H. KISTNER.

DEVICE FOR HAMMERING PISTON RINGS.

APPLICATION FILED MAY 11, 1920.

1,435,481. Patented Nov. 14, 1922.

2 SHEETS—SHEET 1.

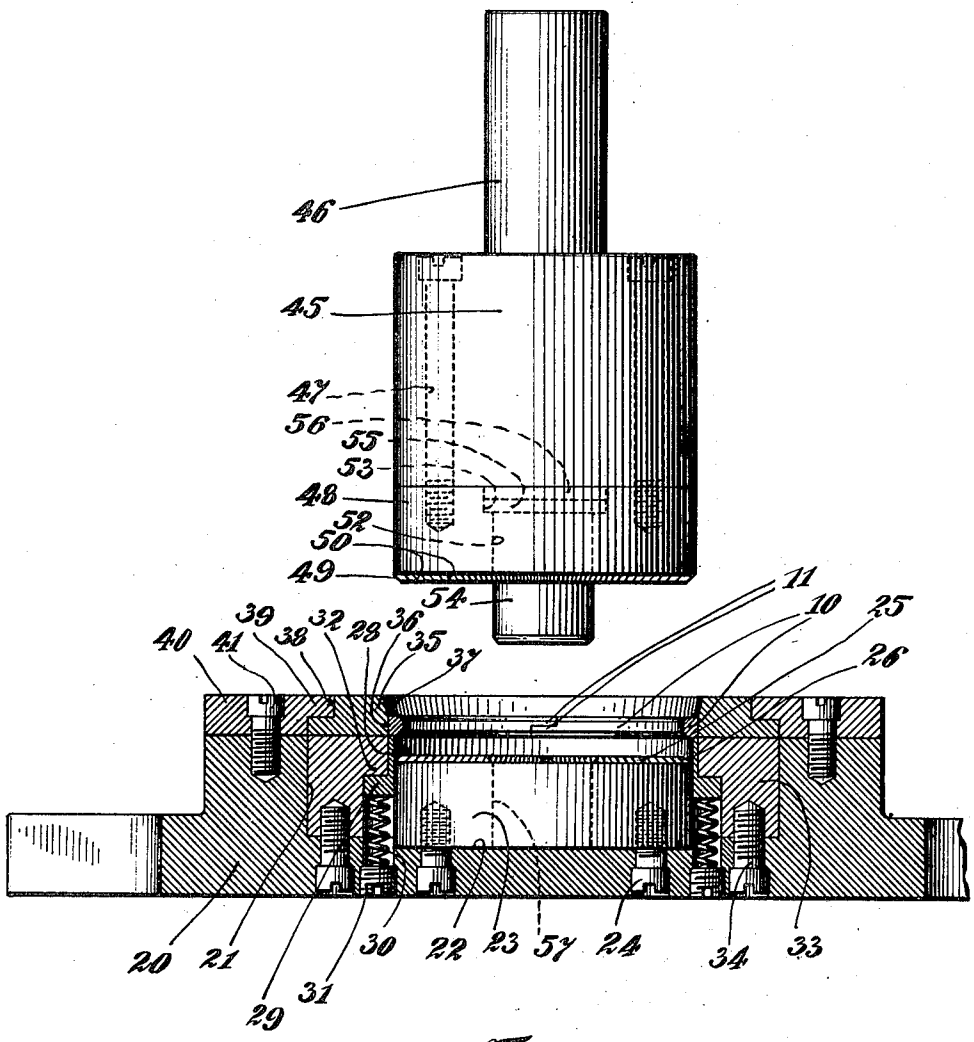


Fig. 1.

Inventor
Herman Kistner
By his Attorney
Frank C. Fischer.

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2 SHEETS—SHEET 2.

Fig. 2.

