

No. 847,168.

PATENTED MAR. 12, 1907.

C. E. DOWNS.
FISHING TOOL.

APPLICATION FILED DEC. 5, 1905.

2 SHEETS—SHEET 1.

FIG. 1.

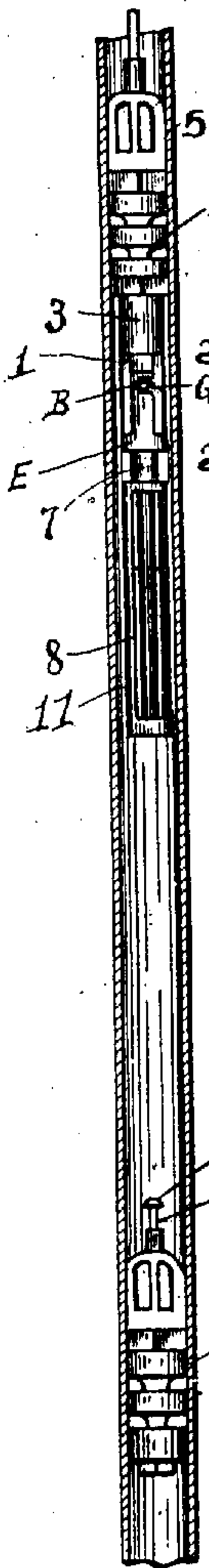


FIG. 15.

