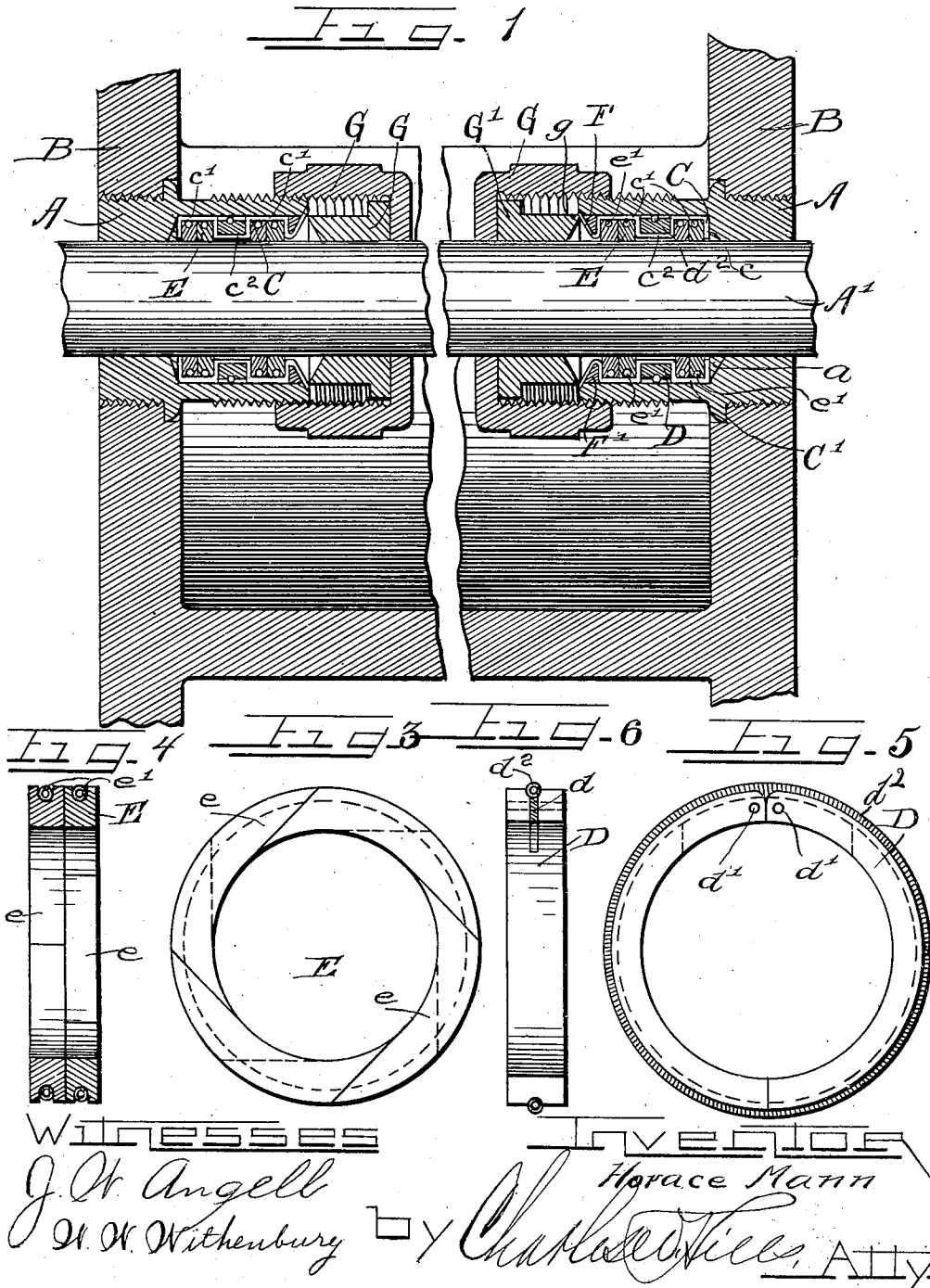


No. 824,799.

PATENTED JULY 3, 1906.

H. MANN.
METALLIC PACKING.
APPLICATION FILED JULY 20, 1905.

2 SHEETS—SHEET 1.



UNITED STATES PATENT OFFICE.

HORACE MANN, OF MUSKEGON, MICHIGAN.

METALLIC PACKING.

No. 824,799.

Specification of Letters Patent.

Patented July 3, 1906.

Application filed July 20, 1905. Serial No. 270,504.

To all whom it may concern:

Be it known that I, HORACE MANN, a citizen of the United States, and a resident of the city of Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Metallic Packing; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to metallic packing, and more particularly to a metallic packing for piston-rods or the like of that class adapted to be self-adjusting to wear. Heretofore in many of the devices of this class the packing-rings have been so constructed that as they become worn they fail to fit perfectly to the piston-rod or other article to which they are applied. Furthermore, in many of the self-adjusting packings heretofore constructed it has not been possible to adjust or set them up longitudinally of the shaft, and as a consequence their packing effect is radially of the shaft only, and most of the constructions have not been capable of being used in the ordinary forms of stuffing-boxes.

