No. 750,037. PATENTED JAN. 19, 1904.

J. B. PHILLIPS.

MACHINE FOR GRINDING PISTON CHAMBERS AND RINGS.

APPLICATION FILED FEB. 16, 1903.

NO MODEL.

Fig. 1.

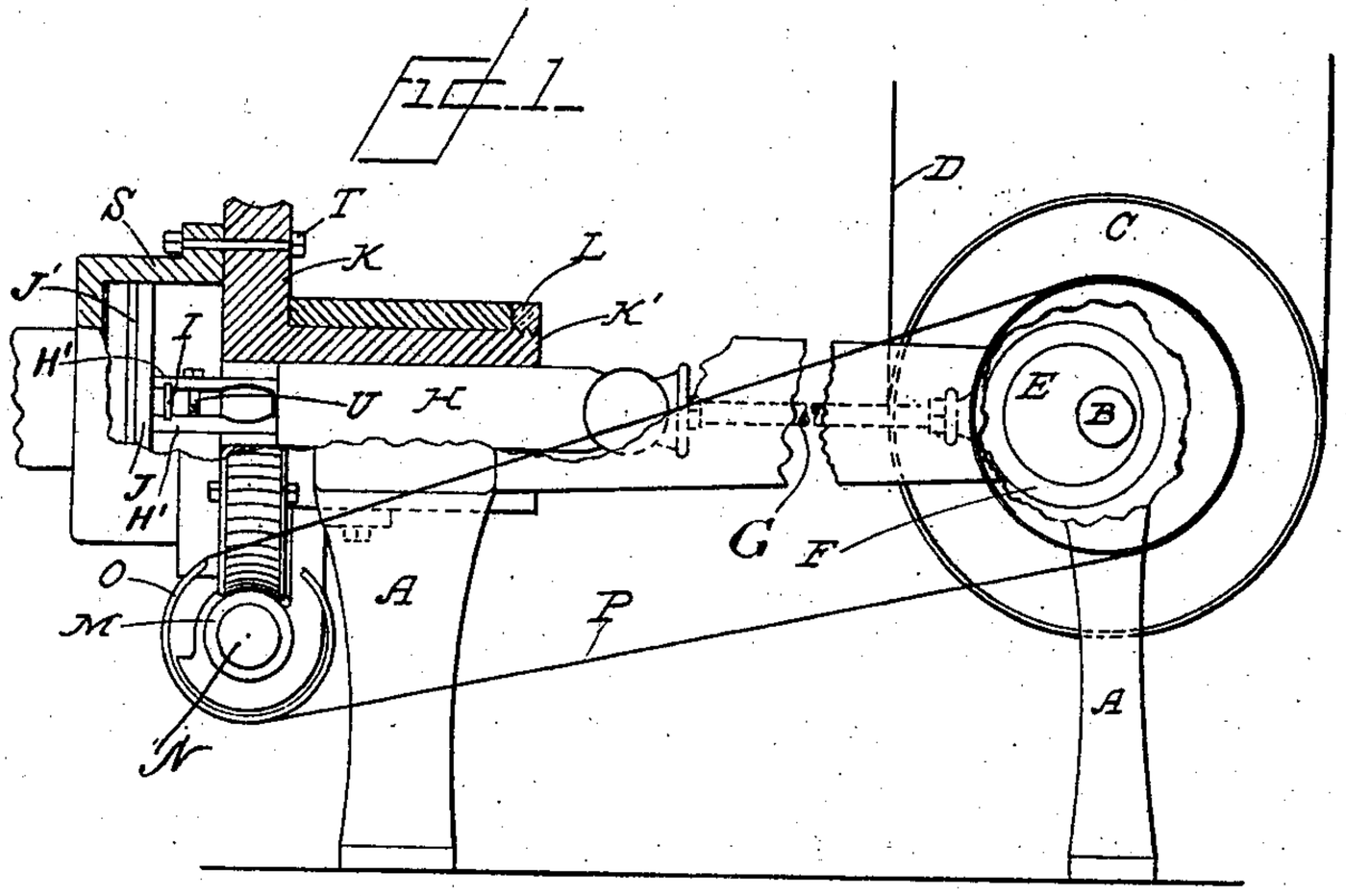
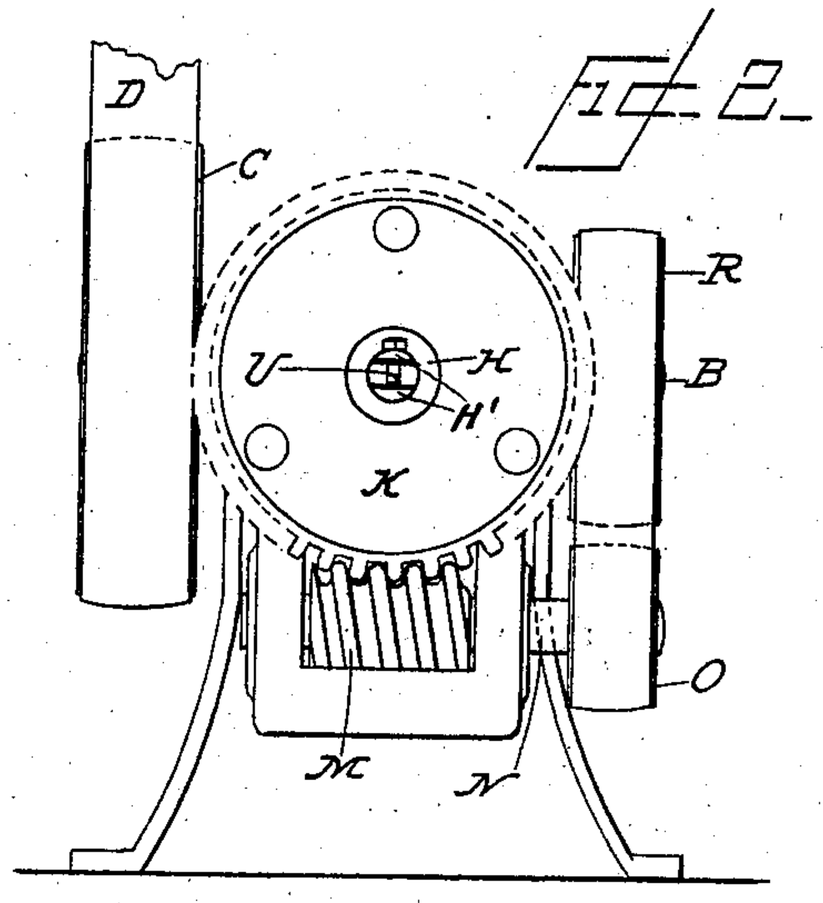


