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G. E. WAGNER

ROTARY PERCUSSION IMPLEMENT

Filed May 13, 1926

Fig. 1

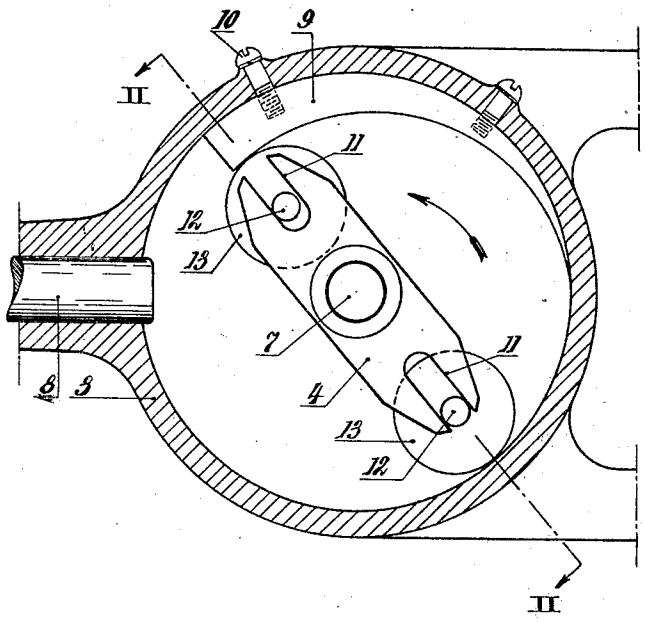
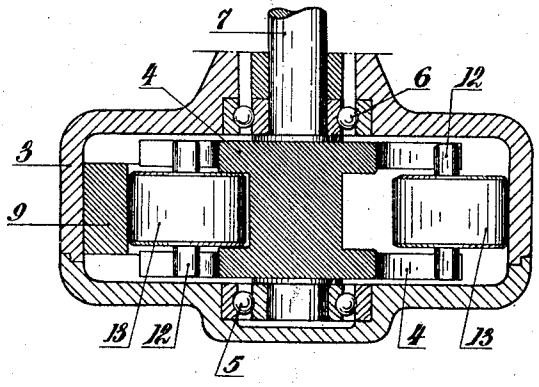


Fig. 2



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UNITED STATES PATENT OFFICE.

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ROTARY PERCUSSION IMPLEMENT.

Application filed May 13, 1926, Serial No. 108,930, and in France January 16, 1926.

The present invention concerns a rotary percussion implement or apparatus which can be employed as a hammer for various work.

This implement comprises a casing which contains an actuating element rotating at high speed and retaining in the tangential direction, but not in the radial direction, one or more striking or impact bodies which are subjected to centrifugal force and bear against the inner surface of the said casing. The outline of the said inner surface is such that each such body is first brought towards the axis of rotation of the said actuating element, and is then suddenly released, so that it will strike against the head of a suitably placed tool holder.

It is obvious that since each impact body is in contact with the inner surface of the casing for the major part of its stroke, it will be subject to a rapid wear unless special means are employed to obviate this drawback.

In my invention, each body has the form of a cylindrical roller provided on either side with an axle which is engaged in a radial slot formed in the said actuating element.

A constructional form of a rotary percussion implement according to my invention is shown by way of example in the appended drawings.

Fig. 1 is a section through the middle part of the implement.

Fig. 2 is a section on the line II—II of Fig. 1.

In both figures, 3 is a casing of substantially circular form containing the actuating element 4 which is mounted in the bearings 5 and 6 and is secured to the high-speed shaft 7.

In the casing 3 is mounted the tool holder 8 which extends slightly within the said casing and carries a suitable tool at the outer part.

The said tool holder is maintained in the casing in any suitable manner, but it is susceptible of a slight endwise or radial motion relatively to the said casing.

Within the casing 3 is disposed a ramp 9 which is secured thereto by the screws 10, and which changes the internal outline of the casing from circular to non-circular.

According to the invention, radial slots 11 are provided in the ends of the actuating element 4, and in each slot is engaged a small axle 12 pertaining to a roller 13 which is adapted to roll upon the inner surface of the casing 3.

The operation is as follows:

Assuming that the actuating element 4 is in rapid rotation and that a tool, mounted in the holder 8, is in contact with the work, the centrifugal force exerted on the rollers 13, which have a certain play in the radial direction, will press the said rollers strongly against the inner surface of the casing 3. Since the friction between the axles 12 and the surfaces of the slots 11 is very slight, the said rollers will roll without slipping upon the inner surface of the casing.

During the rotation of the actuating element 4, a roller meets and travels along the ramp 9 and thus is caused to approach the axis of rotation of said element; but when it leaves the said ramp, it is abruptly impelled outward by the centrifugal action, and strikes with great force upon the head of the tool holder 8.

A like action will occur for each roller, and in a very rapid succession, so that a hammering effect will be imparted to the tool which is carried by the tool holder 8.

It is evident that since the rollers 13 have simply a rolling action upon the inner surface of the casing 3 and upon the ramp 9, there will be practically no loss of power, and no appreciable wear of the parts.

Besides, the coefficient of rolling friction between each roller 13 and the head of the tool holder 8 is very small, so that the reaction is substantially perpendicular to the contact surfaces, and practically no effort will take place except in the direction of the axis of the tool holder; otherwise stated, although the roller 13 does not strike the head of the tool holder 8 perpendicularly to its surface, the action will be effected as if the percussion took place according to the axis of the tool holder.

Obviously, the invention is not limited to the example hereinbefore described, and represented in the appended drawings, and in particular, I may employ more than two rollers 13, or on the contrary, only a single roller. I may further adopt another outline for the internal surface of the casing 3 and for the ramp 9.

I claim as my invention:

A rotary percussion element, comprising a casing; a high-speed shaft projecting thereinto; an actuating element within the

casing secured at its center to said shaft to rotate therewith and embodying two oppositely-extending, forked portions which are provided with alining radial terminal slots; an impact roller mounted in each of said forked portions and having axles on its opposite sides which are slidably engaged in the slots therein whereby said rollers will be carried around by said actuating element in its rotation and will be forcibly pressed against the inner surface of the casing; and a member projecting into said casing to receive the full impact of each roller periodically during the rotation of the actuating element.

In testimony whereof I affix my signature.

GEORGES ERNEST WAGNER. [L. S.]