E. W. BULLARD.

RATCHET MECHANISM.

APPLICATION FILED SEPT. 13, 1920.

1,388,927.

Patented Aug. 30, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

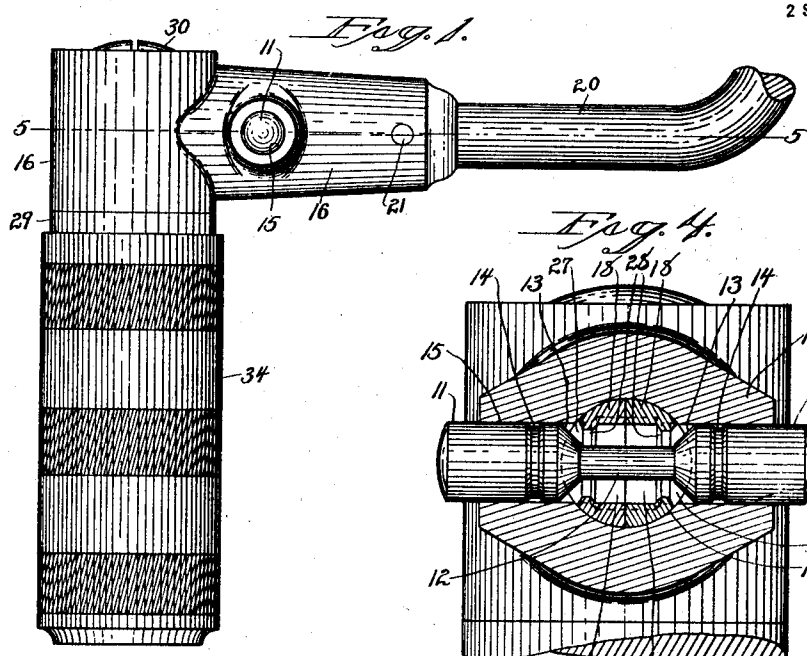


Fig. 4.

Fig. 2.

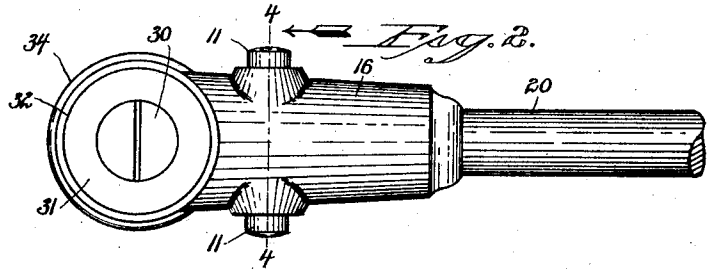
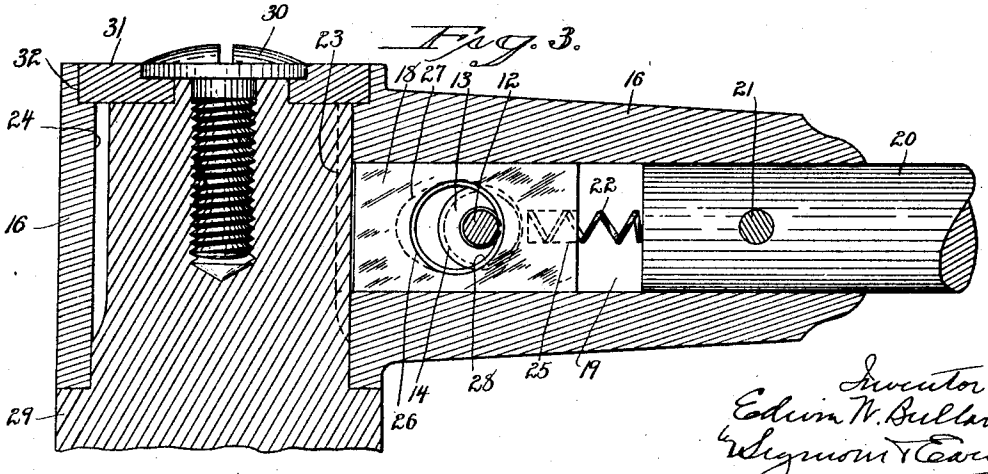


Fig. 3.



Inventor
Edwin W. Bullard
by Sigmund Earle
Atty

E. W. BULLARD.

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2 SHEETS—SHEET 2.

Fig. 5.

