

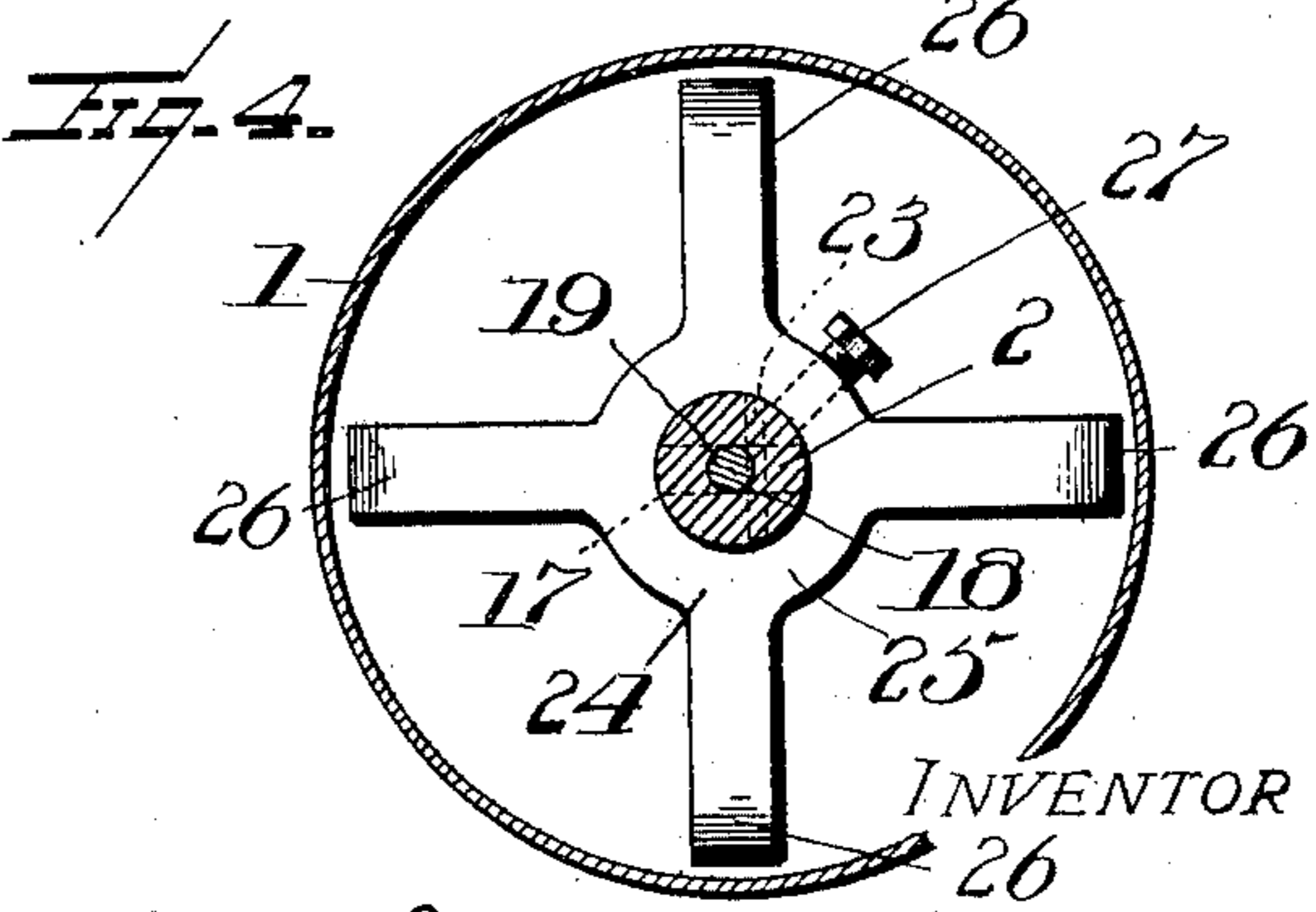
