

(No Model.)

J. ZIRIKELBACK.
RATCHET BIT BRACE.

No. 438,338.

Patented Oct. 14, 1890.

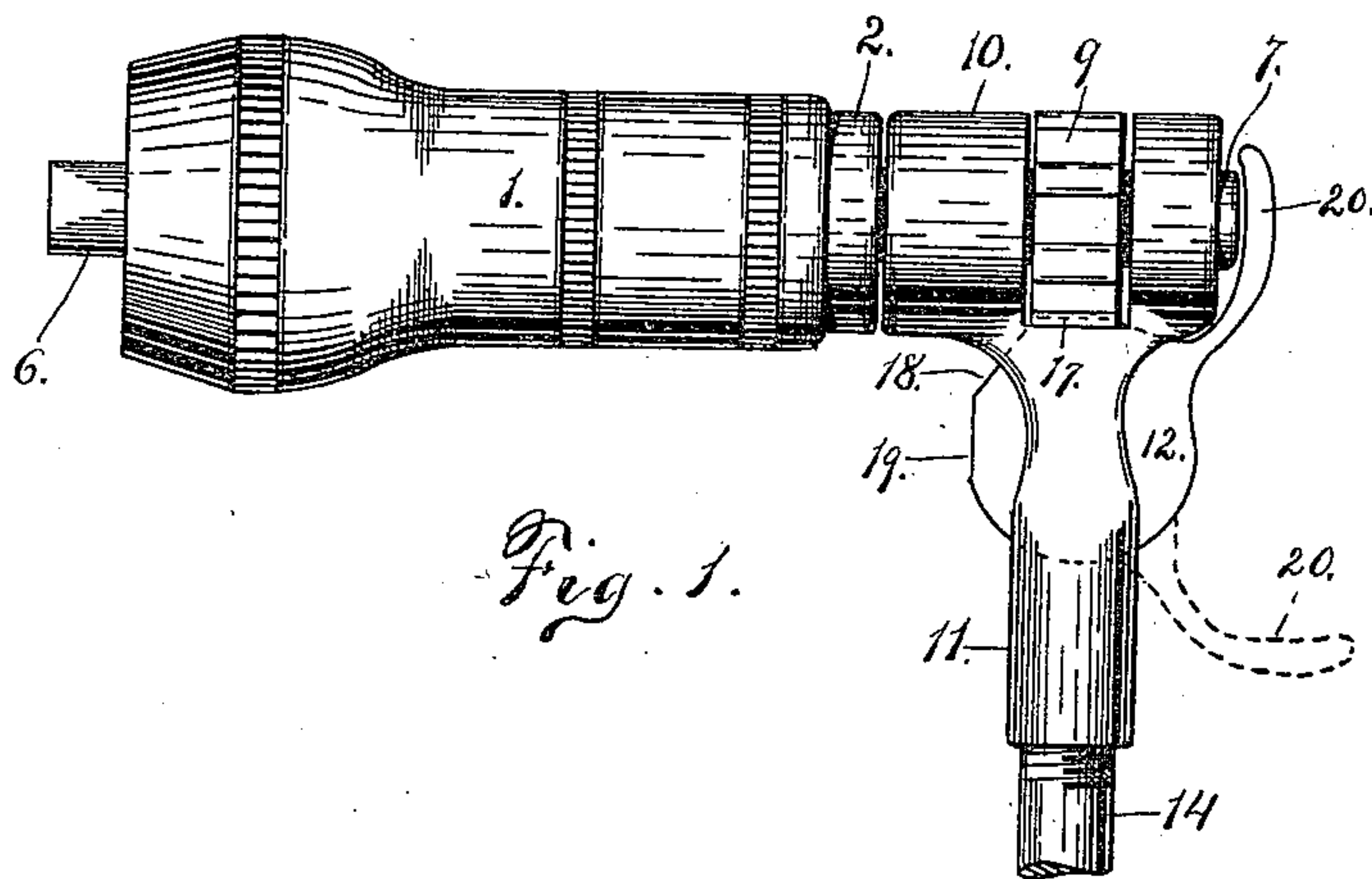


Fig. 1.