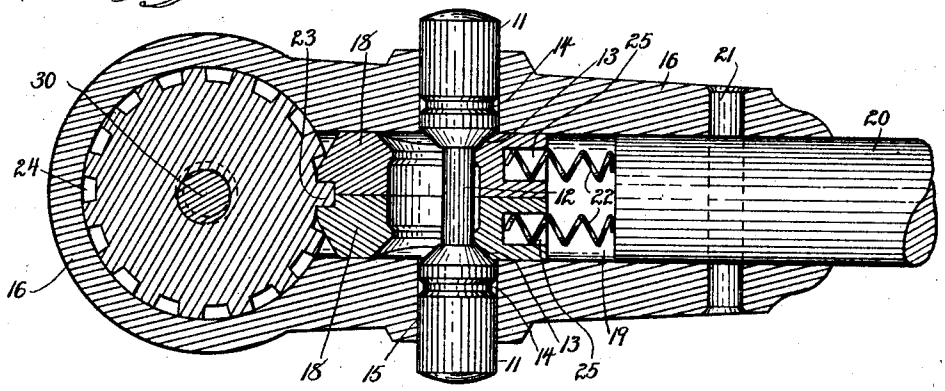


Fig. 6.

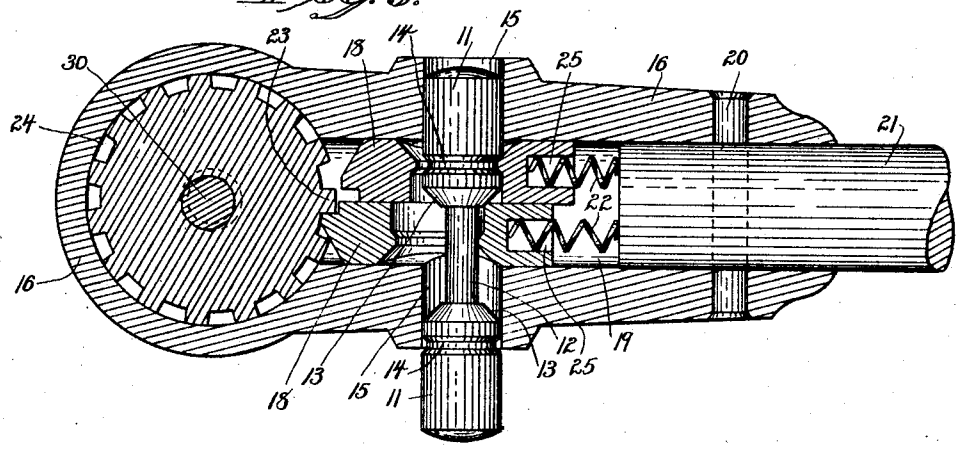


Fig. 8.

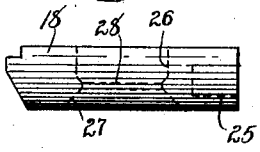


Fig. 7.

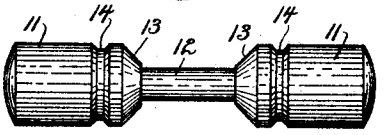


Fig. 9.

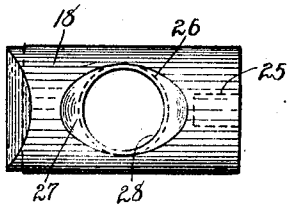
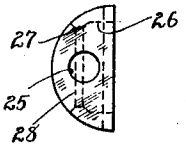


Fig. 10.



Inventor.
Edwin W. Bullard
by Seymour & Earle
Attys

UNITED STATES PATENT OFFICE.

EDWIN W. BULLARD, OF WHITNEYVILLE, CONNECTICUT, ASSIGNOR TO WINCHESTER REPEATING ARMS CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION.

RATCHET MECHANISM.

1,388,927. Specification of Letters Patent. Patented Aug. 30, 1921.

Application filed September 13, 1920. Serial No. 409,859.

To all whom it may concern:

Be it known that I, EDWIN W. BULLARD, a citizen of the United States, residing at Whitneyville, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Ratchet Mechanisms; and I do hereby declare the following, when taken in connection with the accompanying drawings, and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this application, and represent, in—

Figure 1, a view in side elevation of my improved ratchet-mechanism as applied to a bit-brace of which the crank-lever is broken away.

Fig. 2, a plan view thereof.

Fig. 3, an enlarged broken view thereof in vertical longitudinal section showing one of the two pawls in elevation, as well as the end of the crank-lever.

Fig. 4, a view, partly in elevation and partly in transverse section on the line 4—4 of Fig. 2 with its double cam-slide in its intermediate or inoperative position.

Fig. 5, a view, partly in plan and partly in longitudinal horizontal section on the line 5—5 of Fig. 1, also showing the double cam-slide in its inoperative position.

Fig. 6, a similar view showing the slide in one of its operating positions.

Fig. 7, a detached plan view of the slide.

Fig. 8, a detached plan view of one of the pawls.

Fig. 9, a similar view thereof in elevation.

Fig. 10, a rear end view thereof.

My invention relates to an improvement in that class of ratchet-mechanisms employing complementary longitudinally-sliding semicircular contacting pawls, my improved mechanism being designed for use in bit-braces, wrenches and the like, and the object being to produce a simple, durable, convenient and efficient closed-in mechanism of the character described.

