

No. 773,124.

PATENTED OCT. 25, 1904.

A. F. CHRISTMAS.
ELECTRIC HAMMER.

APPLICATION FILED DEC. 4, 1903.

NO MODEL.

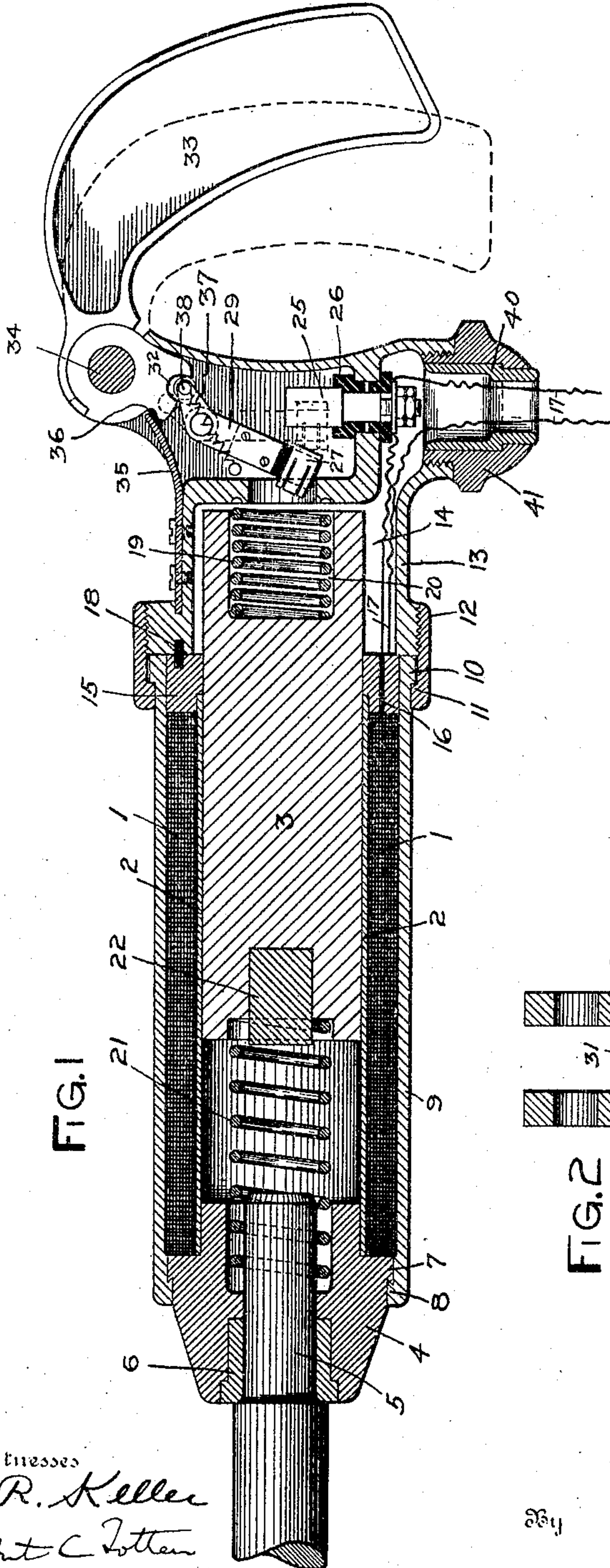


FIG. 1

Witnesses
J. R. Keller
Robert C. Lott

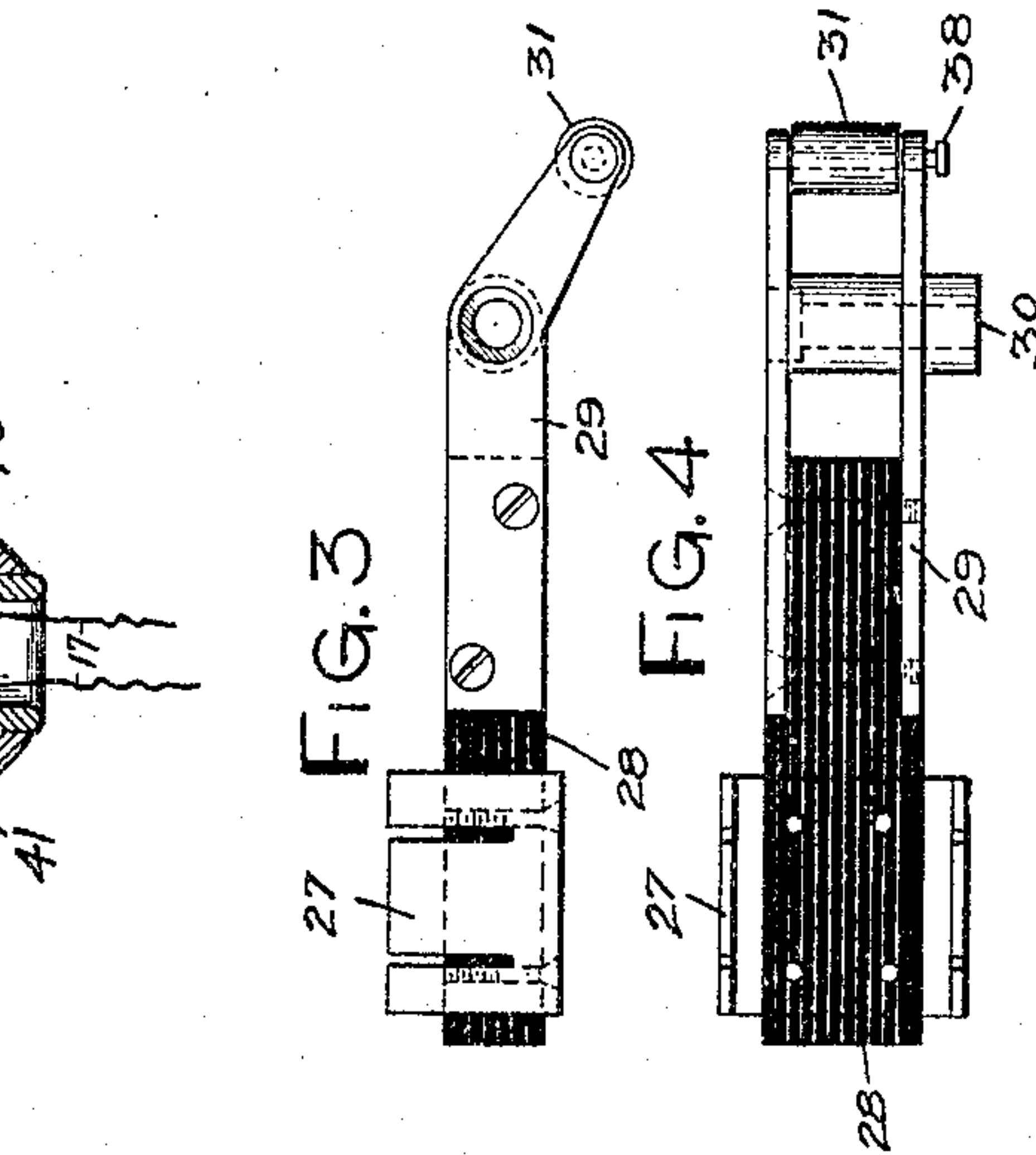


FIG. 3

FIG. 4

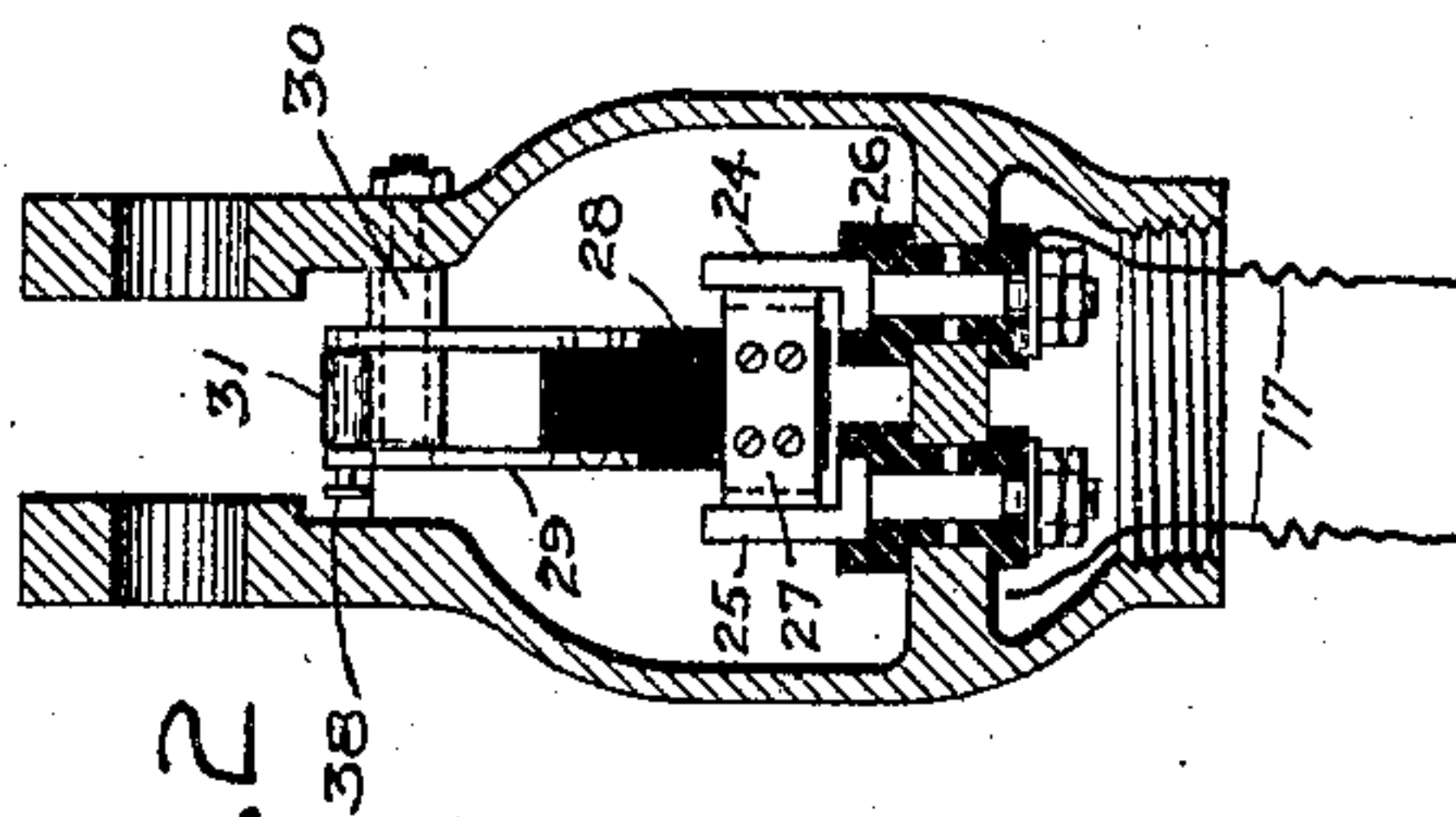


FIG. 2

Inventor

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ADOLPH F. CHRISTMAS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO FRANK R. McFEATTERS, OF WILKINSBURG, PENNSYLVANIA.

ELECTRIC HAMMER.

SPECIFICATION forming part of Letters Patent No. 773,124, dated October 25, 1904.

Application filed December 4, 1903. Serial No. 183,836. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH F. CHRISTMAS, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Hammers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to electric reciprocating tools—such as hammers, rock-drills, chipping-tools, calking-tools, and the like; and the object is to provide a tool of this character which is strong and which can be started by the mere act of pressing the same against the work and stopped by the mere act of withdrawing the same from the work.

