J. DAHN.

FEED MECHANISM FOR RATCHET BRACES.

APPLICATION FILED OCT. 16, 1909.

1,036,577.

Patented Aug. 27, 1912.

3 SHEETS—SHEET 1.

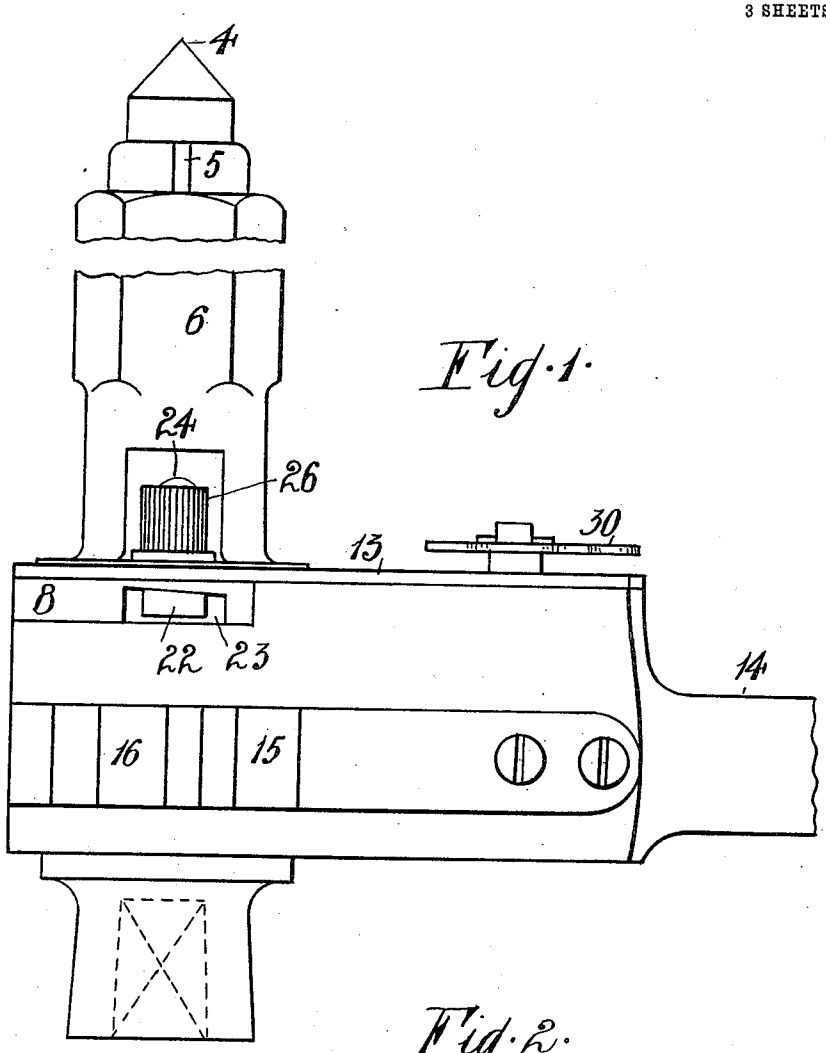
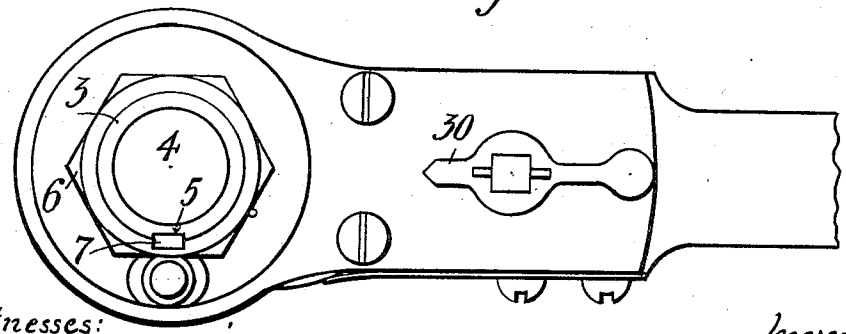


Fig. 1.

Fig. 2.