Fig. 2.



Witnesses
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No. 750,037. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

JOHN B. PHILLIPS, OF SAN BERNARDINO, CALIFORNIA.

MACHINE FOR GRINDING PISTON CHAMBERS AND RINGS.

SPECIFICATION forming part of Letters Patent No. 750,037, dated January 19, 1904.

Application filed February 16, 1903. Serial No. 143,718. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PHILLIPS, a citizen of the United States, residing at San Bernardino, county of San Bernardino, State of California, have invented new and useful Improvements in Machines for Grinding Piston-Rings and Piston-Chambers, of which the following is a specification.

In the construction of piston-chambers after a suitable casting is made the interior of the chamber is bored as smooth as it is possible to get it in the lathe. There still remain fine tool-marks in the casing which when the chamber is to be used for air are liable to cause leakage. Piston-rings are turned out a little too large to fit into the piston-chamber, and a piece is cut out and remainder is sprung in, so that it will pass into the chamber. The exterior surface of the piston-ring has fine tool-marks in it, and it must be ground, so that it will perfectly fit the piston-chamber. This work has heretofore been done by an operator being constantly in attendance upon the machine at which the grinding is done and constantly assisting in the grinding by turning the parts.

The object of my invention is to provide a machine in which the piston-chamber may be secured to a rotating part and the piston carrying the piston-ring may be secured to a reciprocating part and be reciprocated in the piston-chamber while it is slowly turning until it is ground to fit such chamber perfectly. I accomplish this object by the machine described herein and illustrated in the accompanying drawings, in which—

Figure 1 is a side view, partly in elevation and partly in section, showing its application to grinding the piston-chamber and piston-ring of a Westinghouse triple valve. Fig. 2 is an end view of the same, the parts of the triple valve being omitted.

