No. 892,623. PATENTED JULY 7, 1908.

F. H. RICHARDS.

ADJUSTING AND LOCKING DEVICE.

APPLICATION FILED MAY 24, 1901.

Fig. 1.

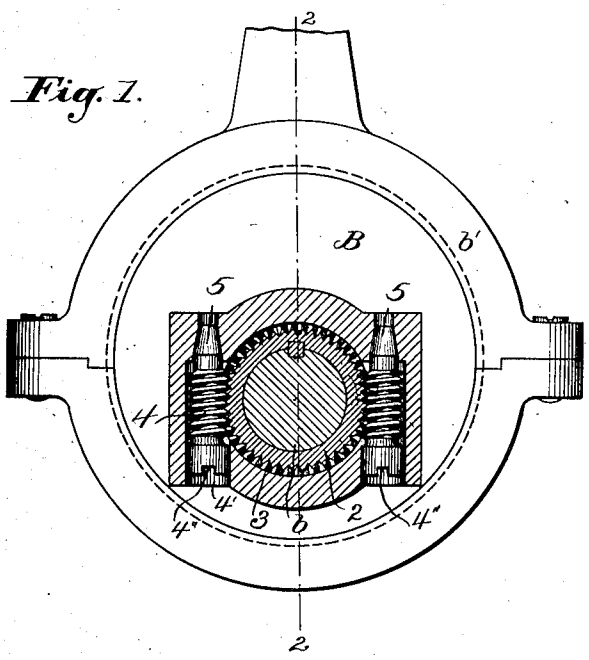


Fig. 2.

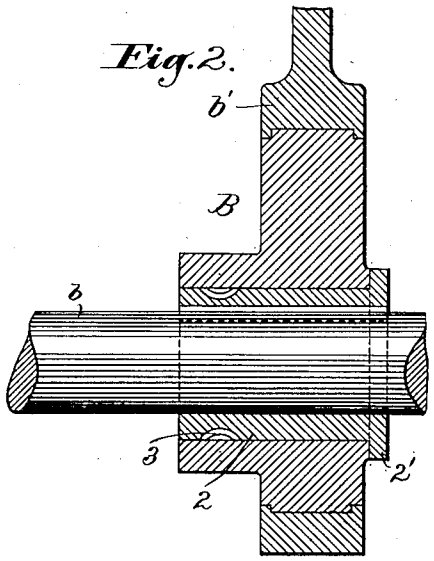


Fig. 7.

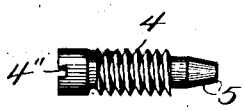


Fig. 5.

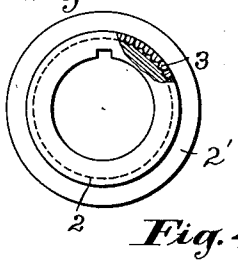


Fig. 6.

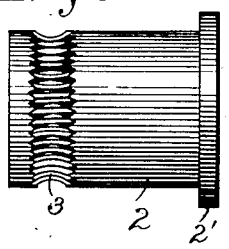


Fig. 3.

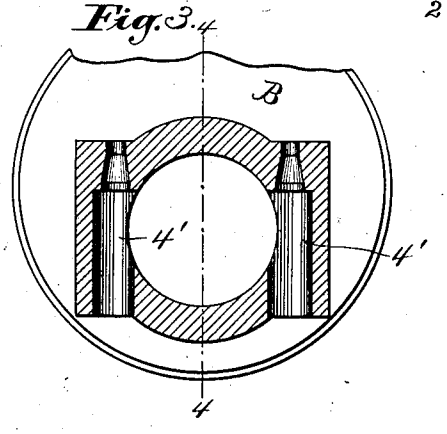
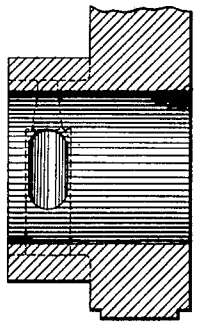


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

ADJUSTING AND LOCKING DEVICE.