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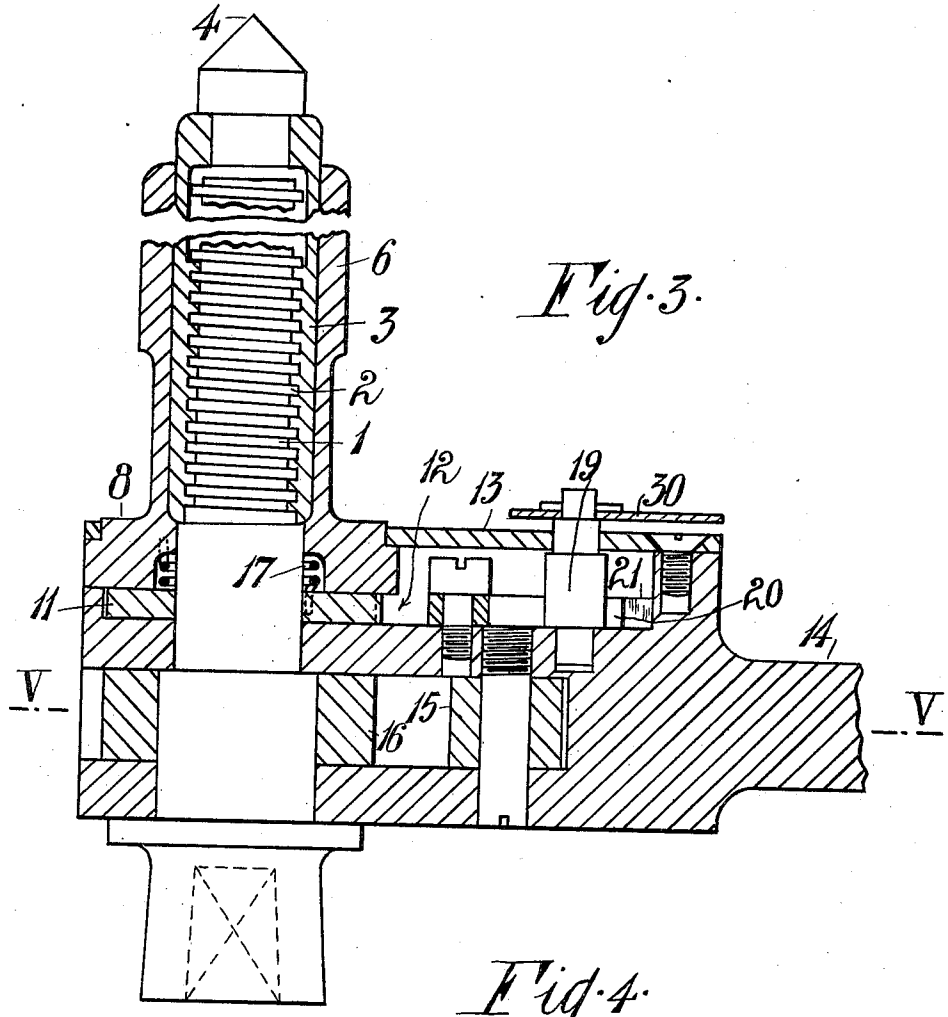
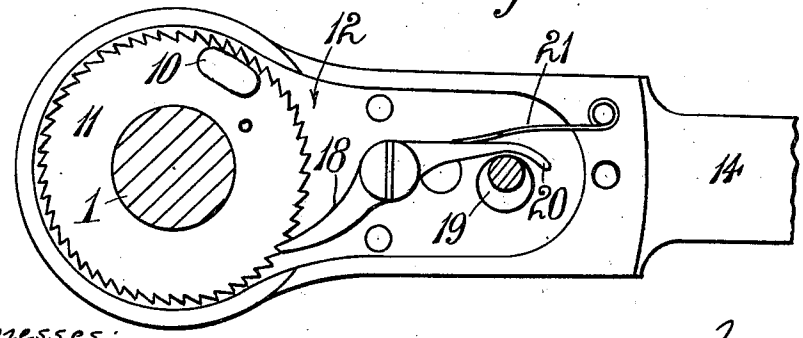


Fig. 3.

Fig. 4.



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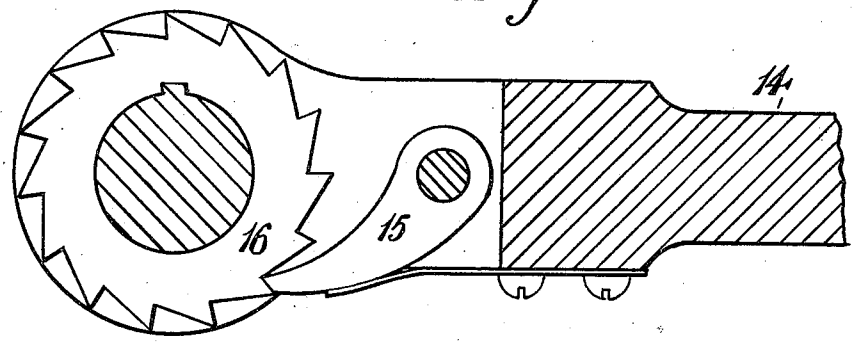
3 SHEETS—SHEET 3.

