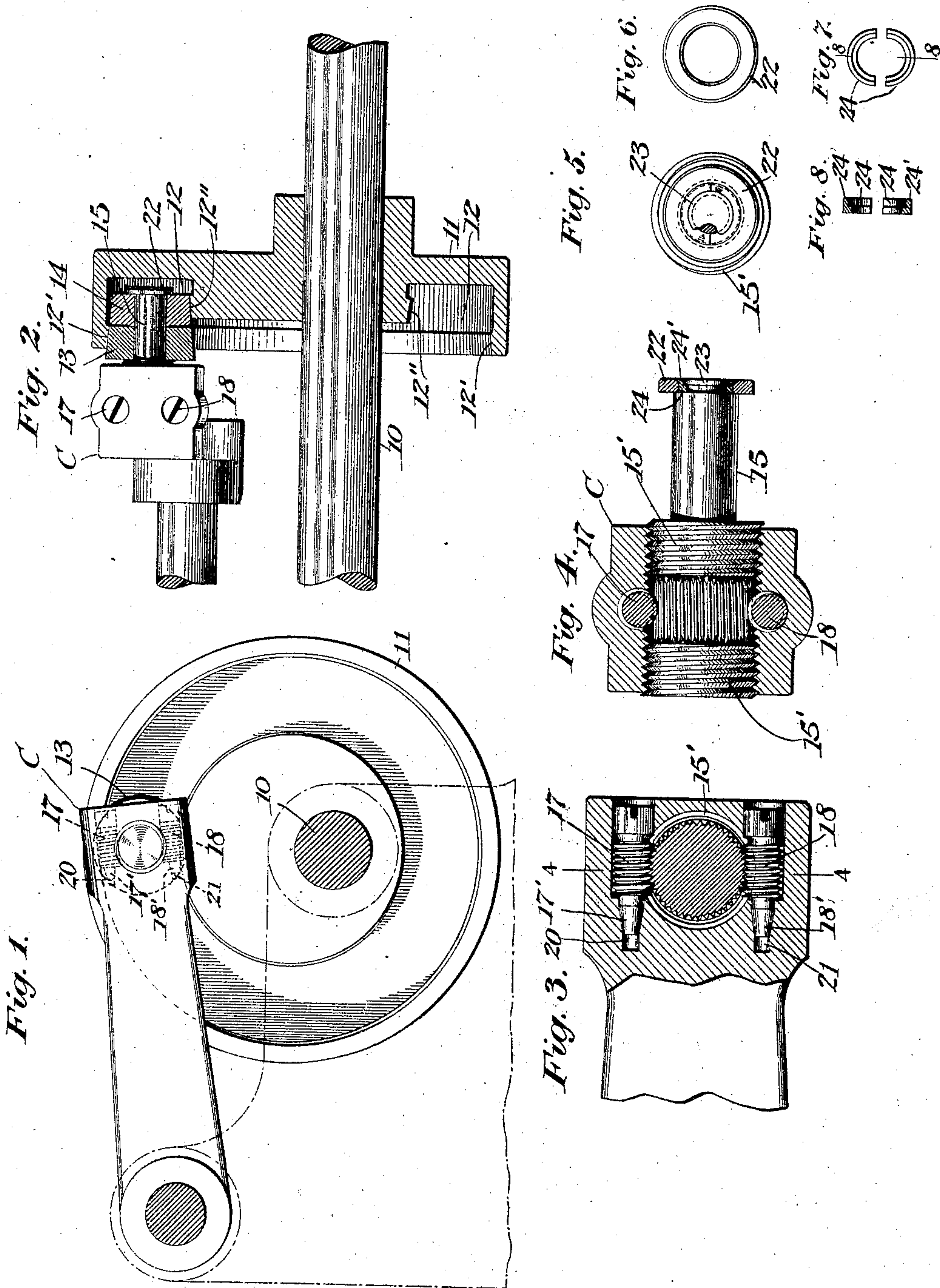


No. 850,252.

PATENTED APR. 16, 1907.