No. 892,623. Specification of Letters Patent. Patented July 7, 1908.

Application filed May 24, 1901. Serial No. 61,703.

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Adjusting and Locking Devices, of which the following is a specification.

The invention relates to combined adjusting and locking devices, and has for its object the provision of means for adjusting a machine element to a precise rotarial position, in which position it may be held or locked against displacement.

My invention includes as one of its features a plurality of rotative members or actuators for imparting movement to and also for holding a rotatable member, each actuator serving not only as a means for effecting the rotarial adjustment of the machine element but also in coöperation with other actuators to effectually lock the parts in the position to which they may have been adjusted.

The invention is shown applied in the present drawing to an eccentric, it being adapted, as illustrated herein, for shifting the angular position of the eccentric with relation to the shaft upon which it is mounted. It will, of course, be understood, however, that this particular machine element is illustrative only of an application of the device, which, in general, is adapted, as before stated, for obtaining a rotarial adjusting movement of a part or element and effecting the locking thereof in a definite position.

In the drawing, Figure 1 is a partly elevational, partly sectional view of the device as applied to an eccentric, the section being taken through the hub of the eccentric and showing the actuators in position. Fig. 2 is a sectional view on the line 2—2 of Fig. 1. Fig. 3 is partly an elevational and partly a sectional view of the eccentric, the section being similar to that of Fig. 1, while in the figure the actuators and various other associated parts are removed. Fig. 4 is a sectional view on the line 4—4 of Fig. 3. Fig. 5 is an end view of a part for coöperating with the actuators embraced in the device, this part being shown as a sleeve rotarially of which the eccentric may turn during its adjustment. Fig. 6 is a side elevation of this part; and Fig. 7 is a view of one of the actuators employed in the device.

Similar characters of reference designate corresponding parts in all figures.

The member, designated in a general way in the present specification and drawing by B and whose rotarial adjustment the present device is designed to effect, is herein shown as an eccentric whose operating shaft is designated by *b*. This eccentric is provided with the usual eccentric-strap *b'* which, as a result of the rotation of the eccentric, is reciprocated in the well-known manner.

The present invention is adapted to effect, as before stated, the angular adjustment of this eccentric or member B with reference to the shaft *b*, and the actuating means for the purpose embodies, in general, a series of engaging and coöperative shoulders which are preferably spirally arranged with relation to each other, whereby a rotation of the actuator results in a turning or rotating movement of the member whose shoulders engage with those of the actuator. For the purpose of locking the parts in a definite position I have provided two actuators which are adapted to rotate the member in opposite directions. The parts are so organized that rotation of the adjustable member in either direction by the rotation of one actuator serves through the operation of the said shoulders to move the idle actuator to a position in which its movement is checked and frictionally prevented with a restraining force increasing in proportion as the first actuator is operated. This checking movement of each actuator also reacts upon the other, resulting in the movement of the manipulated actuator likewise to a position in which its rotation is checked.

As organized in the present construction, the shaft *b* is provided with a fixed sleeve 2 keyed or otherwise secured to the operating shaft. At one end this sleeve 2 is provided with a flange 2', while on this sleeve the eccentric is mounted to rotate. The shoulders herein referred to are formed in part upon this sleeve, being herein shown in the form of thread sections 3 formed in the exterior surface of the sleeve, while the actuators consist of screws 4 located in appropriate sockets 4' in the hub of the eccentric in such positions as to permit the shoulders formed by their

threads 4^3 to engage with the shoulders of thread sections 3. Each screw 4 is shown as provided with a cross-slot 4″ in its head for its convenient manipulation.

