

No. 854,169.

PATENTED MAY 21, 1907.

W. JONES.  
STAY BOLT CLUTCH.  
APPLICATION FILED FEB. 8, 1906.

Fig. 1.

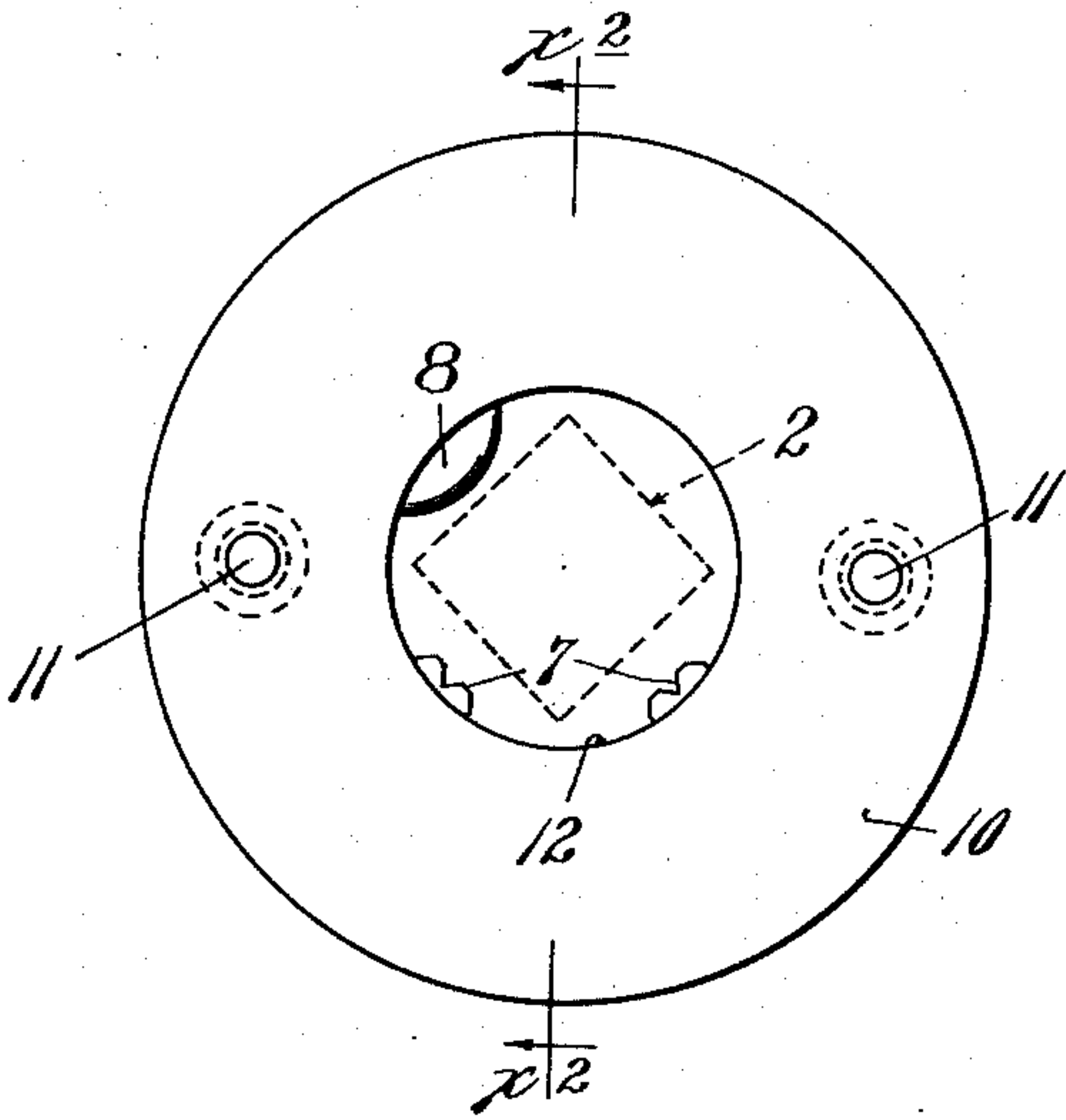


Fig. 3.