With these ends in view, my invention consists in a ratchet-mechanism characterized by having its pawls operated by means of a transversely-arranged double cam-slide manually operated by pressure upon its ends whereby it is pushed in one direction or the other. My invention further consists in certain details of construction and combination of parts as will be hereinafter described and pointed out in the claims.

As herein shown, my invention is embodied in a bit-brace though not so limited as indicated.

In carrying out my invention as herein shown, I employ a double cam-slide, preferably made in one piece and comprising complementary buttons 11 united by a stem 12 of relatively small diameter, each of the buttons being formed at its inner end with a cone-shaped cam 13 flanked by a circumferential detent-groove 14. This cam-slide has sliding movement in both directions in a transverse bore 15 formed about midway the length of the housing 16 of the mechanism and alternately coacts with two longitudinally-slidable contacting semicircular pawls 18 located in a bore 19 concentric with the axis of the housing 16 and at a right-angle to the bore 15 aforesaid. The contacting faces of the said pawls are located in the vertical axis of the mechanism and the noses of the pawls are located in planes parallel with the said axis, whereby I am enabled to make the noses of the pawls of the maximum width. The outer end of the bore 19 receives the crank-lever 20 which is fastened by a pin 21 passing transversely through the outer end of the housing. Two helical springs 22 interposed between the inner end of the bore 19 and the outer ends of the respective pawls provide for moving the same inward into engagement with the teeth of the ratchet 23 which is located in a circular chamber 24 formed in the inner end of the housing and standing at a right angle to the longitudinal axis thereof, the inner ends of these springs entering sockets 25 formed in the outer ends of the pawls.

The said pawls are formed with complementary transverse holes 26 for the reception of the respective buttons of the cam-slide and its centrally-arranged stem. Each of the said holes is expanded at its outer end to form a cam-surface 27 for coaction with the cam 13 of its complementary button 11. Each of the holes 26 is also contracted to form an interior detent-rib 28 for coaction with the circumferential detent-groove 14 of its complementary button.

As shown, the ratchet 23 forming a part of the chuck-head 29 is secured in place within the housing by a screw 30 mounted

in a washer 31 set into a rabbet 32 formed in the top of the housing, concentric with the chamber 24 thereof. The chuck-head as shown is provided with a chuck 34 but these details form no part of my invention.

When the cam slide is in its intermediate position as shown in Figs. 2, 4 and 5, both of the pawls are forced forward by their springs into engagement with the ratchet, which is thus locked against being turned in either direction. When, however, the slide is longitudinally moved in either direction the cam 13 of the button pushed coacts with the cam-surface 27 of the adjacent pawl, whereby the same is forced back into its retired position (Fig. 6) in which it is held by the entrance of the rib 28 of the pawl into the groove 14 of the button.

I claim:

1. A ratchet-mechanism having a housing, a ratchet, a pair of complementary, longitudinally-sliding contacting pawls located in the said housing, and a transversely-arranged double cam-slide mounted in the housing, passing through the said pawls and provided at its ends with complementary cam-surfaces for operating the same.

2. A ratchet-mechanism having a housing, a ratchet, a pair of complementary, longitudinally-slidable contacting pawls located in the said housing, and a cam-slide mounted in the housing at a right angle to the axis thereof, passing through the said pawls and provided with complementary-cam surfaces for the operation thereof, and with complementary means for holding the same in their retracted positions.

3. A ratchet-mechanism having a housing, a ratchet, a pair of complementary, longitudinally-slidable contacting pawls located in the said housing, and a transversely-arranged cam-slide passing through the said pawls and comprising two complementary cam-buttons united by a stem.

4. A ratchet-mechanism having a housing, a ratchet, a pair of complementary, longitudinally-slidable contacting pawls located within the housing, and a transversely-arranged cam-slide mounted in the housing, passing through the said pawls and comprising complementary buttons united by a stem, each button being formed at its inner end with a conical cam-face flanked by a circumferential groove.

5. A ratchet-mechanism having a housing, a ratchet, a pair of complementary, longitudinally-slidable contacting pawls located in the said housing and each formed with a transverse opening, a cam-surface and a detent-rib; and a double cam-slide transversely arranged in the housing, passing through the said cams and provided with complementary cam-surfaces for operating the pawls and with means for coacting with their detent-ribs.

6. A ratchet-mechanism having a housing, a ratchet, a pair of complementary, longitudinally-movable contacting semicircular pawls, the contacting faces whereof are in the vertical central plane of the housing and the noses whereof are parallel to the said plane, and a transversely-arranged cam-slide mounted in the said housing, passing through the said pawls and having complementary cams for the operation thereof.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

EDWIN W. BULLARD.

Witnesses:
ERIK S. PALMER,
A. E. HODGSON.