

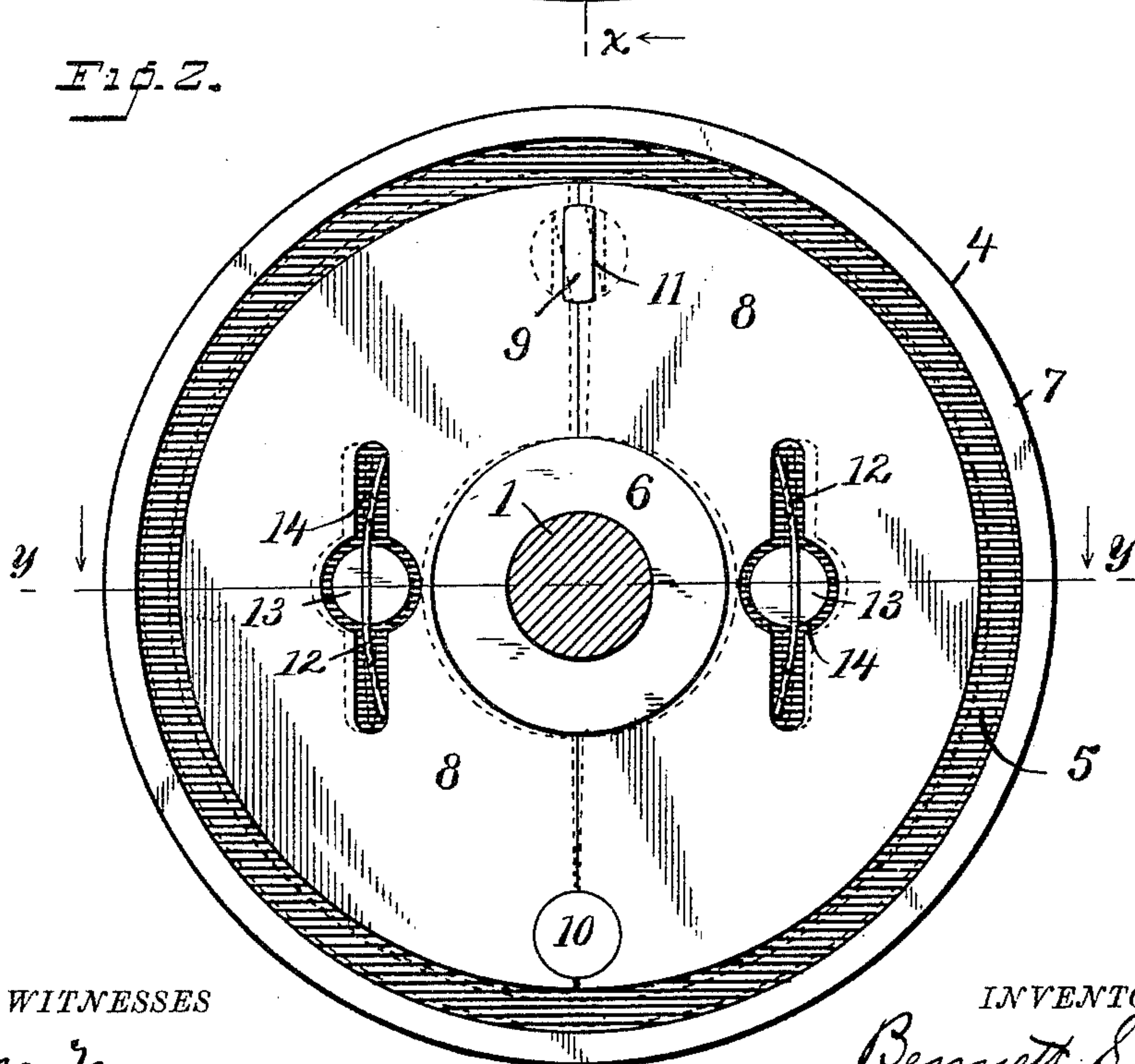
