

No. 810,587.

PATENTED JAN. 23, 1906.

B. D. TILLINGHAST & H. B. PORTERFIELD.

ROPE CUTTER.

APPLICATION FILED MAR. 18, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

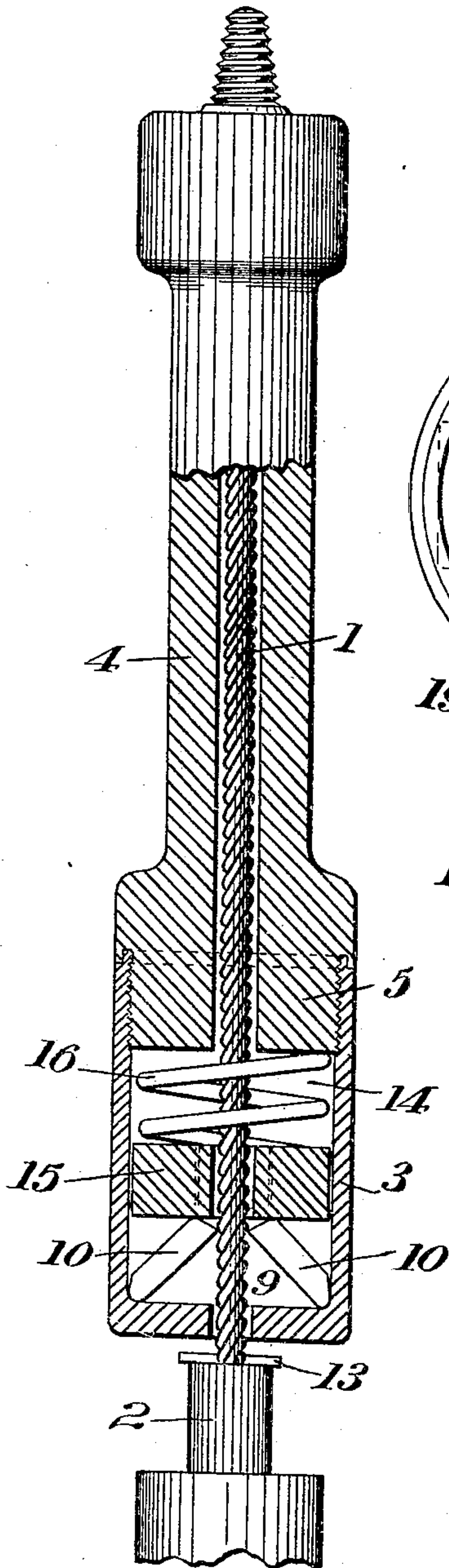


Fig. 3.