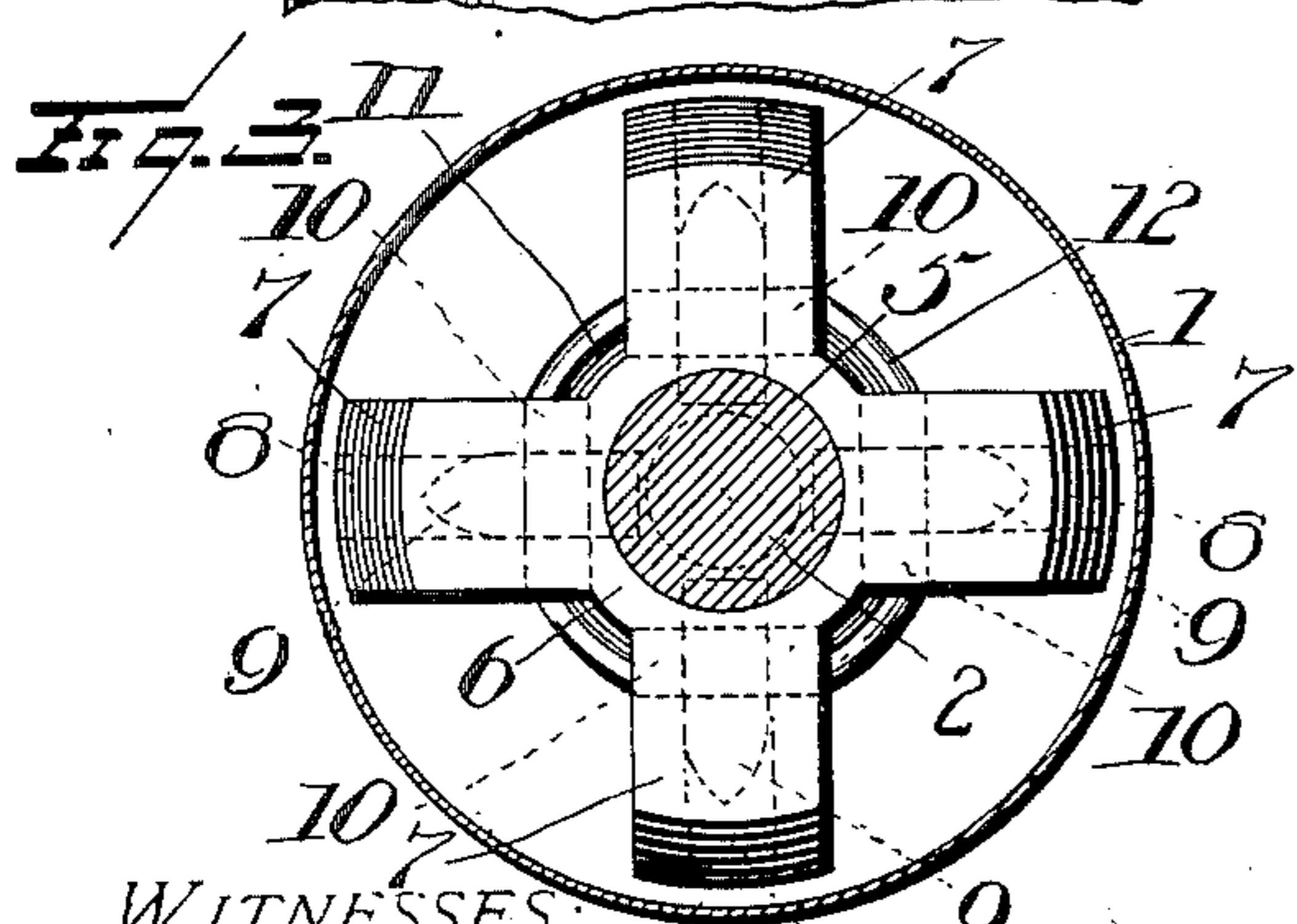