In the drawings, A is the frame of the machine, which is adapted to be fastened upon a work-bench or other suitable supporting structure. (Not shown.) In the rear end of the frame is rotatively mounted shaft B, one end of which carries pulley C, to which power is applied by belt D, driven by suitable power. (Not shown.) On shaft B is rigidly mounted eccentric E, which works in eccentric-strap F, to which strap is attached eccentric-rod G. This eccentric-rod is connected with the traversing mandrel H, the front end of which is bifurcated into arms H′, which receive and hold stem I of piston J, provided with rings J′, when they are to be ground. This mandrel reciprocates in hub K′ of the worm-wheel K, which wheel is rotatively mounted in the front end of the frame. This worm-wheel is secured to the frame by nut L, screwed upon the rear end of the hub, which keeps the worm-wheel firmly secured in the frame. This wheel meshes with and is driven by worm-gear M, rigidly mounted on shaft N, which shaft is rotatively mounted in bearings in the frame. On shaft N is rigidly mounted pulley O, which is driven by belt P, which passes over pulley R, rigidly mounted on shaft B. Pulleys O and K are shown in Fig. 1 as partly broken away to show parts which would otherwise be obscured thereby. The piston-chamber S is secured to the worm-wheel by bolts T.

In the operation of my machine the piston-chamber is bolted to the worm-wheel, and the piston whose rings are to be ground therein is secured to the reciprocating mandrel in any suitable manner. In securing the piston of the Westinghouse triple valve after stem I is passed into the furcations or arms of the mandrel they are held secured thereto by screw U. Power is then applied to rotate pulley C, thereby through connecting mechanism causing the reciprocation of the piston J in chamber S and at the same time causing the rotation of said chamber, a suitable supply of oil being supplied by means (not shown) to properly grind the parts. It will be observed that by this construction a different portion of the surface of the piston-chamber is presented to any given section of the piston-ring at each reciprocation thereof, whereby every part of the ring is evenly ground to fit every portion of the surface of the piston-chamber, thereby making it a perfect fit and avoiding any chance for leakage of air when the piston and chamber are in actual use. It will also be observed that as soon as an operator has secured the

parts in position he can set the machine in motion, and thereafter until the piston chamber and rings are ground it needs no further attention, and he may take charge of and attend to several of such machines or do other work.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for grinding piston chambers and rings; a frame; a gear rotatively mounted therein, said gear being adapted for having a piston-chamber secured thereto; means to rotate said gear; a mandrel in the hole in said gear, said mandrel having means to attach a piston thereto; and means to cause the reciprocation of said mandrel in said gear.

2. In a machine for grinding piston chambers and rings the combination of a frame; a worm-wheel having a hollow hub, said wheel being adapted for the attachment thereto of a piston-chamber; a worm-gear adapted to mesh with said worm-wheel; means to rotate said worm-gear; a mandrel having means to attach a piston thereto, said mandrel extending through said worm-wheel and adapted to reciprocate therein while said wheel revolves; and means to cause the reciprocation of said mandrel.

3. A machine for grinding piston-rings into piston-chambers, comprising a frame; a shaft rotatively mounted in said frame; pulleys and an eccentric on said shaft; an eccentric-strap on said eccentric; a traversing mandrel adapted to have secured thereto a piston; an eccentric-rod connecting said mandrel and said strap; a worm-wheel having a hollow hub mounted in said frame and surrounding a portion of said mandrel and adapted to rotate in said frame around said mandrel and to have attached thereto a piston-chamber; a worm-gear having a shaft rotatively mounted in said frame, said gear being adapted to mesh with said worm-wheel; a pulley on said worm-gear shaft; and a belt on said pulley and on the pulley on the shaft having the eccentric thereon.

In witness that I claim the foregoing I have hereunto subscribed my name this 6th day of February, 1903.

JNO. B. PHILLIPS.

Witnesses:
W. J. CURTIS,
J. W. CURTIS.