Dec. 26, 1933. M. PARISI 1,940,692

ELECTRIC HAMMER

Filed Nov. 19, 1931

Fig. 2.

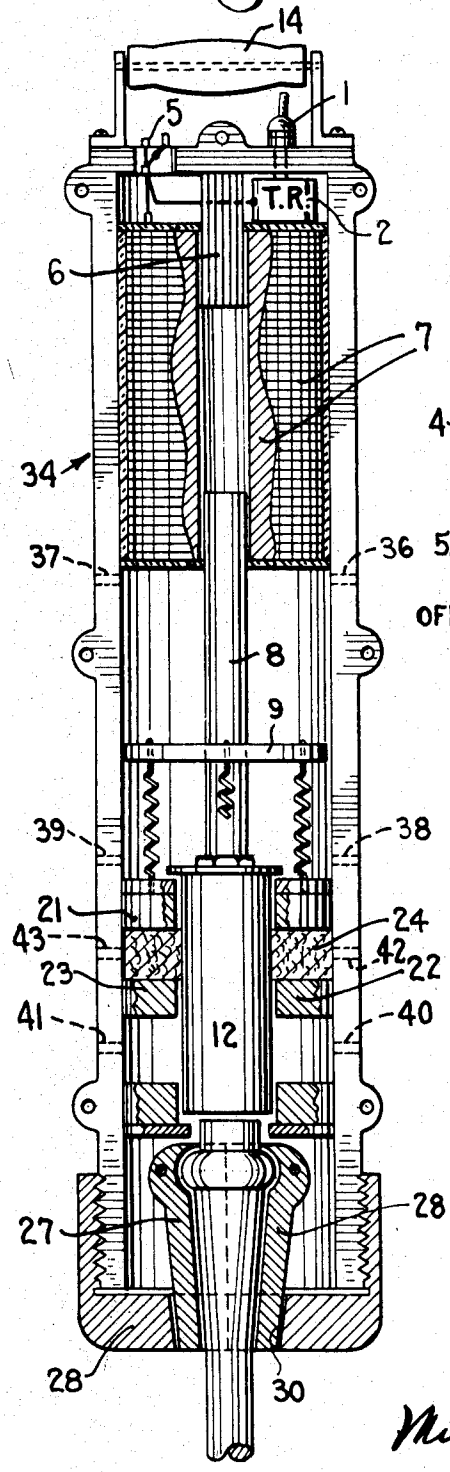



Fig. 3.



Fig. 4.

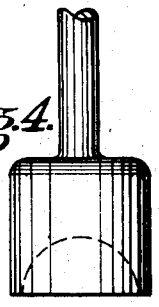


Fig. 5.

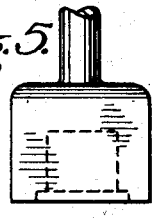


Fig. 6.

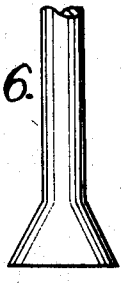
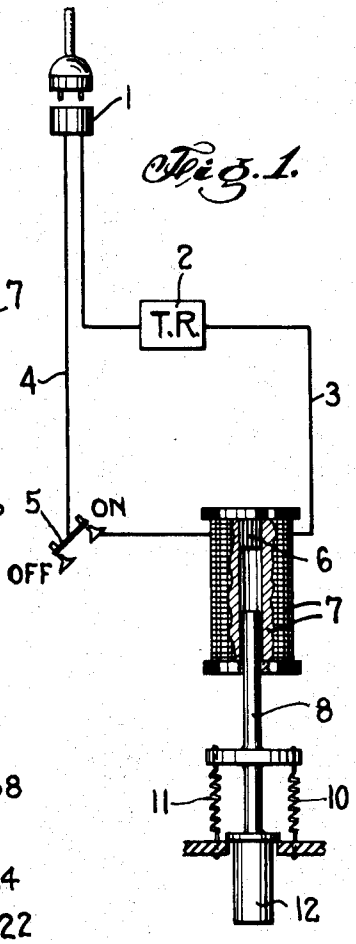


Fig. 1.




INVENTOR.

Michael Parisi

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# UNITED STATES PATENT OFFICE

1,940,692

## ELECTRIC HAMMER

Michael Parisi, New York, N. Y., assignor to Isidor Goldberg, New York, N. Y.