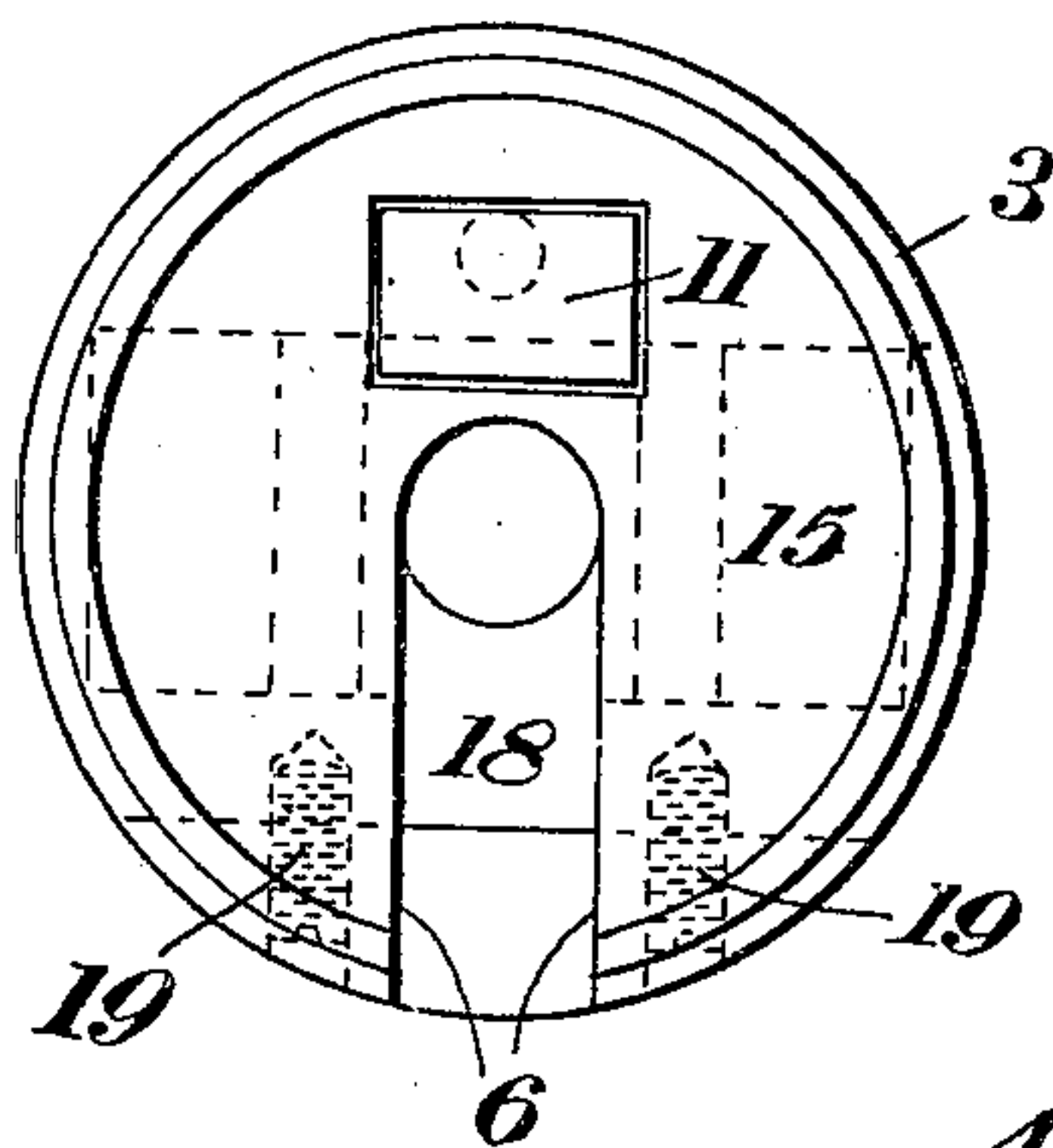


Fig. 2.

