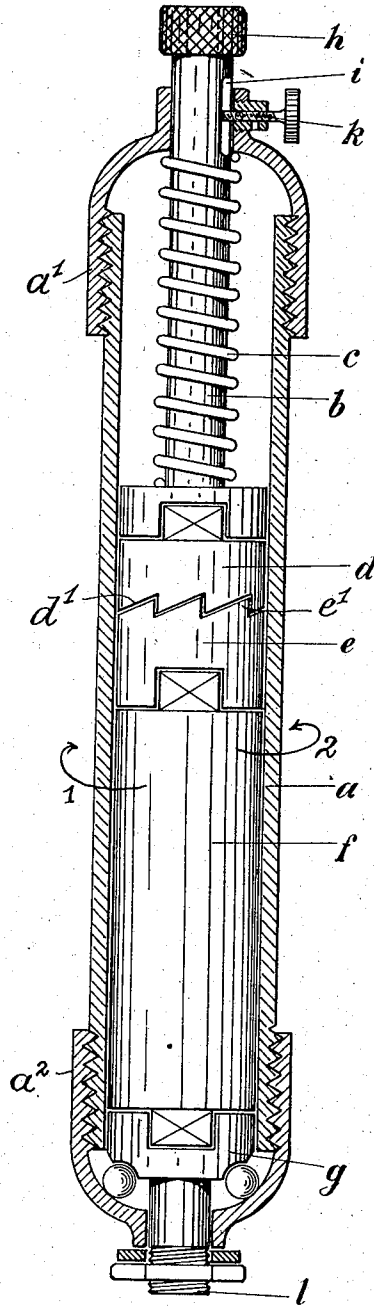


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POWER DRIVEN TOOL.  
APPLICATION FILED MAY 22, 1916.

1,215,439.

Patented Feb. 13, 1917.



Witnesses:—  
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# UNITED STATES PATENT OFFICE.

HUBERT WAGNER, OF GAUTING, NEAR MUNICH, GERMANY.

## POWER-DRIVEN TOOL.

1,215,439.

Specification of Letters Patent.

Patented Feb. 13, 1917.

Application filed May 22, 1916. Serial No. 99,260.

*To all whom it may concern:*

Be it known that I, HUBERT WAGNER, a subject of the German Emperor, and residing at Gauting, near Munich, Germany, have invented certain new and useful Improvements in Power-Driven Tools, of which the following is a specification.

The present invention has reference to certain new and useful improvements in power-driven tools, and relates more specifically to a novel combination tool, driven by flexible shafting in either direction and adapted to be used either as percussive hammer, chisel or the like, or as rotary drill, and the invention essentially consists of the construction, arrangement and cooperation of parts as will hereinafter be fully described and claimed.

My improved tool is of the spring-hammer class, in which a plunger within the cylindrical handle is reciprocatorily actuated in axial direction by a rotor which is driven in suitable manner, for instance by a flexible shaft. From well known constructions of this type the present tool differs in that the impulsion of the hammer-head plunger is not caused by the action of a spring, but by having teeth on the crown of the shaft-driven rotor act directly on similar facing teeth on the bottom of the driven plunger, the spring here being used for always retaining the driven plunger in operative contact with the rotor. Upon reversing the direction of power, the tool can be used as an ordinary drill, the sets of teeth intercoupling and the plunger then constituting also a rotor, and the two rotors rotating jointly.

The described arrangement of having the rotor and the plunger extend co-axially of each other, serves to impart a strictly axially directed impulsion to the active tool head and to reduce the wear to a minimum, since the evenly distributed ratchet teeth are all in use simultaneously, so that a highly satisfactory operative effect is obtained.

In order to make my invention more readily understood, I will now describe it in detail with reference to the accompanying drawing, which represents a longitudinal section through the tool, partly in elevation.

In the tubing *a*, which conveniently may serve as handle and which is closed above and below respectively by the centrally perforated closures *a*<sup>1</sup>, *a*<sup>2</sup>, is loosely retained the rotor *f* which engages below with the cou-

pling claw *g* and is rotated in well known manner, for instance by the flexible shaft *l* secured to the coupling member *g*. The upper end of this rotor carries on its face a set of ratchet teeth *e*<sup>1</sup>, which may be in one with the rotor or may be provided on a special head piece *e*, operatively connected to the rotor. Above this rotor is guided in the casing *a* and in the throat of the closure cap *a*<sup>1</sup> the driven plunger *b*, whose lower face is likewise provided with a set of ratchet teeth *d*<sup>1</sup>, which may also extend from the lower face of a special, exchangeable foot-piece *d*, instead of being worked right out of the plunger base. The upper end of the plunger shank is provided with a longitudinally extending recess *i* into which extends loosely the set screw *k* threading in the wall of the top closure, for preventing rotary displacement of the plunger when hammering, but allowing free reciprocation thereof. A helical spring *c*, surrounding the plunger shank, is put under tension upon each forward thrust of the plunger and tends to always return the plunger teeth into operative contact with the rotor teeth. The chuck or socket *h* serves to receive the chisel, hammer, drill or the like.

The operation is the following:—On the power being turned on it is transmitted by the flexible shaft *l* to the clutch member *g* and in turn to the rotor. The teeth of the latter, when traveling from right to left in the direction of arrow 1, in cooperating with the plunger teeth impart to the plunger a continuation of axial reciprocations, the spring *c* alternately contracting and extending, and keeping the rotor and plunger always in close operative contact. The blows of the tool are strictly axially directed and thus of the highest degree of efficiency.

If the tool is to be used as drilling device, the rotor *f* must be rotated from left to right (arrow 2), when the two sets of teeth will form between them a clutch-coupling, and the member *b* will serve as drill spindle and rotate jointly with the rotor *f*. In this instance, obviously, the set screw *k* must be unscrewed until it comes free of the recess *i*.

What I claim is:—

1. In a tool of the character set forth, the combination of a casing, a power-driven rotor therein, teeth extending from the top of said rotor, a tool-supporting plunger in said casing, teeth extending from the base of said plunger, the said two sets of teeth be-

ing of practically identical pitch and equal in number, means for retaining said plunger in yielding operative contact with said rotor, and means for preventing rotary movement

5 but allowing axially reciprocatory movement of said plunger relative to said casing.

2. In a tool of the character set forth, the combination of a casing, a rotor therein adapted to be power-driven in either direction, a head piece to said rotor and ratchet teeth on said head piece, a tool-receiving plunger in said casing, a foot piece to said plunger and ratchet teeth on said foot piece, said rotor and said plunger with their respective toothed end pieces all being in axial alinement, resilient means for allowing said plunger to ascend the height of said teeth but retaining it always in operative contact with said rotor, the said two sets of practically identically shaped and disposed ratchet teeth in conjunction with said resilient means allowing said rotor to operate on said plunger in a reciprocatory lifting manner when rotating in the one direction,

and in a rotary manner when revolving in the opposite direction, and means for preventing at will rotary movement of said plunger relative to its casing.

3. In a tool of the character set forth, the combination of a casing, a rotor therein adapted to be power-driven in either direction, ratchet teeth on said rotor, a tool-receiving plunger in said casing, ratchet teeth on said plunger, the said sets of ratchet teeth coöperating with each other either skip- 35 pingly or couplingly according to the direction of drive, a helical spring encircling the shank of said plunger and tending to yieldingly press the said plunger teeth home on the said rotor teeth, and releasable means for 40 preventing the said plunger from rotating within its casing.

In testimony whereof I affix my signature in presence of two witnesses.

HUBERT WAGNER.

Witnesses:

W. S. SPEGITTERY,  
HARRY SCHMID.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."