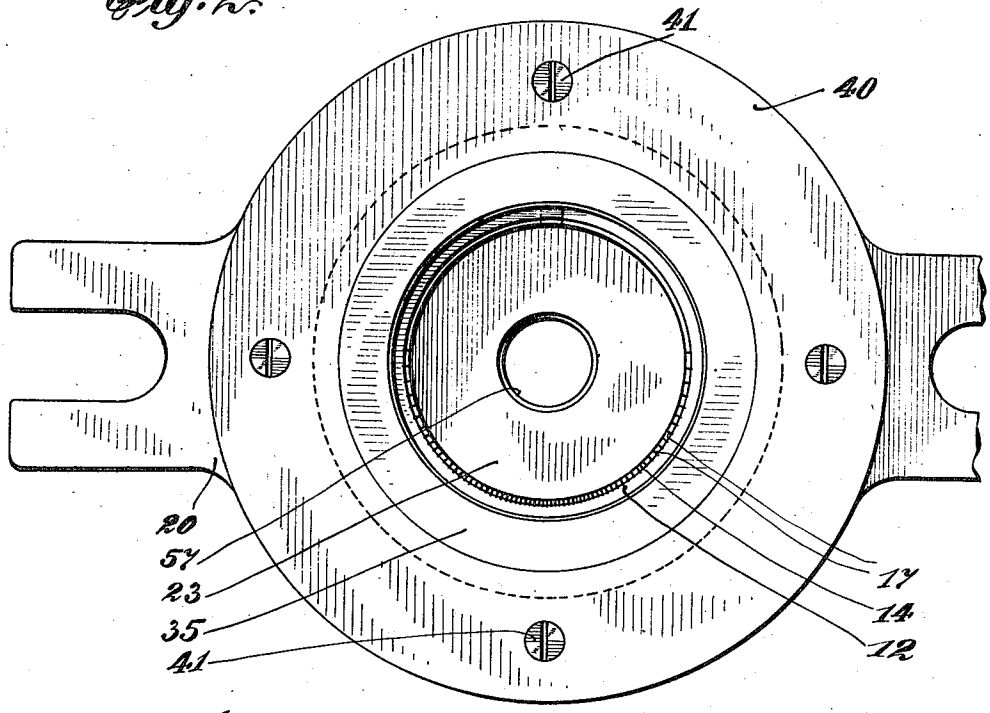


Fig. 3.

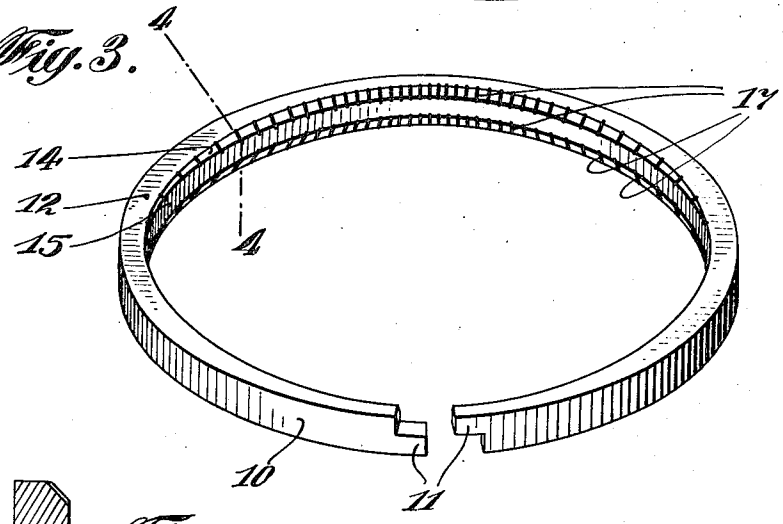
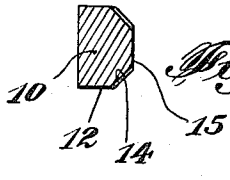


Fig. 4.



Inventor
Herman Kistner
By his Attorney
Fred C. Fischer.

Patented Nov. 14, 1922. 1,435,481

UNITED STATES PATENT OFFICE.

HERMAN KISTNER, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO VICTORY HAMMERED PISTON RING COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DEVICE FOR HAMMERING PISTON RINGS.

Application filed May 11, 1920. Serial No. 380,500.

To all whom it may concern:

Be it known that I, HERMAN KISTNER, a citizen of the United States, residing in the city of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Devices for Hammering Piston Rings, of which the following is a specification.

The principal object of this invention is to provide a mechanism and process for producing truly round concentric piston rings, highly elastic, compression proof, and of high tension, imparted by the peculiar and novel hammer treatment accorded them and by which the metal is toughened and strengthened by compression, rather than weakened by expansion as are rings made in the ordinary manner.

A further object is to provide a mechanism that will tension the ring by hammering upon both sides simultaneously, producing the desired peening effect in a rapid and effective manner under any pressure which may be desired.

These and other objects, which will become apparent as the description progresses, are attained by the novel construction, combination and arrangement of parts hereinafter described and shown in the accompanying drawings, forming a material part of this disclosure, and in which:—

Figure 1 is a side elevational view of a punch and vertical sectional view of a die in which the percussion hammer operations are performed.

Figure 2 is a plan view of the die.

Figure 3 is a perspective view of a piston ring, showing the peening marks and illustrating the peculiar manner in which they are arranged.

Figure 4 is an enlarged cross sectional view taken on line 4—4 of Figure 3.

