Sept. 13, 1927. 1,642,560

F. SCHELLERER

POWER HAMMER

Filed April 28, 1926 2 Sheets-Sheet 1

Fig. 1.

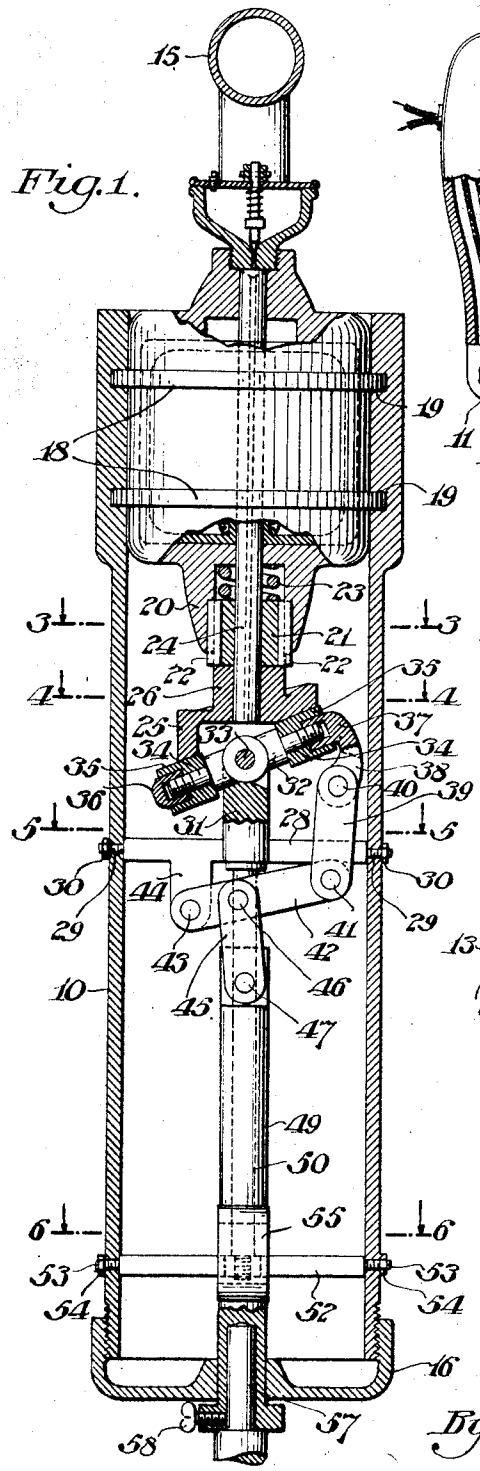
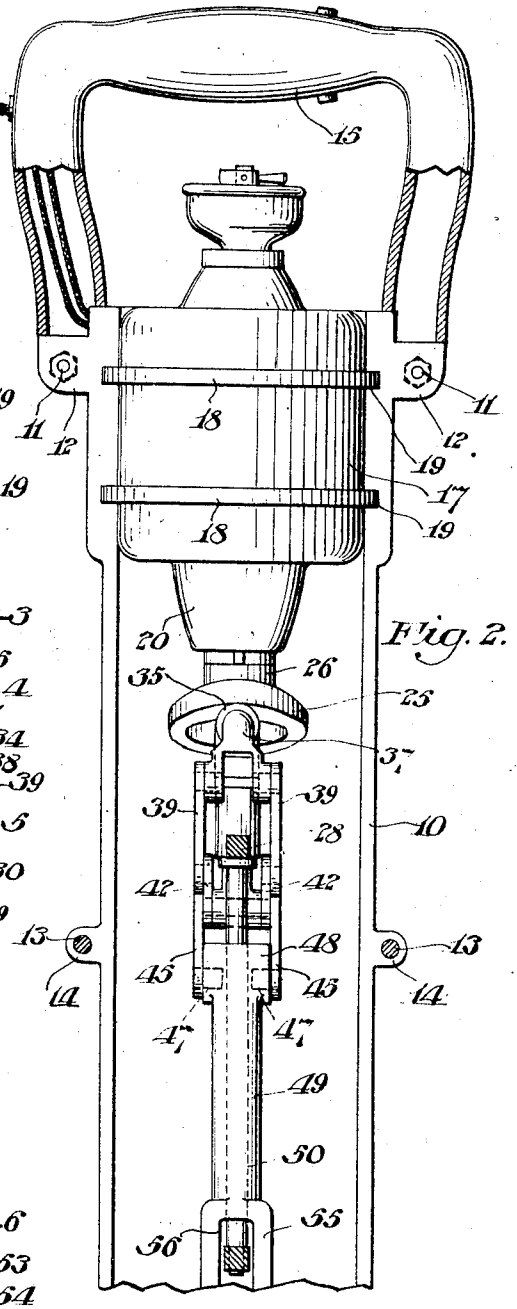


Fig. 2.



