

B. S. TRUXAL.  
CLUTCH MECHANISM.  
APPLICATION FILED OCT. 17, 1907.

929,521.

Patented July 27, 1909.

Fig. 1.

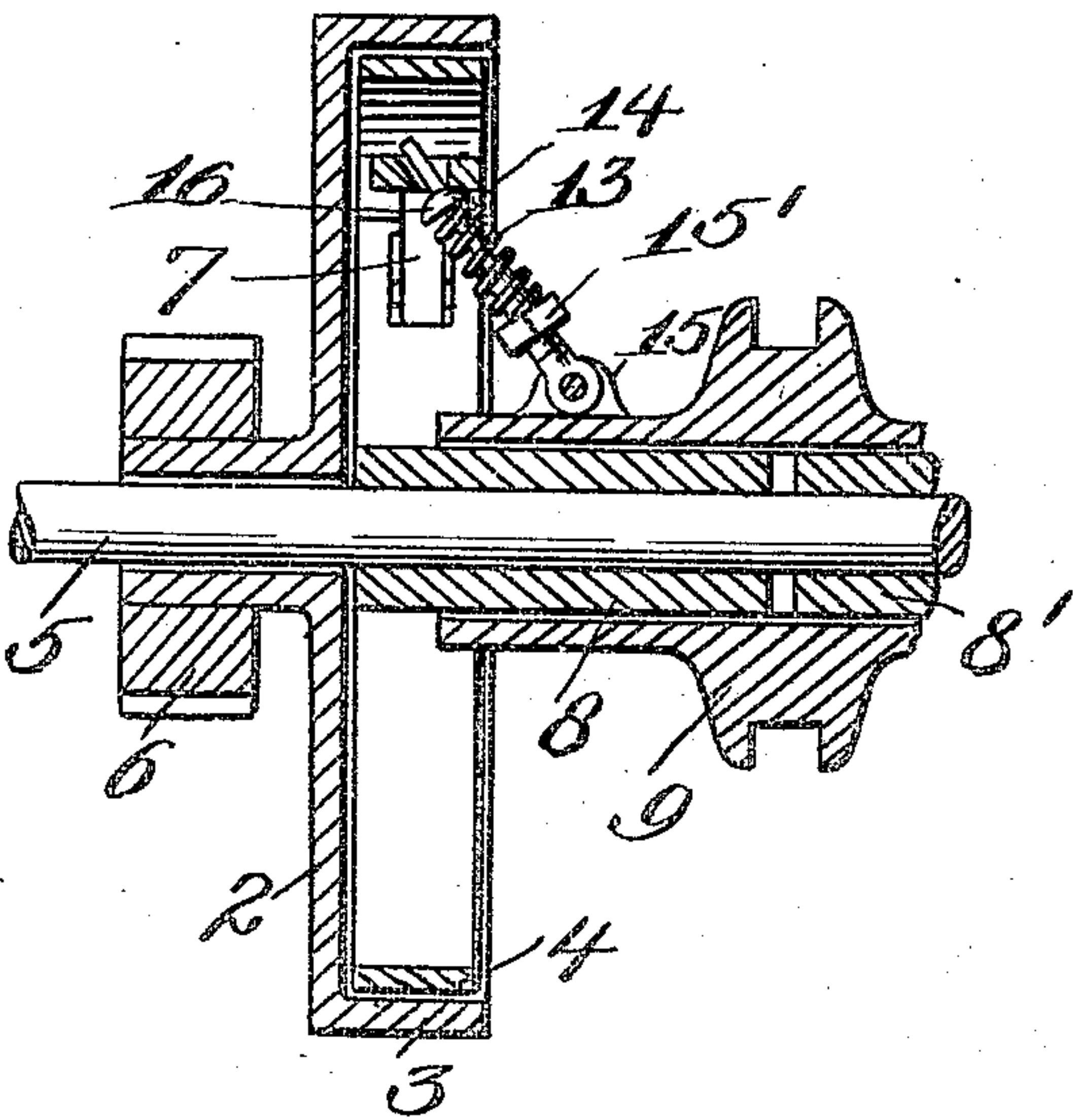


Fig. 2.

