(No Model.)

B. WILLIAMS & J. S. MATTHEWS.

Piston Packing.

No. 235,843. Patented Dec. 21, 1880.

FIG. 1

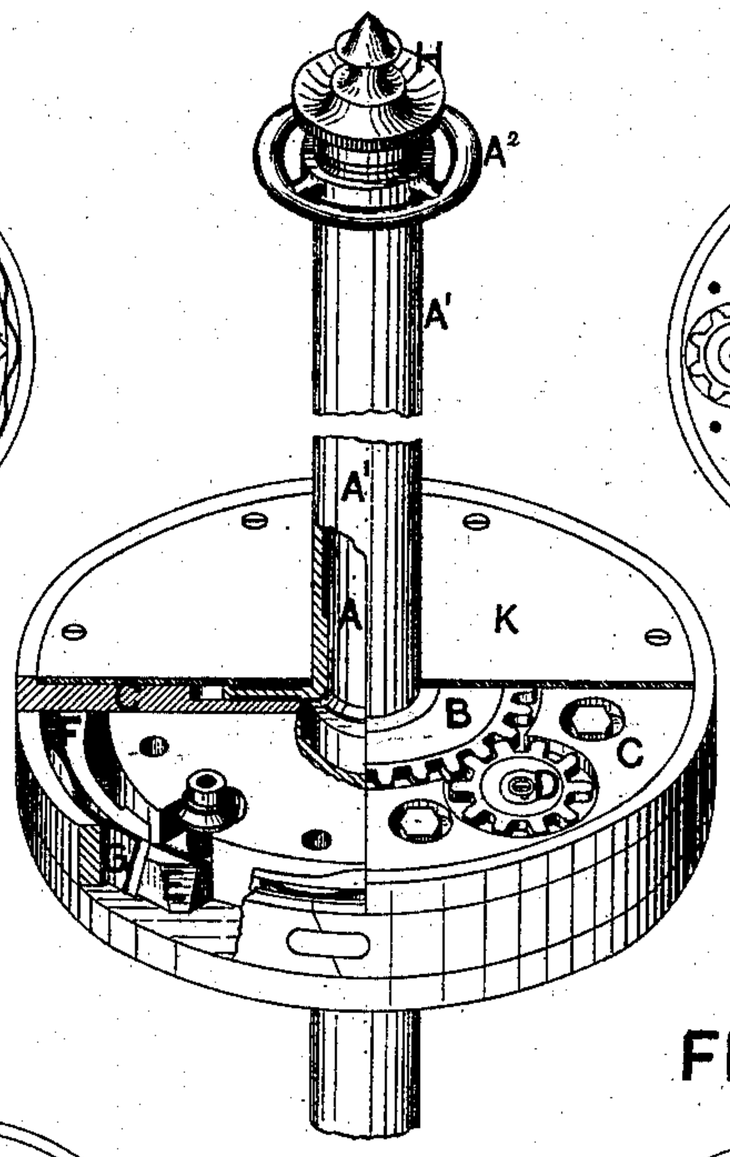


FIG. 3

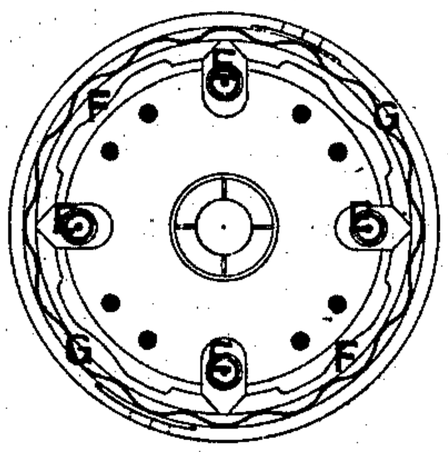


FIG. 2

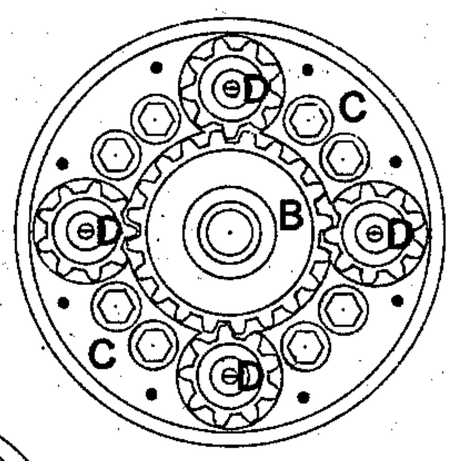


FIG. 4

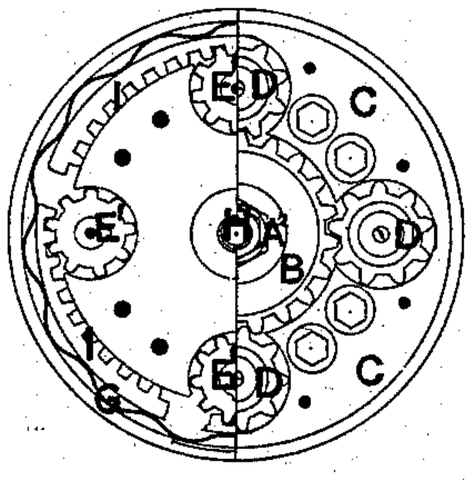


FIG. 5

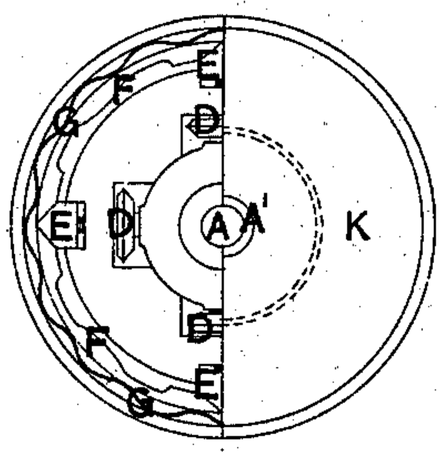


FIG. 4ª

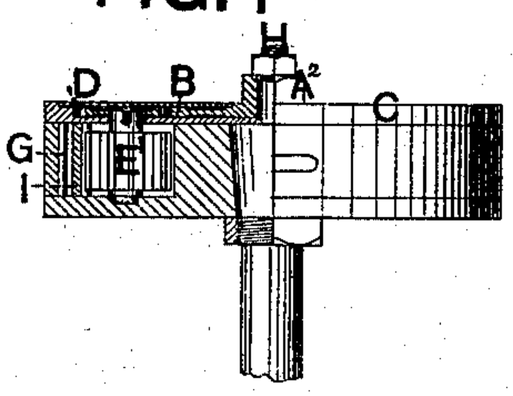
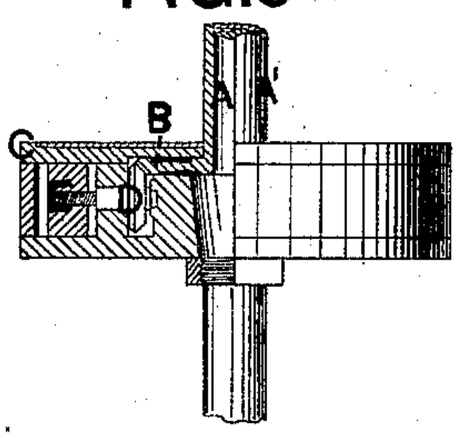


FIG. 5ª



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UNITED STATES PATENT OFFICE.

BENJAMIN WILLIAMS AND JACOB S. MATTHEWS, OF CARDIFF, COUNTY OF GLAMORGAN, SOUTH WALES, GREAT BRITAIN.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 235,843, dated December 21, 1880.

Application filed March 25, 1880. (No model.) Patented in England August 21, 1879.

To all whom it may concern:

Be it known that we, BENJAMIN WILLIAMS, engineer, and JACOB SCOTT MATTHEWS, gentleman, both of Cardiff, in the county of Glamorgan, South Wales, Great Britain, have invented a new and useful Improvement in or Applicable to Apparatus for Tightening or Adjusting the Packing-Rings of Pistons, (for which we have obtained Letters Patent of Great Britain for fourteen years, No. 3,375, dated August 21, 1879,) which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, and to the figures and letters marked thereon—that is to say:

This invention relates to improvements in or applicable to apparatus for tightening or adjusting the metallic or other material packing-rings of pistons, the object being to increase or reduce the degree of contact of said packing-rings with the interior surface of the cylinder without breaking joints or removing the cylinder-cover, and to exert upon the packing-rings an equal pressure alike all round and insure a uniform contact-surface. The adjustment may be effected by this apparatus in a few moments and without stopping the engine, and the construction is durable.