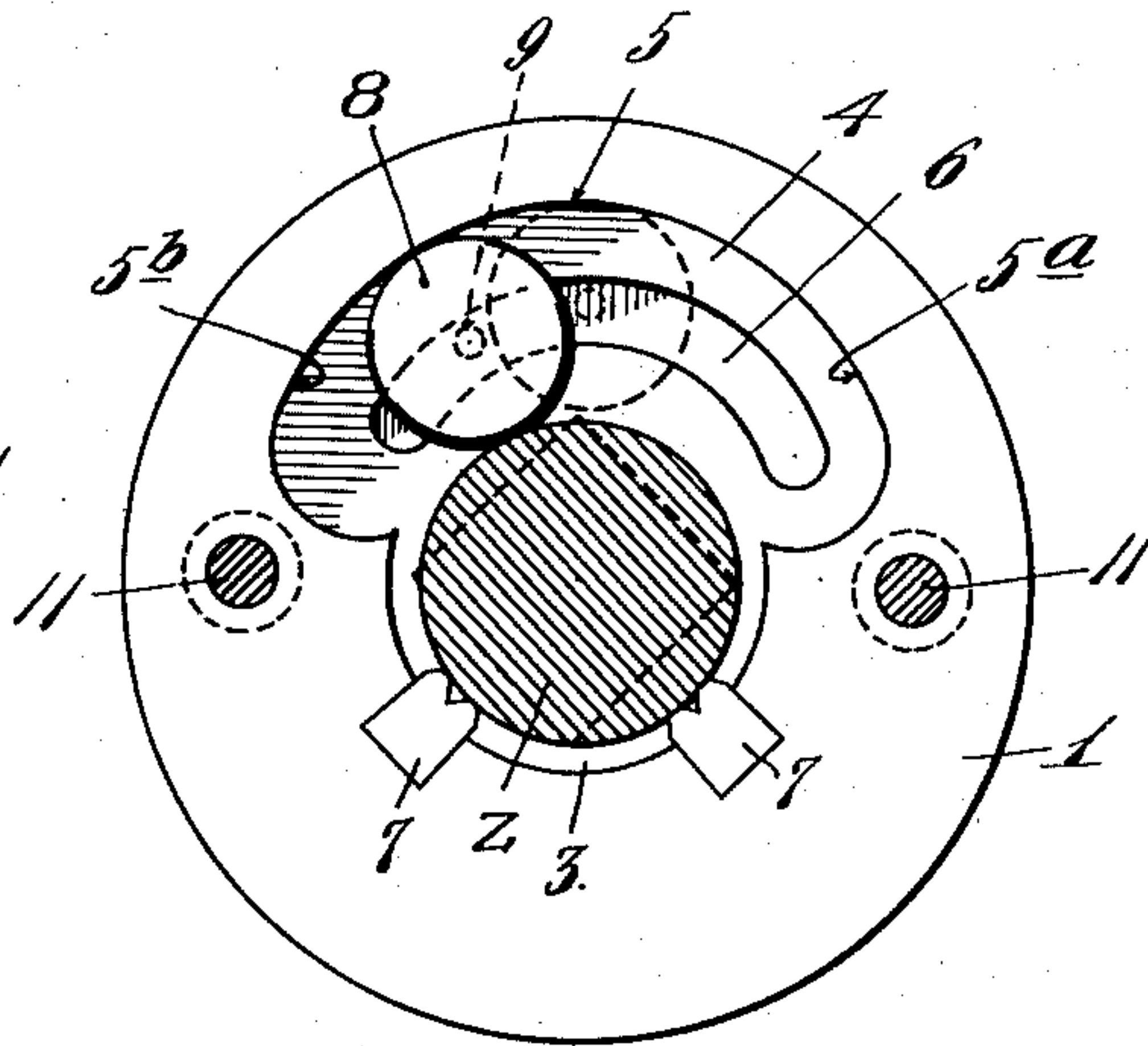


Fig. 2.