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Fig. 3.

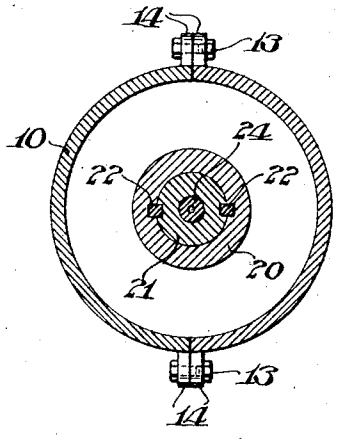


Fig. 5.

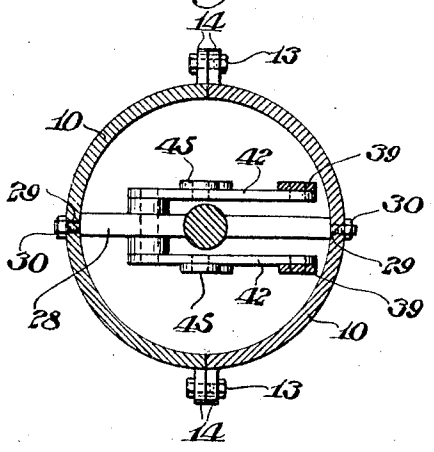


Fig. 4.

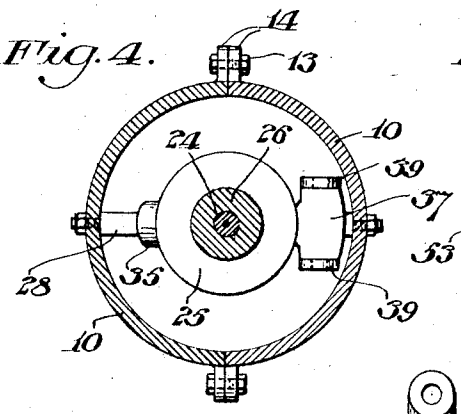
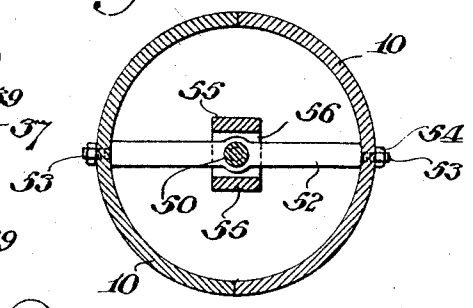


Fig. 6.



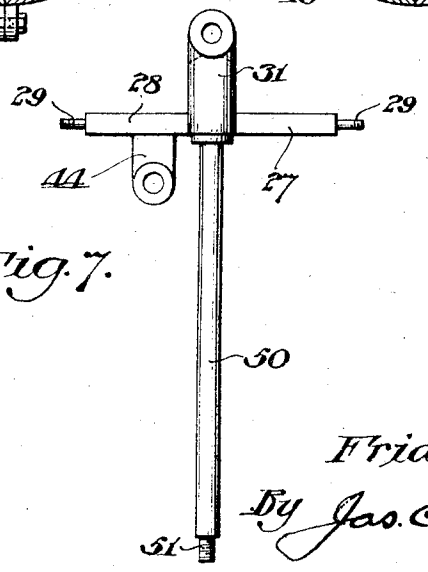


Fig. 7.

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Patented Sept. 13, 1927. 1,642,560

UNITED STATES PATENT OFFICE.

FRIDOLIN SCHELLERER, OF SECANE, PENNSYLVANIA.

POWER HAMMER.

Application filed April 28, 1926. Serial No. 105,334.

My invention relates to a power hammer, that is to say, to a device which may be actuated by an electric or other suitable motor, whereby tools may be properly reciprocated for percussive drilling, riveting, or other similar operations, such as are ordinarily performed by pneumatic and steam actuated hammers. The principal object of my invention is to provide a power actuated hammer, which will be relatively simple in construction and efficient in operation, having novel means for converting the rotary motion of the motor into the reciprocating motion of the tool. A further object of my invention is to provide an improved form of construction whereby the apparatus may be readily assembled and taken apart when required.

The nature and characteristic features of my invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a vertical central section, certain portions being shown in elevation, of a power hammer embodying the main features of my present invention;

Fig. 2 is a similar view, the section being taken transverse to that of Fig. 1;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1;

Fig. 4 is a horizontal section taken approximately on the line 4—4 of Fig. 1;

Fig. 5 is a horizontal section taken approximately on the line 5—5 of Fig. 1;

Fig. 6 is a horizontal section taken approximately on the line 6—6 of Fig. 1; and

Fig. 7 is an elevational view of a frame member employed for supporting certain parts of the mechanism.