Fig. 5.



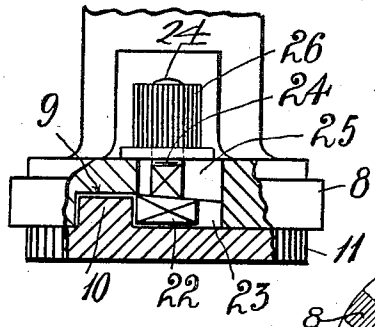


Fig. 6.

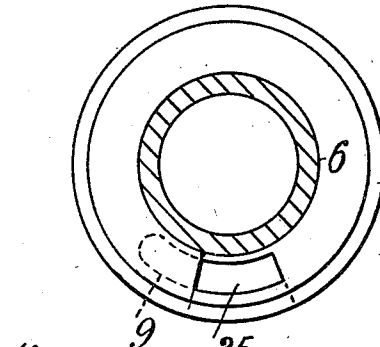


Fig. 7.

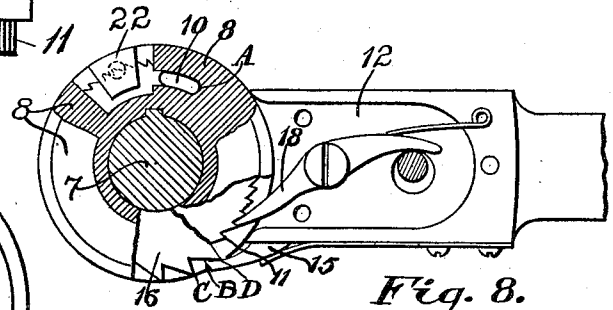


Fig. 8.

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UNITED STATES PATENT OFFICE.

JOHN DAHN, OF NORTH FITZROY, VICTORIA, AUSTRALIA.

FEED MECHANISM FOR RATCHET-BRACES.

1,036,577. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed October 16, 1909. Serial No. 523,028.

To all whom it may concern:

Be it known that I, JOHN DAHN, a subject of the King of Sweden, residing at No. 460 Rae street, North Fitzroy, in the State of Victoria, Commonwealth of Australia, mechanical engineer, have invented Improved Feed Mechanism for Ratchet-Braces, of which the following is a specification.

This invention relates to ratchet braces or drills and particularly the feed mechanism which may be thrown into or out of gear at will and which is capable of being adjusted or regulated as desired, while a further feature consists in the employment of a left-hand threaded feed-screw by means of which a positive feed is assured.

The invention is illustrated by the accompanying drawings whereof—

Figure 1 is a side elevation (broken) of a ratchet brace fitted with the improvements, and Fig. 2 is a plan thereof. Fig. 3 is a vertical section through Figs. 1 and 2. Fig. 4 a plan, partly in section, showing separately the feed ratchet mechanism. Fig. 5 is a horizontal section on line V—V Fig. 3. Figs. 6 and 7 are details partly in section illustrating the means of adjustment for decreasing or increasing the feed.

According to this invention the feed screw 1, which is formed with left-handed threads 2 of any preferred shape or number of threads, engages an elongated threaded nut 3 provided at the end with a center 4 and slidably connected by a longitudinal groove 5 therein to an elongated sleeve 6, (Fig. 2) which is provided with a feather 7 adapted to engage said groove 5.

The inner end of the sleeve 6 is formed with a disk 8 in the face of which is a recess 9 (Figs. 6 and 7) into which fits a projection 10 formed on a ratchet-wheel 11 loosely mounted on the feed screw 1. Said ratchet wheel is seated in a recess or chamber 12 provided with a cover 13 (Fig. 3) and formed in the operating end of the handle or lever 14. Said lever has a pawl 15 in engagement with the usual drill ratchet-wheel 16 connected to the feed screw.

It is important that the ratio of the number of teeth of said ratchet-wheels 11 and 16 is such that there is no common factor by which the numbers thereof are equally divisible. As an example it may be stated that a practical ratio is fifty-two (52) teeth on the feed ratchet-wheel 11, and fifteen (15) teeth on the drill ratchet-wheel 16. The object of this ratio is to cause the pawls of the ratchet wheels 11 and 16 to engage at different times.

