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W. H. MYERS.

PACKING RING FOR PISTONS.

(Application filed Dec. 21, 1899.)

(No Model.)

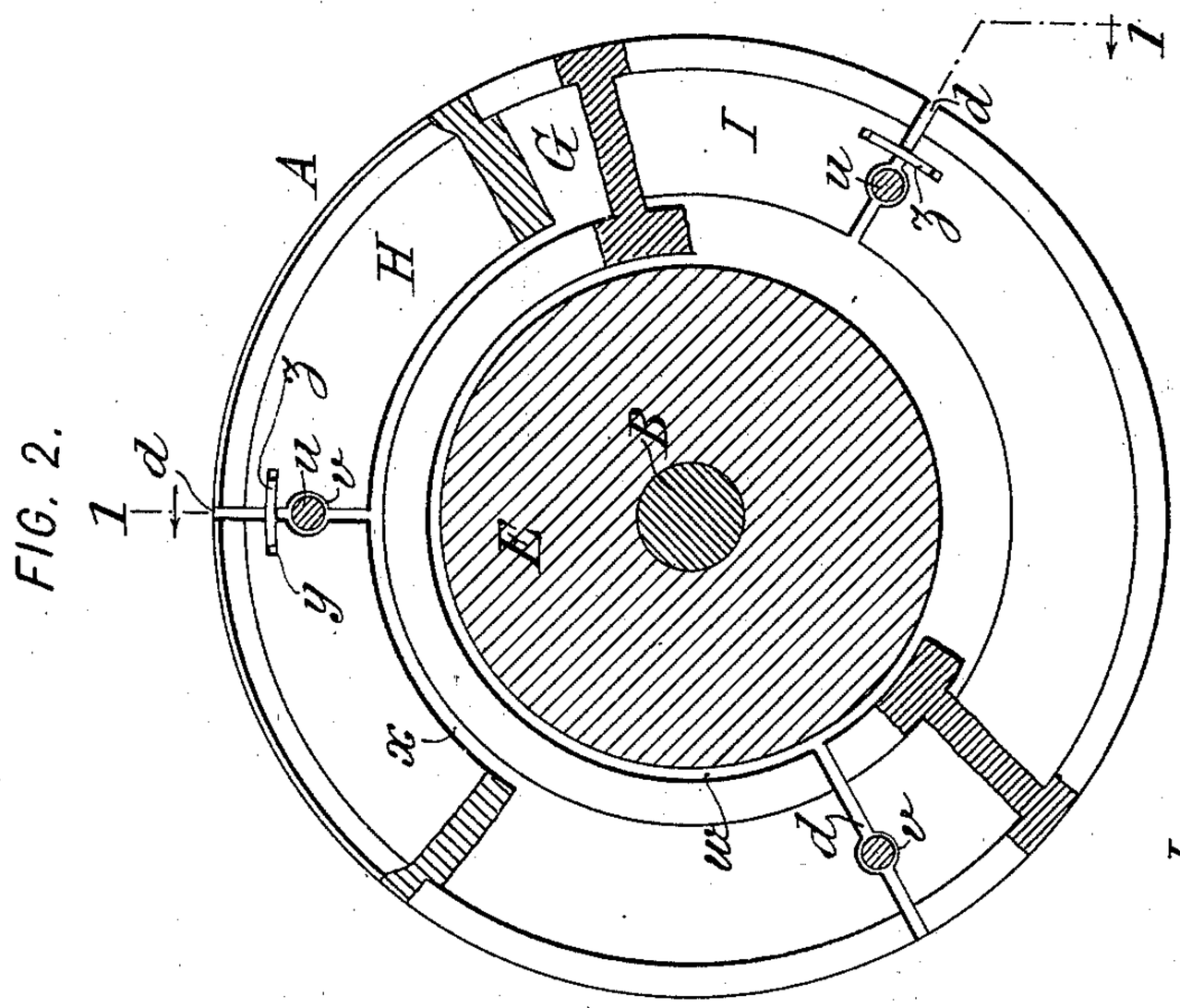

FIG. 2.