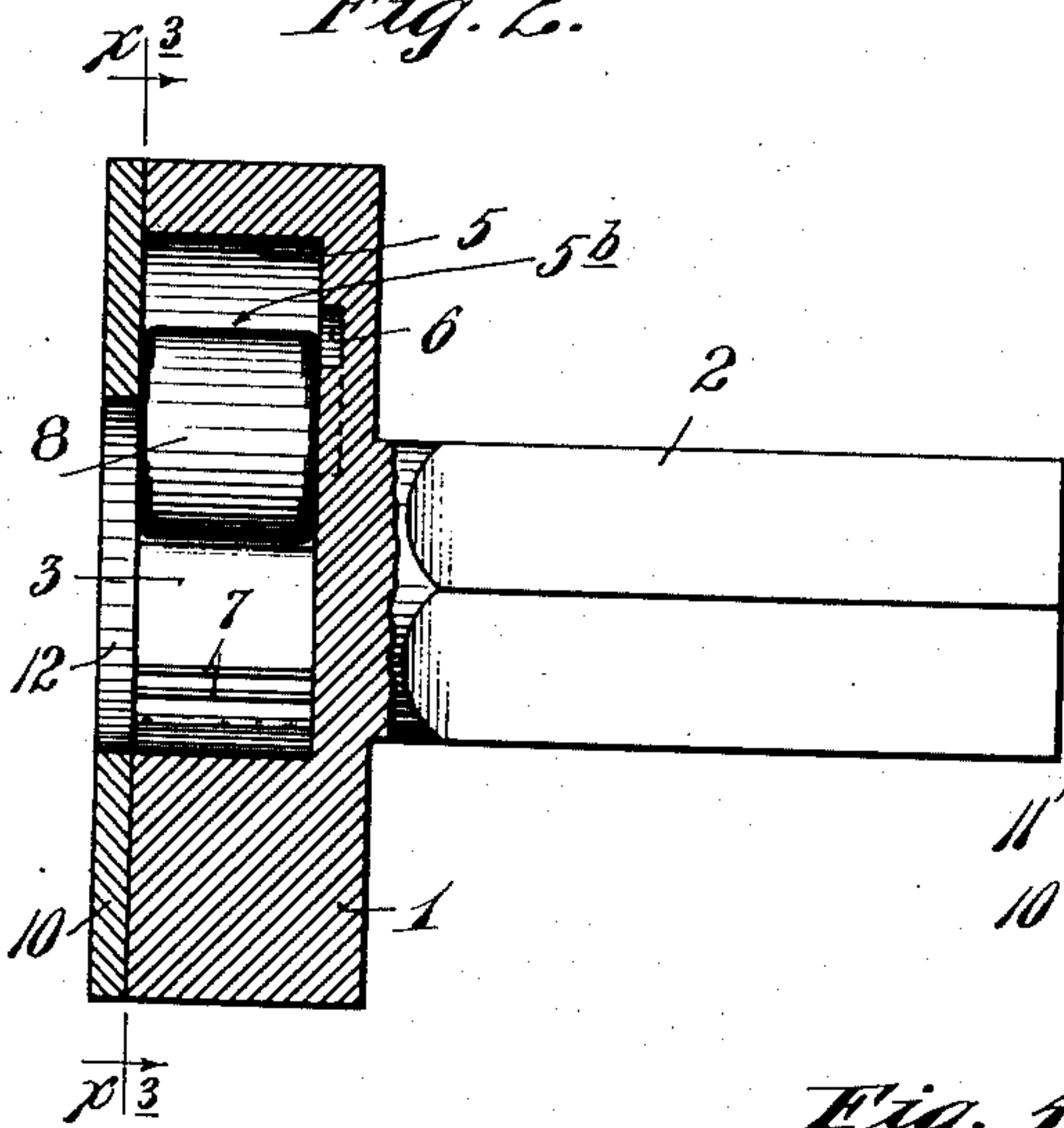


Fig. 4.