Referring to the drawings, in the particular embodiment of my invention therein shown, 10 is a housing, preferably made in two parts, longitudinally separable. The two parts of the housing are held together by means of a pair of bolts 11 passing through ears 12 provided near one end of the housing, and a pair of bolts 13 passing through ears 14 at an intermediate portion of the housing. A handle 15 is secured at one end of the housing, preferably by means of the bolts 11 which serve to secure the two halves of the housing to each other. At the other end of the housing a cap member 16 is mounted, preferably by being threaded thereon.

An electric motor 17 is mounted in the handle end of the housing, being positioned by means of annular ribs 18 which are seated in complemental grooves 19 in the inner surfaces of the housing. The innermost end of the motor casing is provided with a projecting sleeve 20, in which there is mounted a sleeve 21 provided with keys 22, whereby the sleeve 21 may be permitted to slide longitudinally in the projecting sleeve 20 of the motor. A spring 23 is positioned between the inner end of the sleeve 21 and the end wall of the motor.

The motor shaft 24 extends through the slidable sleeve 20, and is provided on its end with a crown cam 25. The cam 25 is provided with a collar 26 for securing the same to the motor shaft 24, and the end face of the collar 26 abuts against the end face of the slidable sleeve 21, whereby the sleeve 21 serves to take the thrust of the cam during the operation of the device, as will be hereinafter set forth.

Mounted within the housing is a frame 27, shown in detached elevation in Fig. 7 of the drawings. The frame 27 has a cross strut 28, the ends of which are threaded as at 29 and extend through the walls of the housing 10. Nuts 30 mounted on the threaded ends 29 of the strut 28 serve to secure the frame 27 in place, and also assist in holding together the two halves of the housing. The frame 27 has a bracket lug 31 extending upward from the strut portion 28. A rocker arm 32 is pivoted intermediate its ends, being mounted in the lug 31 by means of a pin 33. The ends of the rocker arm 32 are provided with spindles 34, on which rollers 35 are journaled. The rollers 35 engage the working face of the cam 25 mounted in the end of the motor shaft. The rollers 35 are held in place on the spindles 34 by means of nuts 36 and 37 which extend within the rollers 35, whereby the arrangement will be more compact.

The nut 37 has an extension 38 to which links 39 are pivoted by means of pins 40. The links 39 are pivotally connected by means of pins 41 to the free ends of levers 42. The other ends of the levers 42 are pivoted by means of a pin 43 to a lug 44 which depends downwardly from the strut 28 of the frame 27. Links 45 are connected by means of pins 46 to the levers 42. The other ends of the links 45 are connected by

means of pins 47 to the enlarged head 48 of a reciprocable sleeve 49.

The sleeve 49 is slidably mounted on a rod 50 which constitutes a portion of the framework 27. The lower end of the rod 50 is threaded as at 51, and said threaded portion is mounted in a cross strut 52, the ends of which are threaded as at 53 similarly to the ends 29 of the struts 28. Nuts 54, which are mounted on the threaded portions 53, serve to secure the strut 52 in position, and also to assist in holding together the two halves of the housing. The sleeve member 49 is enlarged as at 55, and slotted as at 56 adjacent the cross strut 52, to clear the same during the reciprocation of the sleeve member.

Below the enlarged portion 55 of the sleeve member 49, the same extends through and is slidably mounted in the cap member 16, and the end thereof is drilled out for the reception of the shank 57 of the particular tool, such as a riveting head, chisel head, or the like, which it is desired to use in connection with the hammer. A thumb nut 58 secures the shank in the tool at the end of the sleeve member.

A suitable electric switch of any desired construction (not shown) may be mounted in the handle of the tool for the control of the electric motor by the operator, and the handle may be made hollow for the accommodation of the lead-in wires of the motor.

The operation of the device will now be readily understood. As the motor shaft 24 is rapidly rotated, the cam 25 will be correspondingly rotated. The rollers 35, carried by the rocker arm, bearing against the working face of the cam, will cause the rocker arm 32 to be rapidly oscillated about its axis. The motion of the rocker arm 32 will be transmitted by means of the extension 38 of the nut 37 mounted on one end of the rocker arm, and as the same is thus oscillated, the motion will be communicated by means of the links 39 to the levers 42, and thence by means of the links 45 to the sleeve member 49. As the sleeve member 49 is rapidly oscillated on the rod 50, the tool, the shank 57 of which is mounted in the sleeve member, will thereby be actuated.