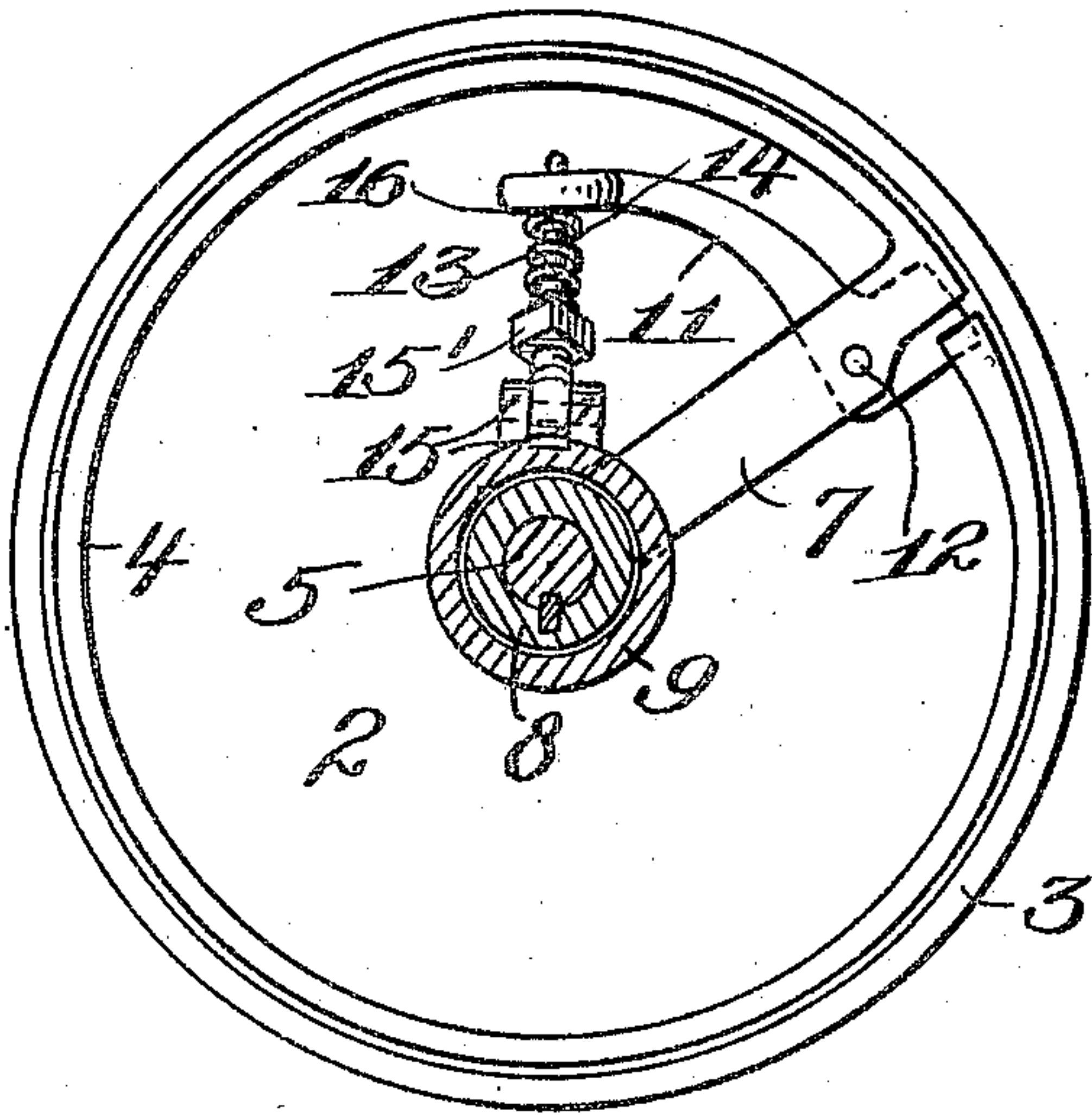


Fig. 3.

