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O. WINTER.

PISTON RING EXPANDER.

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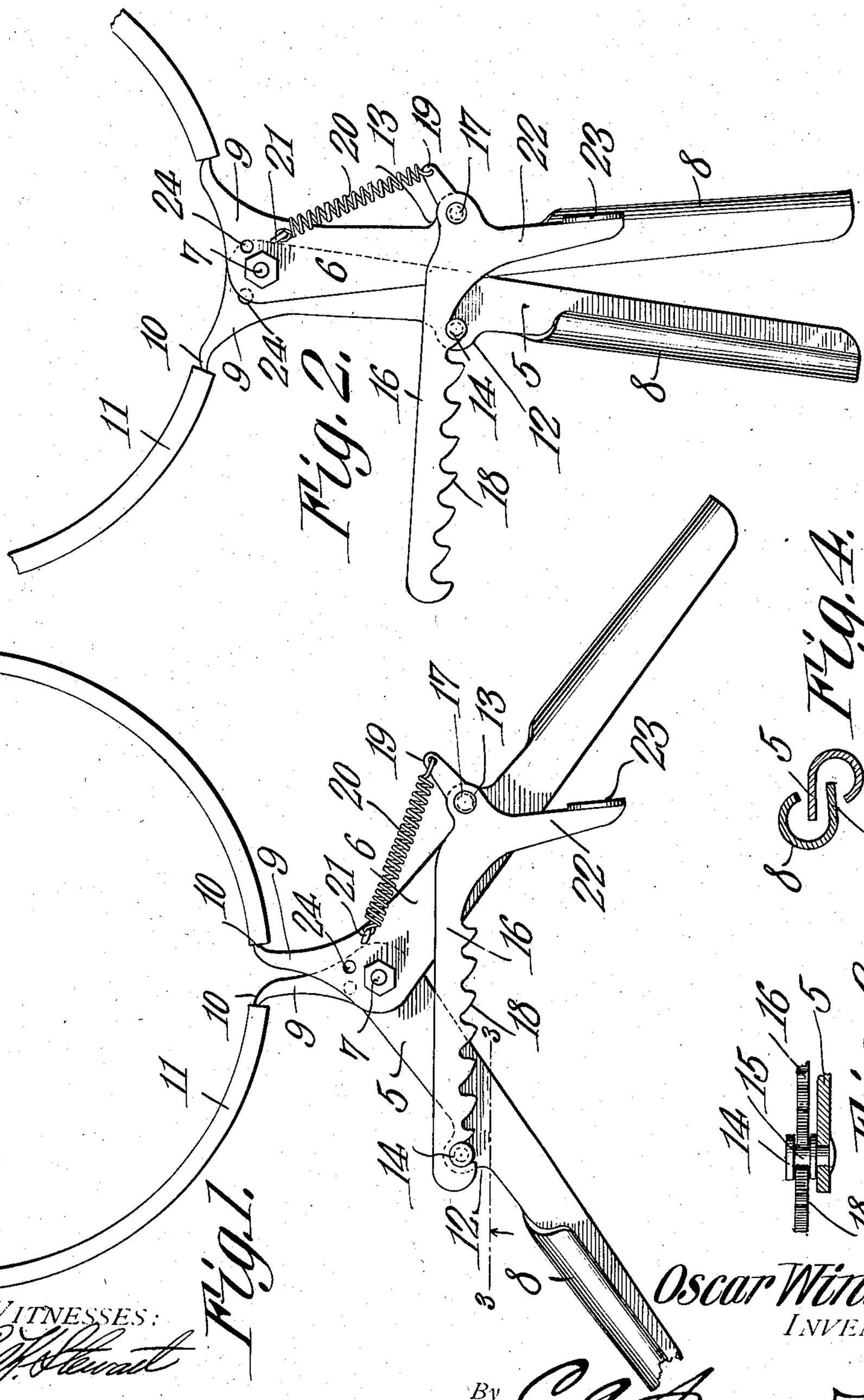

Fig. 1.

Fig. 2.

Fig. 4.

Fig. 3.

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PISTON-RING EXPANDER.

No. 855,031. Specification of Letters Patent. Patented May 28, 1907.

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To all whom it may concern:

Be it known that I, OSCAR WINTER, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented a new and useful Piston-Ring Expander, of which the following is a specification.

This invention relates to piston ring expanders and has for its object to provide a comparatively simple and inexpensive tool of this character by means of which the packing rings of engine pistons and the like may be positioned on and removed from the piston more expeditiously and with less labor than heretofore.

A further object of the invention is to provide a packing ring expander including a pair of pivotally united jaws having a locking member associated therewith for holding the work-engaging arms of said jaws in expanded position, said locking member being provided with a finger piece for moving the same to released position.

A further object is to form the pivoted jaws with operating handles the longitudinal edges of which are curved laterally and adapted to overlap when the terminals are in closed position thereby to present a smooth unobstructed gripping surface for engagement with the hand of the operator.