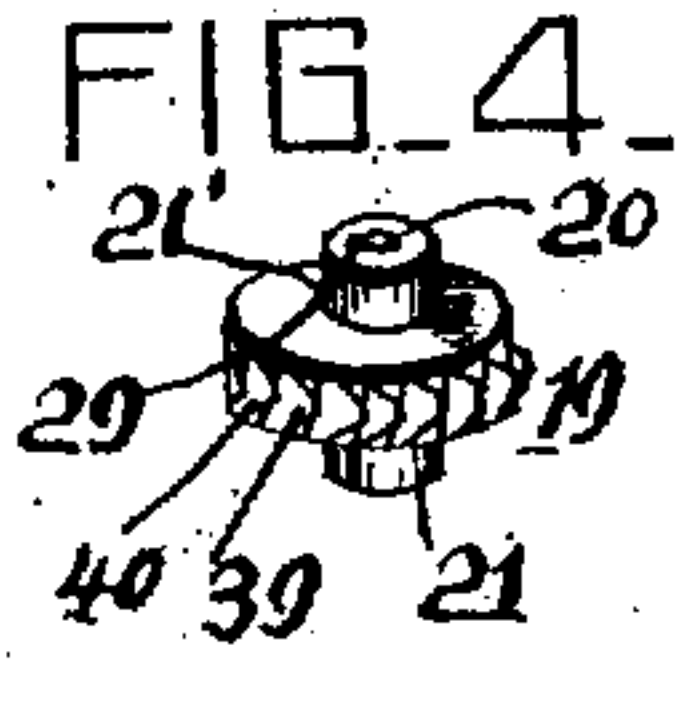
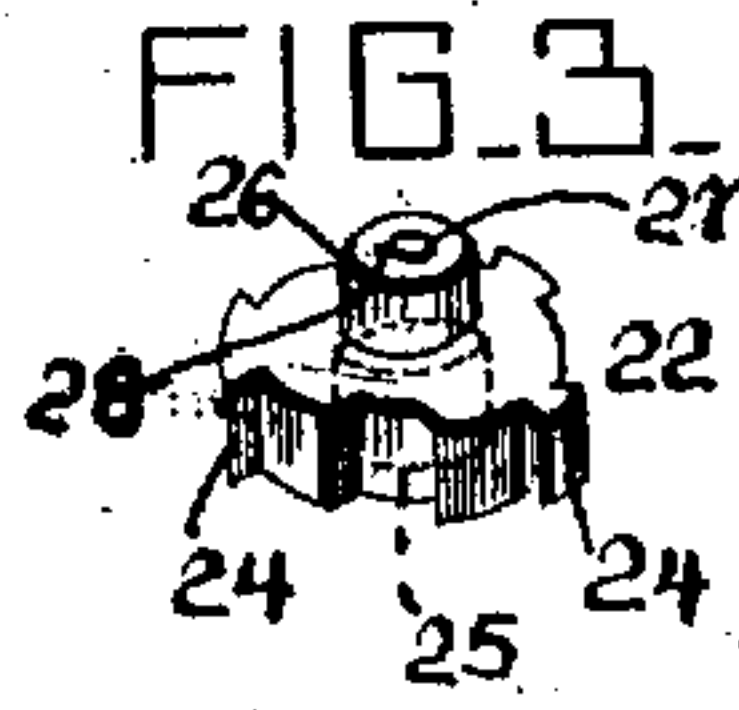
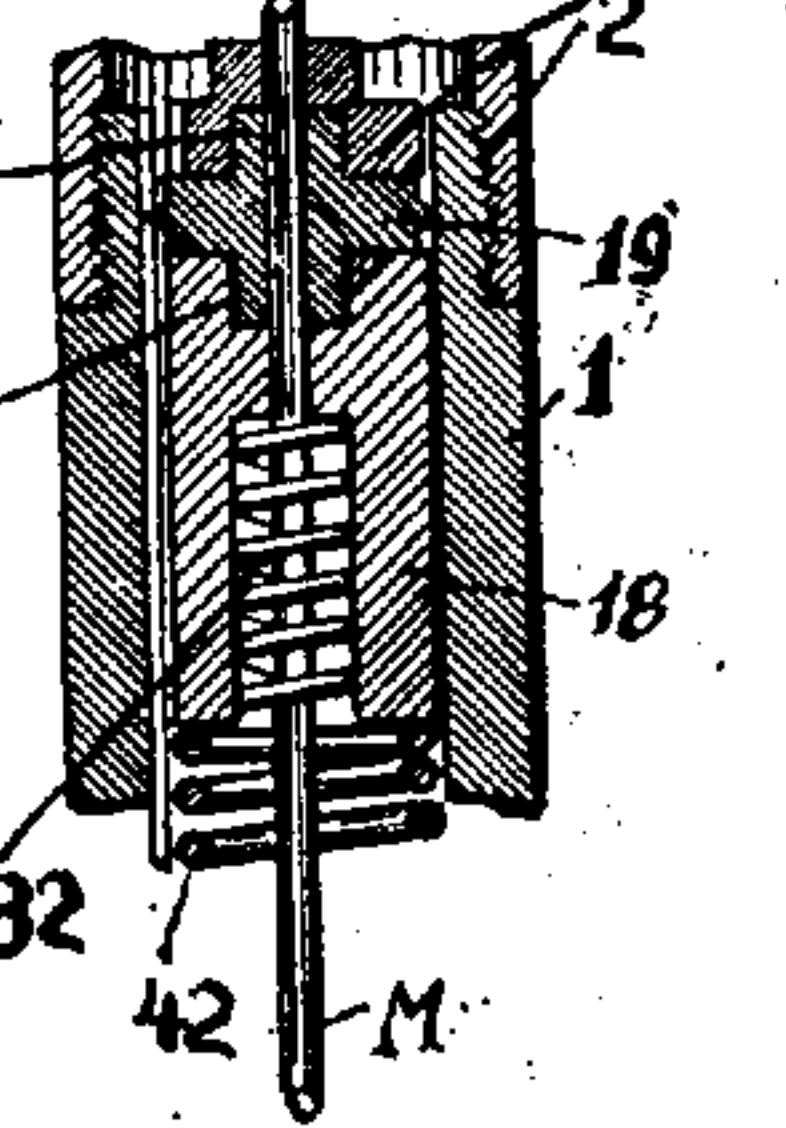


FIG. 5.

