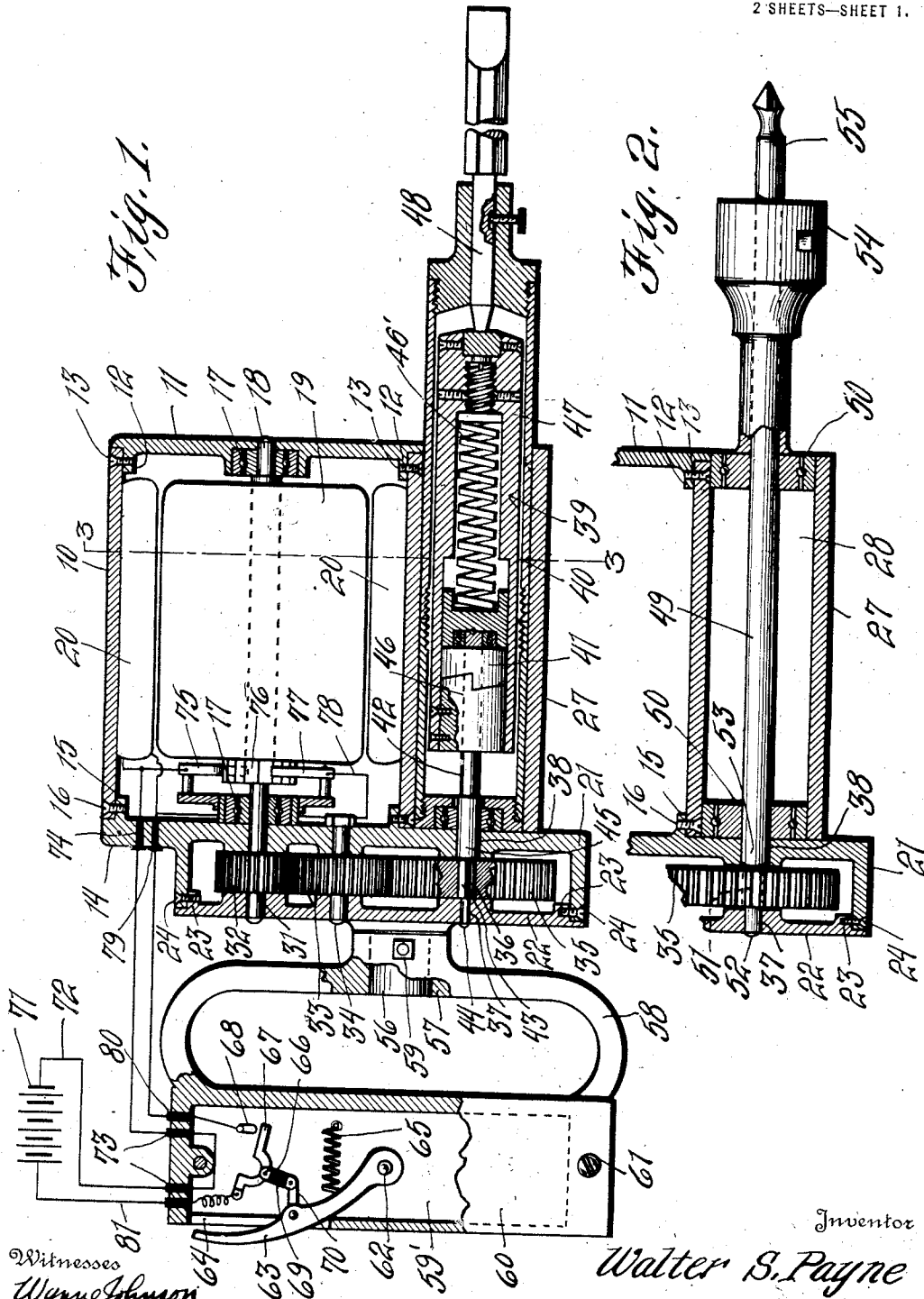


W. S. PAYNE.
 DRILL, HAMMER, AND MOTOR CASE COMBINED.
 APPLICATION FILED OCT 25, 1915.

1,217,815.

Patented Feb. 27, 1917.
 2 SHEETS—SHEET 1.



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Inventor
 Walter S. Payne
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 Attorney

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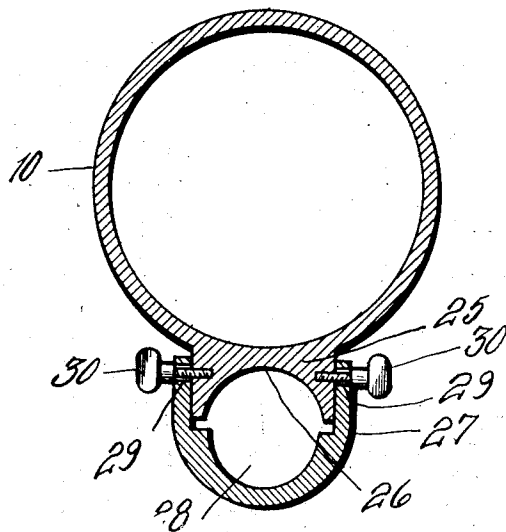


Fig. 3.