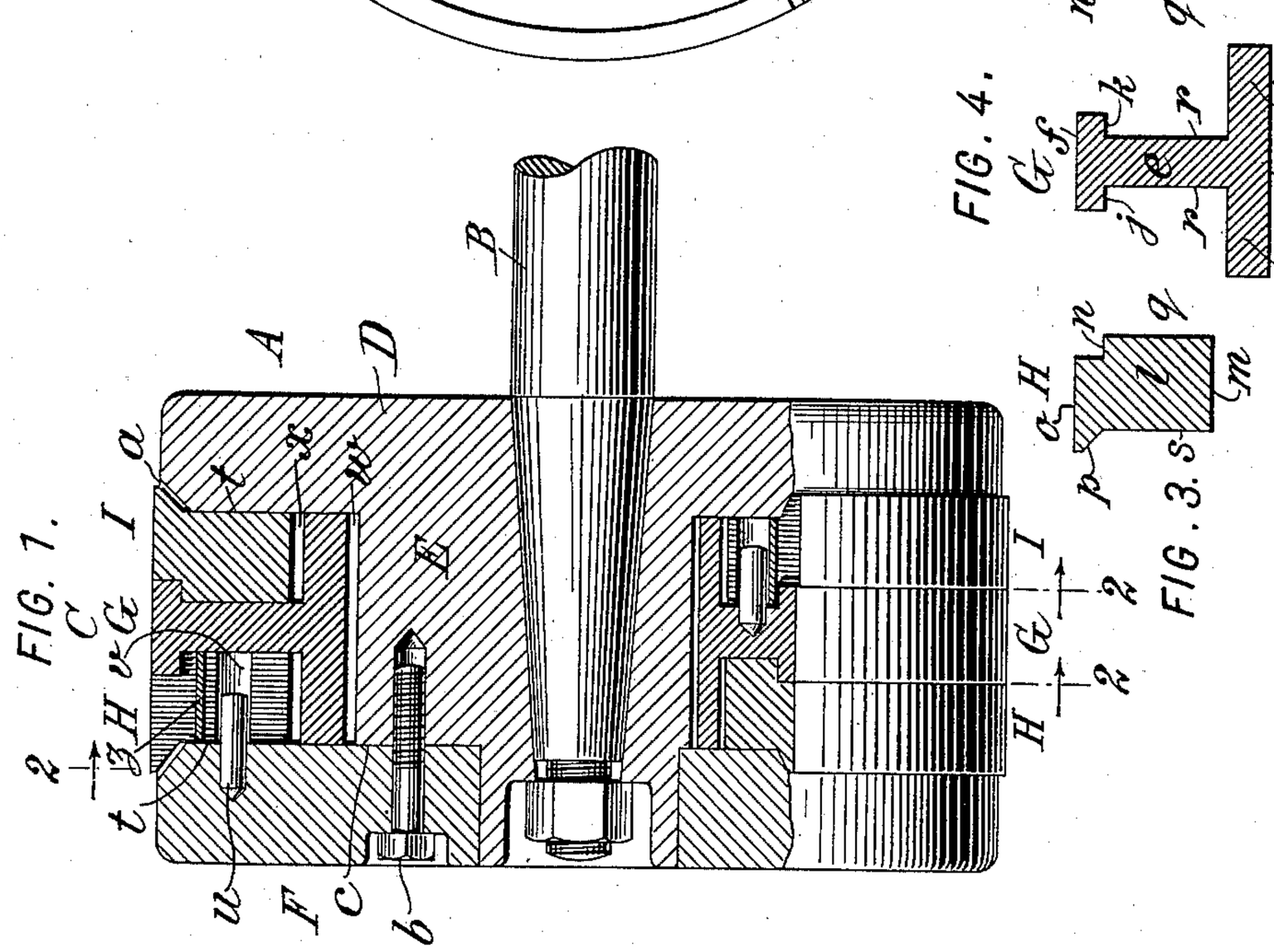

FIG. 1.

FIG. 3.

FIG. 4.

FIG. 5.

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PACKING-RING FOR PISTONS.

SPECIFICATION forming part of Letters Patent No. 656,562, dated August 21, 1900.

Application filed December 21, 1899. Serial No. 741,113. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MYERS, a citizen of the United States, residing in New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Packing-Rings for Pistons and the Like, of which the following is a specification.

This invention relates to packing-rings for pistons and to similar devices and aims to provide certain improvements therein.