In the accompanying drawings, Figure 1 is a longitudinal section through a hammer constructed according to my invention. Fig. 2 is a cross-section through the handle-casting with the handle omitted. Fig. 3 is a side view of the circuit-closing switch, and Fig. 4 is a plan view of the same.

My hammer is provided with only a single motor-coil, (shown at 1,) having inside of it a lining-tube 2, which reciprocates the core or armature 3. This coil and the armature are inclosed in a suitable casing. Tools of this kind are subjected to violent shocks, and heretofore difficulty has been experienced in so constructing the casing as to withstand these shocks. My casing comprises the front end or nose-piece 4, preferably formed of soft steel and having an opening therethrough for the passage of the shank 5 of the tool. A hardened-steel bushing 6 is placed in this end piece to take the wear of the tool-shank. This end piece is provided with an external annular shoulder 7, which is engaged by an internal annular shoulder 8 on the coil-inclosing tube 9. Preferably both the shoulders 7 and 8 are slightly undercut, as shown in Fig. 1, so as to prevent their slipping past each other after being worn. The inclosing tube 9 at its opposite end is provided with an external annular shoulder 10, which is engaged by an internal shoulder 11 on one end of a coupling-sleeve 12. This sleeve at its oppo-

site end is internally-threaded and engages external threads on the end or handle casting 13. The coupling-sleeve 12 binds all of the parts together.

The end piece 13 is made hollow, so as to provide a chamber 14, into which the end of the core 3 can project when retracted. The space at the end of the coil is filled by a bushing 15, which is provided with an opening 16, through which pass the circuit-wires 17, leading to the coil. In order to prevent rotation of this bushing and the shearing off of these circuit-wires, I place a short pin 18 in alining openings in the bushing 15 and end piece 13.

Interposed between the inner end of the core 3 and the end piece 13 is a helical spring 19, which acts as a cushion and also starts the core on its return stroke. Preferably the end of the core is provided with a chamber 20 in which this spring will be inclosed when compressed, so as to permit said core to move entirely to the end of the chamber 14. A similar helical spring 21 is interposed between the opposite end of the core and the front end piece 4 and serves to retract the core, said core being moved in its active stroke by the energization of the coil 1. A hardened-steel plug 22 is set into the forward end of the core 3 to take the wear of the impact with the shank of the tool.

In the handle-casting are mounted the two circuit-terminals 24 and 25, which are arranged to be electrically connected by a metallic U-shaped member 27, carried on a block of insulation 28, secured to the ends of the switch-arms 29. The latter are suitably pivoted to the casing, as at 30, and their outwardly-projecting arms are provided with a cross bar or roller 31, which is engaged by a fork 32, formed on the handle 33. This handle is pivoted to the casting at 34, and a stiff leaf-spring 35 is secured to the casting and engages a shoulder 36 on the handle and tends normally to hold said handle away from the casting in the full-line position shown in Fig. 1. The switch-arms 29 and their engagement with the fork 32 are so arranged that when the handle is in this position the switch-piece

27 will not bridge the terminals 24 and 25, and consequently the circuit to the coil is broken. The act of pressing the tool against its work, however, will bring the handle 33 to the position shown in dotted lines, Fig. 1, and this movement swings the switch-blade about its pivot and brings the bridge-piece 27 between the terminals 24 and 25, thus closing the circuit to the coil and putting the tool into operation. As soon, however, as the pressure against the tool is released the spring 35 will throw the handle 33 out, thus causing the circuit to be broken.

A helical spring 37 has one end connected to a stud 38 on the end of the switch-blade and its opposite end secured to the casing in such position that the axial line of said spring will pass the center on which the switch-blade is pivoted whenever said switch-blade moves from one position to another, said spring thus accelerating the opening and closing movements of the switch and preventing the formation and maintenance of arcs. The wires to the hammer pass into the casing through a bushing 40, secured to the handle-casing by means of a screw-threaded sleeve 41, the object of this being to permit the formation of knots in the cord inside of the casing, so as to take the strain off the binding-posts.

