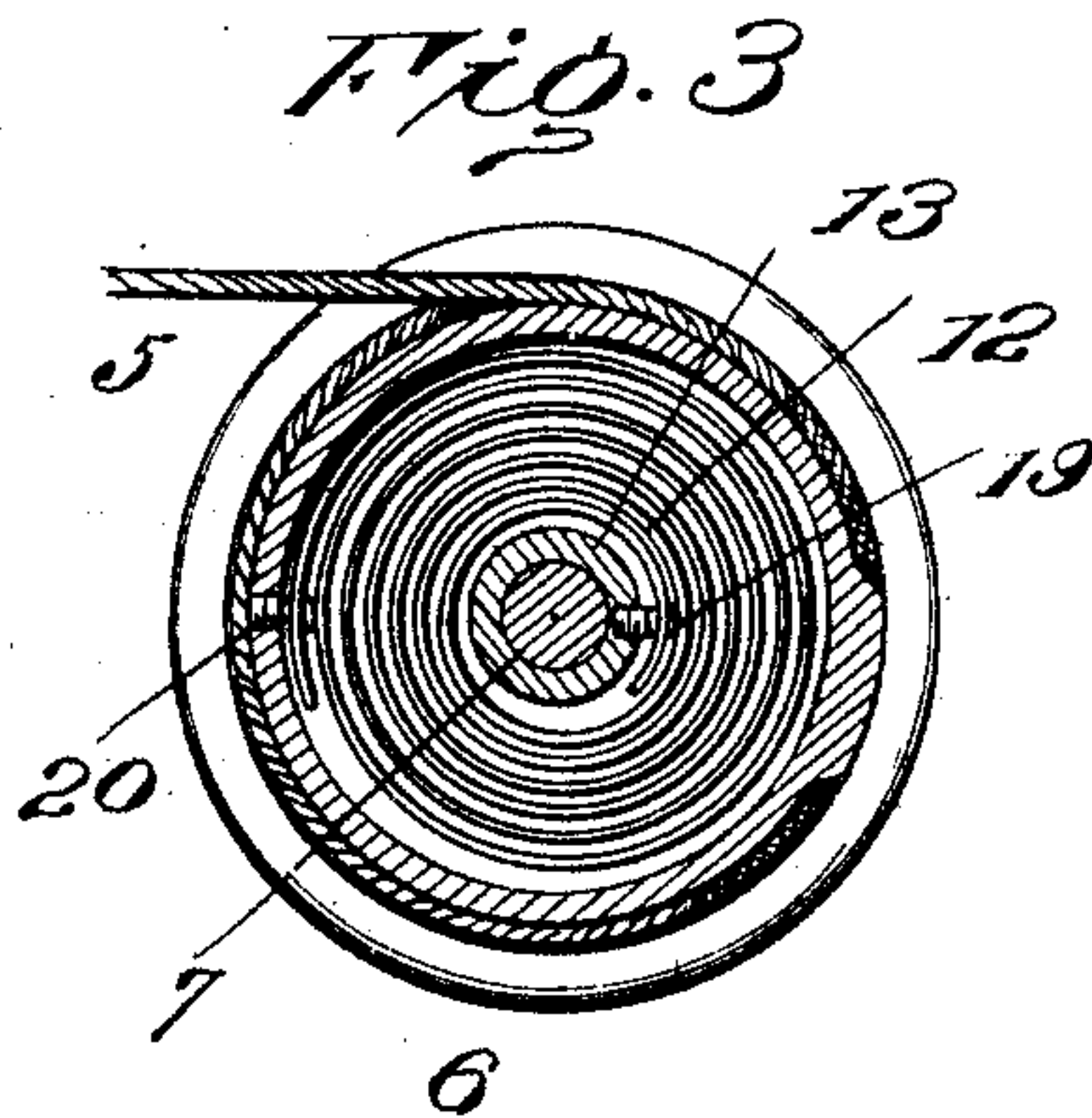