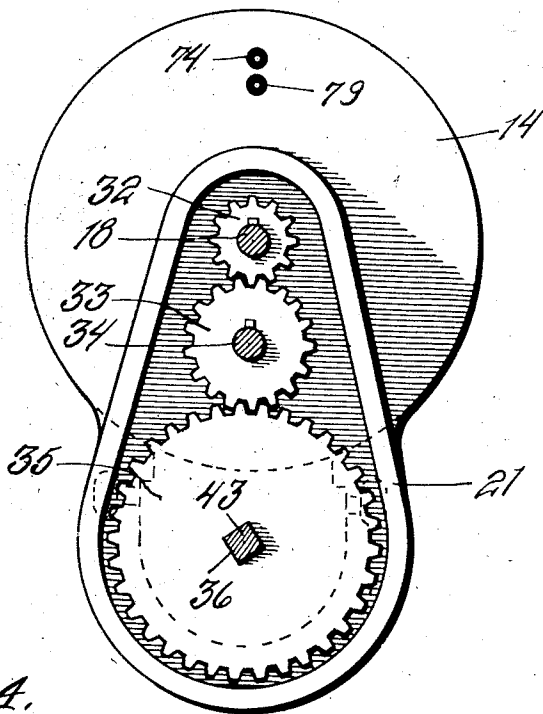


Fig. 4.

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WALTER S. PAYNE, OF UNIVERSITY PLACE, NEBRASKA.

DRILL, HAMMER, AND MOTOR-CASE COMBINED.

1,217,815.

Specification of Letters Patent. Patented Feb. 27, 1917.

Application filed October 25, 1915. Serial No. 57,800.

To all whom it may concern:

Be it known that I, WALTER S. PAYNE, a citizen of the United States, residing at University Place, in the county of Lancaster and State of Nebraska, have invented certain new and useful Improvements in Drills, Hammers, and Motor-Cases Combined, of which the following is a specification.

My invention relates to a motor casing, having means for receiving and holding a tool to be driven by the motor, such as a reciprocatory or rotatable tool, and has for its object the provision of such apparatus, which may be conveniently manipulated by a single operator.

An important object of the invention is to provide apparatus of the above mentioned character, which is simple in construction, inexpensive to manufacture, strong, durable, and light.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a central vertical longitudinal sectional view through apparatus embodying the invention,

Fig. 2 is a similar view with parts broken away, and a rotatable tool or drill in place.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1, parts being omitted, and,

Fig. 4 is an end elevation of the apparatus with the end or head closing the gear casing, removed.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a cylinder or body portion of the motor casing. Disposed adjacent one end of the cylinder 10 is a head or end 11, carrying an annular flange 12, projecting into the cylinder 10 and secured therein by means of screws 13 or the like. Arranged adjacent the opposite end of the cylinder 10 is a head or end 14, carrying an inwardly projecting annular flange 15, extending into the end of the cylinder 10 and secured thereto by means of screws 16 or the like. The ends or heads 11 and 14 carry ball bearings 17 receiving the ends of an armature shaft 18 having an armature 19 rigidly mounted thereon. Surrounding the armature are the field magnets

20, held stationary upon the cylinder 10 by any suitable means.

Formed upon the outer side of the head 14, preferably cast integral therewith, is a gear casing 21, the outer side of which is closed by a removable cap or end 22, having a flange 23, projecting into this gear casing and held in place by screws 24 or the like.

Formed upon one side of the casing or cylinder 10 is a longitudinal member 25, having a recess 26 curved in cross-section. The member 25 receives a longitudinal clamp 27, forming therewith a chamber 28, for a purpose to be described. The ends of the clamp 28 are provided with elongated openings 29, receiving clamping screws 30 having screw-threaded engagement with the lug or member 25. It is obvious that the clamp 27 may be adjusted transversely with respect to the lug 25. The function of having the clamp 25 transversely adjustable is to provide means for rigidly attaching a hammer or the like to the casing 10.

The armature shaft 18 projects into the gear casing 21 and is journaled therein, as shown at 31. This armature shaft carries a small pinion 32, engaging a larger pinion 33, carried by a stub shaft 34, journaled in the gear casing, as shown. The larger pinion 33 engages a larger pinion 35, having an opening 36, which is square in cross-section. This opening is arranged adjacent small and large openings 37 and 38, which are circular in cross-section.