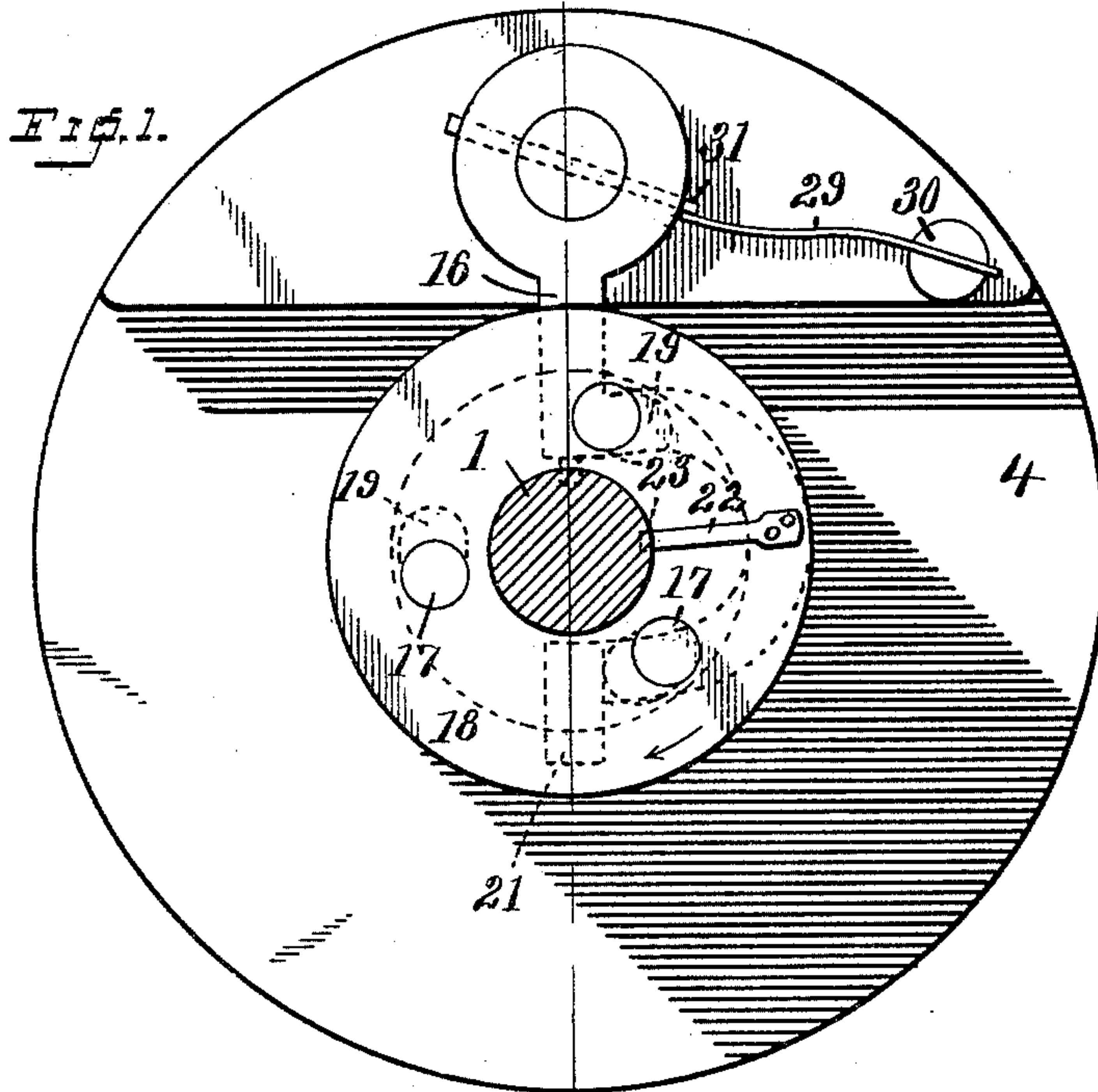
(No Model.)