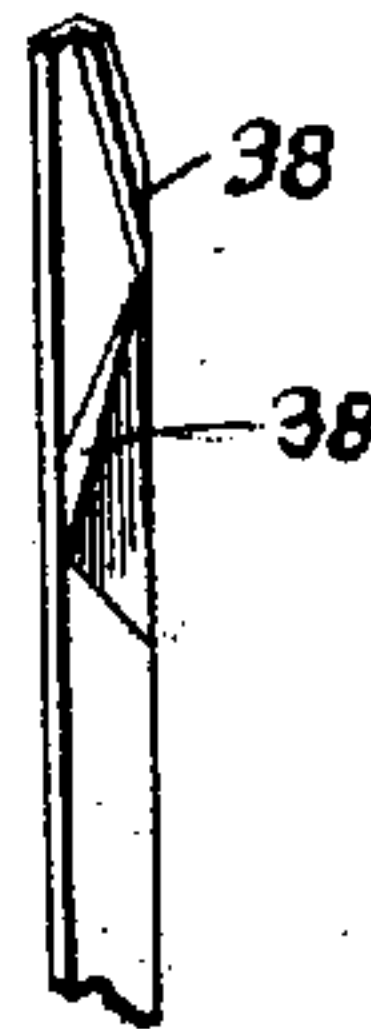


FIG. 6.

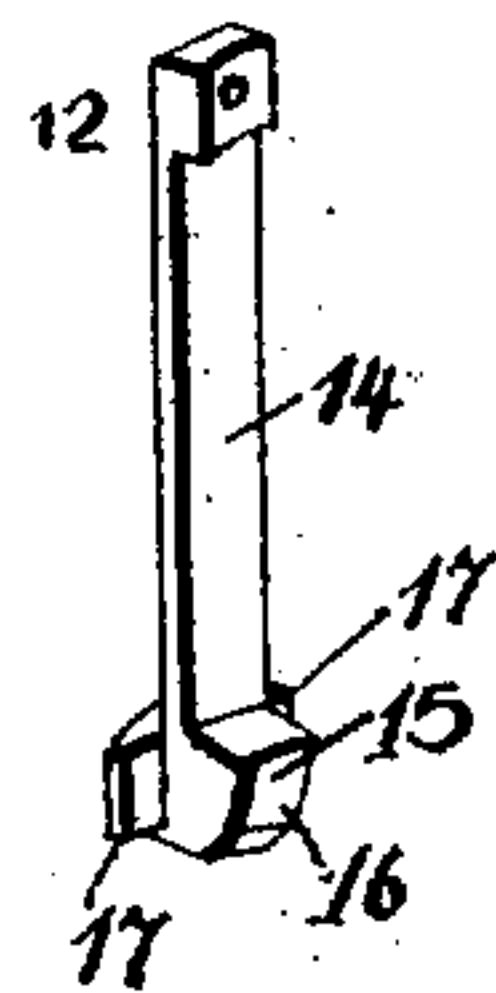


FIG. 7.

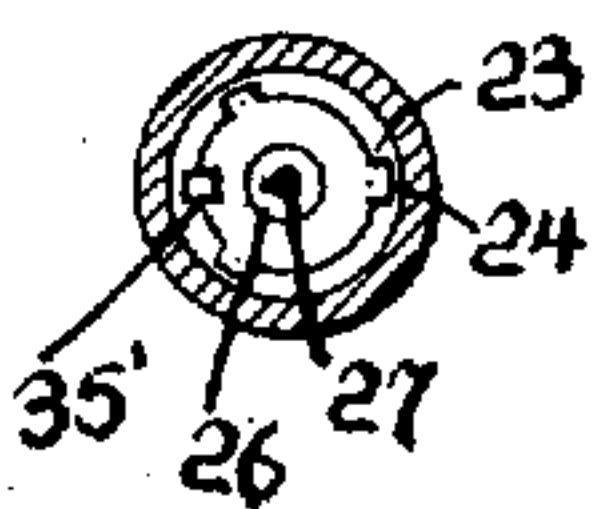


FIG. 8.



FIG. 9.

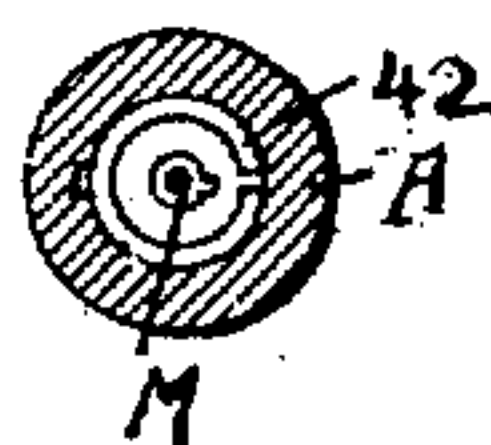


FIG. 10.

