Dec. 6, 1927. 1,651,462

E. G. MAKI

PISTON RING REMOVER AND APPLIER

Filed March 5, 1927

Fig. 2.

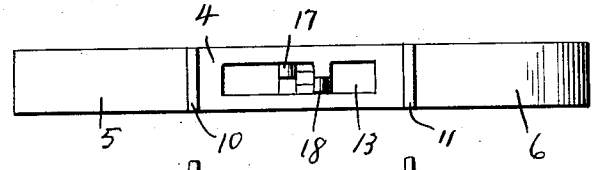


Fig. 1.

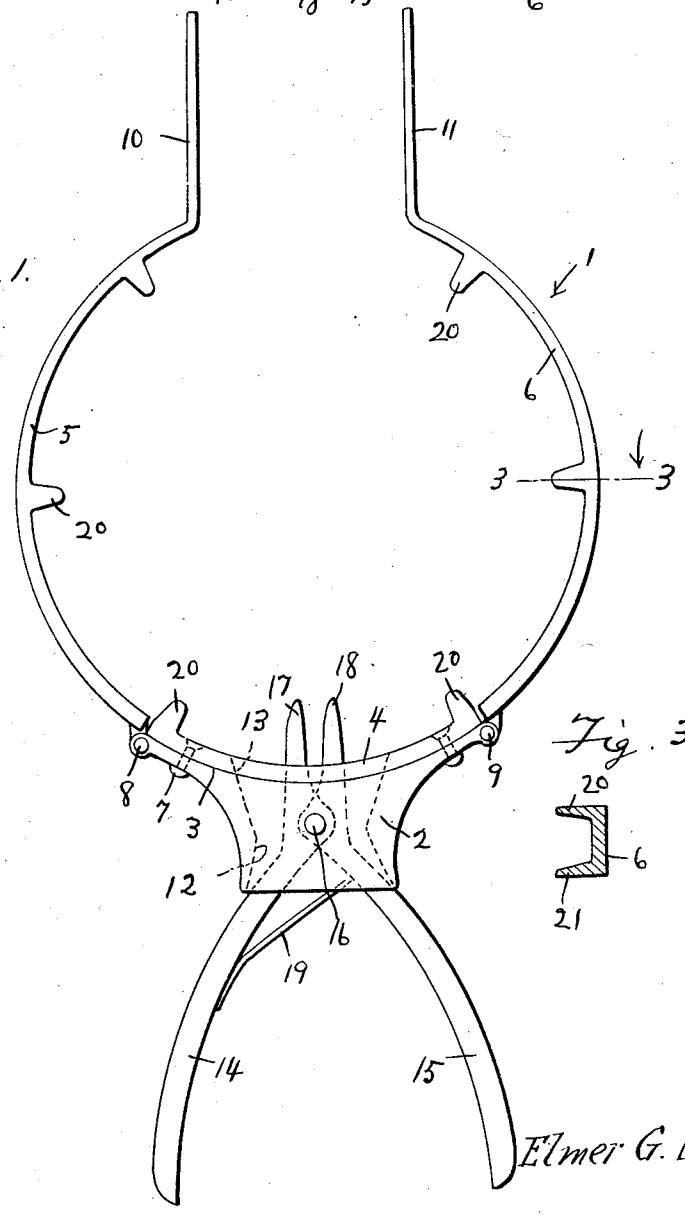


Fig. 3.

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PISTON-RING REMOVER AND APPLIER.

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The present invention relates to improvements in tools and has reference more particularly to a tool for detaching and removing piston rings from pistons.

One of the important objects of the present invention is to provide a tool of the above mentioned character which will save considerable time and labor in removing and applying piston packing rings, the tool being of such construction as to permit the same to be readily and easily placed over the piston to facilitate the removal of the packing rings therefrom.

A further object is to provide a tool of the above mentioned character which is simple in construction, strong and durable, and further well adapted to the purpose for which it is designated.

Other objects and advantages of the invention will become apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this application, and in which like reference characters designate like parts throughout the views:

Figure 1 is a top plan view of the tool, embodying my invention.