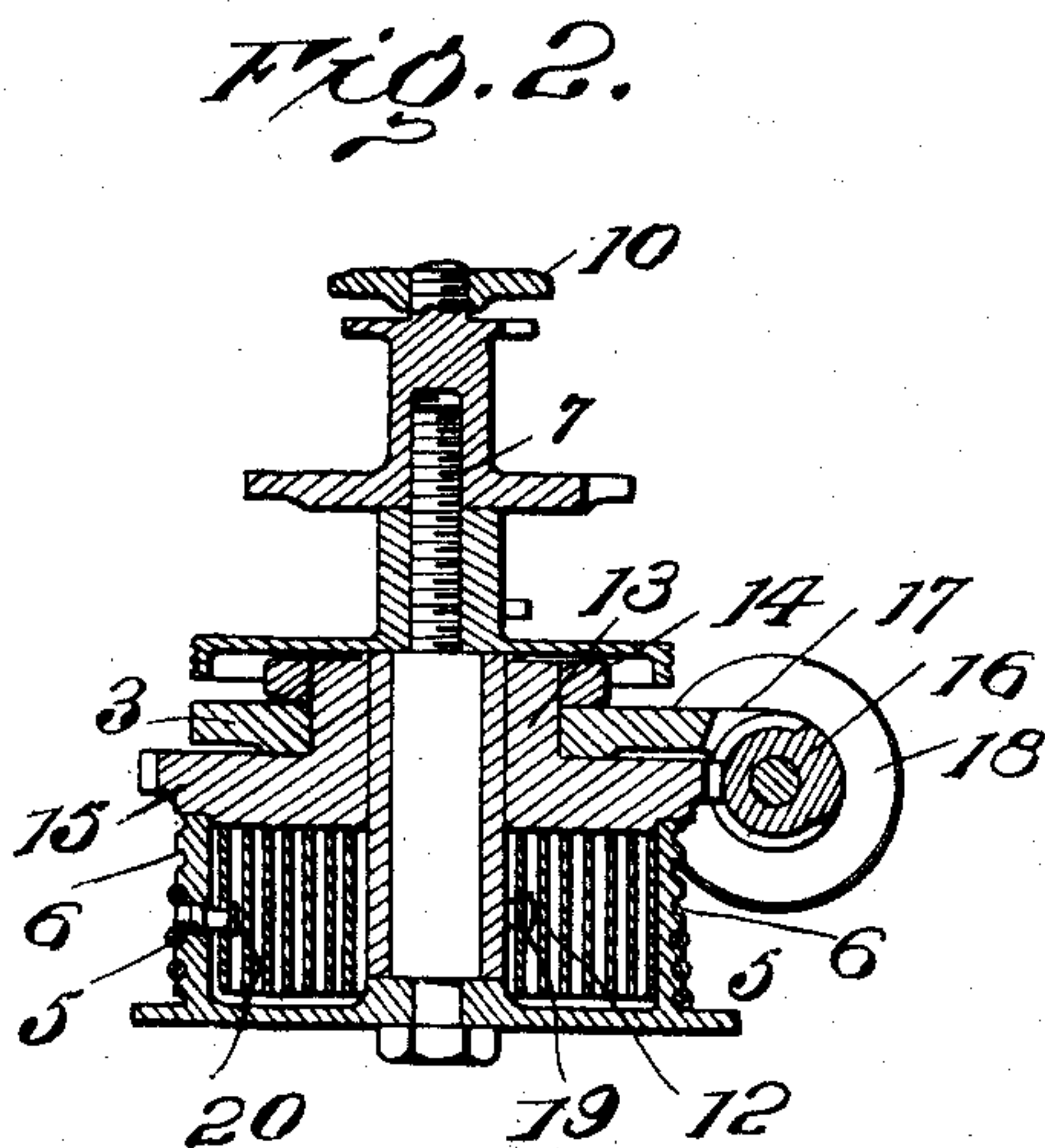