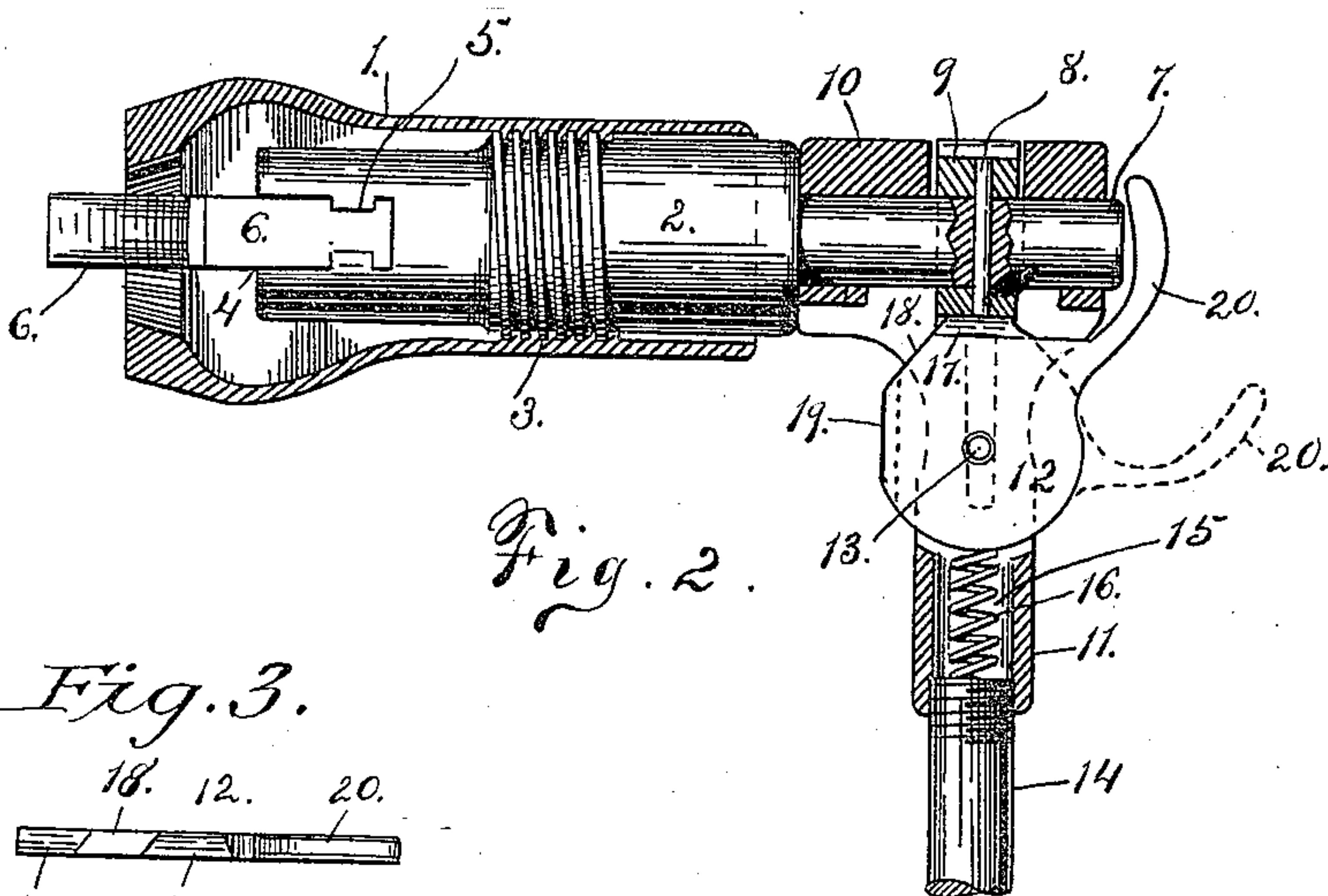


Fig. 2.