Figure 2 is a front edge elevation.

Figure 3 is a sectional view, taken approximately on the line 3—3 of Figure 1.

In the drawing, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates generally my improved piston ring tool, the same comprising a head 2, the forward end portion being enlarged and the inner face being concaved, as illustrated at 3, for a purpose hereinafter to be more fully described.

Also forming a part of the present invention is a relatively large annular member formed of spring metal, the same being constructed in such a manner as to provide a plurality of segmental sections. Three of such sections are preferably formed, the same consisting of a relatively short intermediate section 4 and the larger end sections 5 and 6 respectively. The intermediate section 4 of the segmental annular member is riveted to the concaved inner face 3 of the head 2, as illustrated at 7, with reference more particularly to Figure 1 of the drawing. This intermediate section 4 is of substantially the same length as the length of the concaved inner face or edge 3 of the head 2.

The inner end of the segmental section 5 is hingedly secured to the inner end portion of the head 2, as at 8, while the inner end of the other end section 6 is hingedly secured to the opposite inner end portion of the head 2 as at 9. In this manner, the end sections 5 and 6 of the annular member are secured to the head 2, so that said sections may be free to swing outwardly, whereby to permit the annular member to be readily disposed around the piston whose packing rings are to be removed.

The outer free ends of the sections 5 and 6 are disposed laterally, in parallel spaced relation to form a pair of handles 10 and 11 respectively, and the purpose thereof will also be presently described.

The head 2 is formed with an enlarged transversely extending slot 12, and in registration with this slot is a similar slot 13 formed in the intermediate portion of the intermediate section 4 of the segmental annular member. Adapted for disposition within the slot 12 formed in the head 2 are the inner ends of a pair of levers 14 and 15, the levers being pivotally connected together, by means of a vertically extending pivot pin 16, which is carried by the head 2, and the particular manner in which these levers are connected together, with respect to the head is clearly shown in Figure 1.

A pair of co-acting jaws 17 and 18 are formed on the pivoted ends of the levers, and these jaws are disposed through the slot 13 formed in the intermediate section 4 of the segmental annular member, so that the free ends of the jaws extend into the space surrounded by the annular member. These jaws taper gradually toward their outer free ends and as is clearly shown in Figure 2, the jaws are not disposed in the same horizontal plane, one jaw being disposed above the other jaw, in order that the same may properly engage the split end of the piston packing ring which is seated in the groove provided therefor, in the piston, in the manner well known in the art. These jaws are adapted to be moved in opposite directions, and are normally retained in a closed position, through the medium of the leaf spring 19, which is interposed between the pivoted levers or handles 14 and 15. The slot 12 is of such size as to permit the pivoted portions of the coacting levers to be free to move therein, and the same is true with respect to the slot 13, formed in the intermediate mem-

ber 4 of the segmental annular member, in order to permit the proper and free movement of the co-acting jaws 17 and 18.

Associated with the annular member is a means for supporting the expanded piston ring and the same comprises the provision of pairs of laterally extending ears or lugs 20 and 21 respectively, which lugs or ears are formed on the upper and lower edges of the sections of the segmental annular member at spaced intervals in the manner as clearly shown in Figures 1 and 3. These laterally extending ears or lugs are disposed inwardly from the several segmental sections and extend into the space surrounded by the annular member, as is clearly illustrated in Figure 1.

The use of my improved piston ring tool may be briefly stated as follows:

In removing a piston packing ring from a piston, the segmental sections 5 and 6 are swung outwardly on their pivots 8 and 9 respectively, so that the tool may be placed around the piston, and when the annular member is disposed adjacent the ring which is to be removed from the piston, the handles 10 and 11 formed at the outer free ends of the sections 5 and 6 are grasped, and the pointed ends of the co-acting jaws 17 and 18 are disposed between the split end of the packing ring. Pressure is then applied to the levers or handles 14 and 15, so that when the levers are moved inwardly toward each other, the jaws will move outwardly, consequently spreading or expanding the piston packing ring, and simultaneously causing the packing ring to move outwardly from its groove in the piston, against the inner face of the segmental annular member and between the co-acting upper and lower laterally extending ears or lugs 20 and 21.