3 Sheets—Sheet 1.

B. S. LEWIS.
FRICTION CLUTCH.

No. 461,081.

Patented Oct. 13, 1891.



WITNESSES

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INVENTOR

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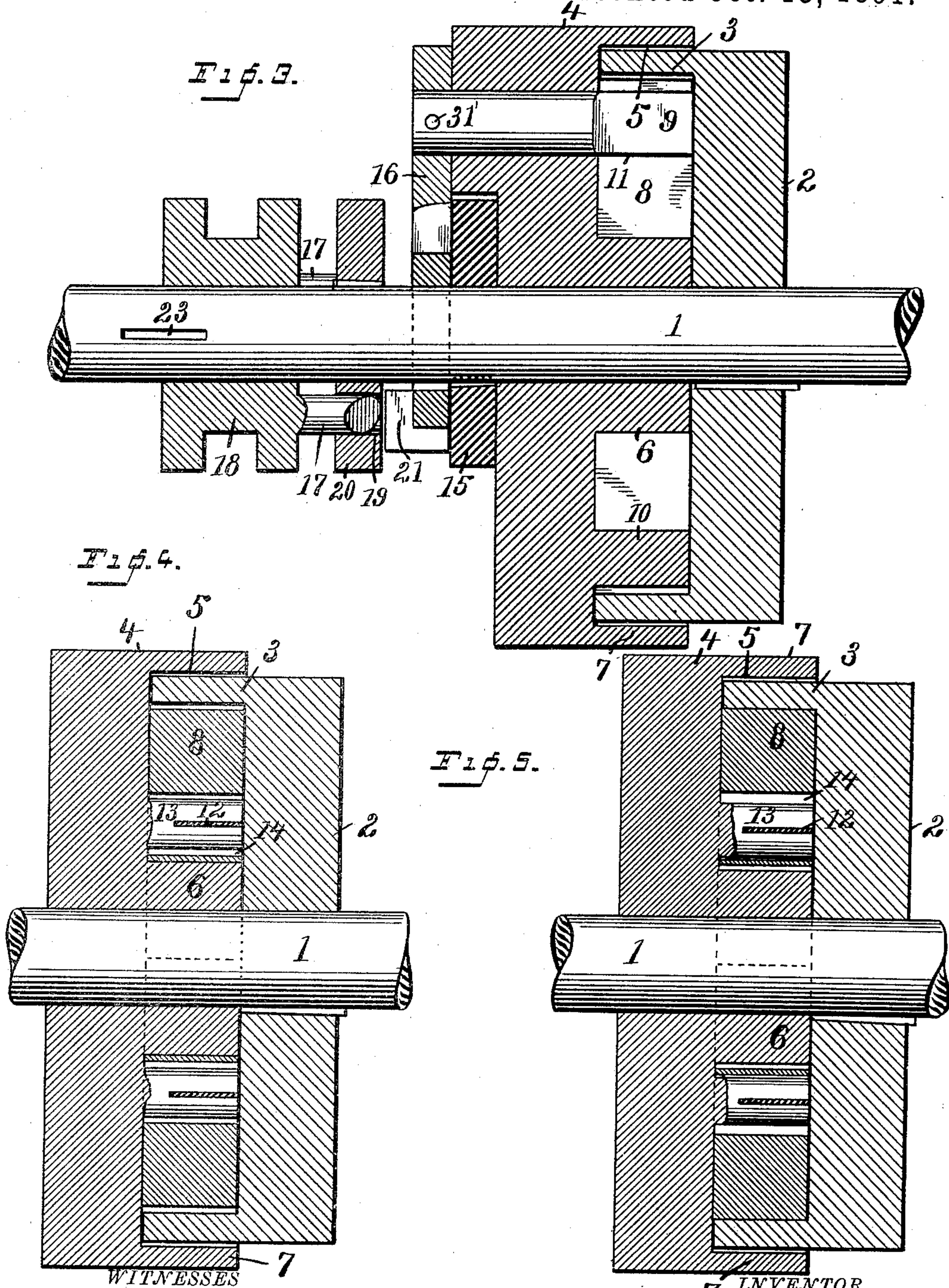
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