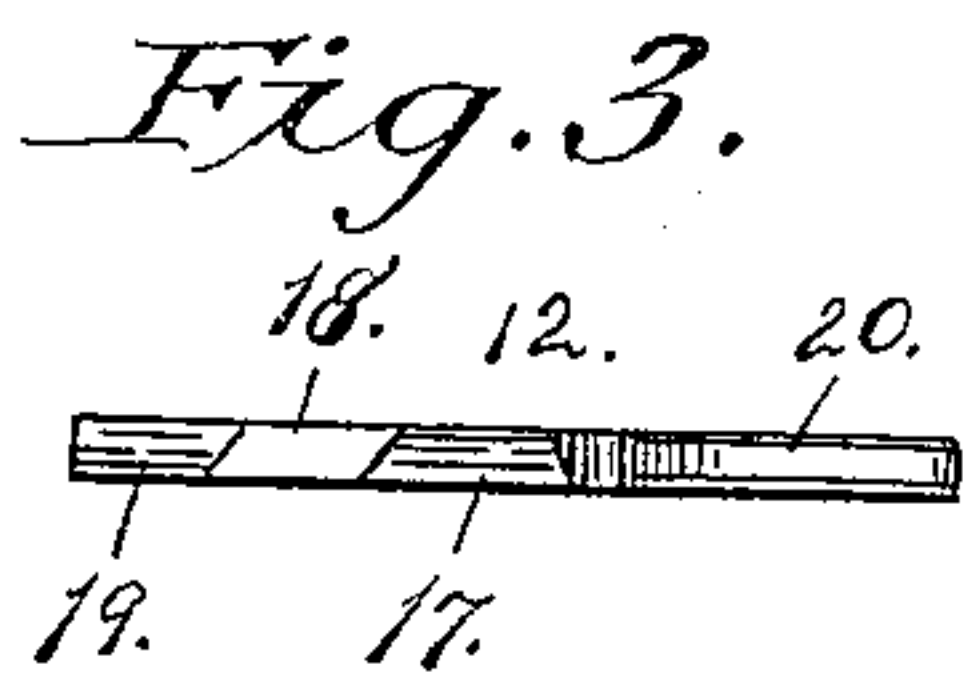


Fig. 3.