Evidently, when each screw is turned in a direction tending to urge it inward toward the bottom of its socket the resulting movement of the shaft will be in opposite directions for the two screws. Each screw in the present instance is adapted to engage with a friction surface, each screw being here shown as provided with a conical portion 5 at its end which engages with a corresponding recess 5′ at the bottom of the socket. Upon the examination of Fig. 1, it is evident that upon turning each screw in the aforesaid direction the tendency is to force the opposite screw into firmer engagement with its socket, the result being that the engaging friction surfaces serve to effectually check and hold the screw not only from longitudinal but also from angular movement. Further rotation of the manipulated screw now moves the same axially upon the relatively-fixed shoulders 3 carrying this screw likewise into firm frictional contact with its socket. Of course, instead of forming the shoulders 3 upon a separate member they may be formed directly upon the shaft itself. The present device affords, therefore, means for securing the rotarial adjustment of a part or element whereby the angularity thereof with reference to its shaft, etc., may be altered, while by the continued manipulation of either or both actuators when in position the parts are firmly fastened and held in their adjusted position.

In my copending application for adjusting devices, Serial No. 13,867, filed April 23, 1900, there is claimed a structure which is disclosed to a certain extent in the present application; namely, a pair of members one of which is rotatably mounted in the other, the rotary member being provided with a worm, and a pair of screws carried by sockets in the other and engaging the worm for effecting rotary adjustment of said member.

Having described my invention, I claim—

1. The combination with a pair of members one of which is an eccentric adjustable relatively to the other, of an actuator for effecting such adjustment, one of the said members having a smooth-walled socket in which said actuator is located and the other member having shoulders engaging shoulders on the actuator; and a device operatively connected with the said member on which the shoulders are formed and which moves toward a locking position when the actuator is operated.

2. The combination with a pair of members one of which is an eccentric adjustable relatively to the other, of an actuator for effecting such adjustment, one of the said members having a smooth-walled socket in which said actuator is located and the other member having shoulders engaging shoulders on the actuator; and a device operatively connected with the said member on which the shoulders are formed and which moves toward a locking position when the actuator is operated, said device having a friction part which is shifted into its engaging position when the device moves to its locking position.

3. The combination with a pair of members one of which is an eccentric angularly adjustable in both directions relatively to the other member, of a pair of actuators severally for effecting such respective adjustments, one of the said members having a pair of sockets in which said actuators are located and the other member having shoulders engaging with shoulders on the actuators, and said actuators having friction parts adapted to seat themselves in cavities connecting with the respective sockets.

4. The combination with a pair of members one of which is an eccentric rotatably mounted on the other, of a pair of screws engaging with a worm formed on the said other member for effecting the rotary adjustment of the eccentric, said screws being located in sockets formed in the eccentric.

5. The combination with a pair of members one of which is an eccentric rotatably mounted on the other, of a pair of screws each having a tapering end part and engaging with a worm formed upon the said other member for effecting the rotary adjustment of the eccentric, said screws being located in sockets formed in the eccentric and being adapted to seat themselves in tapering cavities formed at the bottoms of said sockets.

6. The combination with a pair of members one of which is an eccentric angularly adjustable in both directions relative to the other member, of a pair of screw-like actuators severally for effecting such respective adjustments, said actuators being adapted to engage with shoulders upon one of the said members and being longitudinally shiftable with respect to the other of said members.

7. The combination with an eccentric, of a shaft, having a worm formed on its periphery; and a pair of screws disposed on opposite sides of said shaft and having tapering end portions, said screws being seated in sockets formed in the hub portion of the eccentric and engaging with the worm upon said shaft.

8. The combination with a pair of members one movable within the other, of means carried by each member coöperating to effect an adjustment of the two members, and the adjusting means being fashioned to frictionally lock the adjustment.

9. The combination with a shaft, of a sleeve mounted thereon and having a worm formed on its periphery, and a pair of screws disposed on opposite sides of said sleeve and having

tapering end portions seated in sockets formed in a portion of one of said members and engaging with the worm upon said sleeve.

10. The combination with a shaft having worm teeth formed on its perimeter, of an eccentric mounted upon said shaft and having sockets disposed on opposite sides of said shaft and provided at their bottoms with tapering recesses, and a screw having a tapered end seated in each of said sockets.

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