A still further object of the invention is to generally improve this class of devices so as to increase their utility, durability and efficiency.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, and illustrated in the accompanying drawings, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification: Figure 1 is a front elevation of a tool constructed in accordance with my invention showing the tool in position preparatory to expanding the ring. Fig. 2 is a similar view showing the work-engaging arms of the jaws in expanded position. Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1 looking in the direction of the arrow. Fig. 4 is a similar view showing the handles in closed position.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The improved tool comprises a pair of laterally movable jaws 5 and 6 pivotally united at 7 and each preferably formed of a single piece of flat metal having one longitudinal edge thereof curved laterally to form an operating handle 8. The pivoted jaws 5 and 6 are each provided with a laterally extending arm 9 the terminal 10 of which is sharpened and hardened for engagement with the adjacent end of the packing ring, indicated at 11.

The outer longitudinal edges of the jaws 5 and 6 are provided with laterally extending ears or lugs 12 and 13 to one of which is riveted or otherwise rigidly secured a locking pin 14 having its periphery provided with a circumferential groove 15 adapted to receive the teeth of a locking member 16. The locking member 16 is pivotally mounted at 17 on the lug 13 and is preferably in the form of a rack the teeth of which are curved or rounded at 18 so as to permit the same to ride over the locking pin 15 when the operating handles 8 are brought together in the act of expanding the work-engaging arms. Extending laterally from the locking member 16 at the pivot point 17 is an angularly disposed arm 19 provided with a terminal eye for the reception of the adjacent end of a coiled spring 20, the opposite end of the coiled spring being secured to a staple or eye 21 carried by the movable jaw 6. It will thus be seen that the locking member is normally and yieldably supported in engagement with the locking pin 14 thereby to cause the teeth of the locking member to automatically engage the locking pin 14 when the operating handles are adjusted in the act of expanding the packing ring.

As a means for releasing the locking member from engagement with the pin 14 said member is provided with a depending arm 22 having one edge thereof extended laterally to form a terminal finger piece 23 so that by exerting a lateral pressure against the finger piece 23 the free end of the locking member will be elevated against the tension of the spring 20 and thus release the pivoted jaws. The work-engaging arms 9 are preferably formed with one or more transverse openings 24 in which the bolt or pivot pin 7 may be placed thereby reducing the distance

between the work-engaging points 10 and making the tool suitable for application to small rings.

In order to expand the ring 11 the terminal points 10 of the work-engaging arms are positioned against the ends of the ring and a lateral pressure exerted on the operating handle 8, as best shown in Fig. 1 of the drawing, thus separating the points 10 and expanding the ring so as to permit the same to be readily removed from the piston.

In order to position the ring on the piston the operating handles are partially drawn together and the points 10 inserted between the adjacent ends of the packing ring, in the manner before stated. The locking member 16 is then released by pressing on the finger piece 23 thus allowing the terminals or points 10 of the work-engaging arms to gradually come together and the ring to be positioned in the seating groove in the piston.

Attention is called to the fact that when the operating handles are in closed position the adjacent longitudinal edges thereof overlap so as to afford a smooth unobstructed gripping surface for the hand of the operator while holding the ring in expanded position preparatory to positioning the same on the piston.

The tool may be used for expanding contracted packing rings having their adjacent or split ends cut diagonally, square, or angular but when used for expanding rings having diagonally disposed abutting faces the latter are preferably provided with suitable depressions for the reception of the points of the work-engaging arms so as to prevent slipping of the same during the expanding operation.

If desired, the ring shown in Fig. 1 may also be provided with suitable recesses or depressions to receive the terminals of the work-engaging arms.

From the foregoing description it will be seen that there is provided a strong, durable tool by means of which packing rings may be conveniently removed from or replaced in position on pistons without danger of destroying, breaking or otherwise injuring the ring or piston.

Having thus described the invention what is claimed is:

1. A tool of the class described including pivotally united jaws one of which is provided with a locking pin, a locking member pivotally mounted on the opposite jaw and provided with spaced teeth adapted to engage the locking pin for holding the jaws in adjusted position, a spring for yieldably supporting the locking member in engagement with the pin, and a finger piece carried by the locking member for moving the same to released position.

2. A tool of the class described including pivotally united jaws each formed of a flat piece of metal having one end thereof extended laterally to form a work-engaging arm, one longitudinal edge of each jaw being curved laterally to form a curved bearing surface constituting an operating handle, a pin carried by one of the jaws, a locking member pivotally mounted on the opposite jaw and provided with spaced teeth adapted to engage the pin, a finger piece carried by the locking member, and a spring interposed between the locking member and the adjacent jaw for yieldably supporting the teeth in engagement with the pin.

3. A tool of the class described including pivotally united jaws having laterally extending work-engaging arms the terminals of which are pointed, said jaws having their longitudinal edges curved laterally in opposite directions to form operating handles, lugs extending laterally from one longitudinal edge of each jaw, a pin secured to one of the lugs and provided with a circumferential groove, a locking member pivotally mounted on the opposite lug and provided with spaced teeth adapted to engage the groove in the locking pin, said locking member being provided with a finger piece and having an extension projecting laterally at the pivot point of the locking member, and a spring one end of which is secured to the extension of the locking member and the opposite end thereof secured to the adjacent jaw.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses:

OSCAR WINTER.

Witnesses:

W. B. N. HAWK,

W. C. THOMPSON.