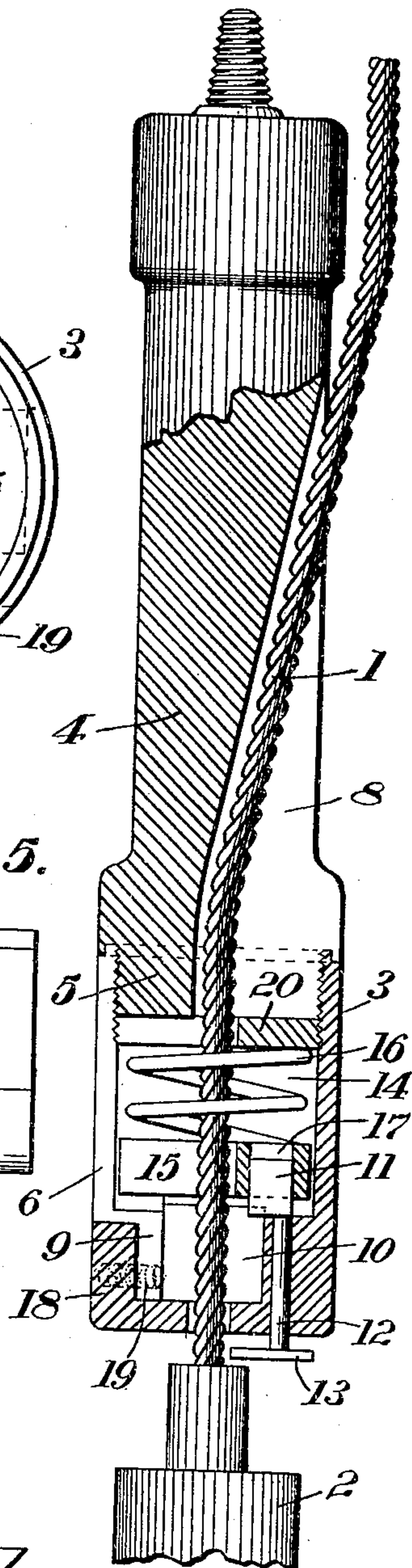


Fig. 4. Fig. 5.

