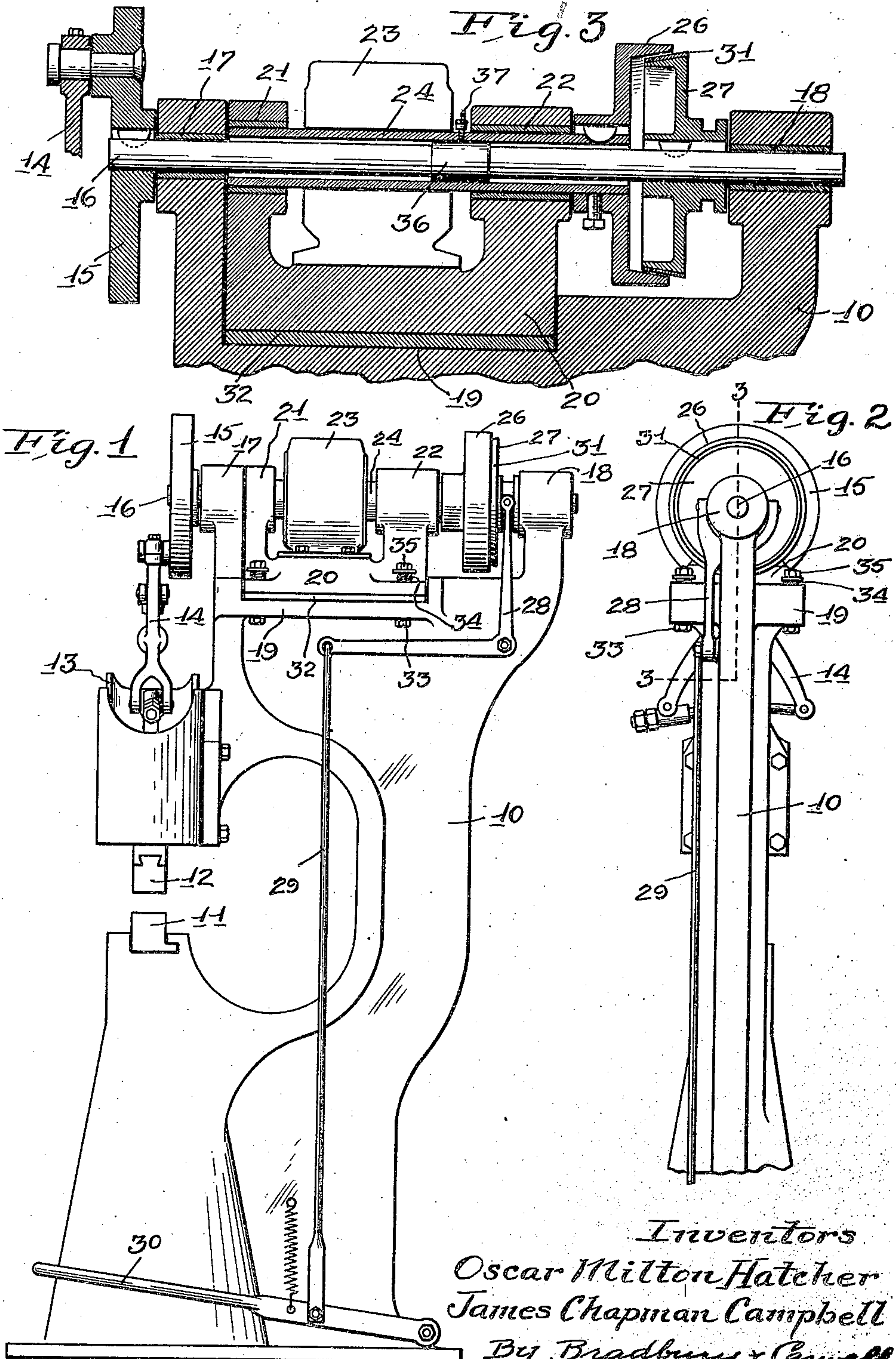


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O. M. HATCHER ET AL.,
POWER HAMMER.
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UNITED STATES PATENT OFFICE.

OSCAR MILTON HATCHER AND JAMES CHAPMAN CAMPBELL, OF MANKATO, MINNESOTA.

POWER HAMMER.

Application filed May 7, 1921. Serial No. 467,778.

To all whom it may concern:

Be it known that we, OSCAR MILTON HATCHER and JAMES CHAPMAN CAMPBELL, citizens of the United States, residing in the city of Mankato, county of Blue Earth and State of Minnesota, have invented new and useful Improvements in Power Hammers, of which the following is a specification.

Our invention relates to improvements in power hammers.

Its object is to provide a simple and efficient device, which, in practice, we have chosen to call a motor-in-head power hammer, the same including a novel arrangement of an electric motor in connection with hammer mechanism propelled by said motor.

More specifically, it is our object to provide a power hammer with a motor for driving the crank-plate shaft, the motor shaft containing said crank-plate shaft without contact therewith and being releasably engageable with said crank-plate shaft through the medium of shock reducing clutch members.

A further object is to secure durability and compactness of structure by supplying, in the head of a power hammer, a driving motor, said motor being cushioned against vibration, shocks and jars from the main hammer body and arranged with the axis of its shaft in relation coincident with the axis of the crank-plate shaft of the hammer mechanism.

With the foregoing and other objects in view, which will appear in the following description, the invention resides in the novel combination and arrangement of parts and in the details of construction hereinafter described and claimed.

