April 17, 1956 L. TARWATER 2,741,924

MOTION CONVERTING MEANS

Filed June 18, 1951

FIG. 1.

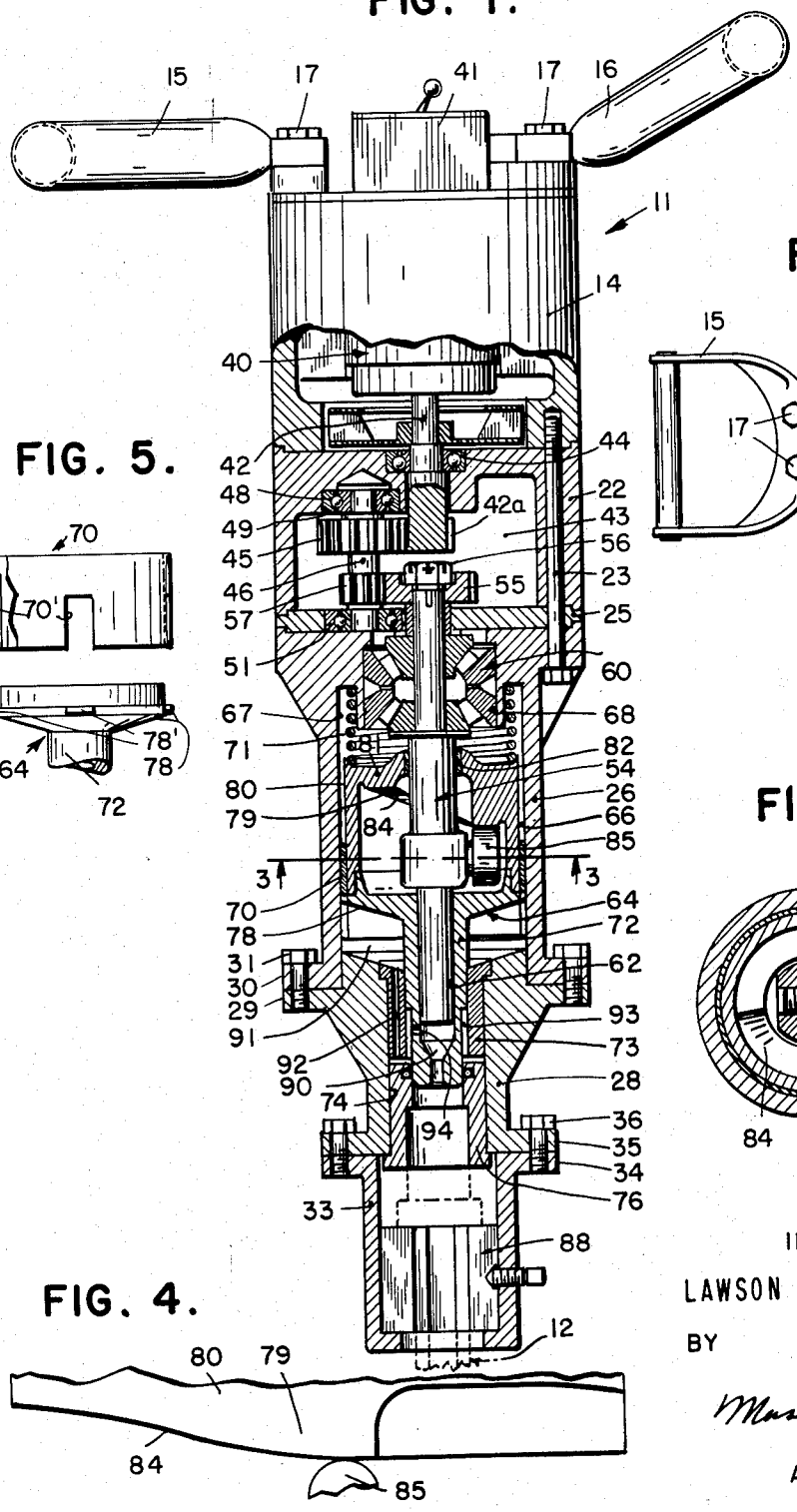


FIG. 2.

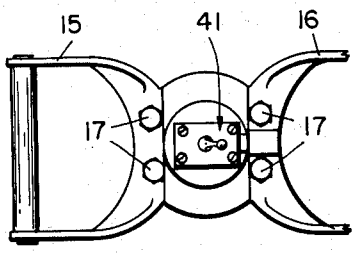


FIG. 5.

FIG. 3.

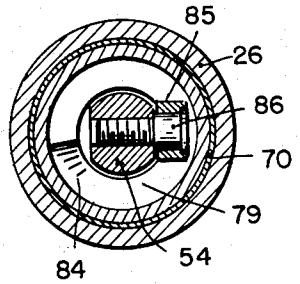


FIG. 4.

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MOTION CONVERTING MEANS

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1 Claim. (Cl. 74—56)

This invention has to do with motor-driven hammers or tamping machines.

An object of the invention is to provide a novel, electrical hammer or tamping machine having improved operating characteristics over electrical tamping machines presently in use with which I am familiar.

Another object is to provide a power-driven hammer or tamper having novel and efficient means for transmitting power from the motor to the hammer of the machine. In this connection it is an object to provide a simplified drive mechanism for translating the rotary motion of a driveshaft into reciprocatory rectilinear motion of a hammer shaft or bar.