Application November 19, 1931
Serial No. 576,050

1 Claim. (Cl. 172—126)

The principal object of this invention consists of producing a portable electric hammer, suitable for use in trades and adaptable to general hammering work, or like metal stamping, riveting or die casting, punching, scaling, or cutting operations, when of limited weight. The present design being approximately half the actual size. For heavy forgings, or any other industrial uses requiring greater power, hammers of larger proportions can be designed on the same general lines herewith indicated. The present hammer design is intended to work from an electric lighting socket, at 110 volts, and direct current only. It should be understood that where alternating current is the only supply available, this hammer can be operated thereon, provided a thermionic valve or rectifier is inserted in the supply circuit, furnishing from three to five amperes. With these and other objects in view, which will be fully described hereafter, and to render clearer the working of my invention, I have attached this drawing, in which:

Fig. 1 is a diagram showing the general principle on which my invention works.

Fig. 2 indicates a longitudinal cross section of the hammer.

Figs. 3, 4, 5 and 6 indicate a few of the tools and dies suitable for use with this hammer.

In Fig. 1, numeral (1) indicates a base receptacle through which the current enters the apparatus. One of the conductors (4) from said receptacle through a switch (5) enters the winding of a solenoid (7) while the other end of this winding through conductor (3) forms an integral part of the circuit of a timing relay (2). This timing relay may consist of an ordinary electromagnetic make and break device, or a split second watch mechanism suitable to be timed for closing and opening the circuit from one to a few times per second. Such timing relay being of a standard make, does not need any further description. Each time the current enters the solenoid, it will magnetize a short laminated core (6) which will attract the plunger (8) until the same will slide in the open core of the solenoid. The plunger (8) forming an integral part of a soft iron disc (9) to which are attached four coiled steel springs, of which only two (10—11) are shown. At the lower end of plunger (8) is attached a steel cylinder which forms the head of the hammer (12). Each time the current is thrown in the solenoid, this hammer is lifted up, through the plunger attraction, and the springs are stretched. When the current is broken off, said springs will recoil and add their energy to the falling mass of the hammer, thus increasing considerably the force of the blow. This operation is repeated rapidly and the number of blows per minute depends mainly upon the design, the size of the parts and the length of the stroke of the apparatus.

Fig. 2 shows a cross sectional view of a Hammer of this kind. The whole mechanism is contained in a cylindrical casing of duraluminum (34) carrying a handle (14). This casing being cast in two half rounds, and each half is provided with a number of flanges and holes for holding them together by means of bolts and wing nuts. In Fig. 2, one-half of the casing is removed, to show the inner arrangement of the parts, and other details of the hammer. In the upper part of said casing, numeral (1) indicates a receptacle through which the current from a lighting socket enters the apparatus. The circuit goes through the timing relay (2) and the winding (7) with switch (5). When the current energizes the solenoid, its core (6) will attract the plunger (8) and to accelerate its uplifting action, the iron disc (9) will act as an armature to the effect of the magnetic flux produced from the coil (7). It will be noted that the casing (34) is provided with several small orifices (36—37) (38—39) (40—41) these being necessary for the ventilation of the apparatus. It should also be noted that the casing (34) is provided with a number of circular partitions (21—22—23) and others, said partitions having a central hole, through which the hammer head (12) moves up and down, and being guided in its movements by said partitions. Between two of these partitions, there is a space filled with greased cotton waste (24) for the purpose of keeping the hammer head well lubricated. There are also provided holes (42—43) through which oil can be supplied to the lubricating chamber. At the lower end of the cylindrical casing of the apparatus, there are attached two tool retainers (26—27). These retainers are of a half round and conical shape, and their inner space is of a shape to fit the shank of the tool to be held therein. An outside sleeve (28) with a conical hole (30) is provided to fasten in the tool retaining chamber whatever tool is to be used with the hammer. It should be understood that all tools to be used with this hammer, shall have similar shanks, and said shanks to be made somewhat smaller than the inner chamber of the tool retainers, thus allowing the tool therein to move freely up and down, thereby minimizing vibrations affecting the casing of the apparatus.

With Fig. 3 I have indicated a hammer tool, and with Figs. 4, 5 and 6, a round head rivet die, and a square head rivet die, and a cutting tool, respectively. Many other kinds of dies or tools can be used with this hammer. It should be understood that in having thus described my invention, I do not intend to limit myself to the present design; the above being only for the purpose of disclosing the idea, and many changes can be brought to its present structure, without parting from the spirit of my invention. Having thus described my invention, what I claim and wish to be protected by Letters Patent in the United States, is:

In an electric hammer, a solenoid, current connections associated with said solenoid, a core fixed at one end of said solenoid, a plunger consisting of core and impact portions, and a cross-bar intermediate thereof, said core being slidable within said solenoid, resilient means fixed at one end and attached at the other end to the cross-bar, thereby to accelerate the return of the hammer upon break of current within the solenoid, and a series of concentric spaced bearing surfaces surrounding said plunger for guiding the same, and a packing carrying lubricant disposed within at least one of the surfaces between the concentric bearing surfaces.

MICHAEL PARISI.