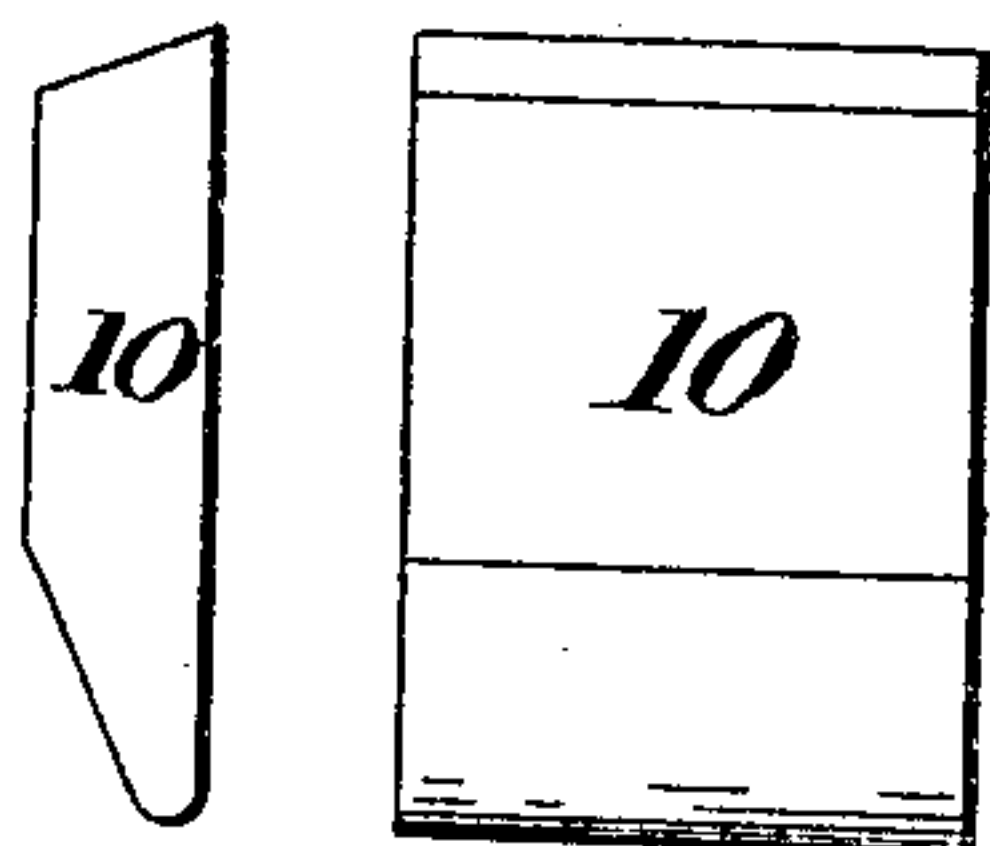
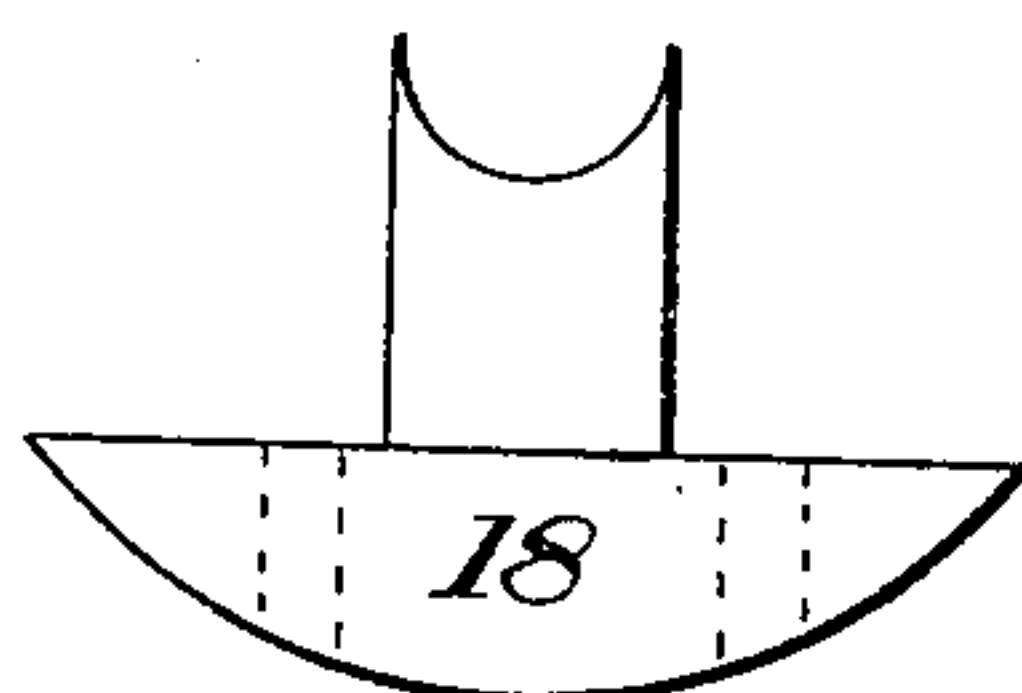


