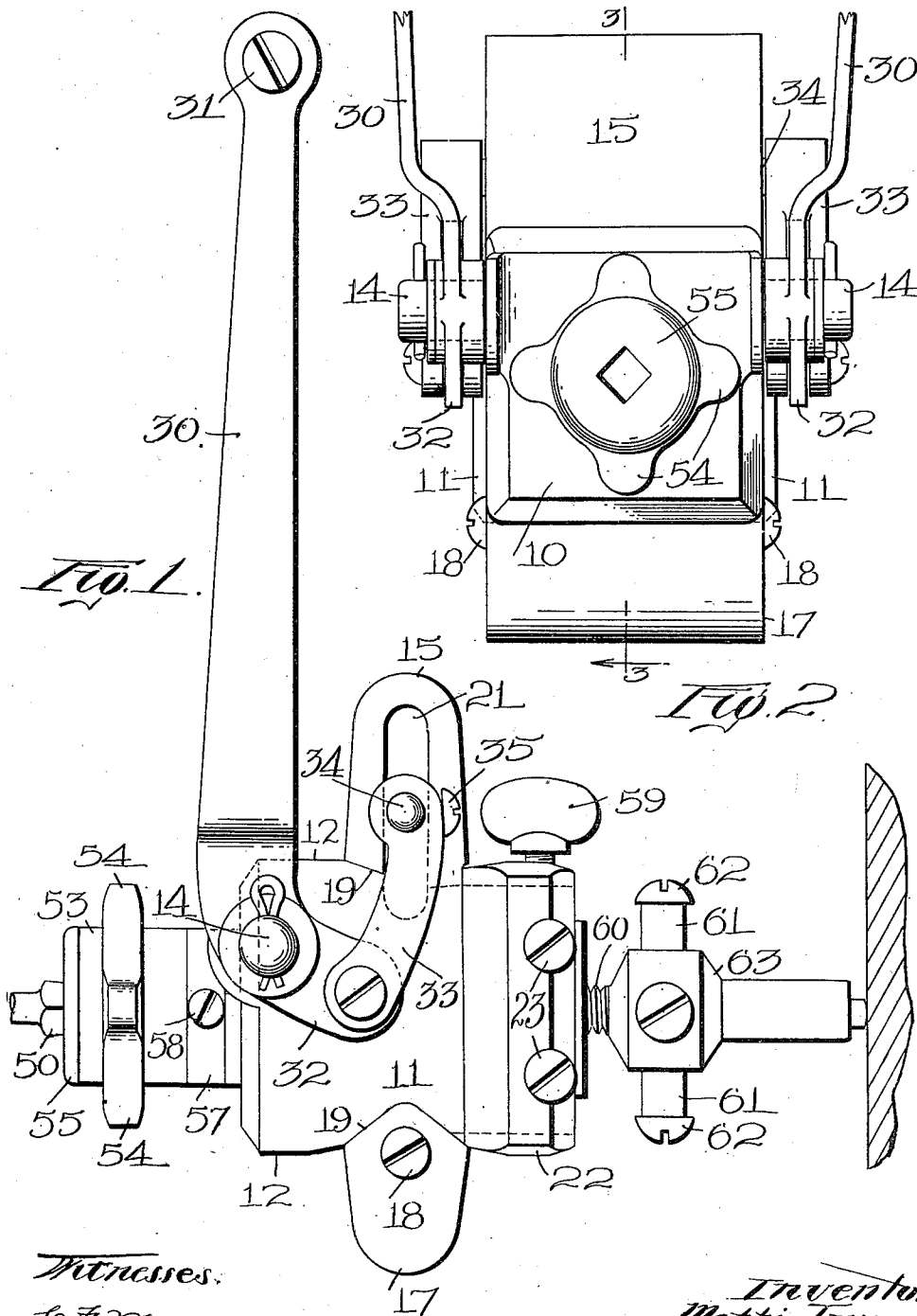


M. LUOMA.
 RATCHET DEVICE.
 APPLICATION FILED FEB. 11, 1910.

995,615.

Patented June 20, 1911.

2 SHEETS-SHEET 1.



Witnesses:
 C. F. Mason
 C. J. Hartnett.