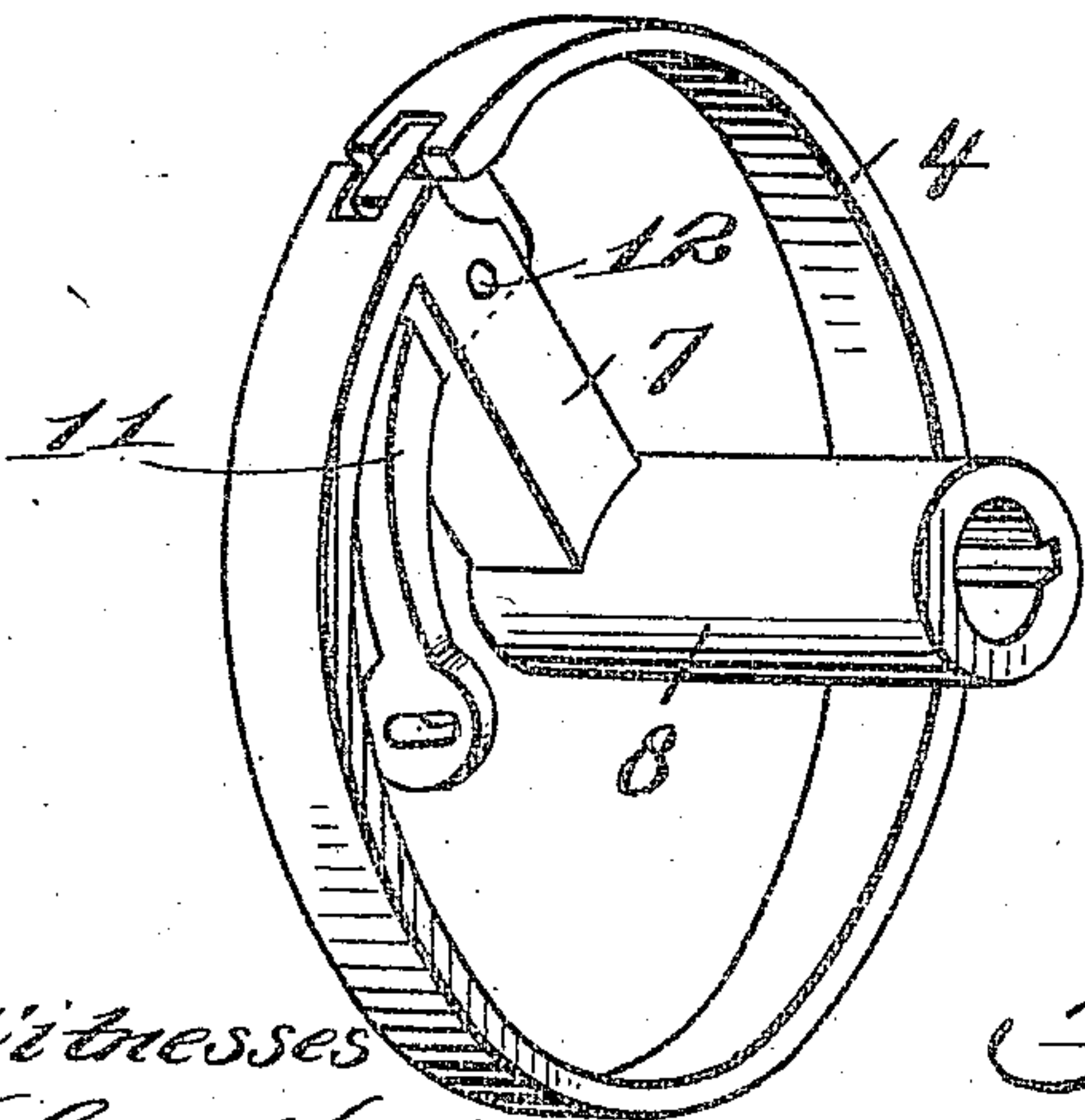
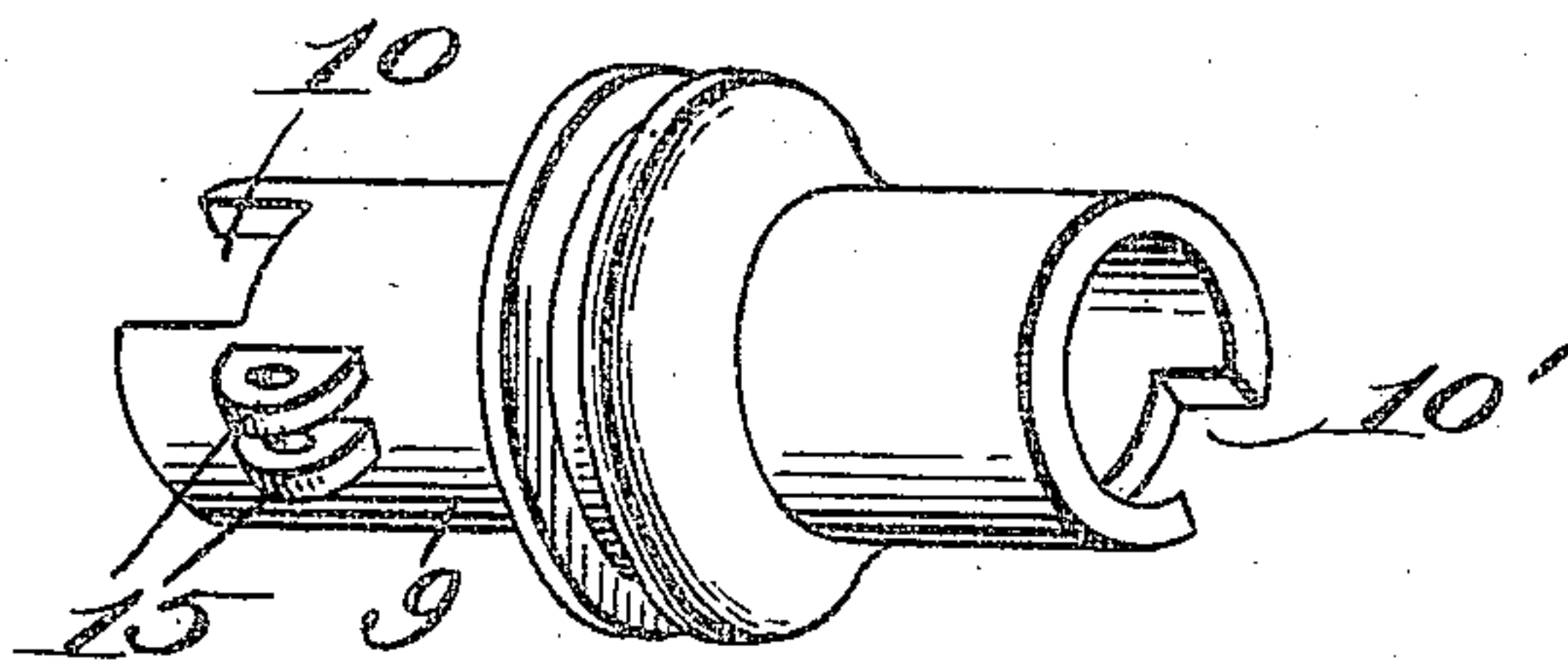