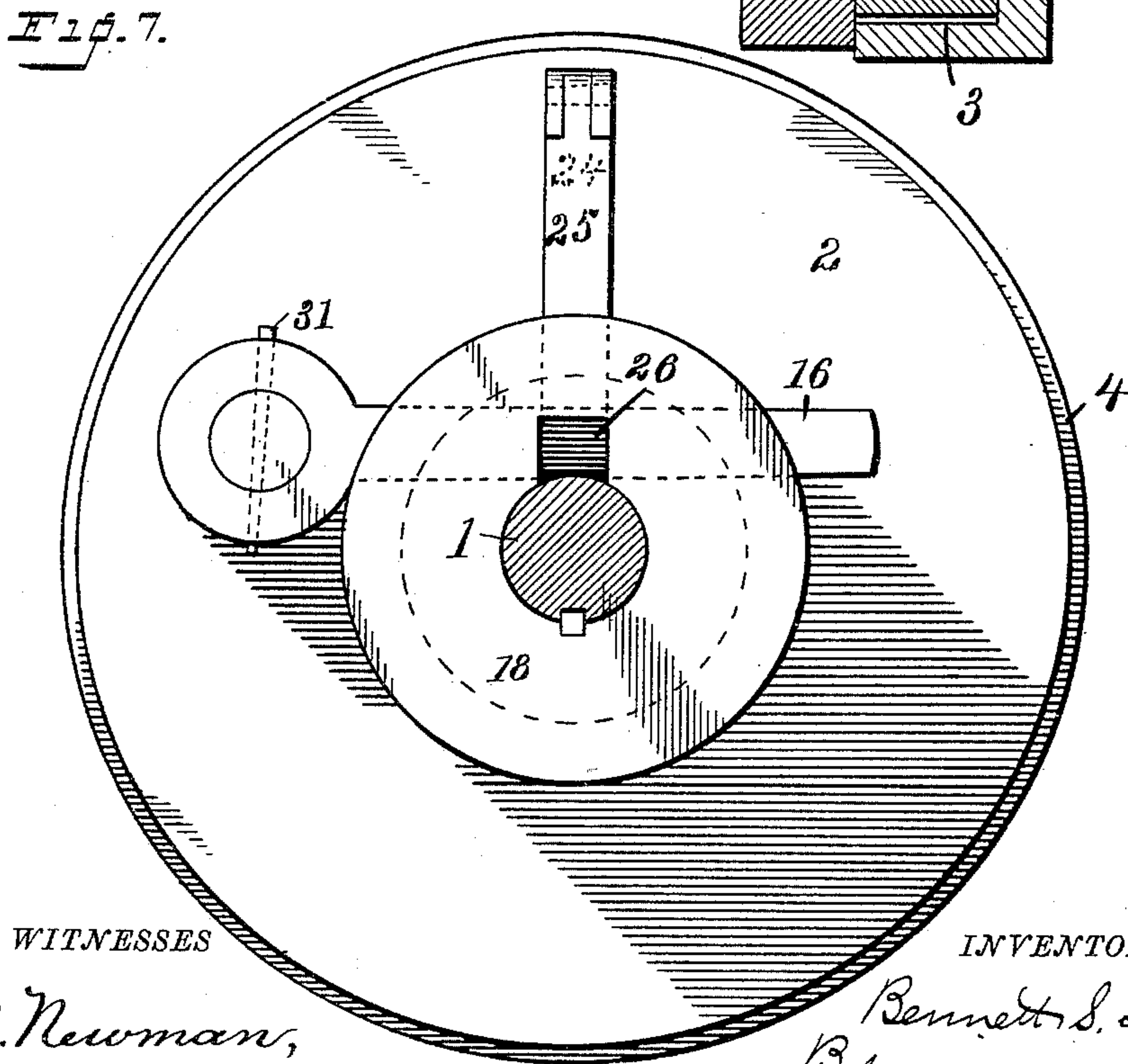
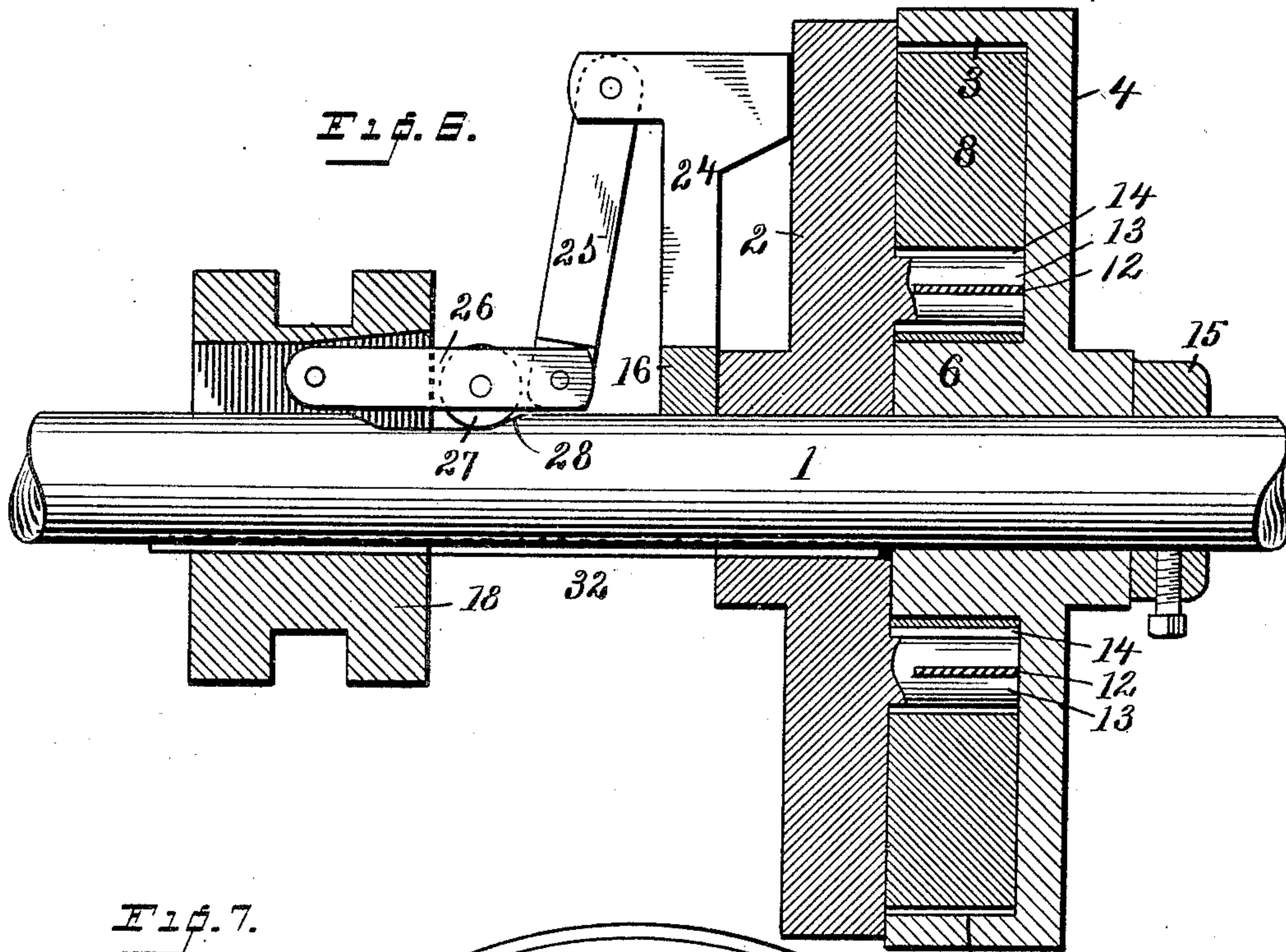
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UNITED STATES PATENT OFFICE.