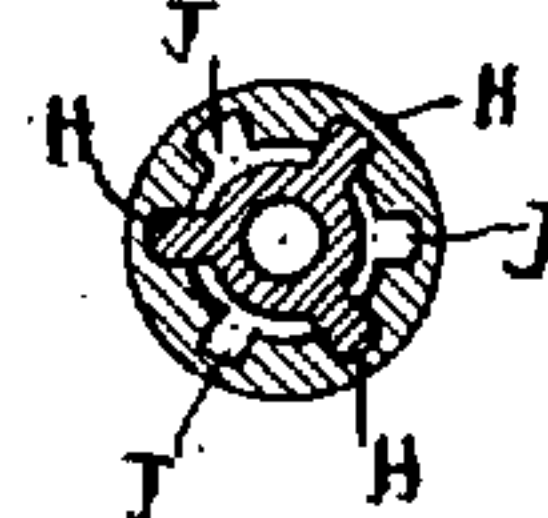


FIG. 11.

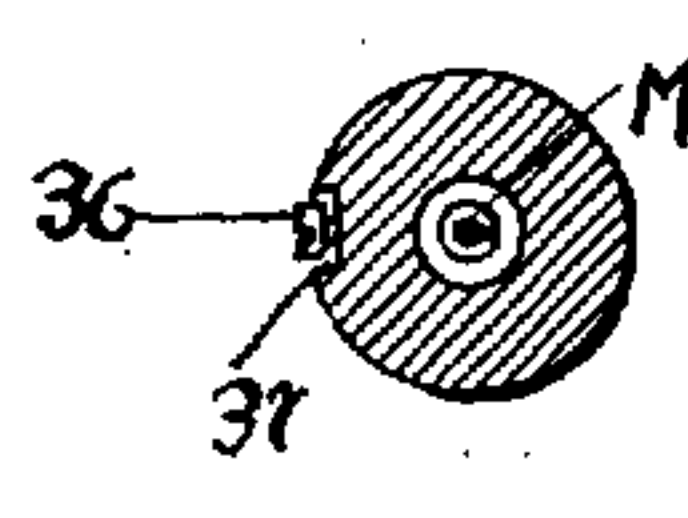


FIG. 12.

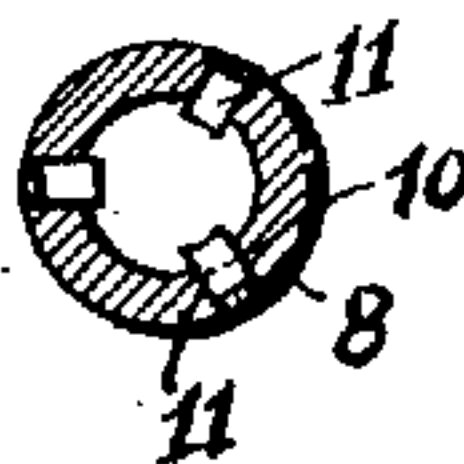


FIG. 13.

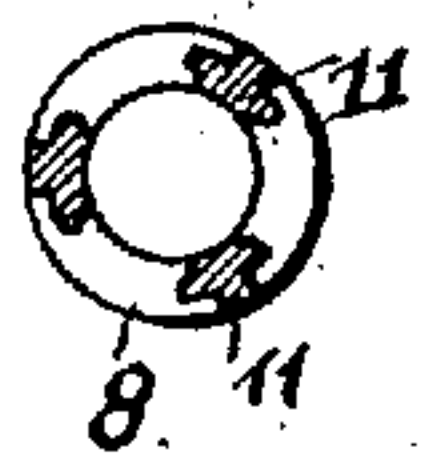


FIG. 16.