Fig. 4.



Witnesses  
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Fig. 5. Benjamin S. Truxal

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# UNITED STATES PATENT OFFICE.

BENJAMIN S. TRUXAL, OF CHATTANOOGA, TENNESSEE.

## CLUTCH MECHANISM.

No. 929,521.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed October 17, 1907. Serial No. 397,845.

*To all whom it may concern:*

Be it known that I, BENJAMIN S. TRUXAL, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented new and useful Improvements in Clutch Mechanism, of which the following is a specification.

This invention relates to clutch mechanism.

Clutch mechanism involving my invention may be put to advantageous use in many different connections; for instance, as part of a hoisting apparatus such as that disclosed in my co-pending application for patent Serial No. 397,844, filed October 17, 1907. A familiar type of clutch comprises a divided or split ring adapted to be forced into working engagement with a suitable member so as to clutch together the two parts. Ordinarily these two parts are put into contact suddenly, which is apt to cause injury or even breakage besides undue wear. I provide a ring of the character set forth and an operating member therefor and interpose between such parts an improved yieldable power-transferring member, so that, notwithstanding the fact that the said operating member may be violently or suddenly operated to actuate the clutch, no injury can result owing to the presence of this yieldable medium. I also make provision for compensating for wear between certain of the parts of the clutch mechanism.

In the drawings accompanying and forming part of this specification I show in detail one effective form of embodiment of the invention which, to enable those skilled in the art to practice the same, will be set forth at length in the following description, while the novelty of the invention will be included in the claims succeeding said description.

Referring to said drawings: Figure 1 is a vertical sectional view of clutch mechanism involving my invention. Fig. 2 is a transverse sectional view of the same. Fig. 3 is a perspective view of the divided ring and expanding lever. Fig. 4 is a like view of the operating member for the said ring, and Fig. 5 is a detail view of a spring and rod hereinafter more particularly described.

Like characters refer to like parts throughout the several figures of the drawings.

The clutch mechanism shown in the drawings embodies in its make-up a wheel or disk as 2 shown as provided with a lateral flange as 3 which surrounds the ring 4. The

ring 4 in the present case is of divided resilient form, it being adapted automatically, when freed from the influence of its operating member, to contract out of engagement with the inner surface of the rim or flange 3. When the ring 4 has been expanded to the requisite extent its periphery frictionally engages the inner surface of the flange or rim 3 to clutch together the ring 4 and wheel 2. Either of these parts may be fastened to the shaft 5. In the present case the ring 4 rotates with this shaft, while the wheel 2 is loose on said shaft. I have shown as fastened to a lateral hub on the wheel 2 a pinion 6. It follows therefore that, when the shaft 5 is rotating and that when the ring 4 is in clutching engagement with the rim or flange 3, the wheel 2 will be turned for rotating the pinion 6.

The divided ring 4 is shown as having at one end thereof the radially-disposed inwardly-extending arm 7 which terminates at its inner end in an elongated hub or sleeve 8 which is adapted to be keyed or otherwise fastened to the shaft 5 for turning movement therewith. If desired, the ring 4, radial arm 7, and hub or sleeve 8 can be made in one piece by casting. In Fig. 1 of the drawings I have shown a second hub 8' with which, if desired, may be associated parts exactly like those hereinbefore described in detail; in other words, the wheel 2 and ring 4 may be duplicated.

