F. N. MASON.

PISTON ROD PACKING.

APPLICATION FILED JUNE 27, 1910.

971,292. Patented Sept. 27, 1910.

Fig 1

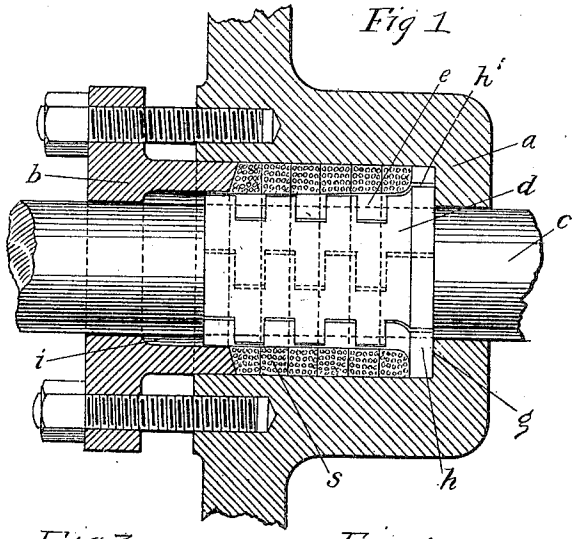


Fig 2

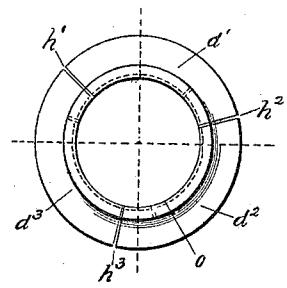


Fig 3

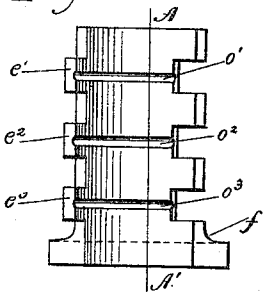
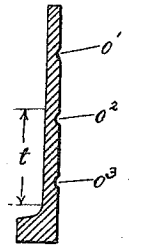


Fig 4



Section A-A'

Fig 5

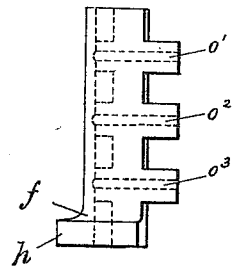


Fig 6

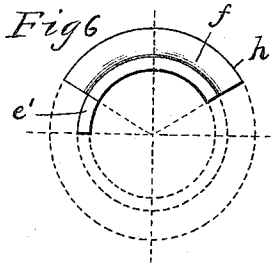
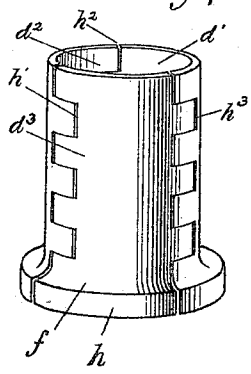


Fig 7



WITNESSES:

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PISTON-ROD PACKING.

971,292. Specification of Letters Patent. Patented Sept. 27, 1910.

Application filed June 27, 1910. Serial No. 569,227.

To all whom it may concern:

Be it known that I, FRANK N. MASON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Piston-Rod Packing, of which the following is a specification.

My invention pertains to certain new and advantageous improvements in piston rod packing, the primary object being to provide combined metallic and non-metallic elements, in conjunction with the ordinarily constructed stuffing-box, piston-rod and gland, whereby certain fundamental advantages will be produced, and certain defects in the present known methods will be overcome.

I am aware that patents of a somewhat similar nature and intention have been previously taken out, special reference being given to the patent to Philo H. Weaver, #811,603, dated Feb. 6, 1906, but my improved device aims to, and accomplishes, results not possible with the aforementioned invention.

My invention is applicable, and of great utility, in connection with steam, air, gas, or water appliances, or wherever it is desired to provide a tight, non-leakable, packing around a movable part of the mechanism.

Constructively my device involves a metallic sleeve or tube made up of a plurality of segments, the minimum number being three, which interlock one with the other, insures flexibility, and at the same time a more reliable steam tight contact with the piston rod, than if said sleeve were in but one or two parts.

Further advantages will be brought out in detail during the progress of this specification, of which the accompanying drawing is a part, and referring to said drawing:

Figure 1 is a longitudinal and part sectional view of the assembled device in position in a stuffing-box and surrounding the piston-rod; Fig. 2 is a plan view of the built up sleeve; Fig. 3 is a vertical inner face view of one of the segments; Fig. 4 is a vertical section taken on the line A—A′ of Fig. 3; Fig. 5 is a vertical outer face view of one of the segments; Fig. 6 is a plan view of one of the said segments, and Fig. 7 is a perspective view of the assembled sleeve or tube.

Throughout the drawings the letter *a* designates a stuffing-box of ordinary construction, and well known usage; *b* is a screw actuated packing-gland; and *c* the piston-rod. Around this piston-rod, and inside the stuffing-box, is first seated the built up metallic sleeve shown in Fig. 7, with the flanged end engaging the bottom of the said box. This member is composed of a plurality of independent segments, the minimum number being three, as shown, although in some instances it might be found expedient to use a still greater number. Each of these segments, here designated as d', d^2, and d^3, is provided with a plurality of spaced apart lugs e', e^2, and e^3, longitudinally of both edges, which insures an interlocking of all the segments, when brought into assembled position.