Referring to the drawings in detail, the numeral 10 designates in general a piston ring, which, as shown in Figs. 3 and 4, is of uniform cross section throughout except at the overlapping ends 11, at the opening.

The lateral edges of the ring present flat parallel outer portions 12 and equal bevelled inner portions 14, formed at an angle of approximately forty-five degrees with the inner surface 15, which is concentric with the exterior surface of the ring.

The bevelled surfaces 14 have in them a plurality of radial indentations 17, of substantially uniform depth, and arranged relatively close together at a point opposite the ring opening, the indentations becoming spaced progressively further apart on each side to a point at the center of the ring, from whence they are omitted to the ends 11; thus half of the ring is stressed by condensing the metal, due to the peening or percussive effects of hammer strokes, and the remainder, adjacent the opening, left in its natural condition.

The mechanism for producing these effects, and which is the subject matter of the invention, will now be described.

Use is made of a powerful press, (not shown) comprising in combination with other operative parts a platen or work receiving element and a quick operating plunger or ram arranged perpendicularly with respect to the platen.

Attached to the platen is a die holder 20 of the usual type, containing a circular recess 21, having a central depression 22 in which is seated a die 23, held by the screws 24, passing up through the bottom of the die holder. The upper marginal edge 25 of the die is bevelled and on the bevelled surface are ridges 26 adapted to produce the aforesaid indentations, it being understood that the bevel 25 corresponds to that of the ring.

Circumjacent the die 23 is a thin cylindrical stripper 28, the thickness of its wall being equivalent to the flat side portion 12 of the ring, the stripper having an outturned flange 29 at its bottom resting upon a plurality of coiled compression springs 30, set in appropriate openings in the die block, and supported by screws 31, these springs maintaining the stripper in a normally raised position.

The upper side of the flange 29 abuts, when raised, against a ring 32 formed with an annular block 33 fitted to the recess 21 and held firmly therein by the screws 34 passing up through the die holder.

Disposed over the block 33 is a guide ring 35 the opening 36 of which is adapted to receive the piston ring 10 when closed, the upper part of the ring 35 being bevelled outwardly, as at 37, to permit the rings to be conveniently entered.

Entering the annular recess 38 in the outer upper portion of the guide ring 35 is the corresponding portion 39 of a clamp

ring 40, held by the screws 41 to the top of the die block, with which it corresponds in outer diameter.

The punch or hammer element is comprised of a cylindrical body 45 having a stem 46 engageable by the usual means in the plunger of the press, the circular punch 48, which is an exact counterpart of the die 23, having a bevelled edge 49 and raised ridges 50 is held to the body by the screws 47 as shown.

A central circular opening 52 having a counterbore 53 is formed in the punch, the same containing a pilot or guide stem 54 projecting outward below the punch, and held by its enlarged head 55, set in the counterbore 53 and backed by a washer 56, the extremity of the pilot being bevelled or rounded so as to readily enter into the corresponding guide opening 57 in the center of the die 23.

In operation, the punch and die having been assembled and aligned in the press, the ring to be peened is closed and entered in the guide ring 35 until it rests upon the upper edge of the stripper 28.

The press is then caused to operate, moving the punch 48 down, the pilot 54 entering the opening 57, thereby assuring correct registration, and continuing downward, depresses the ring and stripper until the ring contacts with the die, whereupon the punch and die simultaneously operate to produce the desired corrugations.

As the punch rises, obviously the stripper, due to its spring supports, releases the ring from the die so that it can be easily removed.

From the foregoing it will be seen that a simple but highly effective apparatus has been disclosed which can be conveniently and quickly operated, and while the mechanism described is the preferred embodiment of the invention, it is not desired to restrict the exact details of construction, it being obvious that minor variations, not involving the exercise of invention, may be made without departing from the scope and spirit of the appended claims.

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

1. An apparatus for peening rings, comprising upper and lower elements having ridged facing surfaces, the upper element being movable to and from the lower element, a guide for locating the rings, and a spring actuated stripper circumjacent said lower element.

2. An apparatus for peening rings comprising a die block, a circular die secured therein, said die having a bevelled margin, narrow radial raised elements disposed in progressively spaced relation on the bevelled margin, a punch having its edge formed as a counterpart for said die, means for guiding said punch relative to the die, a guide for the rings and spring actuated means for ejecting the rings after impressing.

3. An apparatus for hammering rings comprising oppositely disposed members, each having raised radial ridges on their bevelled edges whereby indentations are formed on each side of the rings simultaneously and means for actuating one of said members relative to the other.

This specification signed and witnessed this 30th day of April, 1920.

HERMAN KISTNER.

Witnesses:
FRED'K C. FISCHER,
F. NOLL.