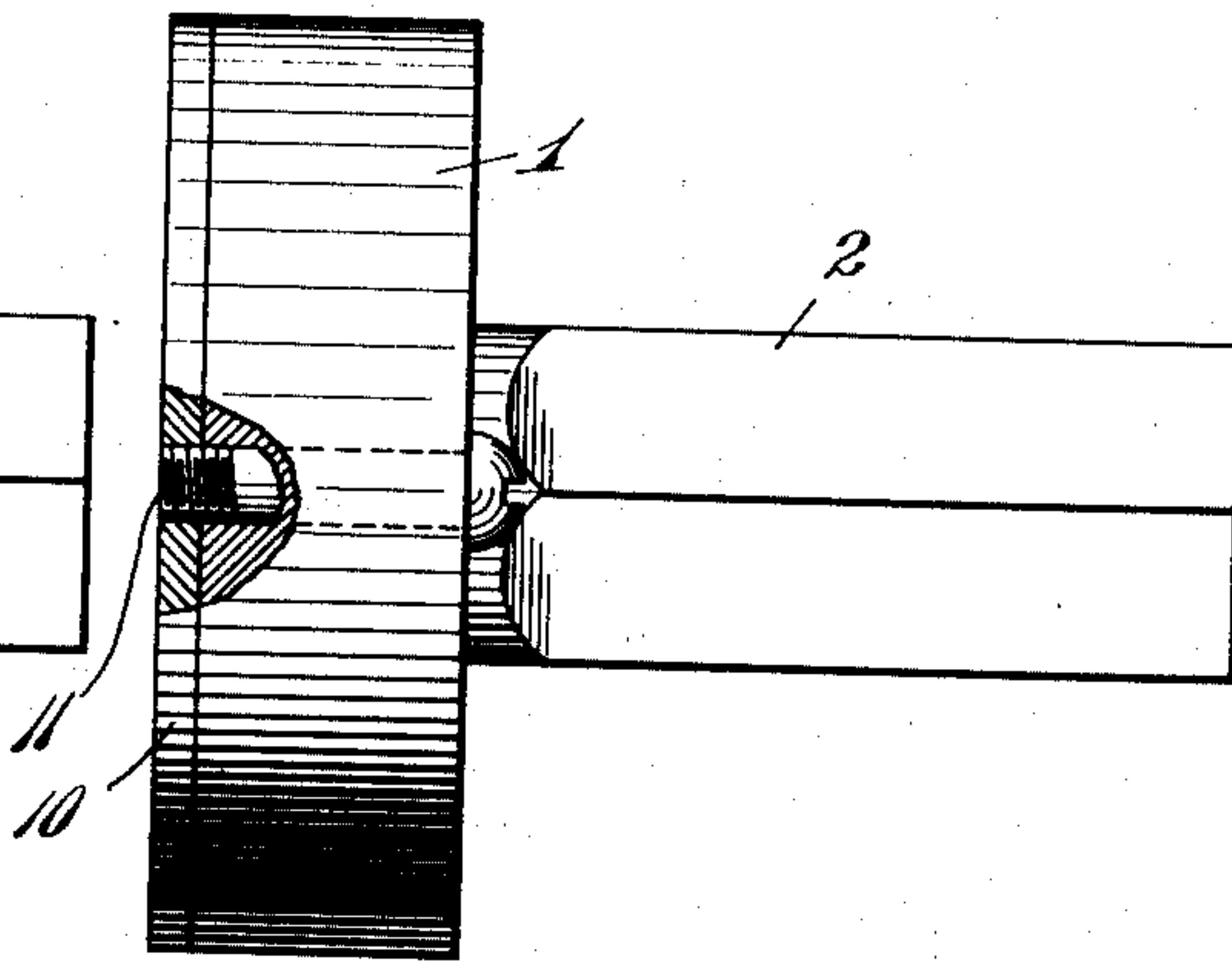
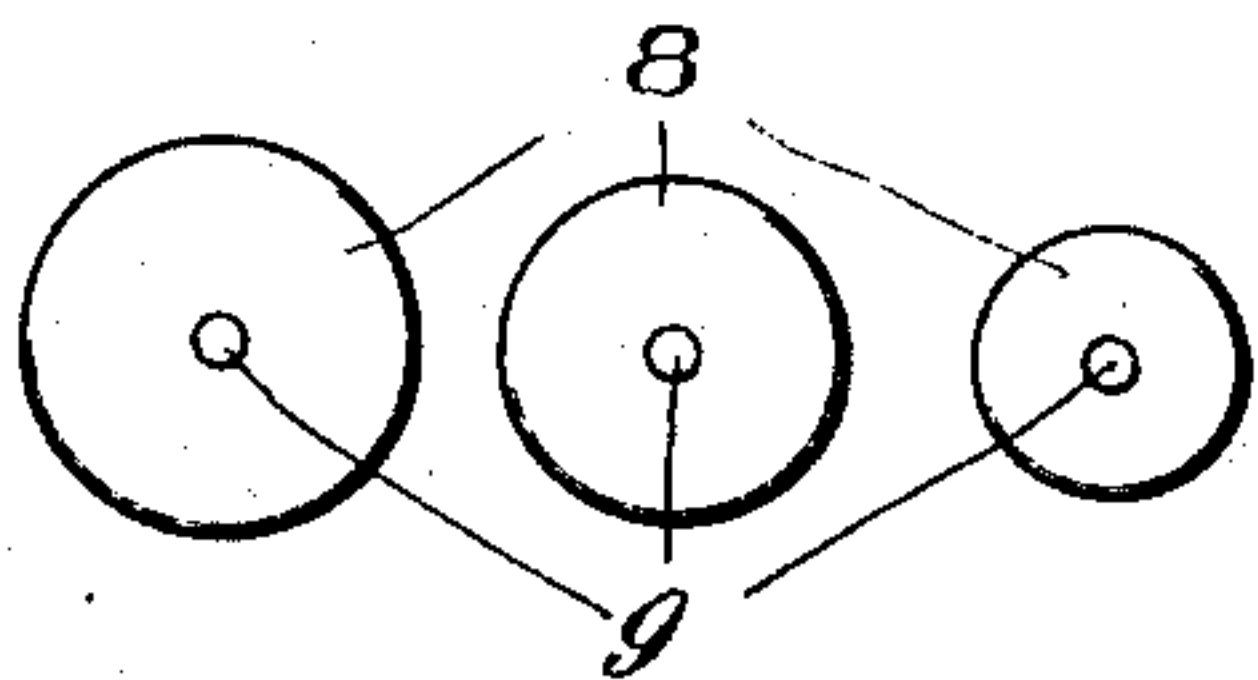