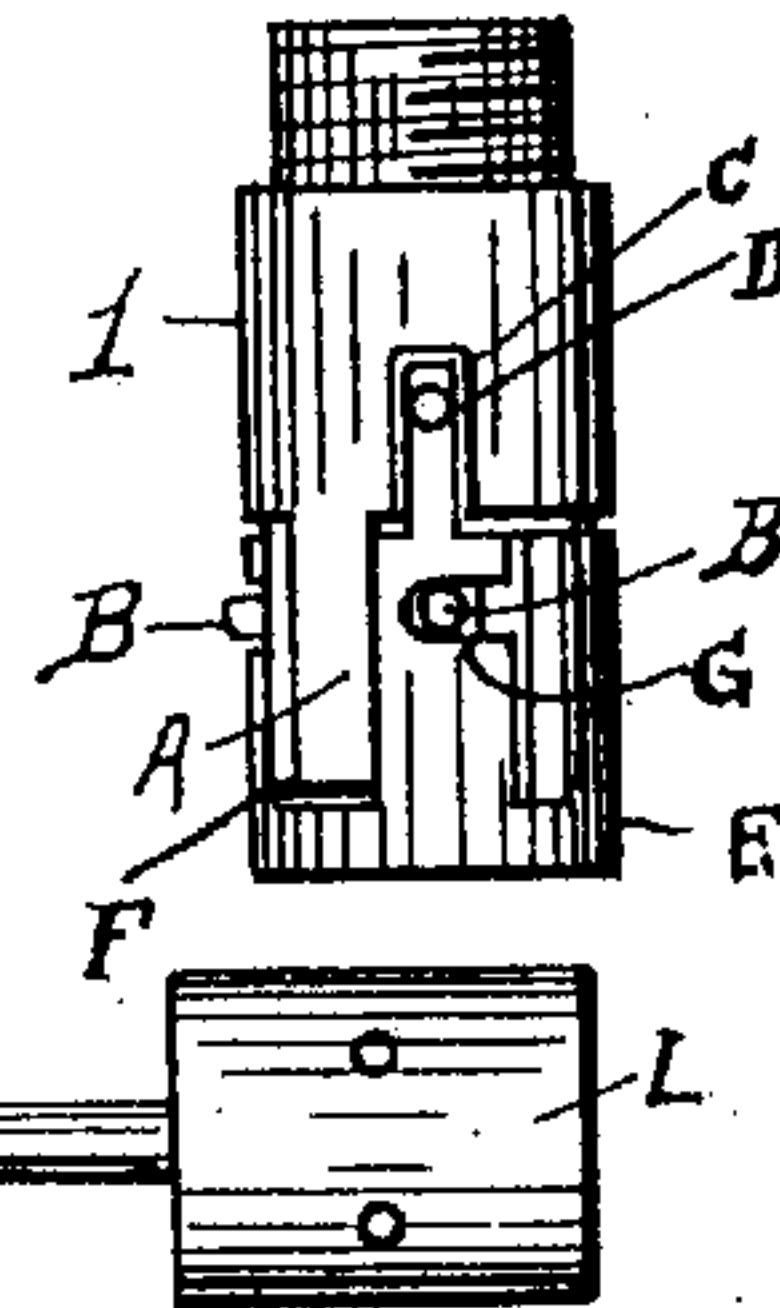
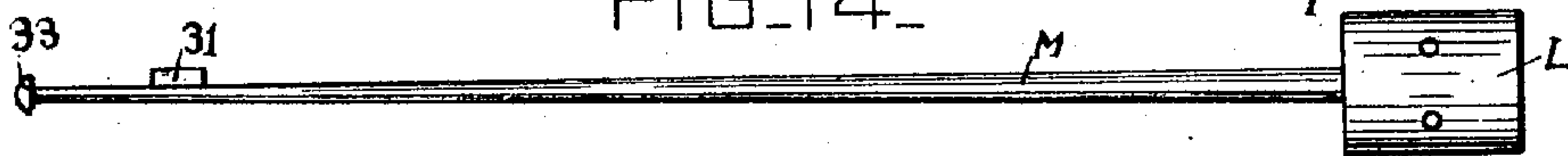


FIG. 14.