Heretofore for what are known as "single-ring packings" for pistons—that is, pistons which are equipped centrally with packing-rings for resisting leakage in both directions—it has been common to use two divided rings, one carrying the other, so that their joints or slitted portions are staggered, and the two seated in a groove surrounding the piston in such manner that steam may enter beneath them to expand them against the walls of the cylinder and permit them to contract to follow irregularities in such walls. My invention aims to provide an improved packing-ring especially applicable to single-ring pistons and which shall be simple in construction and effective to make a tight joint in operation. To this end in carrying out the preferred form of my present invention I provide certain features of improvement, which will be hereinafter set forth as applied to a single-ring or centrally-packed piston.

In the accompanying drawings, Figure 1 is a side elevation, partly in axial section, on the lines 1 1 of Fig. 2 of a piston provided with the preferred form of my present improvements. Fig. 2 is a transverse section thereof cut in the planes of the lines 2 2 of Fig. 1 and showing the respective rings or segments in fragmentary side elevation, and Figs. 3, 4, and 5 are cross-sections of the respective rings.

Referring to the drawings, let A indicate a piston, B its rod, and C its packing-ring. In their general features these parts may be of any suitable or desired construction, in which the packing-ring can be carried in a groove *a*, surrounding the piston in such manner that it can work out and in to follow the face of a cylinder. As shown, the piston consists of a spider-plate D, having a reduced body E, on which a follower-plate F is held by screws *b*, the parts being so formed that their respective walls constitute the side and bottom walls of the groove *a* and that a tight joint between the spider and follower is made at *c*.

My improved packing-ring consists of two or more slitted rings, three being preferably employed, these constituting the main or central ring G and supplementary or side rings H and I. The main ring G has a narrow central body *e*, a wide outer bearing-face *f*, a wider inner face *g*, equally-projecting lateral flanges *h i* at each side thereof, an internal shoulder *j*, opposite the flange *h*, and an internal shoulder *k*, opposite the flange *i*. The spaces between the shoulders *j* and *k* and the flanges *h* and *i* constitute grooves into which the rings H and I can partly enter and be loosely held. The rings H and I are of identical construction with each other, but reversed in position. Each has a wide body *l*, an inner face *m*, an external shoulder *n*, an outer bearing-face *o*, and a lateral flange *p*. The adjacent side faces *q* of the rings H and I fit corresponding flat side faces *r* of the ring G. The opposite flat side faces *s* of the rings H and I fit the adjacent side faces *t* of the groove *a*. The slit *d* of each ring is staggered relatively to that of another, and the rings are held in this relation by studs *u*, engaging recesses *v*, formed in the slits of the rings. The studs may be fixed to an adjacent ring or an adjacent part of the piston, the stud in Fig. 1 being shown as fixed to the follower. The rings H and I are preferably formed with opposite sockets *y*, in which are seated plates *z*, which cross the slits to prevent leakage out through them. These plates are the same width as the adjacent body part of the ring. The ring G is of slightly-less depth than the groove *a*, clearance inwardly of the ring being sufficient to form a steam-chamber *w* within the ring. The rings H and I are of slightly-less depth than the distance from the exterior of the ring G to the outer side of its inner flanges, thus forming a steam-chamber *x* inwardly of its outer ring. The flanges *h i* of the ring G are of approximately the same width as the groove *a*, and the bodies *l* of the rings H and I must at least equal in width the distance between the body *e* of the ring G and the lateral edge of its adjacent pro-

jecting flange. The shoulders *n* of the rings H and I interlock with the shoulders *k* or *j* of the ring G, respectively, and thus hold the rings concentric and limit the relative expansion of the outer rings. The faces *f* and *n* of the respective rings are of equal width to give the rings like bearing area against the cylinder to the end of effecting uniform wear.