A further object is to provide a power-driven hammer which delivers a sharp blow without damage or undue wear to the motor, bearings, gears, and other parts of the mechanism.

More particularly it is an object to provide an improved cam mechanism and construction associated with the hammer or striker bar of the tamping machine.

These and other objects will be apparent from the drawing and the following description.

Referring to the drawing:

Fig. 1 is a sectional elevational view of a tool embodying the invention;

Fig. 2 is a plan view on a smaller scale;

Fig. 3 is an inverted sectional view in the plane of line 3—3 of Fig. 1;

Fig. 4 is a developed view of the cam track; and

Fig. 5 is an exploded elevational view on an enlarged scale showing the liner and a portion of the striker.

More particularly describing the invention, reference number **11** generally designates the power-driven hammer or tamping machine and **12** indicates the upper portion of a tamping tool which would be detachably mounted therein and operated by the machine.

The tamping machine is made up of a plurality of sections of housing or casing. At the upper end of the tool is a motor housing **14** on which are mounted handles **15** and **16** by bolts **17**.

A gear housing **22** is mounted directly below the motor housing and secured thereto by bolts **23**. A bearing plate **25** and a cam housing **26** are positioned in that order below the gear housing and secured thereto by the bolts **23**. An end housing **28** is mounted at the lower end of the cam housing, being secured thereto by means of flanges **29** and **30** and bolts **31**. Below this the machine is provided with a bushing retainer **33** which is detachably secured in place by means of flanges **34** and **35** and bolts **36**.

At the upper end of the tool within the motor housing **14** is a suitable electric motor **40** and this may be provided with conventional wiring and a switch **41** for controlling it. The motor **40** has a depending motor shaft **42** which extends into the space **43** within the gear housing, being received within a bearing **44** mounted in the upper end of that housing. This shaft carries gear teeth **42a** at its lower end which mesh with a gear wheel **45**

fixedly mounted on or formed on a countershaft **46**. This latter shaft is supported at its upper end in a bearing **48** mounted in a recess **49** in the gear housing **22** and at its lower end in a bearing **51** mounted in the bearing plate **25**.

A driveshaft **54** is mounted in axial alignment with the motor shaft and driven by means of a pinion **55** keyed thereto at its upper end and retained by nut **56** which meshes with a gear section **57** on the countershaft **46**.

The driveshaft is supported near its upper end in a double radial thrust bearing **60** and at its lower end within a bore **62** formed in what will be termed a striker, indicated generally by **64**.

The cam housing is hollow, being formed with an interior cylindrical wall **66**. Near its upper end the housing is provided with an annular space **67** and radially inward of this is a lesser bore or counterbore **68** in which is mounted the aforementioned bearing **60**. A liner or guide sleeve **70** extends partway up the wall **66** and is fixedly mounted in any conventional way in the bore **66**. The striker **64** is adapted for reciprocal motion within the chamber in the housing **26** and it fits slidably within the liner **70**, being shown in up position on the drawing. It is yieldably urged outwardly by a powerful compression spring **71** partially received in annular space **67**. Keys **78'** on the flange portion **78** of the striker slidably fit slots or guideways **70'** in liner **70** as shown in Fig. 5.

The lower portion of the striker comprises a tubular section **72** which is received slidably within a bushing **73** at the upper end of a bore **74** through housing section **28** and within a second bushing **76** within the same bore. Above the section **72** the striker is flanged at **78** and above this is a cam section **79** having an outward cylindrical wall surface **80**. The upper end of section **79** includes a centrally apertured wall **81** which supports a bearing **82** receiving shaft **54**. The under surface of wall **81** is formed to provide a cam track **84**, the profie of which is shown in Fig. 4.

The driveshaft is provided with a cam follower **85** which rides on the cam track, the follower being mounted upon a threaded pin **86** which is threadedly mounted in the driveshaft radially thereof.

In the operation of the device the driveshaft **54** is rotated by the motor through the medium of the gears in the gear housing **22**. The cam follower **85** rotates with the shaft riding on the cam track **84** thereby serving to lift the striker against the action of the compression spring **71** and release the same once during each revolution. Each time the cam follower passes the high point of the cam the spring **71** forcibly urges the striker outwardly to deliver a hammer blow against a tool **12** which is received within a bushing **88** in bushing retainer **33**. In order to relieve any pressure build-up which might otherwise occur in the lower end of the striker in the space **90** and in the space **91** within the housing **26**, the bushing **73** is provided with several axially extending passages **92** which communicate with an annular space **93** around the lower end of the striker and in turn with the space **90** through ports **94** in the striker.

While I have illustrated and described a preferred form of my invention, I contemplate that various changes and modifications can be made without departing from the invention, the scope of which is indicated by the following claim.

I claim:

In a motor-driven hammer, a housing, a motor in said housing, a driveshaft mounted for rotation in said housing, gear means operatively connecting said shafts, a striker member, said housing providing a cylindrical chamber and a cylindrical bore of reduced diameter therebelow, said striker member including a lower section slidably received in said bore and an upper section slidably

received in said chamber, said driveshaft being rotatably received in said lower section, said upper section providing a downwardly facing cam track, a cam follower on said driveshaft extending radially thereof and engaging said cam track, said lower section of said striker member and said housing providing an annular space in said bore, said lower section having a port communicating with said space, said housing having a vent passage extending from the lower portion of said cylindrical chamber to said annular space, and spring means yieldably urging said striker member toward the lower end of said housing.

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