Fig. 5.



Witnesses.

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# UNITED STATES PATENT OFFICE.

WILLIAM JONES, OF MINNEAPOLIS, MINNESOTA.

## STAY-BOLT CLUTCH.

No. 854,189.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed February 8, 1906. Serial No. 300,094.

*To all whom it may concern:*

Be it known that I, WILLIAM JONES, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Stay-Bolt 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 has for its object to provide an improved clutch adapted to grip and hold cylindrical bodies, and to this end it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings which illustrate my invention, like characters indicate like parts throughout the several views.

Figure 1 is an elevation looking at the face of the improved clutch. Fig. 2 is a vertical section taken on the line  $x^2 x^2$  of Fig. 1, some parts being left in full. Fig. 3 is a transverse vertical section taken on the line  $x^3 x^3$  of Fig. 2. Fig. 4 is a side elevation of the improved clutch, some parts being sectioned; and Fig. 5 shows a set of clutch rollers.

The numeral 1 indicates a disk-like head having an angular shank 2, projecting back from its central portion. The head 1 is formed with a central recess 3, with an eccentric roller seat 4, that is in reality a segmental enlargement of the seat 3. This roller seat 4, is formed with a roller engaging bearing surface 5—5<sup>a</sup>—5<sup>b</sup>. At the point 5 the roller engaging surface is farthest from the axis of the head 1, and central seat 3, and it gradually approaches near to the said axis in both directions and from the said point 5 toward the points 5<sup>a</sup> and 5<sup>b</sup>. Within the seat 4, the head 1 is formed with a segmental retaining groove 6 that extends parallel to the roller engaging surface 5—5<sup>a</sup>—5<sup>b</sup>. Hardened steel clamping jaws 7, are firmly set in seats formed in the head 1, and extending radially from the seat 3, opposite to the segmental seat 4. The clutch roller 8, works in the seat 4, and is provided at one end with a small trunnion 9 that works in the retaining groove 6 and free always to bear against the roller engaging surface 5—5<sup>a</sup>—5<sup>b</sup>. The roller is held in working position, and its trunnion 9 is maintained in engagement with the retaining groove 6, by means of a disk-like retaining plate 10, which is rigidly but

detachably secured to the head 1, preferably by machine screws 11. This retaining plate 10, has a central perforation 12, but the same diameter and alined with the central seat 3, of the head 1.