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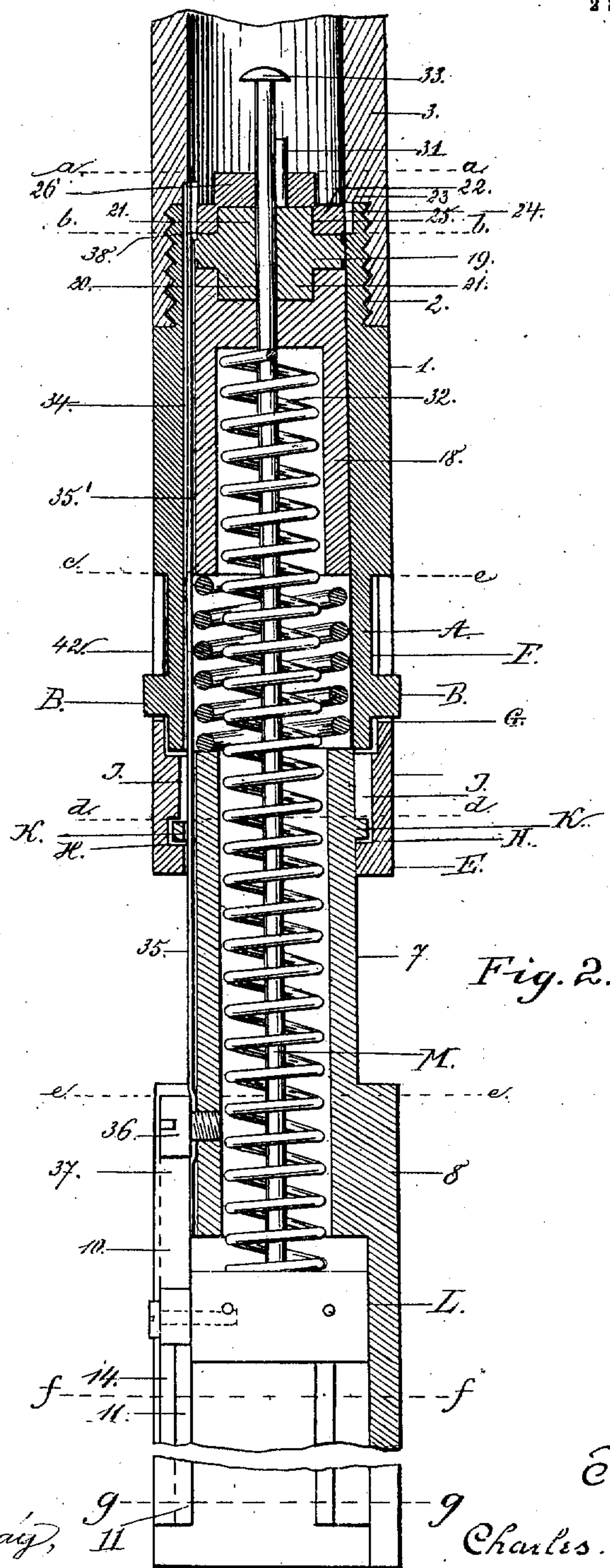
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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES E. DOWNS, OF MANNINGTON, WEST VIRGINIA.

FISHING-TOOL.

No. 847,168.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed December 5, 1905. Serial No. 290,448

To all whom it may concern:

Be it known that I, CHARLES E. DOWNS, a citizen of the United States of America, residing at Mannington, in the county of Marion and State of West Virginia, have invented certain new and useful Improvements in Fishing-Tools, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to certain new and useful improvements in fishing-tools; and the invention relates more particularly to a fishing-tool adapted to be used in oil and Artesian wells.

15 My invention aims to provide positive and reliable means for automatically gripping an object within a well, whereby it can be elevated. The fishing-tool is particularly employed for removing standing valves from 20 oil-wells, and it is adapted to be carried by the lower or foot end of the lower valve of a working barrel.

25 The present invention is an improvement upon my oil-well device patented October 17, 1905, and numbered 802,182, and has for its object to improve the construction and increase the efficiency and utility of devices of this character.

30 With the above and other objects in view the invention consists in the novel construction, combination, and arrangement of parts, to be hereinafter more fully described and claimed, and, referring to the drawing accompanying this application, like numerals and 35 characters of reference designate corresponding parts throughout the several views, in which—

40 Figure 1 is a vertical sectional view of the lower end of a working barrel, illustrating a working valve equipped with my improved fishing-tool and also showing a standing valve adapted to be gripped by said tool. Fig. 2 is a vertical sectional view, on an enlarged scale, of the tool proper. Fig. 3 is a 45 detail perspective view of the locking washer or nut employed in the improved device. Fig. 4 is a similar view of the toothed wheel employed in connection with the improved device. Fig. 5 is a fragmentary perspective 50 view of one of the actuating rods or bars employed in the device. Fig. 6 is a perspective view of one of the gripping-arms employed in the device. Fig. 7 is a cross-sectional view taken on the line *a a* of Fig. 2.