The numeral 39 designates a reciprocatory hammer as a whole, of any well known or preferred construction, such as the hammer shown and described in my pending application for Power operated hammer, Serial No. 16,389, filed March 23, 1915. While this hammer will not be described in detail it will be stated that it embodies a casing 40, adapted to be inserted within the clamp 27 and held therein. Arranged within this casing is a rotatable cam 41, which cannot reciprocate and is rigidly mounted upon a shaft 42, having a square portion 43, to fit in the opening 36 and circular portions 44 and 45, to enter the openings 37 and 38. The rotation of the shaft 42 drives the cam 41, which contacts with a reciprocatory cam 46, causing a hammer 47 to reciprocate, and strike a reciprocatory tool 48. The cam 41 is rotatable but cannot move longitudinally while the cam 46 is movable longitudinally but cannot rotate. It is obvious that by virtue

of the shape of the contacting faces of these cams that the turning movement of the cam 41 will move the cam 46 rearwardly, while a spring 46' will move it forwardly. The cam 41 is rigidly attached to the shaft 42.

In Fig. 2, the power operated hammer is removed and a rotatable drill substituted therefor, embodying a rotatable shaft 49, carried in ball bearings 50, inserted in the clamp 27 and held therein. The shaft 49 is similar in construction to the shaft 42 and has a square portion 51 and small and large cylindrical portions 52 and 53, to enter the openings 37 and 38. It is thus obvious that the pinion 35 will drive the shaft 49. The shaft 49 carries at its forward end a drill chuck 54, carrying a drill 55.

It is thus apparent that the tool to be operated, either reciprocatory or rotatable, may be conveniently inserted within the clamp 27, and connected with the gear 35 for rotation therewith.

In order that the apparatus may be conveniently manipulated, the cap 22 is provided with a cylindrical stud or trunnion 56, fitting in a tubular socket 57 formed integral upon a handle 58. The socket 57 is clamped to this shank by a bolt 59. The handle may thus be arranged vertically or horizontally with respect to the casing or cylinder 10 or assume any intermediate angular position.

Formed integral with the handle 58 is a switch casing 59', serving as a hand grip, and having one side closed by a removable plate 60 held in place by screws 61 or the like.

Pivotaly mounted within the casing 59, at 62, is a swinging lever 63, the outer end of which projects outwardly through a longitudinal slot 64. This lever is pushed outwardly by a spring 65, as shown. Pivoted within the casing 59', upon a stationary pin or member 66 and insulated therefrom is a switch 67, one end of which is adapted to engage and disengage a stationary contact 68. The switch 67 is provided with a crank 69, rigidly connected therewith and insulated therefrom. This crank serves to turn the switch 67 and is moved by a link 70, pivotally connected therewith and with the lever 63, as shown.

The numeral 71 designates a source of current, one pole of which is connected with a wire 72, extending through insulating sleeves 73 and passing into the casing 59. The wire 72 passes through an insulating sleeve 74 and enters the cylinder 10 and is connected with one brush 75 of the motor. This brush engages the usual commutator 76 engaging the brush 77 of opposite polarity. The brush 77 is connected with the wire 78 passing through insulating sleeves 79 and 80 and connected with the stationary contact 68.

Having permanent electrical connection with one end of the switch 67 is a wire 81, having electrical connection with the opposite pole of the source of current.

The operation of the apparatus is simple and is as follows:

The shaft 42 or 49 of the tool to be operated is arranged within the clamp 27, and the tool held therein by proper manipulation of the clamp. The end of this rod or shaft is connected with the gear 35, as is obvious. This having been done, the tool is brought into suitable proximity to the work and the apparatus may be conveniently supported with the left hand while the casing 59' is grasped in the right hand. The lever 63 may be conveniently moved inwardly by the thumb or the like and upon such movement the switch 67 engages the contact 68. When this takes place current flows from the positive pole of the source of current through wire 72, brush 75, commutator segment, armature 19, commutator segment, brush 77, wire 78, contact 68, switch 67, and wire 81, back to the opposite pole of the source of current 71. The armature shaft is accordingly rotated, which rotation is transmitted to the gears 32, 33 and 35, and the rod or shaft of the tool driven at a reduced speed.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described the invention, I claim:—

In apparatus of the character described, a motor casing, an armature extending longitudinally within the motor casing and having an armature shaft, a tube secured to the lower portion of the motor casing and extending longitudinally thereof for substantially its entire length and adapted for the reception of a tool having a movable shaft, a gear casing carried by the rear end of the motor casing and extending downwardly in proximity to the rear end of the tube, a train of gears arranged within the gear casing and connected with the armature shaft and the shaft of the tool, a handle secured to the rear side of the gear casing, and a switch lever carried by a handle to control the operation of the motor.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER S. PAYNE.

Witnesses:

O. N. SHORE,
J. F. JOHNSON.