The tool shown and described is very strong and compact and will withstand the severe vibrations due to the reciprocations of the armature. Furthermore, the arrangement of the circuit-closer and handle is such that the attendant is relieved of the necessity of starting and stopping the tool, the mere act of presenting the tool to the work or withdrawing the same therefrom sufficing to start and stop the same.

What I claim is—

1. In an electric reciprocating tool, the combination of a coil and core, a tube inclosing the same and having an internal shoulder at one end, two end pieces, one having an external shoulder which is engaged by the internal shoulder on the tube and the other having external screw-threads, and a coupling-sleeve having internal screw-threads engaging the external screw-threads on the one end piece and also having means engaging the end of the inclosing tube.

2. In an electric reciprocating tool, the combination of a coil and core, a tube inclosing the same and having an internal shoulder at one end, an end piece having an external shoulder which is engaged by the internal shoulder of the inclosing tube, a second end piece at the opposite end of the inclosing tube, said second end piece and the adjacent end of the tube being provided the one with an external shoulder and the other with external screw-threads, and a coupling-sleeve having an internal shoulder engaging the external shoulder on the one member and also having internal screw-

threads engaging the external screw-threads on the other member.

3. In an electric reciprocating tool, the combination of a coil and core, a tube inclosing the same and having an internal shoulder at one end and an external shoulder at the other end, two end pieces, one having an external shoulder which is engaged by the internal shoulder on the tube and the other having external screw-threads, and a coupling-sleeve having an internal shoulder engaging the external shoulder on the tube and also having internal screw-threads engaging the external screw-threads on the one end piece.

4. In an electric reciprocating tool, the combination with the casing, of a coil and core therein, a handle movably secured to said casing, and a circuit-closer operatively connected to said handle and so arranged that when the handle is pressed toward the work said circuit-closer will close the circuit to the coil.

5. In an electric hammer, the combination with the casing, of a coil and core therein, a handle movably connected to said casing, a spring arranged to normally move said handle away from the casing, and a circuit-closer operatively connected to said handle and so arranged that when the handle is pressed toward the work said circuit-closer will close the circuit to the coil.

6. In an electric reciprocating tool, the combination with the casing, of a coil and core therein, a handle hinged to said casing, circuit-terminals in said casing, and a switch-blade connected to said handle and so arranged that when the handle is pressed toward the work said blade will engage said terminals.

7. In an electric reciprocating tool, the combination with the casing, of a coil and core therein, a handle pivoted to said casing, circuit-terminals in said casing, and a switch-blade pivotally mounted in said casing and operatively connected to said handle and so arranged that when the handle is pressed toward the work said blade will engage said terminals.

8. In an electric reciprocating tool, the combination with the casing, of a coil and core therein, a handle movably secured to said casing, circuit-terminals in said casing, a switch-blade pivoted in said casing and operatively connected to said handle and arranged to engage said terminals when the handle is pressed toward the work, and a helical spring connected to said switch-blade and to the casing and arranged to pass the pivot center of said blade when the latter is moved in either direction.

9. In an electric reciprocating tool, the combination with the casing, of a coil and core therein, a handle movably secured to said casing and provided with a fork, a spring arranged to normally press said handle away from the casing, circuit-terminals, and a

switch-blade pivoted in the casing and having a projection engaging the fork on the handle and arranged to engage said circuit-terminals.

10. In an electric reciprocating tool, the
5 combination with the casing, of a coil and core therein, a handle pivoted to said casing and provided with a fork, circuit-terminals, a switch-blade pivoted in the casing and having an arm engaging the fork on the handle, and

a spring secured to the casing and arranged 10 to normally press said handle away from the casing.

In testimony whereof I, the said ADOLPH F. CHRISTMAS, have hereunto set my hand.

ADOLPH F. CHRISTMAS.

Witnesses:

F. W. WINTER,

ROBERT C. TOTTEN.