In operation steam leaks behind the rings from the steam side of the piston and seats the rings against the opposite wall of the groove *a*, as well as expanding the rings into intimate contact with the walls of the cylinder and yieldingly holding them outwardly, so that they may play to follow any irregularities in such walls. The flat sides *q*, *r*, *s*, and *t* are forced into such intimate contact that no steam can flow up between them toward the exhaust side of the piston, and any steam traveling around through the chambers *w* and *x* to the slit *d* will be prevented from escaping through this slit by the check-pieces *z*. Thus a perfectly-tight joint will be made, first for one stroke and then for the reverse stroke. The steam in the chamber *w* will be partly counterbalanced by that in the chambers *x*, so that the relative outward pressure on the three rings will be approximately equal, thus avoiding more rapid wear of one than another. Each ring can contract freely, and the side rings can contract independently of the central ring. The overhanging flanges of the central ring will prevent the side rings from dropping out of position in case they travel past the counterbore, which sometimes extends so far inwardly of a cylinder as to be passed by one of the packing-rings.

It will be seen that my invention provides improvements in packing-rings which can be readily and advantageously availed of, and it will be understood that the invention is not limited to the particular details of construction, arrangement, combination, and use set forth as constituting its preferred form, since it can be employed according to such modifications as circumstances or the judgment of those skilled in the art may dictate without departing from the spirit of my invention.

What I claim is—

1. The combination with a piston having a peripheral groove, of a plurality of expansive packing-rings mounted in said groove, each having a subdividing-slit staggerred in position relatively to that of the adjacent ring, and one having a laterally-extending face and the other having a reciprocal laterally-extending face, said faces engaging and preventing undue expansion of the one relatively to the other in use, and the one ring having a flange at its inner side extending laterally within the other ring, and a shoulder at its outer side overhanging the latter, said rings having a steam-space between the outer side of said flange and the adjacent side of the ring opposite said flange.

2. The combination with a piston having a peripheral groove, of a packing surrounding said piston consisting of a plurality of expansive rings mounted in said groove, each having a subdividing-slit staggered in its position relatively to the like slit of an adjacent ring, one having a shoulder overhanging the other to limit its outward expansion, and having a groove inwardly of such shoulder and the other free to contract independently of that having said shoulder, and having a body loosely entering said groove.

3. In piston-packings, the combination with a piston having a peripheral groove, of a packing-ring in said groove consisting of a plurality of expansive rings each having a subdividing-slit staggered in its position relatively to the like slit of an adjacent ring, the one having a body, an external shoulder, and a bearing-face beyond said shoulder, and the other having a body, an internal shoulder surrounding and engaging the external shoulder of the other for limiting its expansion, a bearing-face beyond said shoulder, and a flange crossing the inner side of said first-mentioned ring, said rings having a steam-space between the outer side of said flange and the inner side of the adjacent ring.

4. In packing for pistons, the combination with a piston having a peripheral groove, of a packing-ring consisting of a ring G having a central body and lateral flanges on its inner side fitting said groove, rings H and I fitting said groove between said body and the opposite sides of said groove respectively, interengaging provisions on said rings limiting relative expansion of said rings H and I respectively, and steam-chambers at the inner sides of said rings for expanding them independently.

5. In a piston-packing, the combination with a grooved piston, of three expansive rings fitting in the groove thereof, each having a subdividing-slit staggered in its relation to that of another, and having communicating pressure-spaces within them for expanding said rings, the outer ones of said rings each having recesses crossing it laterally at opposite sides of its slit, and a member fitting said recesses, crossing such slit, and preventing outflow through the latter.

6. In packing-rings, a ring G having a narrow central body *e*, a wide projecting flange at each side of said body on its inner side, laterally-projecting inner flanges *h* and *i*, laterally-projecting outer flanges *j* and *k*, and side rings fitting against said central ring inwardly of said flanges *j* and *k* and outwardly of said flanges *h* and *i*, said rings having each a subdividing-slit staggered in its relation to that of an adjacent ring.

7. In piston-packings, the compound ring C consisting of expansive rings G H and I, the ring G having inner and outer projecting

flanges, and the rings H and I having bodies fitting against the sides of the ring G and engaging the outer flanges thereon, said rings having outer bearing-faces of approximately-uniform width.

8. In piston-packings, the expansive ring G having body *e*, outer bearing-face *f*, internal shoulders *j k*, and inner flanges *h i*, in combination with expansive rings H and I each having shoulders *n* fitting under said shoulders *j* and *k*, bodies *l* of a width equal to that of the projecting inner flange of said ring G, and each having an outer bearing-face *o* of approximately the width of the bearing-face *f* of said ring G.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM H. MYERS.

Witnesses:

GEORGE H. FRASER,

THOMAS F. WALLACE.