Fig. 9.



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per W. G. Doolittle  
Atty.

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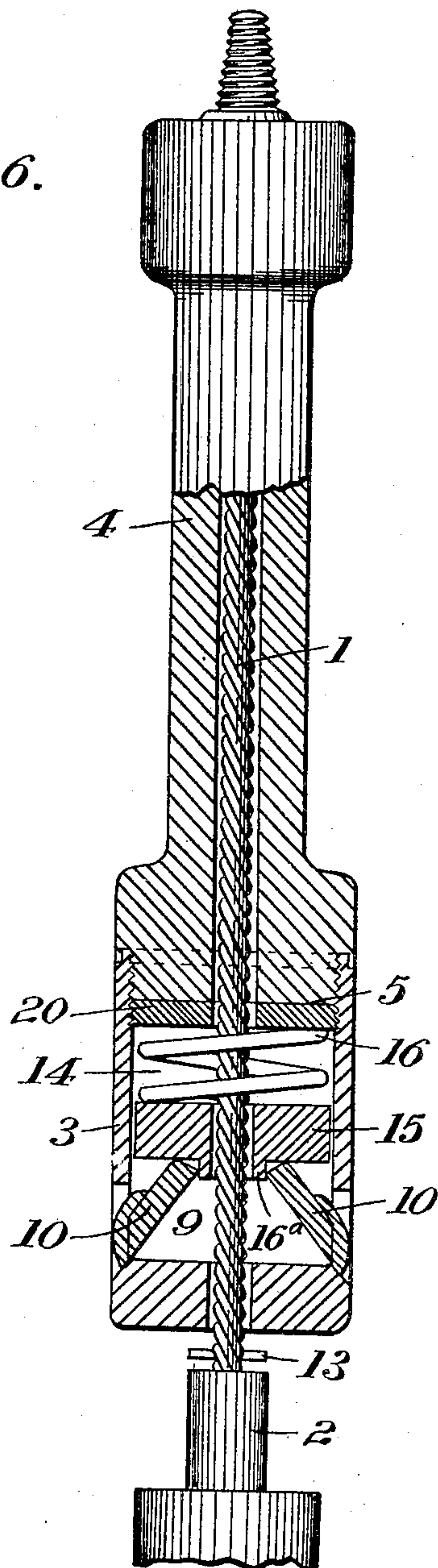
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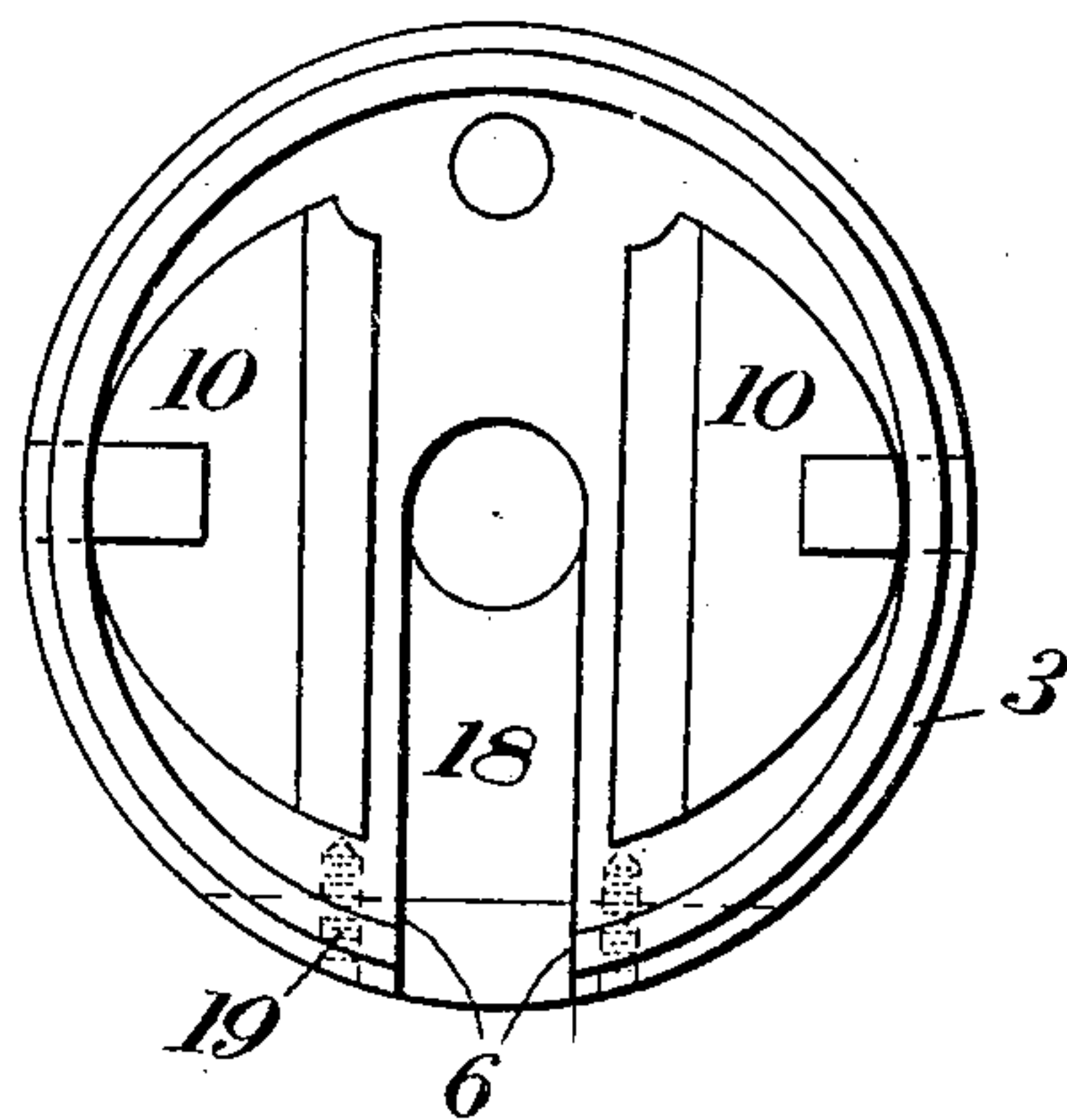
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2 SHEETS—SHEET 2.