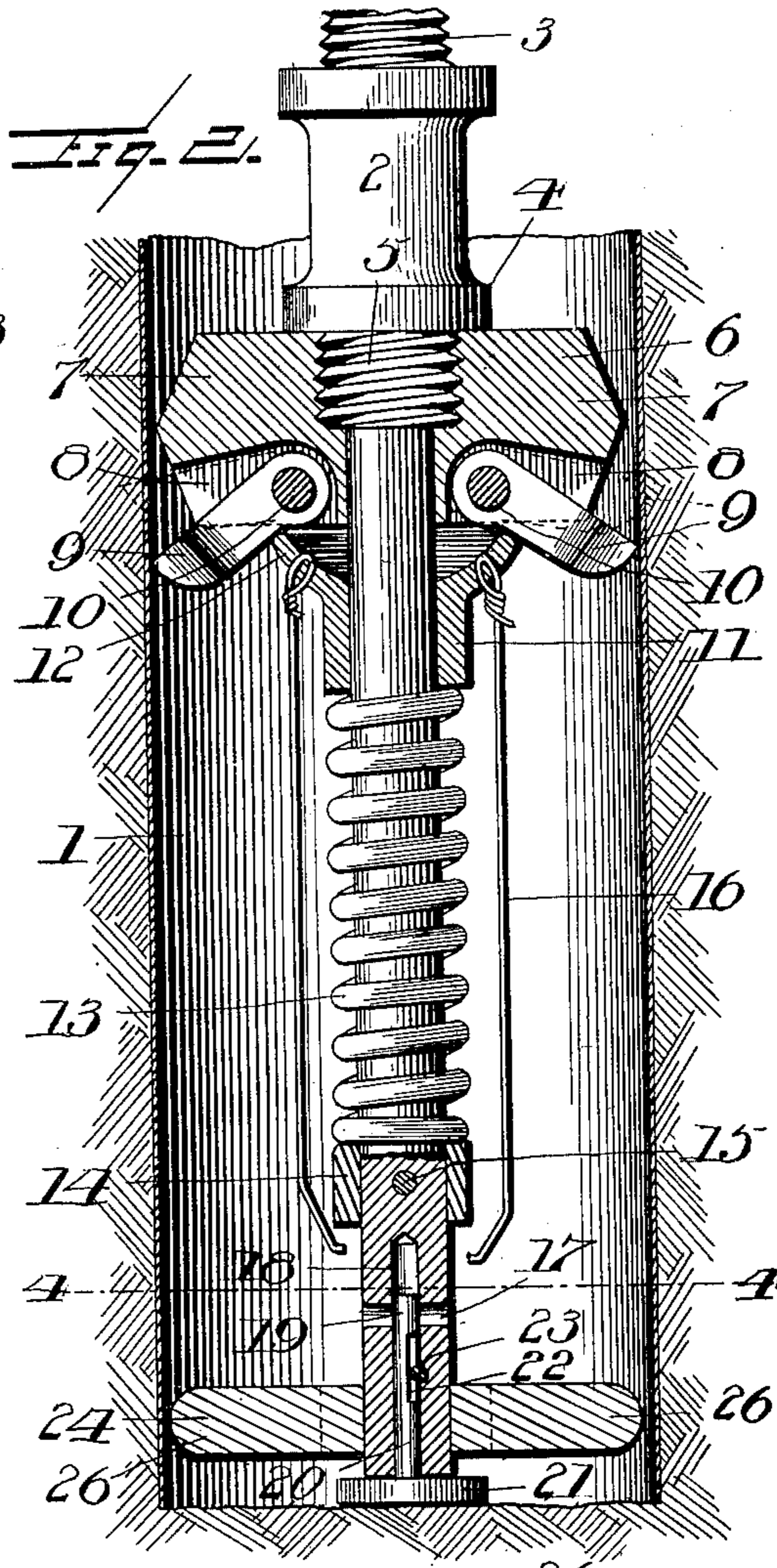