F. H. RICHARDS.
ADJUSTING DEVICE.

APPLICATION FILED APR. 23, 1900.



Witnesses:

Chas. P. Schuch

Geo. H. Hoffman

Inventor:

F. H. Richards

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

ADJUSTING DEVICE.

No. 850,252.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed April 23, 1900. Serial No. 13,867.

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 Devices, of which the following is a specification.

This invention relates to adjusting devices, and has for one of its objects the provision of means for adjusting a stud or similar member to a precise working position, in which it may be held or locked against displacement.

My invention includes as one of its elements a rotative member or actuator for imparting movement to and also for holding a rotatable member, while in the present organization the rotatable member is adapted to have a longitudinal shifting movement in addition to a rotary movement.

Another feature of my invention relates to the employment, in connection with the rotative member, of means for checking the movement of and locking the various members in an adjusted position, the several organized and coacting elements—namely, the rotatable member, the rotative member, and the checking and locking means—forming a self-locking adjusting device especially adapted for use in connection with cam-roll studs and similar machine elements which require longitudinal adjustment to a precise working position.

The present invention also embodies a construction for cam-rolls and a relation of the latter to each other and to their actuating cam-surfaces especially designed to form a satisfactory working combination in which looseness resulting from wear or from other causes may be taken up by a simple adjusting movement.

The invention in its preferred construction is illustrated in the accompanying drawings, in which—

Figure 1 shows my invention applied to a cam-actuated carrier. Fig. 2 is a central section of the cam and of rolls actuated thereby. Fig. 3 is a sectional detail and illustrates on an enlarged scale the roll-carrying end of the carrier. Fig. 4 is a section on line 4 4, Fig. 3. Fig. 5 is an end view of the roll-stud; and Figs. 6 to 8, inclusive, are details of several parts which serve to retain the rolls in place on the stud.

Similar characters designate like parts in the different figures of the drawings.

As before stated, the primary object of my invention is the provision of a device whereby a cam-roll stud or other analogous member may be adjusted to a precise working position, and one way in which this may be done is clearly illustrated in the drawings, in which a shaft 10 is represented having mounted thereon a cam 11, provided with a groove 12, the walls of which present a pair of coacting cam-faces 12' 12'' in engagement with rolls 13 and 14, respectively. These rolls 13 and 14 are slightly tapered to correspond to the faces 12' 12'', which are similarly formed. It will be seen, therefore, that when a stud 15, upon which said rolls may be journaled, is moved with the same toward the cam, as seen in Fig. 2, the roll-surfaces are brought into closer contact with their respective actuating cam-faces, and vice versa. This disposition of the working faces of the cam members and cam-rolls at an angle to the line of adjustment of the supporting-stud, as seen in Fig. 2, is particularly advantageous, since a slight axial movement of the stud, and with it the supported rolls, serves to take up any wear or looseness arising from other causes and to make the parts fit snugly in contact with each other. The shifting of the roll-stud longitudinally may be accomplished in the manner shown in Figs. 3 and 4, in which the longitudinally-shiftable member or stud 15 is provided with screw-threads 15', in engagement with similar threads in the head of a carrier C, so that the rotation of said stud will produce a longitudinal shifting movement of the stud.

Preferably the stud is provided with a series of shoulders which may be disposed obliquely to the screw-threads above mentioned and are shown herein as in the nature of teeth engaged by coacting shoulders, illustrated as being threads of rotative screws 17 and 18, either of which may serve as an actuator for turning the stud, while the other serves as a check for the former. Both rotative members are actuating-screws, being disposed oppositely to adapt them for turning said studs readily in opposite directions. Both of the screws 17 and 18 are seated in this case in the head portion of the carrier C and may have their inner ends tapered, as at 17' and 18', to adapt them to enter conical

recesses 20 and 21 in the head, this construction providing an efficient means for frictionally preventing accidental rotation of the screws after they have been properly seated, and thus locking the parts.