BENNETT S. LEWIS, OF NEW HAVEN, CONNECTICUT.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 461,081, dated October 13, 1891.

Application filed February 6, 1891. Serial No. 380,459. (No model.)

To all whom it may concern:

Be it known that I, BENNETT S. LEWIS, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Friction-Clutches; 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.

My invention relates to friction-clutches for general use, and has for its object to simplify and strengthen their construction and greatly improve their operation in use, the mechanism being quick to act and adjustments being wholly dispensed with. With these ends in view I have devised the simple and novel construction of which the following description, in connection with the accompanying drawings, is a specification, numerals being used to denote the several parts:

Figure 1 is an elevation of my novel clutch as seen from the left in Fig. 3; Fig. 2, an elevation as seen from the right in Fig. 3, the fixed disk being removed; Fig. 3, a section on the line *xx* in Fig. 1; Figs. 4 and 5, sections on the line *yy* in Fig. 2, Fig. 4 showing the parts in the unlocked and Fig. 5 showing the parts in the locked position; Fig. 6, a view corresponding with Fig. 3, illustrating certain changes in the details of construction, without, however, affecting the principle of the invention; and Fig. 7 is a view corresponding with Fig. 1 of the construction shown in Fig. 6.

1 denotes the shaft, and 2 a disk fixed thereto, which is provided with a flange 3. In this form the belt is carried by a pulley 4, which is loose on the shaft. In the face of this disk is a circular recess 5, at the center of which is a hub 6 and around the edge of which is a flange 7.

8 denotes the clamping-plates, which are semicircular in form, each plate having a semicircular recess to receive the hub. The diameter of these plates is enough less than the internal diameter of flange 7, so as to leave a circular recess between the clamping-plate and said flanges to receive flange 3 upon the fixed disk. The clamping-plates

are expanded and caused to engage flange 3 by means of an oscillatory expanding-piece 9. The two clamping-plates have their fulcrums upon a stud 10 and are provided in their faces near the other ends with suitable recesses 11 to receive the expanding-piece, the engaging portion of the latter being made angular, so that when turned in either direction it will throw the clamping-plates outward, as indicated by dotted lines in Fig. 2.

In order to throw the clamping-plates back to the closed position as soon as the expanding movement has ceased, I provide suitable springs 12. In the present instance I have shown these springs carried by studs 13, said studs being carried by the belt-pulley and both studs and springs lying in suitable recesses 14 in the clamping-plates.

15 is a collar keyed to the shaft, which holds the belt-pulley against endwise movement thereon.

Oscillatory movement may be imparted to the expanding-piece in various ways. In Figs. 1 to 5 I have shown said piece mounted in the belt-pulley and having at its rear end an arm 16, which is adapted to be engaged by any one of a series of pins 17, carried by a sleeve 18, which slides on the shaft. This sleeve is shown as provided with a groove to receive a bifurcated operating-lever in the usual manner. The pins pass through elongated openings 19 in a disk 20, keyed to the shaft. At the end of arm 16 is a head 21, which is engaged by any one of the pins in use when it is desired to lock the clutch. By beveling the ends of the pins, as shown in Fig. 3, and elongating the openings in the disk through which said pins pass I insure that the engaging pin will slip past the head of the arm and engage it positively and with perfect certainty.

In order to insure that pins 17 will always lie at the rear ends of the elongated openings, I provide a spring 22 upon sleeve 18, the end of which engages a slot 23 in the shaft. (See Figs. 1 and 3.) This spring acts to retain the sleeve in its normal position at all times.