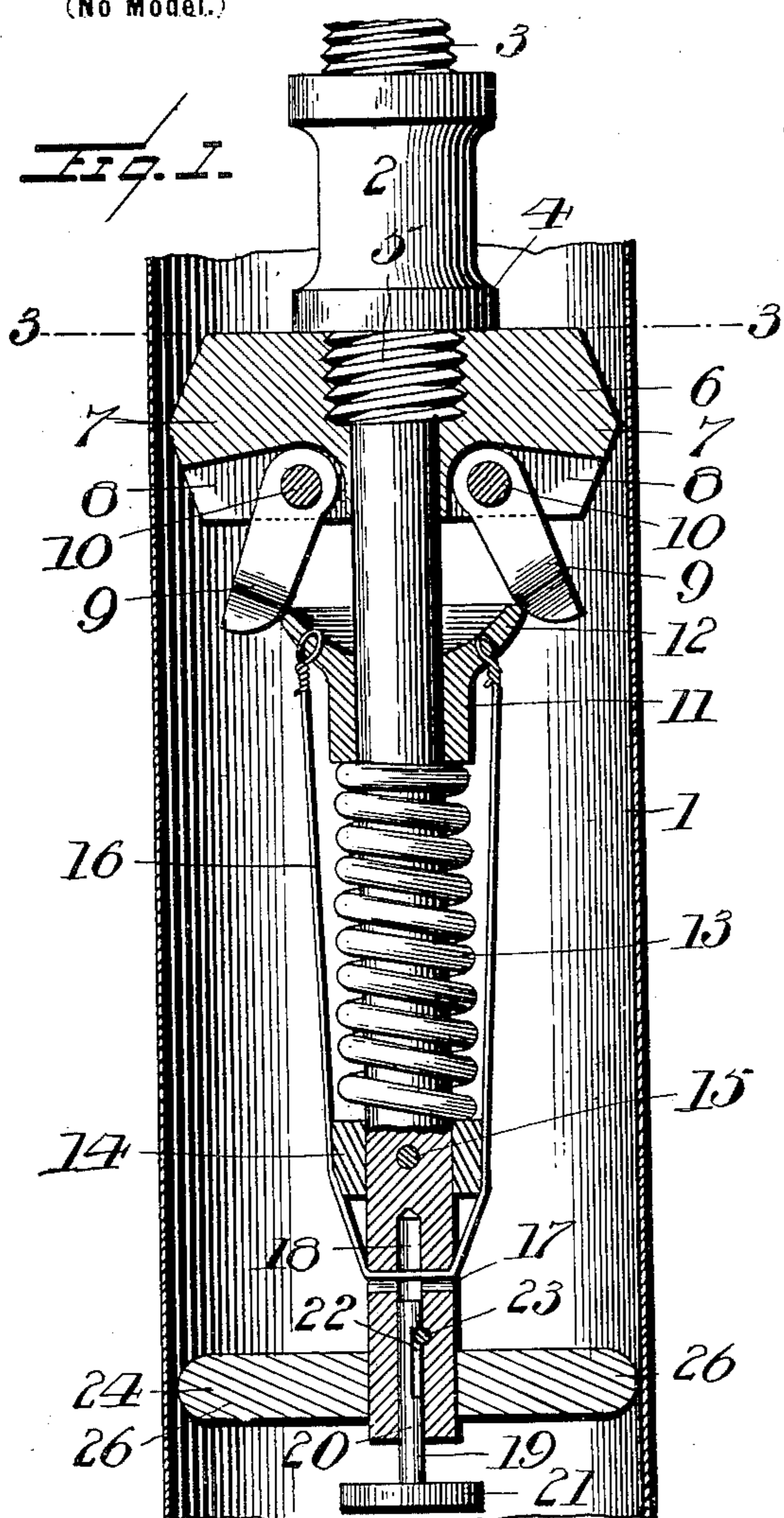
No. 657,777.