As is evident, when the roller 8 is moved in either direction from the intermediate position shown by dotted lines in Fig. 3, it will be forced nearer to the axis of the head 1 and the seat 3, so that it will clamp a round body, which is to be rotated by the device, against the clamping jaws 7. In Fig. 3, a round body, such as a stay bolt, is shown in section and is marked by the character Z. It is also evident that this device is a reversible clutch which is adapted to rotate a stay bolt or other body in either direction and hence is adapted for use to screw a stay bolt into its seat in a boiler or to turn the same out of its seat. It is also evident that the clutch will very firmly hold a bolt or other body which is to be rotated thereby, and that the roller and cooperating jaws 7, will clamp or bite upon such body with a force which is proportional to the resistance which the body offers to its rotation. Otherwise stated, the greater the power required to rotate the body gripped by the clutch, the greater will be the biting action of the clutch thereon, so that it is impossible for the clutch to slip over a body once gripped thereby. The clutch is quick in its action and may be very easily applied to, or removed from the body to be rotated.

For clamping bolts or bodies of different diameter, clutch rollers 8, of different diameter may be employed. A set of these rollers of different diameter is shown in Fig. 5. The one roller may be substituted for another by removing the retaining plate 10, which may, of course, be very quickly and easily done. In order that the rollers of different diameter may be used in the device described, the width of the retaining groove 6 must be considerably greater than the diameter of the trunnions 9, of said rollers. The obvious function of the retaining groove 6, is to prevent the roller, when not in action, from dropping down into the central seat 3, of the head 1.

The improved clutch above described, while adapted for a great many uses, is especially adapted and has been extensively used for screwing stay bolts into and out of boilers. The device is also particularly well adapted to be operated by small portable



pneumatic tool or other portable source of power. The clutch, so-called, is of course adapted to be used as a chuck for gripping and holding bodies of various forms for various purposes.

What I claim is:

1. A clutch of the character described, comprising a head provided with an open recess adapted to receive an object to be clamped and having an eccentric roller seat that approaches more closely to the axis of said head in two directions from an intermediate point, and a clutch roller loosely mounted to freely travel on said eccentric seat and to be automatically forced thereby onto the object to be held, when the clutch is rotated in either of two directions, the reversely extended surfaces of said roller seat, both having materially greater curvature than the said roller, substantially as described.

2. A clutch of the character described, comprising a head provided with a recess and having an eccentric roller seat, a clutch roller mounted to travel on said eccentric roller seat and to be forced by said seat onto the object to be held, and a disk-like retaining plate, detachably secured to said head and perforated centrally to permit the clutch device to be applied to the object to be clamped thereby, substantially as described.

3. In a clutch of the character described, the combination with a head formed with a

central seat having an eccentric enlargement affording a roller seat, said roller seat having an eccentric roller bearing surface and a segmental retaining groove, of a clutch roller in said roller seat, arranged to travel over said eccentric bearing surface and provided with a trunnion working in said retaining groove, and a roller retaining plate detachably secured to said head and provided with central perforations permitting the clutch to be applied to the device to be rotated or held thereby, substantially as described.

4. The combination with a head 1, having a central seat 3, a roller seat 4, a retaining groove 6 and clamping jaws 7, said roller seat 4 having an eccentric roller engaging surface that more closely approaches the axis of said head in two directions from its intermediate portion, of a roller 8 within said seat 4, mounted to travel over said eccentric roller engaging surface and provided with a trunnion 9, working in said retaining groove 6, and a roller retaining plate 10, detachably secured to said head 1, and provided with a central perforation 12, substantially as described.

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

WILLIAM JONES.

Witnesses:

MALIE HOEL,

F. D. MERCHANT.