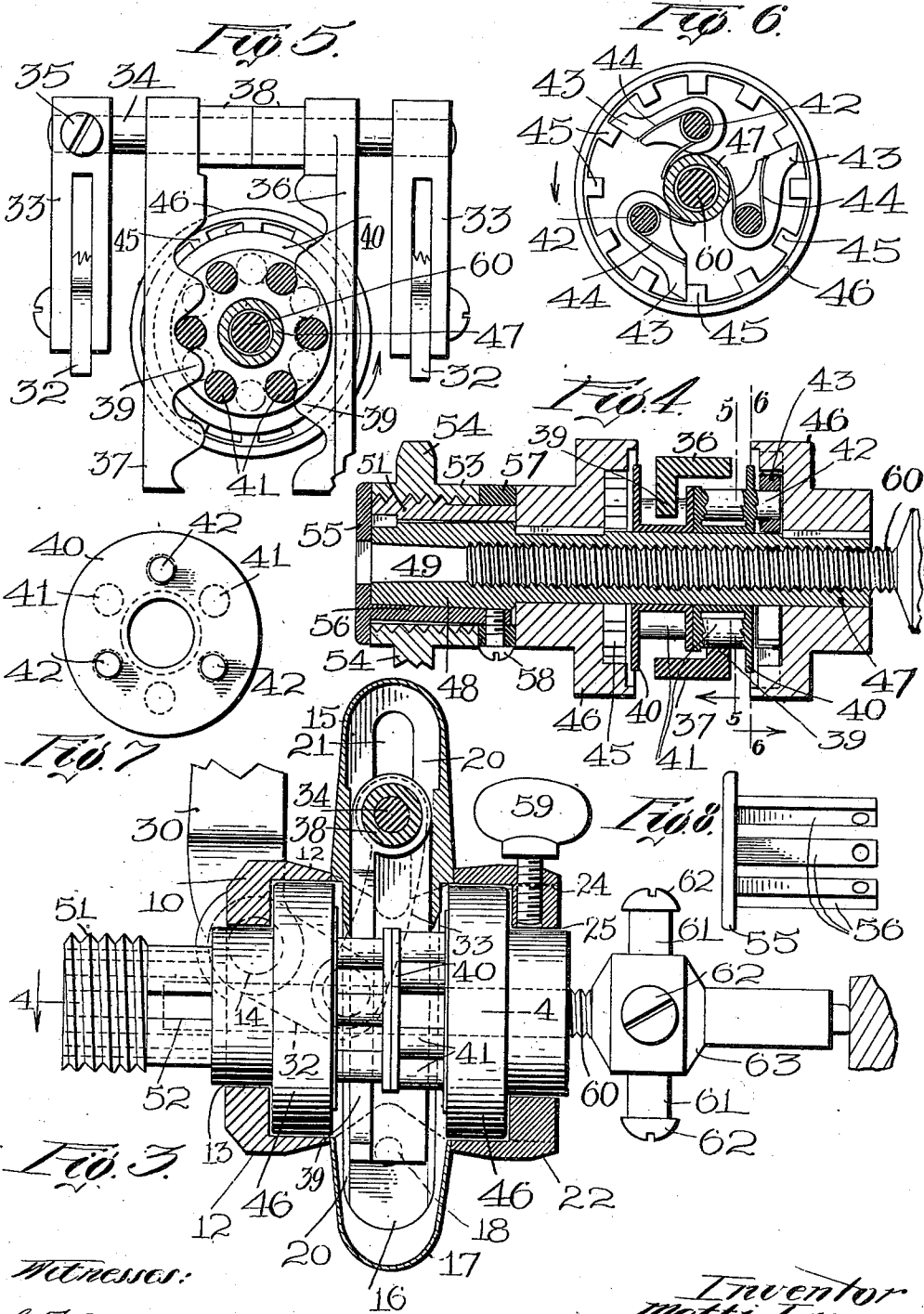
Inventor
 Matti Luoma
 by attorneys
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UNITED STATES PATENT OFFICE.

MATTI LUOMA, OF SOUTH GARDNER, MASSACHUSETTS.

RATCHET DEVICE.

995,615.

Specification of Letters Patent. Patented June 20, 1911.

Application filed February 11, 1910. Serial No. 543,345.

To all whom it may concern:

Be it known that I, MATTI LUOMA, a citizen of the United States, residing at South Gardner, in the county of Worcester and State of Massachusetts, have invented a new and useful Ratchet Device, of which the following is a specification.

The principal objects of the invention are to provide a simple and compact construction capable of being set up in a very small casing or frame and adapted to turn the drill or the like constantly forward on both the forward and back strokes of the operating lever; to provide an improved construction of racks and ratchet wheels, and to provide an improved supporting frame therefor and for the other parts of the device.