There is movable longitudinally of the shaft a sleeve 9 and this sleeve 9 in the present case slides on the inner sleeves 8 and 8', being notched at its opposite ends as at 10 and 10', the notch 10 being adapted to receive the arm 7, while the notch 10' receives the arm of the other ring when the parts are duplicated (not shown.) By virtue of the notching of the sleeve 9 the latter is rotatively connected with the ring 4. The sleeve 9 in the present instance constitutes a convenient operating member for the ring 4, it being adapted, when moved toward the left in Fig. 1, through intermediate parts, to cause the expansion of the ring 4 into frictional engagement with the rim 3. Said sleeve 9 is shown as peripherally grooved to receive the pins (not shown) of the customary hand-operated shipping lever, by means of which said sleeve 9 can be moved longitudinally of the shaft 5. The opposite ends of the divided ring 4 are notched to receive the toe of the expanding lever 11 which be-



tween its ends extends through a slot in the arm 7 and is pivoted to said arm by a pivot such as 12. The lever 11 is so mounted in the present case as to present long and short arms. When the long arm of said lever is swung outward the toe on the short arm of said lever, by acting against the free end of the ring 4, will circumferentially enlarge said ring so as to put the same in clutching relation with the wheel 2. When the said long arm is relieved from pressure the ring 4, by its own action, can contract so as to break the clutching relation.

The means for transferring the effect of the sleeve 9 to the ring 4 include the lever 11 and the spring 13, said spring being in the present case of the push-type and serving as a simple device for yieldingly transferring the effect of the sleeve 9, through the lever 11, to the ring 4. The spring 13 is held in position by a rod 14, one end of which is loosely connected with the tail of the lever 11, while the other end thereof is jointed to the sleeve 9, for example, by being pivoted between complementary ears as 15 on the exterior thereof. It will be clear that the rod 14, when moved endwise, does not of itself transfer motion to the lever 11 owing to the loose connection between said rod and lever. The spring 13 encircles the rod and the upper or outer end of the same acts against the tail of the lever 11, while the inner or lower end bears against a shoulder as 15' which may consist of a nut threaded on to said rod and by adjusting which the tension of the spring 13 can be regulated. By running the nut 15' outward on the rod 14 wear between the toe of the lever 11 and free end of the ring 4 may be compensated for. The outer end of the spring 13 does not act directly against the lever 11 but against a washer 16 surrounding the rod 14 and interposed between the spring and lever. In Fig. 1 the ring 4 is out of engagement with the rim 3, the sleeve 9 at this time being in its intermediate or neutral position.

To cause a working engagement between the ring and rim the sleeve 9 will be moved toward the left. On such movement the rod 14 is moved longitudinally outward, the outer end thereof being projected through the receiving slot therefor in the tail of the lever 11, and the nut 15' by acting against the spring 13 applying a yielding outward

thrust to the long arm of the lever 11, so that the ring 4 is put into engagement with the rim 3 gradually and without shock, notwithstanding the fact that the sleeve 9 may have been violently or suddenly operated by a hand-lever or other similar part. Ordinarily the lever 11 is made of steel, but I find that, by employing the mechanism hereinbefore described, I can make said lever in the form of a casting without the possibility of the same being broken when the parts of the clutch are caused to engage. The spring 13 through the intermediate parts holds the toe of the lever 11 in engagement with the free end of the ring 4 to insure quick action of the clutch when the sleeve 9 is operated.

While my invention is of particular utility when employed in connection with a clutch of the type hereinbefore described it can be utilized with advantage in conjunction with other forms of clutches.

What I claim is:

1. A clutch comprising a divided ring, an operating member for the ring, a lever to act against the ring to expand the same, a rod extending between the lever and the operating member, and a spring encircling the rod and adapted to yieldingly transfer the effect of the operating member to the lever.

2. A clutch comprising a divided ring, an operating member, a rod, a lever for expanding the ring and to which said rod is loosely connected, the rod being jointed to said operating member, and a spring around the rod for transferring the effect of the operating member to said lever.

3. A clutch comprising a divided ring, a ring-expanding member, an operating device for the ring-expanding member, a rod extending between the ring-expanding member and the operating device, loosely connected with one and directly connected with the other, and a spring surrounding the rod and operable by said operating member to apply a yielding effect to said ring-expanding member.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

BENJAMIN S. TRUXAL.

Witnesses:

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H. B. HEYWOOD.