In the drawings, Figure 1 is a perspective view, partly in section, of piston fitted with this tightening apparatus. Fig. 2 is a plan with covering-plate removed; Fig. 3, a like view with junk-ring removed. Fig. 4 represents, in sectional plan, a modification of apparatus, that part of the figure to the left showing the junk-ring removed. Fig. 4ª is a side view, partly in section, of Fig. 4. Figs. 5 and 5ª represent, in sectional plan and sectional side views, respectively, modification of apparatus illustrative of the use of bevel-wheels in place of the spur and pinions shown in Figs. 1 to 4ª.

The tail end A of the piston-rod is, according to this invention, provided with an outer casing, A′, that is a hollow rod or sleeve, to which sleeve A′, on the inner end thereof, is keyed on, or made of a piece therewith, a disk formed as a spur-wheel, B, which wheel is recessed into the junk-ring C, that connects with the rod A. This spur-wheel is in gear with three, four, or more smaller toothed wheels or pinions, D, also recessed into the junk-ring C, and carried on spindles arranged around the outer edge of the junk-ring, and said spindles of these pinions D have a screw-thread on their inner ends, said screws taking into or passing through cone or wedge shaped nuts E, acting on wedge-shaped ring-segments F inside the piston, said cones or wedges and segments E F acting on the springs G, which, in their turn, act on the metallic or other packing-rings, which last are of ordinary construction. Now, in turning the casing or sleeve A′ of the piston-rod, and along with it the spur-wheel B, the pinions D will be turned, and with them their spindles, so that the screws on the ends thereof will act to draw up or force down, as the case may be, the cones or wedges to act on the springs, and so expand the packing-rings; or, by making every other one of the said pinion-spindles screws with right and left hand thread and reversing the alternate corresponding cones or wedges, they will be alternately raised and lowered and act simultaneously upon the packing ring or rings, and thus counterbalance the frictional action on the ring-segments F and force out the packing band or bands regularly and evenly, and allow of the adjustment of the frictional contact of the packing-rings to the greatest nicety.

For the purpose of locking the piston-rod casing or sleeve A′, so as to prevent it from shifting after being adjusted, a screw-thread is formed on the extremity of the tail of the piston-rod A, and a coned or other shaped screw nut or cap, H, is screwed down onto the end of the said sleeve A′, to jam or hold it tightly in position, and also prevent any escape of steam between said sleeve and piston-rod. The hand-wheel A² is fast to the sleeve A′, and is provided for facility of turning the wheel B. K is a covering-plate, and the bolts which serve to secure the junk-ring to the body of the piston are shown in the drawings.

The spindles of the pinions, instead of being formed on their inner ends with screws for actuating the cones or wedges E, may be formed with cam-shaped swells thereon, which will,

when turned by the action of the spur-wheel B and pinions D, act upon the tightening-springs of the packing-bands, or directly upon the packing-bands, to adjust same, as will be well understood without further illustration.

According to a modification shown in Figs. 4 and 4ª, instead of making the nuts E or cams on the spindles of the pinions D, a second pinion, E′, will be formed on each spindle, which second pinion will be geared with a rack formed on circumferential horizontal wedges I, working in recesses in the piston-body, so as to act, when said spindles are turned, to advance the wedges I, and so expand the packing-rings. In these Figs. 4 and 4ª the sleeve A′ is short, and the locking and turning nuts H and A² are formed so that they may be turned by a box-spanner, which would be introduced through a plug-hole in the back cover of the cylinder, so as to effect the simultaneous turning of the packing-expanders.

In Figs. 5 and 5ª the wheels B D are bevel-wheels instead of being spur and pinion, and the ends of the horizontal spindles are screw-threaded, and are fitted with wedge-shaped nuts E, for pressing out the segmental ring-pieces F. The said horizontal spindles and bevel-gearing might equally be employed for acting upon bow-springs of packing-rings, as ordinarily used in pistons, so as to effect the simultaneous adjustment and tightening, and it will be equally obvious that bevel-wheels might be used in the place of the spur-wheel and pinions B and D shown in Figs. 4 and 4ª.

We claim as our invention—

In a spring-packed piston, the combination of the sleeve A′, carrying the spur-wheel B, gearing into pinions D, that are recessed into the junk-ring C, with the rod A, that carries the ring C, and with nuts E, acting on ring-segment pieces F, for pressing out the spring-packing of the piston, and with the turning-wheel A² and locking-nut H, substantially as and for the purpose herein set forth.

In testimony whereof we, the said BENJAMIN WILLIAMS and JACOB SCOTT MATTHEWS, have hereunto set our hands this 2d day of September, 1879.

BENJAMIN WILLIAMS.
JACOB SCOTT MATTHEWS.

Witnesses:
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THOMAS CATTY,
Cardiff, England.