In the illustrated construction the shoulders with which the actuator-screws 17 and 18 cooperate are disposed between the screw-threads 15' 15', and hence the portion of the stud with which such actuators engage is located between bearing portions which serve to steady the stud in the carrier or member C. The relation between either one of the actuator-screws and the shoulders upon the stud with which it engages is similar to that existing between a worm and a worm-wheel, and, in fact, the means for turning the stud consists of a worm-wheel in operative relation with a pair of worms.

The rolls 13 and 14 are, as above stated, journaled on the stud 15 and may be held in place thereon by a collar or washer, such as 22, secured to the stud 15 in a manner clearly illustrated in Figs. 5 to 8, inclusive. The stud 15 has at its forward end a flange 23, between which and the main body portion of the stud may be placed a pair of half-rings 24, the original shape or form of which is shown in section in Fig. 8. The collar 22 is then slipped over the half-rings, as shown in Fig. 4, whereby the latter are prevented from falling off, and the outer edges 24' are then headed over to keep the collar in place.

The present invention affords a simple method for effectively and securely holding a roll-stud in a position to which it may have been moved in effecting an adjustment of a supported roll or rolls as well as a construction and a relation of coacting cam and cam-roll surfaces in which a simple movement accomplishes the adjustment and intimate contacting of the parts.

Having described my invention, I claim—

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

2. The combination with a pair of members adjustable relatively to each other, of an actuator for effecting such adjustment, one of said members having a smooth-walled socket in which said actuator is located, and the other member having shoulders engaging with shoulders on the actuator; and a device operatively connected with the member on which the shoulders are formed and con-

structed with a friction member for frictional engagement with the other of said members and which moves toward a locking position when the actuator is operated, said friction member being shifted into its engaging position when the device is moved to its locking position.

3. The combination with a pair of members adjustable relatively to each other, of a pair of actuators for effecting such adjustment, one of 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 of the respective sockets.

4. The combination with a pair of members adjustable relatively to each other, of an actuator for effecting such adjustment, one of the members having a socket in which said actuator is located, and the other member having shoulders engaging with shoulders on the actuator, and said actuator having a friction part adapted to seat itself in a cavity of said socket.

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

6. In a device of the class specified, the combination with a pair of members one of which is rotatably and longitudinally shiftable with respect to the other and the other of which members is provided with a pair of sockets, of a pair of rotative actuators operatively connected with the said rotatable member and each of which is adapted to move the rotatable member in one direction and to lock it from movement in the reverse direction, said members being adapted to fit frictionally tight in said sockets.

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

8. The combination with a pair of members, one of which is rotatably mounted in the other, of a pair of screws each having a tapering end portion and engaging with a worm formed upon the rotative member for effecting the rotary adjustment of the member, said screws being located in sockets

formed in the other member and being adapted to seat themselves in tapering cavities formed at the bottom of said socket.

9. In a device of the class specified, the combination with a pair of members one of which is rotatable and longitudinally shiftable and is provided with shoulders, of a pair of screws engaging with the shoulders, one of said members having cavities with the side walls of each of which a corresponding screw engages when the screw is actuated to lock the parts.

10. In a device of the class specified, the combination with a pair of members one of which is rotatable and is provided with shoulders and has a threaded portion for effecting its longitudinal adjustment, of a pair of screws engaging with the shoulders, one of said members having cavities with the side walls of each of which a corresponding screw engages when the screw is actuated to lock the parts.

11. In a device of the class specified, the combination with a longitudinally-shiftable member provided with shoulders, of a tapering cam-roll mounted on the member; a cam having a similarly-formed cam-surface with which the cam-roll is adapted to engage, an actuator engaging with shoulders on the rotatable member, and means for locking the member when adjusted.

12. In a device of the class specified, the combination with a rotatable and longitudinally-shiftable member provided with shoulders, of tapering cam-rolls mounted on the member, cams having similarly-formed cam-surfaces with which the rolls are adapted to engage; an actuator engaging with shoulders on the rotatable member; and means for locking the member when adjusted.