The invention also involves other improvements in details of construction and combinations of parts as will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a plan of a drill constructed in accordance with this invention. Fig. 2 is an end elevation thereof. Fig. 3 is a sectional view on the line 3—3 of Fig. 2 with the parts at one end removed. Fig. 4 is a sectional view on the line 4—4 of Fig. 3 showing the parts removed in Fig. 3. Fig. 5 is a sectional view on the line 5—5 of Fig. 4. Fig. 6 is a sectional view on the line 6—6 of Fig. 4. Fig. 7 is an elevation of one of the elements of the device, and Fig. 8 is an elevation of the front plate of the drill clamp.

Although capable of embodiment in many forms, the invention is shown in the drawings in a form in which it comprises a main casing 10 having two pairs of walls 11 and 12. The walls 12 extend in from the end only a short distance, and are cut away at the right in Fig. 1. In the end this casing is provided with a circular opening 13 the purpose of which will be described, and near the end it has a pair of studs 14. Located at the end of one of the walls 12 is a removable transverse member or extension 15 having a pair of legs 16 which extend through between the walls 11 and project from the other side. On this other side is removably fixed an opposite member 17. Both of these extensions are hollow, and they are secured together by a screw 18. They have inwardly

extending flanges 20 so as to form a transverse hollow casing. They are provided with converging edges or projections 19 which fit notches of the same shape in the walls 11 to prevent any tendency toward a rocking motion of these parts. The member 15 is provided with parallel slots 21 located transverse to the axis of the main casing. The main casing is provided with a removable end 22 fixed to the walls 11 by means of bolts or screws 23 and having passages 24 for receiving the ends of these walls 11. This end is provided with a circular opening 25 opposite the opening 13 and in axial alinement therewith.

Mounted on the studs 14 is a hand lever 30 shown as having a handle 31 and two opposite arms, one pivoted on each stud 14. These arms are provided with projecting ears 32 to which are pivoted a pair of links 33. These links are pivotally connected with a rod 34 which projects through the slots 21 on both sides. As the parts are arranged so that the links 33 are substantially parallel with the slots 21 and as the latter serve as guides for the rod it will be obvious that the oscillation of the lever will cause the rod to reciprocate toward and from the center of the casing and in a plane at right angles to the axis thereof. One of the links 33 is permanently fixed to the rod and the other is removably attached thereto by screw or bolt 35. This construction is provided in order to allow of ready assembling and detachment of the parts. Both of these links 33 are shown as bifurcated, the ears 32 being pivoted to them between the bifurcations.

Inside the extension 15 are a pair of racks 36 and 37. Each one is provided with a tubular shoulder 38 by which it is pivoted on the rod 34. These shoulders project inwardly and hold the two racks at the proper distance apart. One of the racks has rack teeth 39 projecting inwardly from one edge thereof, and the other has rack teeth 39 projecting inwardly from the opposite edge thereof. It will be understood of course that the member 15 and its flanged legs constitutes a guide for the two racks. Inside the casing are a pair of wheels 40. Each wheel is provided with teeth or pins 41 adapted to be engaged by their respective racks. These two wheels are set back to back in the cas-

ing and they always rotate together in opposite directions. Each of these wheels is provided with a plurality of pins 42 on their outer or opposite surfaces, which may be integral with part of the pins 41. On these pins 42 are pivotally mounted ratchet dogs 43 pressed by springs 44 into a position to engage teeth 45 of the ratchet wheels 46, one of which is located on the outer side of each of the first named wheels. These ratchet dogs on the two wheels 46 are arranged in opposite positions so that as the handle is moved in one direction and the racks moved inwardly, for example, one of the ratchet wheels 46 will be positively moved with these wheels and the other will remain stationary. On the backward motion the other wheel 46 will be moved, but in the same direction as the first wheel, while the latter will remain stationary during the backward stroke. A rotary member 47 is splined to both of the wheels 46. Consequently this rotary member will have a continued rotation during the complete reciprocation of the racks. This is an important feature, because no time is lost in operation, as both the forward and backward strokes operate alike.

On the end of the rotary member 47 is a head 48 having a socket 49 for receiving the drill shank 50. Removably fixed to this head is a split hollow member 51 having an opening for receiving the head 48. It has an external screw thread, and is provided with a plurality of internal longitudinal passages 52. This head is provided with a loosening member 53 fitting the screw threads and having projections 54 thereon by which it can be turned so as to loosen the drill shank from the socket after a drilling operation is completed. Mounted on the outside of this member is a front plate 55 having legs 56 extending through the passages 52. Mounted at the rear of the adjusting nut 53 is a collar 57 which is fixed by screws 58 to the ends of the legs 56. With this construction it will be seen that the drill shank can be loosened and removed in a very simple manner, by moving the member 53 and plate 55 outwardly until the opening in the latter engages the drill shank and forces it from the socket, and that the parts have tight bearing surfaces so that dust and metallic particles are not likely to enter the interior. The wheels are held by a screw 59 while the loosening member is operated.