Fig. 8 is a similar view on the line *b b* of Fig. 2. Fig. 9 is a similar view on the line *c c* of Fig. 2. Fig. 10 is a similar view on the line *d d* of Fig. 2. Fig. 11 is a similar view on the line *e e* of Fig. 2. Fig. 12 is a similar view on the line *f f* of Fig. 2. Fig. 13 is a similar view 60 on the line *g g* of Fig. 2. Fig. 14 is a side elevation of a gripping-arm support or rod used in connection with the tool. Fig. 15 is an enlarged sectional view of a portion of the tool. Fig. 16 is an enlarged side elevation of 65 a portion of the tool.

Reference will now be had to the accompanying drawing, wherein I have illustrated a portion of the tool similar to the device 70 above referred to, and in describing the invention in detail at various points throughout the description the differences of construction between the fishing-tool shown and described in the above-mentioned Letters Patent and the present invention will be set 75 forth.

As in the construction of the patented device, a sleeve 1 is employed, having a reduced screw-threaded end 2, which is adapted to be 80 secured in the lower end of a section of pipe 3, carried by a working valve 4, which is mounted in a working barrel 5. The lower end of the sleeve 1 is provided with a plurality of depending arms A, each arm carrying an outwardly-extending button or lug B. 85 (See Figs. 2 and 16.) The sleeve 1 is cut away, as at C, to form a recess in which a spring D is seated, said spring being carried by a collar E. Mounted upon the depending arms A of the sleeve 1 is the said collar 90 E, said collar being cut away, as at F, to receive the depending arms A of the sleeve 1. The collar E is provided with transverse slots G adjacent to each cut away portion F, whereby the collar can be rotated to cause 95 the lugs B of the arms A to engage in said transverse slots and retain the collar E in engagement with the sleeve 1. The spring D is employed to hold the collar E in its fixed position, the said spring seating in the recess 100 C when the collar has been rotated, so as to cause the lugs B of the arms A to engage in the transverse slots. The lower end of the collar is provided with radially-disposed recesses H H and slots J. Mounted in the collar 105 E is a tubular contracted end 7 of a gripping-socket 8, the contracted end of said socket being provided with lugs K, adapted

to pass through the slots J J and be moved to seat in the recesses H H, whereby the socket 8 will be supported from said collar.

The socket 8 is provided with a plurality of 5 vertically-disposed slots 10, the lower ends of which have their sides cut away, as indicated at 11. In the socket 8 is mounted a head L, carrying an integral rod M. To the periphery of the head L are secured gripping- 10 arms 14, each arm being provided with a pierced head 12 and with an outwardly-extending lug 15, the inner face of which tapers and is provided with a slight concavity 16. The lower end of each gripping-arm is also 15 provided with outwardly-extending side wings 17 17, adapted to engage in the cut-away portions 11 of the slots 10.

In the upper end of the sleeve 1 is arranged a collar 18, upon which is mounted a toothed 20 wheel 19, having a central bore 20. The toothed wheel is illustrated in Fig. 4 of the drawings, where it will be seen that the top and bottom sides of the wheel are provided with collars 21 and 21', and by again referring 25 to Fig. 2 of the drawings it will be seen that the lowermost collar fits into the collar 18, while the uppermost collar is surrounded by a locking nut or washer 22. The inner side walls of the sleeve 1 are provided with ver- 30 tically-disposed grooves 23 to receive vertically-disposed ribs 24, carried by the periphery of the locking-nut 22. The bottom of the locking-nut is recessed, as indicated at 25, to receive the uppermost collar 21' of the 35 toothed wheel 19. The top face of the locking-nut is also provided with a collar 26, and the bore 27 of the locking-nut and the bore 20 of the toothed wheel are provided with ver- 40 tically-disposed grooves 28 and 29.

