, so that the upper end of the joint may, together with the inverted socket 2, form a ball-and-socket joint to allow the rope to play to a limited extent freely in every direction without bending the rope at the joint or on the end of the tool. The downward taper of the joint member 4 is designed to wedge out the sediment or mud which may collect in the way 7 below the top of the member 1, which carries the tool. The elongation is designed to engage the walls of the way to prevent any such canting of the member 4 as would allow the rope to come against the walls of the perforation 3—that is to say, the joint member 4, constructed as shown, has a free rotary motion around its vertical axis and a limited rotary motion or waggle laterally of said vertical axis and a limited longitudinal motion, so that the rope will play freely up and down and the tool and rope may rotate freely relatively to each other; but when the tool rests upon the bottom of the hole and cants over the elongated joint member 4 will engage the walls of the way 7 before the rope 5 will come into sufficient contact with the upper end of the tool to cause any damage to the rope by such contact.

The tool-carrying member 1 may be most easily constructed in tubular form bored out from the bottom and the tube closed below the lateral openings 8 by a plug 10, fitted in the tube and secured by a cross-pin 11.

In practical operation on the downstroke when the tool 9 impinges upon the earth the wire rope will slack and play downward

through the perforation 3 and will then be free to untwist or rewind, as the case may be. Then on the upstroke the joint member will come into the socket 2 and will be free to adjust itself in accordance with the strain relative to the tool-carrying member.

On the downstroke any sediment which may be in the way or tube will be prevented by the plug from being forced downward and will be squeezed out through the lateral openings by the downward movement of the joint member.

We have shown in the drawings the best form in which we contemplate carrying out our invention; but we do not limit the invention to the particular form set forth, and any form of the joint which will allow the attached end of the rope to play endwise and turn freely relative to the tool and to weave from side to side without engaging the walls of the perforation may be employed without departing from the broad spirit of the invention.

What we claim, and desire to secure by Letters Patent of the United States, is—

1. In a well-drilling tool, the combination of a member having an inverted socket and a perforation extending up from said socket; an elongated perforated joint member having a semispherical portion to enter said socket; and a rope in the perforation of said joint member and extending through the perforation of the socketed member and being of less diameter than such perforation; said elongated portion being arranged to engage the socketed member and to hold the rope out of contact with the same.

2. In a well-drilling tool, the combination of a member having an inverted socket and a perforation extending up from said socket and a way below said socket; a perforated joint member in said way, the upper end of which joint member forms a universal joint with said socketed member and the lower

portion of which is elongated and arranged to have a limited lateral movement in the way; and a rope in the perforation of said joint member and extending through the perforation of the socketed member and being of less diameter than such perforation and held out of contact with the walls thereby by the joint member.

3. In a well-drilling tool, the combination of a member having a perforated top and below such perforation a way; an elongated joint member in said way forming a universal joint with the top of said first-mentioned member and having a limited lateral movement therein; and a rope fastened to the joint member and extending through the perforation in the first-named member and being held by the joint member out of contact with the walls of such perforation.

4. In a well-drilling tool, the combination of a member having a perforated concave top and a way below said perforation and lateral openings from said way having a rounded top; a joint member moving in said way and forming a universal joint with the concave top of said first-named member and decreasing in diameter downward; and a rope fastened to said joint member and extending through said perforation and being of less diameter than the perforation.

5. The combination with a rope and a well-drilling tool, of a universal joint which has a limited lateral and longitudinal movement and connects the rope with the tool.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, at Los Angeles, California, this 18th day of March, 1902.

EDWARD DOUBLE.

FRANK J. KARTEN.

Witnesses:

JAMES R. TOWNSEND,
JULIA TOWNSEND.