The feed ratchet-wheel 11 is connected to the disk 8 of the sleeve 6 by an interposed spring 17, one end of which is secured to ratchet wheel 11 and the other end to the disk 8, (Fig. 3), and which is put in tension on the forward stroke of the handle 14 so as to return said ratchet-wheel to its normal position at the beginning of the backward stroke of said handle.

The feed ratchet-wheel 11 is thrown into gear by means of a spring pawl 18 (Fig. 4) mounted within the covered recess 12 which pawl is operated by an eccentric stud 19 provided with a lever arm 30 outside the cover 13 said stud being adapted to bear against the curved rear end 20 of said pawl. This lever arm also indicates whether pawl 18 is in or out of gear, that is to say whether the feed is automatic or by hand.

The operation of the feed mechanism takes place on the forward or operative stroke of the handle 14, when the pawl 18 is in engagement with ratchet wheel 11. While the ratchet wheel 11 is moved forward, the projection 10 thereon moves also the sleeve 8, which in its turn moves the elongated nut 3, which is secured to said sleeve by means of the feather 5. The screw 1 remains stationary, until it is rotated by means of the pawl 15 and ratchet wheel 16, when the screw and nut 3 travel together and no feed takes place until the next stroke.

The pawl is shown in engagement with the feed ratchet-wheel in Fig. 4 and when the disengaging stud 19 is partially rotated the pawl is moved against the pressure of its spring 21 out of engagement with the teeth of said ratchet-wheel when the feed screw 1 may be fed by rotating the sleeve 6 by hand in the usual manner. The amount of feed is regulated by means of a wedge shaped slidable stop 22 (Figs. 1 and 6) mounted in a seating 23 formed in the face of the disk 8 and adjoining the forward end of the recess 9 therein. Said stop has a threaded shank 24 which passes through a slot 25 in the seating of said disk and is provided with a nut 26 by which the stop 22 is secured at any distance from the forward end of said recess. By this construction the extent of operative movement of the projection 10 formed on the feed ratchet-wheel 11 is regulated, as the farther away

said stop is moved the greater is the amount of lost motion of the feed ratchet-wheel, and conversely, the closer the stop to the recess or projection the greater is the turn of the sleeve 6 which operates the feed nut 3. Moreover the feed may be regulated according to the metal being operated upon and size of hole being drilled, and moreover the feed may be reduced to a minimum or discontinued altogether when the hole being drilled is almost completed thus preventing the edges being broken and insuring a perfect bore.

The purpose of the left threaded screw 1 is as follows: As the friction between the threaded surface of the feed screw 1 and nut 3 is greater than the friction between the cutting edge of the drill and metal that is being bored, the use of a right-handed screw would, when feeding on backward stroke, move the drill backward and away from its work. By using a left-handed screw, this is reversed, and as the movement of the drill and the feed is in the same direaction, no backward slip can take place, hence a positive feed is obtained.

I claim.

1. In feed mechanism for ratchet braces, the combination with a drill ratchet-wheel and handle, of a left-hand threaded feed screw, a nut thereon and a sleeve slidably and non-rotatably connected therewith, a feed ratchet-wheel connected to said sleeve and adapted to be intermittingly rotated by a pawl on said handle.

2. In feed mechanism for ratchet braces, the combination with a drill ratchet-wheel and handle, of a left-hand threaded feed screw, a nut thereon and a sleeve slidably and non-rotatably connected therewith, a feed ratchet-wheel provided with a projection, a disk formed on the end of said sleeve, and provided with a recess with which said projection engages, a spring connecting said sleeve and ratchet-wheel together, an eccentric, a spring pawl on the said handle controlled by said eccentric and adapted to engage said ratchet-wheel.

3. In feed mechanism for ratchet braces, means for regulating the feed comprising a left-hand threaded feed screw, a nut thereon and a sleeve slidably and non-rotatably connected therewith, a disk on the end of said sleeve formed in its face with a recess, a feed ratchet-wheel provided with a projection adapted to engage said recess and an adjustable stop on said disk adapted to be moved to or from the forward end of said recess.

4. In feed mechanism for ratchet braces, means for regulating the feed comprising a left-hand threaded feed screw, a nut thereon and a sleeve slidably and non-rotatably connected therewith, a disk on the end of said sleeve formed in its face with a recess, a feed ratchet-wheel provided with a projection adapted to engage said recess and an adjustable stop mounted in a seating in said disk adjoining said recess, a threaded shank on said stop adapted to pass through a slot in said seating and a nut for securing said shank and stop.

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

JOHN DAHN.

Witnesses:
EDWARD WATERS,
EDWARD N. WATERS.