With the piston ring maintained in its expanded position, due to the holding of the levers 14 and 15, in a closed position, the lugs 20 and 21 will support the ring on the annular member and permit the tool to be moved upwardly, on the piston, so as to enable the same to be disengaged from the upper end thereof and in this manner the piston ring will be removed in a simple and efficient manner.

The same operation takes place in inserting a piston packing ring on a piston, as will be readily obvious from the construction and use of the tools herein shown and above described.

It will thus be seen from the foregoing description that I have provided a tool for removing and inserting piston packing rings, which will save considerable time and labor, and which will furthermore, be of such construction as to enable the same to be readily and easily applied on a piston. The simplicity of my improved tool enables the same to be manufactured at a very low cost, and the same will, at all times, be positive and efficient in carrying out the purposes for which it is designed.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. A tool of the class described comprising a head member, a split annular member secured to the inner end of the head member, each of the free ends of the annular member being disposed outwardly to provide a pair of normally spaced handles, whereby the annular member may be closed around a piston, a pair of oppositely movable co-acting jaws carried by the head and projecting into the space surrounded by the annular member for engagement with the free ends of a piston ring, to expand the same against the inner face of the annular member.

2. A tool of the class described comprising a head member, a split annular member secured to the inner end of the head member, each of the free ends of the annular member being disposed outwardly to provide a pair of normally spaced handles, whereby the annular member may be closed around a piston, a pair of oppositely movable co-acting jaws carried by the head and projecting into the space surrounded by the annular member for engagement with the free ends of a piston ring, to expand the same against the inner face of the annular member, and means for supporting the expanded piston ring on the annular member.

3. A tool of the class described comprising a head member, the inner face thereof being concaved, a segmental annular member adapted to encircle a piston, the same comprising an intermediate section rigidly secured to the concaved face of the head member, a pair of end sections hingedly secured at their inner ends to the inner end portions of the head member, the free ends of the end sections being disposed outwardly to provide a pair of normally spaced handles, a pair of oppositely movable co-acting jaws carried by the head member and projecting through the intermediate portion of the segmental annular member into the space surrounded by the said annular member, the free ends of the jaws adapted for engagement with the split ends of a piston packing ring for expanding the same, and means for supporting the expanded piston ring on the annular member.

4. A tool of the class described comprising a head member, the inner face thereof being concaved, a segmental annular member adapted to encircle a piston, the same comprising an intermediate section rigidly se-

cured to the concaved face of the head member, a pair of end sections hingedly secured at their inner ends to the inner end portions of the head member, the free ends of the end sections being disposed outwardly to provide a pair of normally spaced handles, a pair of oppositely movable coacting jaws carried by the head member and projecting through the intermediate portion of the segmental annular member into the space surrounded by the said annular member, the free ends of the jaws adapted for engagement with the split ends of a piston packing ring for expanding the same, and means for supporting the expanded piston ring on the annular member, said last mentioned means comprising a series of cooperating lugs extending inwardly from the upper and lower edges of each of the segmental sections of the annular member.

5. A tool of the class described comprising a head member, a pair of piston encircling sections hingedly secured at their inner ends to the respective ends of the head member, the free ends of said sections being disposed outwardly to provide a pair of normally spaced handles whereby the sections may be closed around a piston, a pair of coacting levers pivotally carried by the head, jaws formed on the pivoted ends of the levers and extending into the space surrounded by the hinged sections for engagement with the free ends of the split piston ring to expand the same against said sections.

6. A tool of the class described comprising a split annular member adapted to encircle a piston, the same comprising an intermediate section, a pair of end sections hingedly secured at their inner ends to the respective ends of the intermediate section, the free ends of the end sections being disposed outwardly to provide a pair of normally spaced handles, the intermediate section being provided with an enlarged opening, and a pair of oppositely movable coacting jaws extending through the opening into the space surrounded by the annular member for engagement with the free ends of the split piston ring to expand the same.

In testimony whereof I affix my signature.

ELMER G. MAKI.