Patented Sept. 11, 1900.

G. W. KELLOGG.
TOOL FOR PERFORATING PIPES.

(Application filed Apr. 28, 1900.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE WOODWARD KELLOGG, OF BAKERSFIELD, CALIFORNIA.

TOOL FOR PERFORATING PIPES.

SPECIFICATION forming part of Letters Patent No. 657,777, dated September 11, 1900.

Application filed April 26, 1900. Serial No. 14,498. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WOODWARD KELLOGG, a citizen of the United States, residing at Bakersfield, in the county of Kern and State of California, have invented certain new and useful Improvements in Tools for Perforating Pipes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in tools for perforating pipes; and it has for its object to provide a tool of this character which is simple in construction, but thoroughly efficient in operation, whereby pipes after being inserted in the ground for use in connection with oil, gas, and water wells may be readily perforated to permit the inflow of such fluids.

With this and other objects in view, which will appear as the nature of the improvements is better understood, the invention consists, substantially, in the novel construction, combination, and arrangements of parts, as will be hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

In the drawings, Figure 1 is a vertical sectional view of a tool constructed in accordance with the present invention and illustrated as inserted within a well. Fig. 2 is a similar view, the restraining means having been freed and the cutters illustrated as in position to penetrate the casing. Fig. 3 is a top plan view thereof. Fig. 4 is a similar view of the guide.

Referring to the drawings, the numeral 1 designates the tubular barrel or casing of a well, whether the latter be for oil, gas, or water, within which the herein-described perforating-tool is adapted to work. This tool comprises a shank 2, which is adapted to be connected to any suitable form or drive-rod, and to the accomplishment of this latter end the upper portion of said shank is provided with a conical screw-threaded plug 3, adapted to engage a suitable socket in the drive-rod. The shank 2 at a suitable point below the plug 3 is provided with an annular shoulder 4, immediately below which latter point said shank is screw-threaded and of a reduced di-

ameter, as at 5, and mounted upon the threaded portion 5 and abutting against the shoulder 4 is a removable head 6, said head being provided with radially-arranged outwardly-projecting arms 7, each of which has at its lower face an elongated socket or recess 8. A perforating-cutter 9 is pivoted in each of the sockets or recesses 8, a pin 10 being employed for this purpose, and said pins pass through said cutters at the inner ends thereof, so that the cutters may readily swing in said recesses. Below the screw-threaded portion 5 the diameter of the shank 2 is again reduced, and slidably mounted upon said reduced portion is a collar 11. The collar 11 is provided at its upper edge with an annular engaging flange 12, which flange is flared, and said flange is adapted to engage with the cutters 9 when moved toward the head 7 in order to force the same partially into the recesses 8 and against the inner sides of the barrel or casing 1. When in this position, the cutters are adapted to penetrate the barrel or casing for perforating the same, as will hereinafter more fully appear.

The numeral 13 designates a coil-spring which encircles the shank 2 below the collar 11, and said spring at its lower end bears against an annular stop 14, the upper end of the spring 13 connecting with the collar 11. The stop 14 also encircles the shank 2 and is secured to said shank by means of a bolt 15, and it will thus be seen that said stop is held in fixed relation to the shank 2. The spring 13 may be thereby readily compressed, which is its normal condition, and for holding the spring 13 in this position a fastening-wire 16 or its equivalent is employed. The wire 16 has its ends suitably connected to the flange 12, while its body portion passes through a transverse passage or channel 17, formed in the shank 2 adjacent to the lower end thereof, and by reason of this construction it will be seen that the flange 12 of the collar 11 is prevented forcing the cutters 9 into engagement with the barrel or casing 1, said cutters thereby hanging loosely from the pins 10, but in the upward path of said flange.

The shank 2 is provided in its lower end with an inwardly-extending bore 18, the latter intersecting the channel 17 and terminat-

ing at a point thereabove, and fitting within said bore is a cutter 19 for severing the wire 16. The cutter 19 comprises a shank 20, provided at its lower end with a contact-foot 21, and said shank 20 has at one of its sides a recess 22, in which fits a locking-pin 23, through the medium of which the cutter 19 is retained within the bore 18. The recess 22, however, is of sufficient length to permit the cutter 19 being capable of free vertical movement, and said cutter is thereby adapted when the tool is inserted within the casing 1 and the foot 21 contacts with the bottom of the well to move upwardly and into contact with that portion of the wire 16 occupying the channel 17 and extending through the bore 18, whereby said wire is severed at the point mentioned. A detachable guide 24 is also mounted upon the lower end of the shank 2 to assist in the movement of the tool when the latter is inserted into the casing 1, and said guide comprises an annular body 25, provided with radially-projecting arms 26, a set-screw 27 passing through the body 25 and being adapted to impinge against the shank 2 for holding the guide in position thereon.