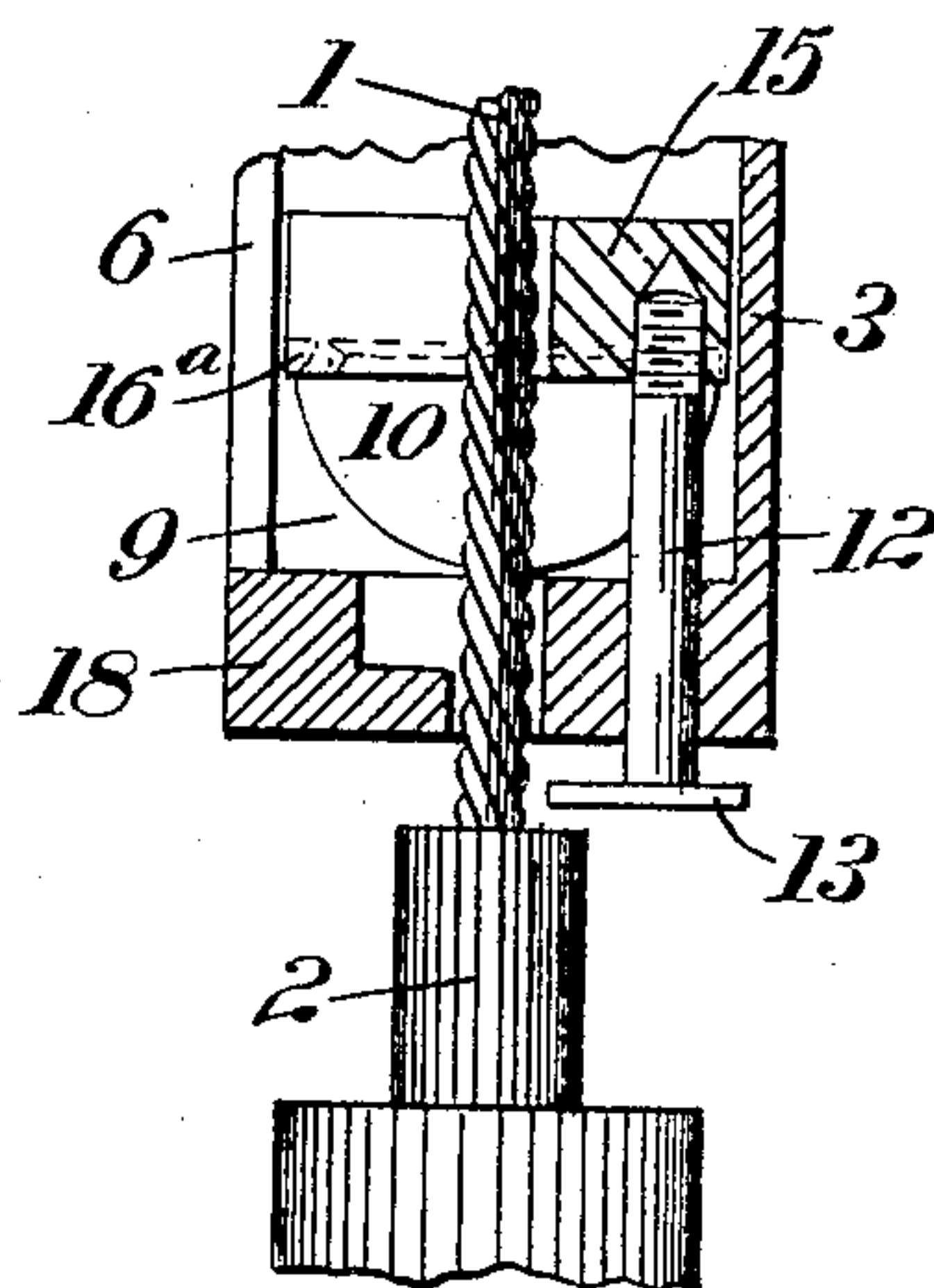
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

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## ROPE-CUTTER.