The rotary member 47 is provided with an internal screw thread from the head 48 to the other end. A feed screw 60 extends into the same and is provided with projections 61 by which it can be fed by hand. Obviously if the handles 61 are kept stationary the rotation of the member 47 will cause the drill to be fed forward automatically, but

the operator can either increase or decrease the feed at will by turning the handles. These handles are shown as comprising screws 62 extending into a hub 63 on the feed screw and collars on these screws.

The manner of use of the device will be obvious from what has been said.

The end of the feed screw is intended to be placed against a support as shown in Fig. 1, so that the drill can enter the work opposite the support.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the same as expressed in the claims. Therefore I do not wish to be limited to all the details of construction shown and described, but

What I do claim is:—

1. The combination of a casing having an extension thereon at one side, a lever pivoted on said casing, a rod extending transversely through said extension and reciprocable therein toward and from the center of the casing, links connecting said lever with the rod for reciprocating the rod, a pair of racks in the casing pivotally connected with said rod and adapted to be moved simultaneously thereby, transversely of the casing, two wheels in the casing, one connected with each rack, a rotatable member extending longitudinally through the casing and having a rotatable member at one end, and means whereby one of said wheels will rotate said longitudinal member on the forward stroke of the racks and the other will rotate it in the same direction on the backward stroke of the racks.

2. The combination of a casing, a rod reciprocable laterally toward and from the center of the casing, two racks independently pivoted transversely on said rod on opposite sides of the center of the casing, one of said racks having teeth projecting inwardly at one side of the center and the other having teeth projecting inwardly at the other side, two wheels in axial alinement in the casing having teeth for engaging said racks, a rotatable member in the casing, and means for transmitting a motion of rotation from said wheels to said member.

3. The combination of a casing having a main portion provided with studs projecting therefrom on opposite sides, an operating lever pivoted on said studs, a transverse removable member extending through said casing and provided with slots in its opposite sides adjacent to said studs, a member on the opposite side of the main casing connected with said transverse member, racks located in said transverse member, a rod connected with said racks extending through the slots in the transverse member, a lever on the studs connected with said rod, a ro-

tary member within the casing, and means within the casing connected with said racks for rotating said rotary member.

4. The combination of a casing having a main portion provided with an opening through its end and with studs projecting therefrom near said opening on opposite sides, an operating lever pivoted on said studs, a transverse removable member extending through said casing and provided with slots in its opposite sides adjacent to said studs, said slots being perpendicular to the axis of said casing, a removable member on the opposite side of the main casing connected with said transverse member, a pair of racks located in said transverse member, a rod connected with said racks extending through the slots in the transverse member, a lever on the studs connected with said rod, a rotary member within the casing extending through said opening, and means within the casing connected with said racks for rotating said rotary member.

5. The combination of a casing having a main portion provided with an opening through its end and with studs projecting therefrom near said opening on opposite sides, an operating lever pivoted on said studs, a transverse removable member extending through said casing and provided with slots in its opposite sides adjacent to said studs, said slots being perpendicular to the axis of said casing, a removable member on the opposite side of the main casing connected with said transverse member, a rod extending through the slots in the transverse member, a lever on the studs connected with said rod, a rotary member within the casing

extending through said opening, and means within the casing connected with said rod for rotating said rotary member.

6. The combination of a casing having a main portion provided with studs projecting therefrom on opposite sides, an operating lever pivoted on said studs, a transverse removable member extending through said casing and provided with slots in its opposite sides adjacent to said studs, a rod extending through the slots in the transverse member, a lever on the studs connected with said rod, a rotary member within the casing, and means within the casing connected with said rod for rotating said rotary member.

7. The combination of a casing having a main portion provided with an opening through its end, a transverse removable member extending through said casing and provided with slots in its opposite sides adjacent to said studs, said slots being perpendicular to the axis of said casing, a removable member on the opposite side of the main casing connected with said transverse member, a rod connected with said racks extending through the slots in the transverse member, a rotary member within the casing extending through said opening, and means within the casing connected with racks for rotating said rotary member.

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

MATTI LUOMA.

Witnesses:

KLAUS A. HANNULA,
JAHN E. THEIKKILE.