It will be noticed in Figs. 1 and 3 that arm 16 curves partially around the shaft, the head of said arm being on the opposite side of the shaft from the expanding-piece. This is in

order to obtain the greatest leverage and cause the mechanism to act instantly and with absolute certainty.

In order to insure that the expanding-piece will return to its normal position the instant the expanding movement ceases, I ordinarily provide a spring 29, (see Fig. 1,) which is carried by a stud 30 and engages a suitable boss or projection 31 on the hub of arm 16. In the present instance I have shown the end of the pin which locks arm 16 upon the expanding-piece utilized as a boss for this spring to bear against, as is clearly shown in Fig. 1. In the form shown in Figs. 6 and 7 arm 16 is straight and is operated upon the toggle principle.

24 denotes an arm which extends outward from arm 16. 25 is a link pivoted to this arm, and 26 a link pivoted to link 25 and to the sliding sleeve. Link 26 is provided with a roller 27, which is caused to travel up an incline 28 on the shaft when the sliding sleeve is moved. When the roller rides up the incline, link 25 is moved upward, which raises arm 24, and consequently arm 16, and oscillates the expanding-piece in the same manner as in the other form. In this form it will be noticed that the parts are to a certain extent reversed, the part corresponding in location with the belt-pulley being in this form keyed to the shaft, and the part corresponding with the fixed disk—that is, the part having flange 3—being in this form loose upon the shaft and serving as the belt-pulley. The real belt-pulley in this form is held in position upon the shaft by a holding-collar 15, the same as in the other form.

The shaft is provided with a spline on which sleeve 18 slides and by which said sleeve is held against rotary movement.

Having thus described my invention, I claim—

1. A friction-clutch consisting of a fixed disk and a belt-pulley, one of said parts having a flange 3, oscillatory clamping-plates lying within said flange, a fulcrum-stud 10, and opposite thereto recesses 11, and an expanding-piece, the engaging portion of which is made angular and lies in said recesses, so that when said expanding-piece is turned the clamping-plates will oscillate on the stud and be expanded against the flange.

2. A friction-clutch consisting of a fixed disk and a belt-pulley, one of said parts having a flange 3, clamping-plates having recesses 14, an oscillatory expanding-piece by which said clamping-plates are expanded against the flange, and springs 12, carried by studs in said recesses, by which the clamping-plates are moved to their normal position when pressure upon the expanding-piece is relieved.

3. In a clutch, the combination, with a fixed disk and a belt-pulley, one of said parts having a flange 3, and clamping-plates lying within said flange, of an oscillatory expanding-piece mounted in the belt-pulley, by which the clamping-plates are operated, an arm 16, secured to the outer end of said expanding-piece, and a sliding sleeve having pins 17, either of which is adapted to engage arm 16 to oscillate the expanding-piece.

4. In a clutch, the combination, with a fixed disk and a belt-pulley, one of said parts having a flange 3, and clamping-plates lying within said flange, of an oscillatory expanding-piece mounted in the belt-pulley, by which the clamping-plates are operated, an arm 16, secured to the outer end of said expanding-piece and having a head 21, a disk 20, having elongated openings, and a sliding sleeve having beveled pins which pass through said openings and are adapted to engage head 21, substantially as described.

5. In a clutch, the combination, with a fixed disk and a belt-pulley, one of said parts having a flange 3, and clamping-plates lying within said flange, of an oscillatory expanding-piece mounted in the belt-pulley, by which the clamping-plates are operated, an arm 16, secured to the outer end of said expanding-piece, a disk 20, having elongated openings, a sliding sleeve having beveled pins which pass through said openings and are adapted to engage arm 16, and a spring 22 upon the sliding sleeve, the end of which engages slot 23, by which said sleeve is held at its normal position.

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

BENNETT S. LEWIS.

Witnesses:

CHARLES KLEINER,
FREDERICK W. HOLDEN.