No. 810,587.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed March 18, 1905. Serial No. 250,775.

*To all whom it may concern:*

Be it known that we, BARRETT D. TILLINGHAST and HARRY B. PORTERFIELD, citizens of the United States, residing at McDonald, in the county of Washington and State of Pennsylvania, have invented new and useful Improvements in Rope-Cutters, of which the following is a specification.

The object of our invention is to provide new and improved means for cutting ropes or cables used in the operation of drilling oil, gas, and other deep wells; and our invention is particularly designed for cutting wire ropes now so generally employed in this class of work.

To this end our invention consists of a new and improved rope-cutter; and in the construction and combination of parts, all as hereinafter described and claimed.

In the accompanying drawings, which illustrate applications of our invention, Figure 1 is a part-elevation and a part-sectional view of a rope-cutter embodying our invention and showing it applied to a wire rope; Fig. 2, a similar view taken at right angles to the view of Fig. 1; Fig. 3, a plan; Figs. 4 and 5, detail views of one form of cutting-knives; Fig. 6, a part-elevation and a part-sectional view of a modified construction of our invention; Fig. 7, a plan of the form of Fig. 6; Fig. 8, a broken sectional view of the form of Fig. 5, taken at right angles to the section of Fig. 5; and Fig. 9, a detail view of retaining-plug.

Referring to the drawings, our invention is shown applied to a wire rope 1, and 2 represents a rope-socket of the usual and well-known form. As illustrated and as preferred our rope-cutter comprises a chambered casing or bowl 3 and a connecting-stem 4. The upper end of bowl 3 is internally screw-threaded and adapted to receive the threaded end 5 of stem 4. The bowl 3 is provided with a slot 6, through which the rope is passed in applying the cutter thereto. Connecting-stem 4 is also provided with a groove or slot 8 for the same purpose. These slots when the parts are assembled are out of line with each other and the rope encircled by the threaded portions of the bowl and stem.

Within the lower part of the casing or bowl we provide a chamber 9, and located in this chamber are a plurality of free gravity-actuated cutting-knives 10. In the drawings we have shown two different forms of cutting-

knives. Both forms, however, operate in substantially the same manner. The knives are free or unattached and are maintained in inoperative positions and released to fall into operative positions by a trip mechanism comprising in the form of Fig. 1 a head 11, a stem 12, and a contact-plate 13. As shown, an edge of each of the unattached knives rests against the head 11 while in inoperative positions and are maintained in said positions until the contact-plate 13 comes into contact with some object. When plate 13 strikes the rope-socket or other object, stem 12 and head 11 are raised thereby, releasing the knives and allowing them to fall into contact with the rope to be cut.

Movable within chamber 14 is a spring-pressed plunger 15. A spring 16 is located in said chamber 14 and exerts a downward pressure on the plunger and the knives. In the form of Fig. 1 the trip mechanism differs somewhat from the form of Fig. 6. In the latter construction the stem 12 is connected directly to the plunger and the plunger provided with a rest 16<sup>a</sup>, by which the knives are maintained out of operative positions. In the form of Fig. 1 the head 11 moves vertically in an opening 17, formed in the plunger.

18 represents a plug attached to the casing or bowl by means of screws 19, and 20 is another retaining-plug. The function of these plugs is to maintain the rope in the desired position within the cutter.