13. In a device of the class specified, the combination with a pair of members, one of which is rotatable and is provided with shoulders and has a threaded portion for effecting its longitudinal movement, of a pair of screws engaging with shoulders on the rotatable member, one of said members having cavities with the side walls of each of which a corresponding screw engages when the screw is actuated to lock the parts; tapering cam-rolls mounted on the rotatable member; and cams having similarly-formed cam-surfaces with which the rolls are adapted to engage.

14. The combination with a pair of members, one of which is provided with a worm and bearing portions on opposite sides thereof, of a pair of oppositely-disposed screw-like actuators engaging with said worm and each of which is adapted to move to a locking position upon the actuation of the other to adjust the worm-provided member.

15. The combination with a pair of mem-

bers, one of which is provided with threaded portions adapted to engage with a threaded opening in the other member, and with a worm disposed between such threaded portions; of a screw-like actuator engaging with said worm and means for locking the members when adjusted.

16. The combination with a pair of members, one of which is provided with threaded portions adapted to engage with a threaded opening in the other member and with a worm disposed between such threaded portions; of a pair of screw-like actuators engaging with said worm and for locking the members when adjusted.

17. The combination with a pair of members, one of which is provided with threaded portions adapted to engage with a threaded opening in the other member and with a worm disposed between such threaded portions; of a pair of screw-like actuators having tapering end portions adapted to engage with the walls of tapering cavities formed in the other member.

18. A cam provided with a pair of oppositely-facing inclined cam-faces combined with a pair of independently-movable inclined cam-rollers, a stud upon which the cam-rollers are mounted, said stud having threaded portions engaging with a threaded opening in the member on which the said stud is mounted, and a worm intermediate said threaded portions, and a pair of screw-like actuators engaging with said worm.

19. The combination with a pair of members, one of which is provided with threaded portions adapted to engage with a threaded opening in the other member; a worm disposed between such threaded portions, and means for locking the members when adjusted.

20. The combination with a movable member, of a rotating body for actuating the said member and a connection between said member and body embodying a roller and a stud carried by one of these and having a wrist-pin carrying said roller, and means for adjusting said stud and roller in a direction parallel to the axis of the rotating body.

21. The combination with a movable member, of a rotating body for actuating the said member, and a rotary connector between said member and body, and means for adjusting said connector and roller in a direction transverse to the plane of movement of said member and body by its rotation, and for locking said connector in its adjusted position.

22. The combination with a movable member, of a rotating body for actuating the said member, a connector between said member and body and adjustable for varying the distance between the same, and a pair of members respectively for adjusting and locking said adjustable member in its various

positions of adjustment in relation to the rotating body.

23. The combination with a pair of members, of a connector member therefor, having
5 means for causing it to move longitudinally in either direction when rotated in the proper direction, and means for rotating the said member for longitudinally adjusting the same.

10 24. The combination with a connector member having means to cause it to move longitudinally when rotated and means to rotate the said member to longitudinally adjust the same embodying a rack upon said
15 member, and a worm-shaft engaging therewith.

25. The combination with a pair of members, one of which is rotatably mounted in the other, said rotative member having a
20 worm formed upon it and the other of said members having sockets, of a pair of screws located in said sockets and engaging with said worm for effecting the adjustment of the said rotary member.

25 26. The combination with a pair of members, of a connector member therefor carried by one of them and engaging the other, and

having means of connection with the member carrying it for causing it to move longitudinally in either direction when rotated in
30 the proper direction, and means for rotating the said member in each direction for longitudinally adjusting the same.

27. The combination with a pair of members, of a connector therefor carried by one
35 of them and so mounted thereon that it will move longitudinally when rotated, and a pair of members in engagement therewith, either of which is adapted to rotate said member in one direction for longitudinally
40 adjusting it and the other of which during such rotation and adjustment will act as a limiter.

28. The combination with a member having a socket, of a member mounted in such
45 socket and having worm-teeth upon it, and a pair of worms engaging such teeth, one for adjusting the said member in its socket and the other for limiting such adjustment.

FRANCIS H. RICHARDS.

Witnesses:

CHARLES F. SCHMELZ,
C. A. WEED.