The manner of operating the herein-described tool is as follows: When it is desired to perforate the well-casing, the tool is passed into the open end thereof, the parts being in the position shown by full lines, and caused to descend therein until the foot 21 comes in contact with the bottom of the well. When this contact takes place, the shank 20 begins to move into the bore 18, and as the shank 2 continues to descend it will be seen that the portion of the wire 16 within the channel 17 is brought closer to the upper end of the shank 20 until the latter contacts therewith and severs the same, whereupon the sleeve 11, becoming freed and under the stress of the spring 13, moves upwardly and forces the cutters 9 into contact with the inner wall of the casing 1, as shown by full lines in Fig. 2. As the shank 2 continues to descend, by reason of the downward pressure thereon through the drive-rod connected thereto, the cutters 9 are caused to penetrate the casing 1, and thus perforate the same in an obvious manner to permit the inflow of the various fluids.

If desired, perforations of different sizes and shapes may be made by simply changing the cutters, and the head 7, as well as the guide 24, may be made in various sizes to suit the varying diameters of different wells. These with other changes in the form, proportion, and minor details of construction, and of which the invention is susceptible, may be made, and the right is therefore reserved to modify or vary the invention as falls within the spirit and scope thereof.

What I desire to claim is—

1. A perforator for pipes, comprising a series of cutters, and spring-actuated means for forcing the latter into contact with a pipe for perforating the same.

2. A perforator for pipes, comprising a series of radially-arranged cutters, and spring-actuated means for forcing the latter into contact with a pipe for perforating the same.

3. A perforator for pipes, comprising a series of pivoted radially-arranged cutters, and spring-actuated means for forcing the latter into contact with a pipe for perforating the same.

4. A perforator for pipes, comprising a series of cutters, spring-actuated means for forcing the latter into contact with a pipe, and means for normally restraining said forcing means.

5. A perforator for pipes, comprising a series of radially-arranged cutters, spring-actuated means for forcing the latter into contact with a pipe, and means for normally restraining said forcing means.

6. A perforator for pipes, comprising a series of cutters, means for forcing the latter into contact with a pipe, means for normally restraining said forcing means, and means for automatically releasing said restraining means.

7. A perforator for pipes, comprising a series of cutters, spring-actuated means for forcing the latter into contact with a pipe, means for normally restraining said forcing means, and means for automatically releasing said restraining means.

8. A perforator for pipes, comprising a series of radially-arranged cutters, spring-actuated means for forcing the latter into contact with a pipe, means for normally restraining said forcing means, and means for automatically releasing said restraining means.

9. A perforator for pipes, comprising a series of pivoted radially-arranged cutters, spring-actuated means for forcing the latter into contact with a pipe, means for normally restraining said forcing means, and means for automatically releasing said restraining means.

10. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head and adapted to swing in a vertical plane, and spring-actuated means for forcing said cutters into contact with a pipe.

11. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head, spring-actuated means for forcing said cutters into contact with a pipe, and means for normally restraining said forcing means.

12. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head, a collar slidably mounted upon said shank for forcing the cutters into contact with a pipe, and means for actuating said collar.

13. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head, a collar slidably mounted upon said shank for forcing the cut-

ters into contact with a pipe, and a spring for actuating said collar.

5 14. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head, a collar slidably mounted upon said shank for forcing the cutters into contact with a pipe, a spring for actuating said collar, and means for normally restraining said spring.

10 15. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head, a collar slidably mounted upon said shank for forcing the cutters into contact with a pipe, a spring for actuating said collar, and a wire for normally
15 restraining said spring.

20 16. A perforator for pipes, comprising a shank, a head carried thereby, a series of cutters carried by said head, a collar slidably mounted upon said shank for forcing the cutters into contact with a pipe, a spring for actuating said collar, a wire for restraining said

spring, and a cutter for severing said wire to release said spring.

17. A perforator for pipes, comprising a 25 shank, a head carried thereby, a series of cutters carried by said head, a collar slidably mounted upon said shank for forcing the cutters into contact with a pipe, a spring also mounted upon said shank for actuating said 30 collar, a wire for restraining said spring, said wire having its ends connected to said collar and its body portion fitting in a transverse passage of the shank, a cutter slidably mounted in said shank and adapted to contact with 35 said wire for severing the latter, and a guide also carried by said shank.

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

GEORGE WOODWARD KELLOGG.

Witnesses:

J. H. BINGHAM,
H. J. WEBSTER.