The cutting-knives are held in inoperative positions by the described means during the operation of lowering our cutter into the well and are so maintained until the contact-plate of the trip mechanism comes in contact with the rope-socket or some other object, when the knives are released and fall into contact with the rope to be cut. In the form of Fig. 1 the spring-pressed plunger rests on the knives and descends with the knives and aids in keeping the cutting-blades of the knives in contact with the rope to be severed. While the knives are in contact with the rope, the rope-cutter is drawn upward by any suitable means (not shown) attached to the connecting-stem. This upward pull of the cutter readily cuts the rope.

While it is desirable to cut the rope as close to the rope-socket as it is possible to do and while our invention is designed to accomplish this, it sometimes happens that the cutter



cannot be lowered sufficiently to come into contact with the rope-socket. This occurs when there has been a "cave-in," and may occur from other causes. Under such a condition our cutter will operate whenever the contact-plate comes in contact with the obstruction.

In the form of Fig. 6 an upward movement of the spring-pressed, plunger caused by the contact-plate coming in contact with the rope-socket or other obstruction, releases the knives and permits them to fall into contact with the rope. In this form we have shown curved cutting-knives.

The rope-cutter may be readily applied to the rope at any point above the well-casing. This is accomplished by first applying the casing or bowl to the rope by means of the slot therein, then attaching the lower retaining-plug and placing the knives, plunger, spring, and upper plug into the respective chambers formed in the bowl. After these parts have been placed in position the connecting-stem is screwed into the upper end of the bowl.

If desirable, the trip mechanism may be omitted and the free gravity-actuated knives placed in contact with the rope when first inserted and kept in contact therewith during the descent of the cutter on the rope. The rope in this case may be cut at any point upon an upward pull of the cutter.

What we claim is—

1. A rope-cutter having a casing or bowl provided with a chamber, an unattached gravity-actuated knife in the chamber, and means for maintaining the knife in an inoperative position.

2. A rope-cutter having a casing or bowl provided with a chamber, a plurality of unattached gravity-actuated knives in the chamber located on opposite sides of the rope to be cut, and means for maintaining each knife in an inoperative position.

3. A rope-cutter having a casing or bowl provided with a chamber, a plurality of unattached gravity-actuated knives in the chamber located on opposite sides of the rope to be cut, means for maintaining the knives in inoperative positions, and a spring-pressed plunger.

4. A rope-cutter having a casing or bowl

provided with a chamber, a plurality of gravity-actuated knives in the chamber, a trip mechanism for maintaining the knives in inoperative position and for releasing the knives to permit them to fall into operative positions.

5. A rope-cutter having a casing or bowl, a connecting-stem attached thereto, said bowl and stem slotted for the purpose of applying the rope-cutter to a rope, said bowl provided with a chamber, a plurality of gravity-actuated knives in the chamber, means for maintaining the knives in inoperative positions and for releasing the knives to permit them to fall into operative positions.

6. A rope-cutter having a casing or bowl provided with a chamber, a connecting-stem attached to the bowl, a plurality of gravity-actuated knives in the chamber, a trip mechanism for maintaining the knives in inoperative positions and for releasing the knives to permit them to fall into operative positions, and a spring-pressed plunger above the knives.

7. A rope-cutter having a casing or bowl provided with a plurality of chambers, a connecting-stem attached to the bowl, a plurality of gravity-actuated knives in one chamber, a spring-pressed plunger above the knives located in another chamber, a trip mechanism for maintaining the knives in inoperative positions and for releasing the knives to permit them to fall into operative positions.

8. The combination with the rope to be cut, of a rope-cutter comprising a casing or bowl provided with a chamber, an unattached knife located in the chamber arranged in contact with the rope.

9. The combination with a rope to be cut, of a rope-cutter comprising a casing or bowl provided with a chamber, a plurality of unattached knives located in the chamber and arranged in contact with the rope on opposite sides thereof.

In testimony whereof we affix our signatures in presence of two subscribing witnesses.

BARRETT D. TILLINGHAST.  
HARRY B. PORTERFIELD.

Witnesses:

W. G. DOOLITTLE,  
MARGARET HUGHES.