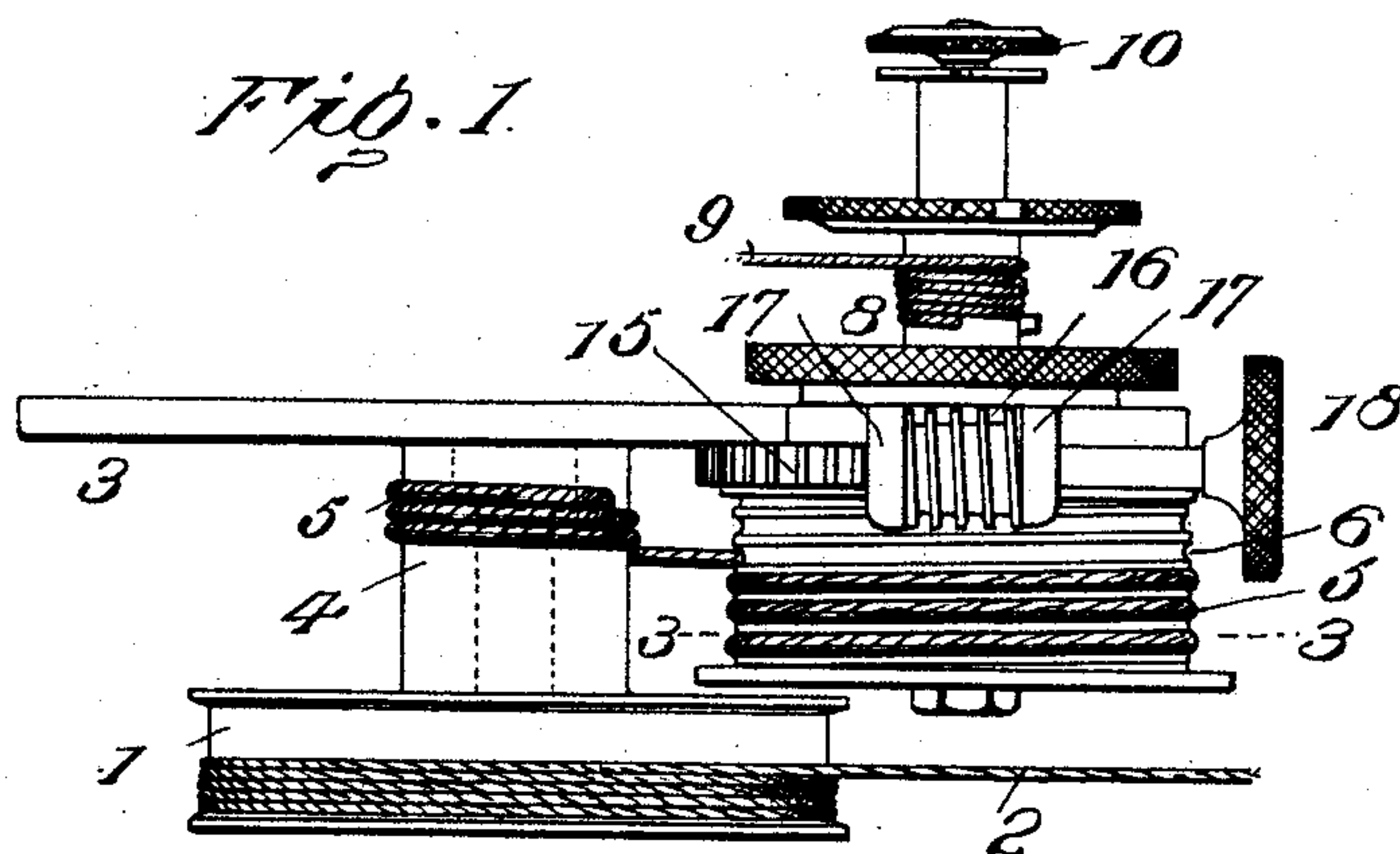