The shock resulting from the actuation of the tool, which might otherwise be transmitted to the motor, will be taken up by means of the spring 23 which is positioned behind the slidable sleeve 22 against which the end of the collar 26 of the cam 25 impinges.

It will be noted that the device may be readily taken apart and re-assembled when desired, it being necessary only to remove the bolts 11 and 13 and the nuts 30 and 54. The two halves of the housing may then be separated, and the parts carried by the framework 27 will be supported by said framework in assembled relationship notwithstanding the removal of the two sections of the housing.

It will also be noted that the axis of oscillation of the rocker arm 32 is preferably located at right angles to and intersecting the axis of the power shaft 24, thus permitting the employment of the crown cam 25 on the end of the power shaft. By the foregoing arrangement, the apparatus may be made compact, which is a desirable feature in connection with tools of a portable character.

It will be seen that there is thus provided a simple and efficient form of power hammer, having novel means for converting the rotary motion of the motor into the reciprocating motion of the tool which is carried by the sleeve member.

Having thus described the nature and characteristic features of my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A power hammer comprising a power driven rotatable shaft, a cam carried on the end of said shaft, a rocker arm actuated by said cam, a link pivotally connected to said rocker arm, a lever pivoted at one end to a stationary portion of the structure and having its free end pivotally connected to said link, a reciprocable tool holding member, and a link connecting said lever to said tool holding member.

2. A power hammer comprising a power driven rotatable shaft, a cam carried on the end of said shaft, a rocker arm having rollers engaged by said cam, a link pivotally connected to said rocker arm, a lever pivoted at one end to a stationary portion of the structure and having its free end pivotally connected to said link, a reciprocable tool holding member, and a link connecting said lever to said tool holding member.

3. A power hammer comprising a housing, a motor mounted therein, a rotatable shaft comprising a portion of said motor, a cam carried on the end of said shaft, a rocker arm actuated by said cam, a link pivotally connected to said rocker arm, a lever pivoted at one end to a stationary portion of the structure and having its free end pivotally connected to said link, a reciprocable tool holding member, and a link connecting said lever to said tool holding member.

4. A power hammer comprising a housing, a motor mounted therein, a rotatable shaft comprising a portion of said motor, a cam carried on the end of said shaft, a rocker arm having rollers engaged by said cam, a link pivotally connected to said rocker arm, a lever pivoted at one end to a stationary portion of the structure and having its free end pivotally connected to said link, a reciprocable tool holding member, and a link connecting said lever to said tool holding member.

5. In a power hammer, a separable housing, a framework rigidly supported in said housing, said framework having a longitudinally extending rod, a sleeve reciprocably mounted on said rod and having means for holding a tool, a link having one end pivotally connected to said sleeve, a lever to which the other end of said link is pivotally connected, said lever being fulcrumed to a portion of the framework, a link having one end pivotally connected to the free end of said lever, a rocker arm pivotally mounted on a portion of said framework, the other end of said last mentioned link being pivotally connected to said rocker arm, and a power operated cam for actuating said rocker arm.

6. A power hammer comprising a power driven rotatable shaft, a cam carried on the end of said shaft, a rocker arm pivoted intermediate its ends and having both ends engaged by said cam and adapted to be actuated thereby, a reciprocable tool holding member, and means for transmitting the motion of said rocker arm to said tool holding member.

7. A power hammer comprising a power driven rotatable shaft, a cam carried on the end of said shaft, a rocker arm pivoted intermediate its ends and having both ends engaged by said cam and adapted to be actuated thereby, a reciprocable tool holding member, and link work connecting said rocker arm to said tool holding member.

8. A power hammer comprising a power driven rotatable shaft, a cam carried on the end of said shaft, a rocker arm pivoted intermediate its ends and having rollers mounted on each end thereof and engaged by said cam, a reciprocable tool holding member, and link work connecting said rocker arm to said tool holding member.

9. A power hammer comprising a housing, a motor mounted therein, a rotatable shaft comprising a portion of said motor, a cam carried on the end of said shaft, a rocker arm pivoted intermediate its ends having both ends engaged by said cam and adapted to be actuated thereby, a reciprocable tool holding member, and link work connecting said rocker arm to said tool holding member.

10. A power hammer comprising a housing, a motor mounted therein, a rotatable shaft comprising a portion of said motor, a cam carried on the end of said shaft, a rocker arm pivoted intermediate its ends and having rollers mounted on each end thereof and engaged by said cam, a reciprocable tool holding member, and link work connecting said rocker arm to said tool holding member.

In testimony whereof, I have hereunto signed my name.

FRIDOLIN SCHELLERER.