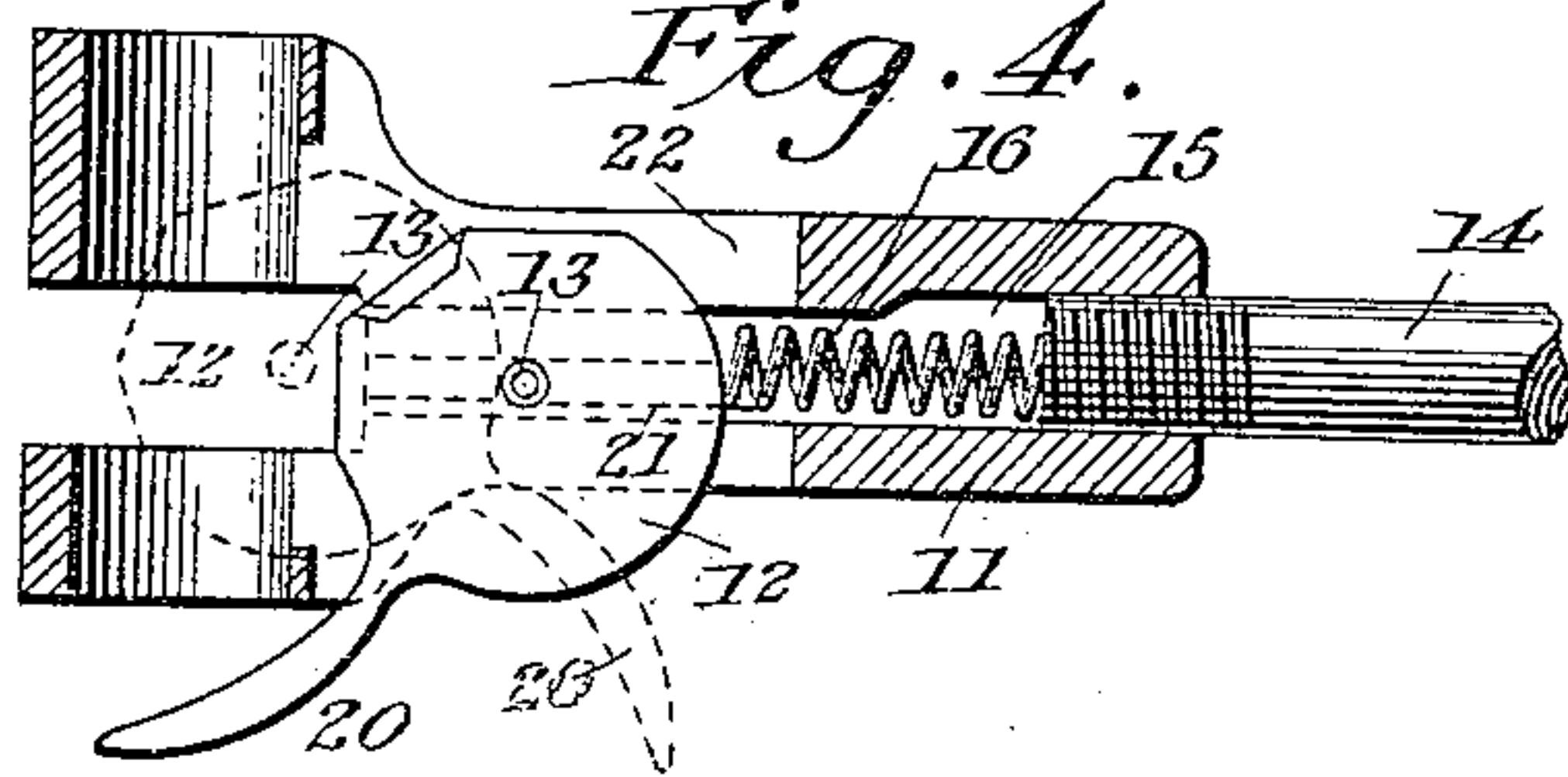


Fig. 4.