The rod M, carried by the head L of the 40 socket 8, extends upwardly through the contracted tubular end 7 into the sleeve 1, said rod passing upwardly through the collar 18 and the bores 20 and 27 of the toothed wheel 45 19 and the locking-nut 22, respectively. The rod M is provided upon one of its sides near its upper end with a rib 31, which is normally retained in the groove 28 of the locking-nut, and at predetermined times enters the 50 groove 29 of the toothed wheel, as will be presently described. The rod M is surrounded by a coiled spring 32, the upper end of which is attached to the collar 18, while the lower end of said spring engages the top of 55 the head L, carried by said rod.

The inner wall of the sleeve 1 is provided with a vertically-disposed groove 34, in which is mounted an actuating-bar 35, said bar ex- 60 tending upwardly between the collar E and the contracted end 7 of the socket and through an opening 35', formed in the collar 18. The lower end of the bar is connected by a screw 36 to the gripping-socket 8, said 65 socket being cut away, as indicated at 37, to accommodate the lower end of said bar and

the screw 36. The upper end of the bar is provided with diagonally-disposed teeth 38 38, adapted to engage the teeth 39 of the toothed wheel 19, said teeth being provided with curved and convex faces 40. 70

Interposed between the lower end of the collar 18 and the top of the contracted end 7 of the socket 8 is a coiled spring 42, employed to retain the socket 8 in an extended position relative to the sleeve 1. 75

In Fig. 1 of the drawing I have illustrated a standing valve 43, the upper end of which I provide with an upwardly-extending pin 44, carrying a cone-shaped head 45, which is adapted to be gripped by the arms 14 when 80 it is desired to remove the standing valve 43.

The operation of the above parts as constructed is as follows: Prior to placing the working barrel 4 in an oil-well the lower end of the valve is equipped with a section of pipe 85 3, carrying the sleeve 1 and its appurtenant parts, including the socket 8. Before placing the sleeve 1 in engagement with the section of pipe 3 the rod M is gripped and elevated until the rib 31 rests upon the top of 90 the uppermost collar 21 of the toothed wheel 19. This is accomplished by setting the toothed wheel, whereby the groove 29 of said wheel will not aline with the rib 31. The elevation of the rod M retains the head 95 L and the gripping-arms in an elevated position, as illustrated in Figs. 1 and 2 of the drawing. When it is desired to remove the standing valve 43, the working valve and the socket 8 are lowered until the gripping-arms 100 embrace the pin 44. Upon the socket resting upon the standing valve 43 the weight of the socket is relieved from the working valve; but as the weight of the sleeve and its appurtenant parts is still sustained by the working 105 valve the sleeve 1 will travel downwardly upon the contracted tubular end 7 of the socket 8. This downward movement of the sleeve 1 causes the toothed wheel 19 to rotate, this being accomplished by the bar 35 110 being held stationary by the socket 8, and as the sleeve 1 moves downwardly, carrying with it the toothed wheel 19 and the locking-nut 20, the outer toothed end of the bar 35 engages the curved side 40 of one of the 115 teeth 39 and rotates the same on account of the diagonal positioning of the teeth 38. As the wheel 19 rotates the groove 29 of said wheel is carried into alinement with the rib 31 of the rod M, which permits said rod to 120 descend, the spring 32, surrounding said rod, having been compressed by the elevation of the rod M prior to the socket 8 engaging the standing valve. The downward movement of the rod M, carrying the head L, causes the 125 arms 14 to engage the cone-shaped head 45 of the standing valve, and as the confronting faces of the lugs 15 of said arms are tapered the arms will pass downwardly over the head and embrace the same. By pulling up- 130

wardly upon the valve 4 the standing valve can be readily removed from the working barrel.

What I claim, and desire to secure by Letters Patent, is—

1. In a tool of the character described, the combination with a working valve, a sleeve carried by the lower end of said working valve, a collar detachably connected to said sleeve, a socket slidably mounted in said collar, and embodying a plurality of resilient arms, of means carried by said sleeve to normally hold said arms in an elevated position, and means carried by said socket, and actuated by the lowering of said sleeve, to re-

lease the first-named means, substantially as described.

2. In a tool of the character described, the combination with a working valve, of a sleeve carried by the lower end of said working valve, a collar detachably connected to said sleeve, a socket slidably mounted in said sleeve, means carried by said socket to grip a standing valve, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES E. DOWNS.

Witnesses:

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J. J. DOWNS.