No. 815,038.

PATENTED MAR. 13, 1906.

J. L. ROBERTSON, JR.
INDICATOR REDUCING WHEEL.
APPLICATION FILED MAY 18, 1905.



Witnesses

Witnesses

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UNITED STATES PATENT OFFICE.

JAMES L. ROBERTSON, JR., OF NEW YORK, N. Y.

INDICATOR REDUCING-WHEEL.

No. 815,038.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed May 18, 1905. Serial No. 261,075.

To all whom it may concern:

Be it known that I, JAMES L. ROBERTSON, Jr., of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Indicator Reducing-Wheels; 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 contemplates the provision of improved means for regulating and adjusting the tension of the pulley-spring in an indicator reducing-wheel for the purpose of effecting a return movement of the pulley proportionate to the piston speed of the engine.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a reducing-wheel. Fig. 2 is a vertical sectional view through the pulley. Fig. 3 is a section on line 3 3, Fig. 1.

Referring to the drawings, 1 designates the drum, on which is wound the cord 2, connected to the cross-head of the piston. (Not shown.) This drum is rotatable upon a shaft depending from the base-plate 3 and is formed with a hub 4, constituting a reduced drum for a second cord 5, connected to the pulley 6. To the extent of the foregoing description the parts are or may be of any preferred construction.

The pulley 6 is rigid upon a shaft or spindle 7, extending through the base-plate 3 and supporting above said base-plate the drum 8, whereon is wound a cord 9, connected to the indicator-cylinder. (Not shown.)

10 is a nut on the upper extremity of the spindle for the purpose of retaining the drum 8 and complementary parts in position.

The pulley 6 is of hollow cylindrical formation and contains a coiled drum-spring 12, designed to operate the pulley in a direction opposite to that in which it is rotated by the cord 5. It is necessary that this spring be capable of regulation and adjustment, so that its tension will be suitable to the speed of the engine-piston, since its office is to impart a return movement to the pulley when the cross-head moves toward the piston-cylinder. When the spring tension is less than it should

be for a given high speed, the cords tend to sag or become deranged, resulting in a strain upon the parts and an imperfect record upon the indicator-card. To insure effective regulation of the spring 12, I provide a sleeve 13, extending through the base-plate and inclosing the shaft or spindle 7. The sleeve is rotatable in the aperture of the base-plate and is provided with a ring or washer 14, bearing against the upper face of the base-plate, and with a rigid gear-wheel 15, which may be secured to or formed integral with the sleeve.

16 is a worm journaled in ears 17, formed on the base-plate, said worm meshing with the gear 15 and having the outer end of its shaft provided with a milled hand-wheel 18.

The sleeve 13 is provided near its inner end with a lug 19, to which one end of the spring 12 is secured, the other end of the spring being attached to a lug 20 on the inner wall of the pulley.

From the foregoing it will be seen that convenient means is provided for regulating the spring, the turn of the hand-wheel 18 effecting a rotation of sleeve 13 on spindle 7 and, according to the direction in which the wheel is turned, tightening or loosening the spring. No locking devices are required, the spring remaining as adjusted, thus enabling the tension to be altered quickly and while the parts are operating at high speed.

I claim as my invention—

1. In a steam-engine-indicator reducing device, a drum, a cord wound on said drum connecting the latter mediate to a piston whereby said drum is rotated in the movement of said piston, a pulley designed to effect the return rotation of said drum, a cord wound upon said pulley and said drum, said pulley having an internal coil-spring, a normally stationary sleeve extending into said pulley to which one end of said spring is secured, the other end being secured to said pulley, a gear-wheel rigid on said sleeve, and a worm engaging said gear-wheel to effect the rotation of said sleeve and consequent regulation of the tension of said spring proportionate to the speed of the piston.

2. In an indicator reducing device, the combination with the base-plate, the pulley, the spindle rigidly secured to said pulley and extending through said base-plate, said pulley having an internal coil-spring, of a sleeve

rotatable in a bearing in said base-plate and
inclosing said spindle, said spring being se-
cured to said sleeve and to said pulley, a
gear-wheel rigid on said sleeve, lugs or ears
5 on said base-plate, a worm journaled in said
lugs and meshing with said gear-wheel, and a
hand-wheel on said worm.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

JAMES L. ROBERTSON, JR.

Witnesses:

JOSEPHINE REGAN,
HERBERT J. HINDES.