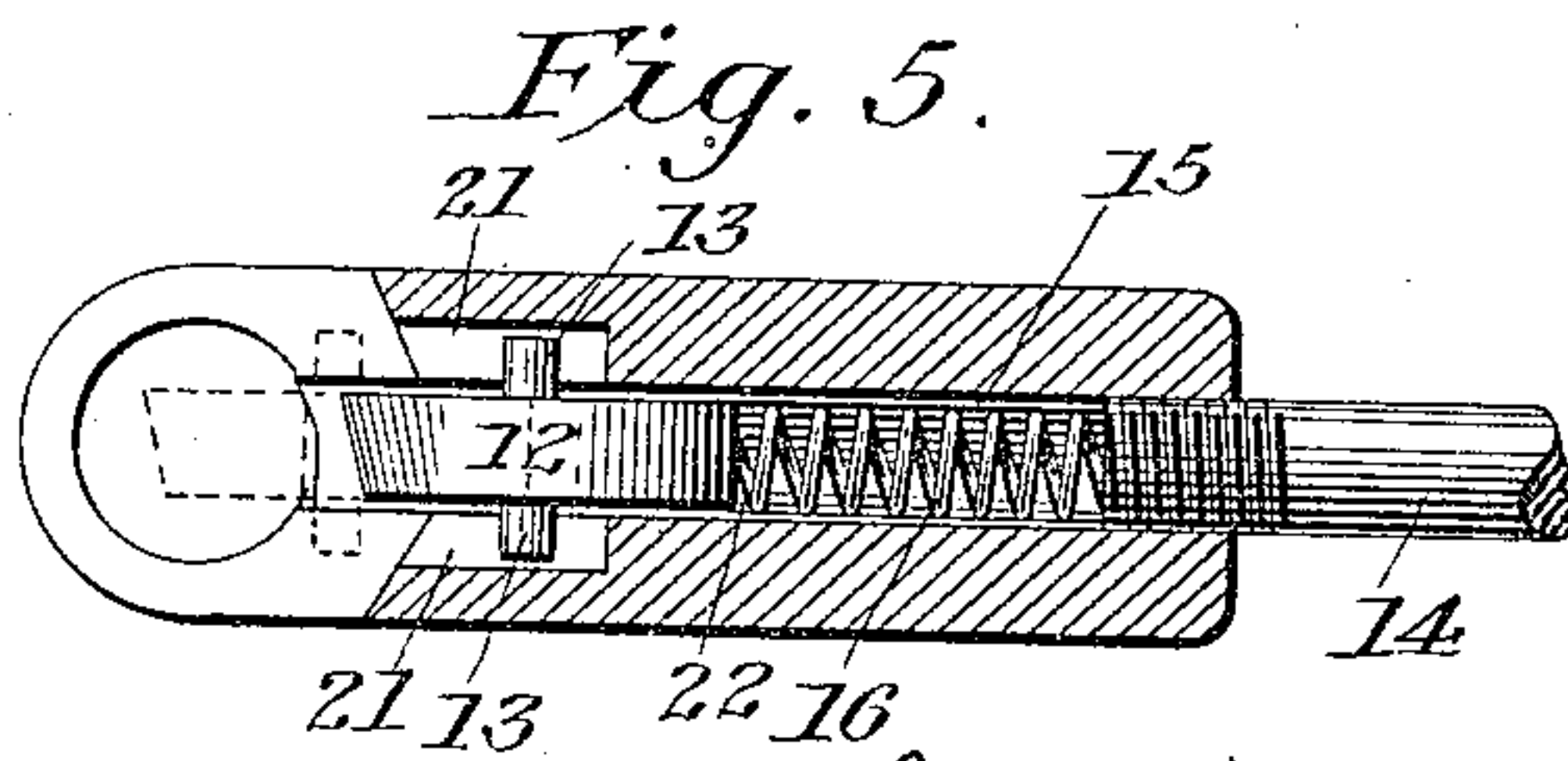


Fig. 5.

Witnesses:

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RATCHET BIT-BRACE.

SPECIFICATION forming part of Letters Patent No. 438,338, dated October 14, 1890.

Application filed August 26, 1889. Serial No. 322,052. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ZIRIKELBACK, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Improvement in a Ratchet Bit-Brace; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in bit-braces, and more particularly to that class of bit-braces in which an intermittent rotary motion is given to the bit from a reciprocating motion of the brace; and it consists of an arrangement of parts by means of which the bit may be carried with the brace from right to left, being released therefrom on its return movement, or the operation may be reversed, or the brace and bit may be secured so as to have the same action as an ordinary bit-brace.

My invention further consists in the details of its construction, all of which I will now proceed to definitely describe and claim.

The object of my present invention is the construction of a simple and inexpensive ratchet bit-brace that shall be very convenient in operation, not likely to get out of order, and that can easily be changed from a right to a left ratchet-brace by simply raising or lowering a compound pawl or lever plate.

In the drawings, Figure 1 is a side view of my improved brace having the lower end of the brace secured thereto. Fig. 2 is a partial central longitudinal section of the same, and Fig. 3 is an edge view of the operating plate or pawl employed. Fig. 4 is a central longitudinal section of the arm 11.

Referring to the drawings, 1 is the outer shell or sleeve of the brace, which is fitted over the part 2, being threaded, as at 3. (See Fig. 2.) The part 2 has arranged at its forward end the slot 4 for the reception of the jaws 6. Within this slot 4 are arranged two small projections 5. The jaws 6 are held in position by the projections 5 in one direction, and their lateral movement is regulated by the position of the outer sleeve 1 upon the

part 2, as in all braces of this general construction, as seen in Fig. 2.

On the opposite end of the part 2 is formed the shank or shaft 7, upon which is rigidly secured by the pin 8 the toothed or gear wheel 9.

An auxiliary sleeve 10, having the short projecting arm 11, is loosely fitted over the remainder of the shaft 7, said sleeve 10 being held in position by the toothed wheel 9. Within this short projecting arm 11 (which is integral with sleeve 10) is mounted the compound pawl or operating or lever plate 12, said plate 12 being mounted on a short pin 13, the ends of which pin 13 rest loosely in slots or grooves running longitudinally with the short arm 11, which pin 13 is also placed loosely within the pawl itself, and thus, although not riveted onto the short arm 11, and although not fastened within the pawl itself, still the pin cannot drop out of its place, as it is snugly locked up within the short arm 11 by the solid circumference of the latter. This operating-plate 12 is constructed as shown in Fig. 2.