In the drawings, Figs. 1 and 2 are side and rear elevations, respectively, of a power hammer embodying our present invention, and Fig. 3 is an enlarged, detail, sectional view taken on the line 3—3 of Fig. 2, the motor, aside from the hollow driving shaft therein, being shown diagrammatically.

Referring to the drawings, we have used the reference numeral 10 to indicate the body of our hammer. Affixed die 11 is located on the body 10 beneath a companion die 12 on a vertically reciprocating ram 13 connected through suitable arms 14 with a crank-plate 15 fixed on the forward end of a crank-plate shaft 16. This shaft is revolvable in spaced forward and rear bearings 17

and 18 on the body 10. A seat 19, formed on said body between the bearings 17 and 18, is designed to carry freely a motor support 20, said support being fitted with forward and rear bearings 21 and 22, which bearings rest in axial alignment with each other and also in the same relation with respect to the bearings 17 and 18 on the body 10. A motor 23, suitably secured as by means of bolts (not shown) to said support 20, is equipped with a hollow driving shaft 24, upon which the revoluble motor element is mounted. This shaft receives the shaft 16, sufficient clearance being furnished between the two shafts so that they are at all times free from contact, one with the other. The forward extremity of said shaft 24 is mounted in the bearing 21, the other end thereof being mounted in the bearing 22 and projecting rearwardly therefrom, as shown. To this rearwardly projecting end of said shaft 24, we secure, by means of a key 25 or otherwise, a driving clutch member 26, said clutch member being designed to co-operate with a slidable clutch member 27 feathered upon the shaft 16 and actuated through suitable means, as by the yoked crank lever 28, link 29 and yielding treadle 30, shown in Fig. 1. We do not wish to limit ourselves to any particular form of clutch, but desire it to be understood that that type of clutch adapted to arrest or reduce the transmission of vibration, shocks or jars from the body 10 to the motor shaft 24 is preferred in our present structure. The form of clutch shown is one of ordinary design. In practice, the friction band 31 on the driven member 27 is made of such material and of such thickness as to best protect the driving member 26 against shocks and vibration, without sacrificing the frictionally engaging properties of said band 31.

Owing to the distance between the bearings 17 and 18 and to avoid vibration of the crank shaft 16, we apply a ring or collar 36 to said shaft 16, as shown in Fig. 3. This ring is of suitable resilient material, the same being suitably fixed against endwise movement and, if desired, secured upon the shaft 16 or to the shaft 24. An oiler 37, carried by the shaft 24, is designed to lubricate the bearing surface of said ring.

The seat 19, as aforesaid, freely carries the motor support 20. A resilient rest 32 of rubber or other suitable material is inter-

posed between the support 20 and seat 19. Said rest, supplying the only contact between the support 20 and body 10, cushions the motor 23 against vibration shocks and jars from said body. We supply yielding means for anchoring the support 20 against the seat 19, said means comprising bolts 33 passing through said seat and the base of said support 20 and including compression springs 34 interposed between the top of said base and nuts 35 on said bolts.

Changes in the specific form of our invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of our invention.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A power hammer, including a body, spaced bearings in said body, a crank-plate shaft revoluble in said bearings, a support, a resilient rest on said body for said support, clamping means for yieldingly securing said support upon said rest, bearings in the support in axial alignment with said bearings in said body, a motor mounted upon the support, said motor including a hollow driving shaft revoluble in the bearings in said support and encircling said crank-plate shaft without contact therewith and co-operating clutch members on said shafts.

2. A power hammer including a body, spaced bearings in said body, a crank-plate shaft revoluble in said bearings, a support having a cushioned rest on the body, bearings in said support in axial alignment with the bearings in said body, a motor mounted upon said support, said motor including a hollow driving shaft revoluble in the bearings in said support and encircling said crank-plate shaft without contact therewith and co-operating clutch members on said shafts.

3. A power hammer including a body, a crank-plate shaft journaled therein, a support having a cushioned rest on the body, a motor mounted on said support, said motor including a hollow driving shaft

journaled in the support and encircling said crank-plate shaft without contact therewith, and co-operating clutch members on said shafts adapted to compensate for variations in the axial relation thereof occasioned by shocks and vibration.

4. A power device of the class described, including a motor, having a hollow driving shaft, a driven shaft passing through said driving shaft without contact therewith and co-operating clutch members for frictionally coupling said shafts, said members being adapted to compensate for axial variations between the shafts occasioned by shocks and vibration.

5. In a power hammer, a driven shaft, a motor cushioned against shocks and jars, the revoluble element of said motor and the driven shaft being arranged in axial alignment, a clutch member on the driven shaft and a companion clutch member on said revoluble motor element, said clutch members compensating for axial variations in said shafts due to shocks and jars set up in the hammer.

6. A power device including a motor having a hollow driving shaft, a driven shaft, passing freely through said hollow shaft, bearings for said shafts near the ends thereof, a resilient ring interposed between the adjacent peripheries of said shafts in substantially medial relation with respect to the bearings of said driven shaft, and co-operating clutch members for frictionally coupling said shafts.

7. A power hammer including a body, spaced bearings in the body, a crank-plate shaft revoluble in said bearings, a support having a cushioned rest on the body between said bearings, a motor mounted on said support, said motor having a sleeve-like driving shaft freely receiving said crank-plate shaft and co-operating clutch members, between the motor and one of said bearings, for frictionally coupling said shafts.

In testimony whereof, we have signed our names to this specification.

OSCAR MILTON HATCHER,
JAMES CHAPMAN CAMPBELL.