The inner concave face of each segment is provided with a plurality of laterally-disposed oil grooves, o', o^2, and o^3, which serve to scrape off and retain part of the lubricant from the rod *c* during its reciprocating movement through the sleeve.

The inner end of each segment, being the end that engages with the stuffing-box bottom *g*, is provided with a solid flange *h*, made to conform to the contour of the said bottom part whether concave or square, which offers adequate resistance to the pressure from the cylinder, or tank as the case might be, the only avenue of escape being through the spaces h', h^2, and h^3, where its force will be retarded and gradually reduced by frictional contact with the interlocking series of lugs *e*, until finally its energy is spent before reaching the outer end of said sleeve.

A fillet *f* is provided at the point where the sleeve *d* and flange *h* join, on each segment, in order to strengthen said segment where the packing is used, for instance on steam hammers, where there is considerable vibration.

The outer circumferential face of each segment is tapered longitudinally, as indicated by *t*, Fig. 4, and this part of my construction affords a wedging feature for the soft packing *s;* when taken in conjunction with the walls of the stuffing-box. This said packing acts to compress the sleeve segments circumferentially against the piston rod *c*, and likewise performs the well known function of preventing escapement of the steam, air, gas, or water.

The gland *b* is preferably provided with a machined or cored-out portion *i*, in order that said gland may receive and embrace the end of the segmental sleeve *d*, as shown in Fig. 1. The inner flanged face of said gland engages the soft packing *s*, when screwed into position, and the compression thus set up against the flange *h*, and likewise against the tapered periphery of the several segments, insures the retention of the metallic sleeve in its desired position.

Any perceptible slackness or wear that might be set up in the sleeve or soft packing, due principally to the frictional action of the moving part, can be readily taken up by simply following up with the adjustable gland *b*, which tightening up process is permissible owing to the space provided at the lug extremities; thus at all times my packing can be kept tight.

The taper given to the sleeve *d* provides a wedging feature for the said soft packing, and insures a positive and continuous compression throughout approximately the entire length of the sleeve.

The advantages of having the metallic sleeve in three or more independent segments is three fold: first, it permits the use of thicker and heavier material, while at the same time still retaining the required flexibility: second, it insures a closer frictional but non-binding contact with the piston-rod than is the case where said sleeve is formed in one or two parts: and third, its life and efficiency is materially increased compared with a sleeve made of thinner material. Heavy castings or forgings are thus available for use, which is not practically possible when said metallic sleeve is composed of less than three segments.

The oil grooves *o* serve a useful purpose by scraping off and alternately depositing the lubricant delivered by the reciprocating piston-rod, and at the same time lessens the frictional contact of said rod with the metallic sleeve segments.

The independently acting segmental construction of the metallic sleeve insures the required amount of flexibility to obviate any binding or undue frictional contact between the said sleeve and piston-rod, or when said rod is out of alinement, or not exactly true in diameter, each segment being free to give laterally, but prevented from longitudinal movement by reason of the interlocking lug feature, and in addition by the circumferential compression accorded to the soft packing.

What I claim as new, and desire to secure by Letters Patent, is:

1. In a piston-rod packing the combination with the stuffing-box, gland, and piston-rod, of a segmentally constructed metallic sleeve within the stuffing-box and around said piston-rod, involving at least three interlocking, independently acting elements, having a plurality of alternating circumferentially-disposed lugs and spaces, and a solid inner flange, said elements being tapered longitudinally in their circumferential faces; and a soft packing interposed between the said sleeve and wall of the stuffing-box, and kept under an adjustable compression.

2. In a piston-rod packing the combination with the stuffing-box, gland, and piston-rod, of a segmentally constructed metallic sleeve within the stuffing-box and around the piston-rod, involving at least three interlocking and independently acting elements, each element having a plurality of alternating circumferentially-disposed lugs and spaces, and a solid inner flange, said elements being tapered longitudinally of their circumferential faces, and also provided with a plurality of lubricant receiving grooves on their inner faces; a soft packing interposed between the said sleeve and wall of the stuffing-box; and means for taking up any slack due to wear and tear on the said sleeve or soft packing.

3. In a piston-rod packing the combination with the stuffing-box and piston-rod, of a segmentally constructed metallic sleeve within the stuffing-box and around said piston-rod involving at least three interlocking elements adapted for independent lateral movement, each segment having a plurality of alternating circumferentially-disposed lugs and spaces, and a solid inner flange, said elements being tapered longitudinally in their circumferential faces, and also provided with a plurality of lubricant receiving grooves on their inner faces; a soft packing interposed between the said sleeve and wall of the stuffing-box; and an adjustable gland provided with an enlarged central aperture for receiving one end of said sleeve and adapted to take up any slack due to wear and tear on the said sleeve or soft packing.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK N. MASON.

Witnesses:
BEATRICE FITZ GERALD,
J. P. APPLEMAN.