At the end of the short arm 11 is secured the end of the brace 14, forming the recess 15 within the arm 11, and into which is placed the spiral spring 16. This spring 16, acting against the operating-plate 12, serves to hold the plate in contact with the wheel 9 in whatever position it may be placed.

The pawl 12 is brought into its position in the grooves 21 of the short arm 11, as shown in Fig. 4, thus: The spring 16 is placed in its position within the recess 15. The pawl is then placed through the opening 22 into the opening made by the taking away of the shank 7 and gear-wheel 9 from their proper position, as shown in the dotted position of the pawl in Fig. 4. The pin 13 is then placed within the pawl. The pawl is pushed back, compressing the spring 16, until the pawl is in the position where the full face of the pawl is shown numbered at its arm by the numeral 20, the pin 13 sliding loosely within the grooves or guides 21. Next, the ratchet-wheel 9 is brought into its proper position. The shank 7 is introduced into the wheel 9, riveted to it by the pin 8, thus keeping the wheel 9 and also the pawl 12 in their positions, as shown

in Fig. 5, the activity of the spring always keeping the edge of the pawl in contact with the wheel 9.

On the periphery of said plate 12 are arranged the two inclined surfaces 17 and 19 and the straight surface 18, which surfaces act as three pawls—one transmitting the motion from the brace to the bit as it moves to the right, releasing it as it returns, the other transmitting the motion from the brace to the bit as it turns to the left, releasing it as it returns, and the third locking the parts together, so as to transmit the motion from the brace to the bit in either direction.

In operation where it is found necessary to introduce a screw in such a place as to make it impracticable to use a bit-brace of ordinary construction, (or in any of the varied uses in which the bit-brace is employed,) to do which a reciprocating rotary motion is essential on account of the limited space given to the sweep, the manipulator has but to set the plate 12 by its lever-arm 20 in position, so that when the surface 17 of the lever-plate, being inclined, is brought directly opposite a groove of the toothed wheel 9 it is forced into it by the spring 16. When in this position, (in which the bit is always withdrawn,) the brace will ratchet, as said before, to the right—*i. e.*, turning the crank to which the short projecting arm 11 is fastened to the right. The lever-plate 12 by this movement, on account of its inclined surface 17, slides over the teeth of the toothed wheel 9 and is forced into the intervening grooves by the activity of the spring 16, being in constant contact with it. While this movement of the crank and short arm is continued to the convenience of the manipulator the bit remains undisturbed. As soon as the operator, however, wishes to continue the operation of withdrawing the bit, he must turn the crank and short arm to the left, when the higher part of the inclined surface 17 cannot likewise slide over

the teeth of the wheel, but, being forced into a groove on this movement to the left, becomes stationary in said direction with the brace, and thus gives a rotary motion to the whole brace and bit, thereby continuing the operation of withdrawing the bit. The inclined surface 19, when brought in contact with the toothed wheel, ratchets on the same principle, but in the opposite direction. When the surface 18 is brought in contact with the wheel, being a straight surface it will allow no ratcheting at all—*i. e.*, the plate cannot slide over the teeth of the wheel—but is kept in a groove by the spring, and in consequence of its square edges cannot slide over the square edges of the teeth.

I claim—

In a ratchet bit-brace, a spring-pressed pawl having a short pin 13, passing loosely through it with ends protruding, said ends playing in slots 21 at the sides of the pawl within the short arm 11, said pawl 12 lying in slot or opening 22, which is formed in the arm and opens into recess of sleeve 10, whereby the pawl may be dropped into the recess made in sleeve 10 for the reception of the shank 7 and the gear-wheel 9, as shown, and by inserting the pin 13 into the pawl and raising the latter the protruding ends of the pin may be brought into the slots 21, in combination with a ratchet-wheel 9, rigidly mounted on the shank 7 and riveted by the pin 8, against which said wheel the edge of the spring-pressed pawl acts, said edge having a flat and two inclined surfaces, and a manipulating-arm 20, by means of which arm any one of said surfaces may be brought in contact with the ratchet-wheel 9, substantially as set forth.

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Witnesses:

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