The object of this invention is to provide a metallic packing which will readily and perfectly adjust itself to wear at all times and which is capable of use in ordinary forms of stuffing-boxes, thereby greatly decreasing the cost of installation.

A further object of the invention is to provide a cheap and durable packing which may be readily removed for inspection and repairs or renewal.

The invention consists in the matters herein-after described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a fragmentary longitudinal section of a device embodying my invention. Fig. 2 is a side elevation of the packing with one section of the shell or casing removed. Fig. 3 is a side elevation of one pair of the packing-rings. Fig. 4 is a transverse section of the same. Fig. 5 is a side elevation of the retaining band or ring. Fig. 6 is a central vertical section of the same. Fig. 7 is an enlarged fragmentary view of the outer end of the shell or casing. Fig. 8 is an enlarged longitudinal section of a packing embodying my invention, showing a slight modification.

As shown in said drawings, a stuffing-box

A is rigidly engaged in the article through which the piston rod or shaft A', to which the packing is to be applied, passes and, as herein shown for convenience of illustration, is engaged in the inner or adjacent heads B of a compound cylinder of any preferred type. The outer end of said stuffing-box A, as shown, is cored to afford a recess about the piston-rod for the packing (indicated as a whole by C) and is provided with an internal shoulder *a*, against which the inner end of the packing abuts. Said packing, as shown, comprises a two-part shell or casing C', of pressed steel or other desired material, divided longitudinally and is of a size when assembled to fit closely against the shoulder *a* of said stuffing-box and is provided with a plurality of peripheral corrugations or folds which are approximately rectangular in cross-section and alternate ones of which afford inwardly and outwardly opening recesses, (indicated, respectively, by *c'* and *c''*.) Any desired number of such corrugations or folds may be provided; but, as shown, they are three in number, the central one of which opens outwardly and is adapted to receive the retaining band or ring D, which, as shown more clearly in Figs. 5 and 6, is constructed in two sections hinged together at one end by means of a segment-shaped plate *d*, fitting within a complementary recess in the end of each section and by means of pins *d'* *d'*, which extend through said sections and said plate. The band or ring D, as shown, fits closely within the recess *c''* and is provided with a peripheral groove adapted to receive a coiled spring *d''*, which acts to bind said sections firmly upon the shell or casing C' and hold its parts in register. In each of the inwardly-opening recesses *c'* of said shell is provided a pair of sectional packing-rings E, each of which comprises a plurality of sections *e*, the ends or abutting faces of which are approximately tangential to the inner periphery of said ring, as shown more clearly in Fig. 3, and the sections comprising the rings of each pair are arranged to break joints, thereby preventing the passage of the pressure fluid past the same. The rings E are each provided with a peripheral groove in which is seated a coiled spring *e'*, which acts to bind said sections into close engagement with the piston rod or shaft A'. Said rings E are constructed of a metal of somewhat less hardness than the rod or shaft A', about

which they are packed, and as they wear they are continually forced inwardly by the coiled spring e' into engagement with said shaft. The outer end of said shell C' is turned outwardly, forming a conical flange F , between which and the adjacent corrugations is provided a recess adapted to receive an annular metallic packing F' of the usual or any preferred packing material, adapted to pack the joint between the stuffing-box and the shell and prevent the passage of the pressure fluid therebetween.

An internally-threaded cap G is adapted to engage upon the externally-threaded outer end of the box A and is shaped to be engaged by a wrench or other desired tool to adjust it on said box, and within said cap is a follower or gland G' of any desired material and provided with a beveled inner end g , adapted to engage against the margin of the flange F , which slightly overlaps the end of the box and force it, together with the packing-rings, inwardly, thereby jamming the packing into the box and preventing the passage of fluid between the rings and the sides of the corrugations or folds.

As shown more clearly in Figs. 2 and 7, the flange F is provided at the meeting edges of the sections with a sheet of tin-foil or other preferred material g' , which is folded over the same and prevents leakage through the joint when the follower or gland G' is set up.

In the construction shown in Fig. 8 the packing C^2 is constructed similarly to the packing C , with the exception that the shell C^3 is provided with a conical outer end C^4 , formed complementally with the inner face of the follower G^2 , thereby forming between said end C^4 and the flange F a conical recess adapted to receive the packing-ring H , of graphite or other lubricating material, which, as shown, is formed in sections and is provided with a peripheral groove adapted to receive the coiled spring h , which holds said ring in place.

The operation of my device is as follows: Inasmuch as the retaining shell and rings are formed in sections, it is obvious that they may be assembled adjacent the stuffing-box upon any piston-rod or other shaft, and when the retaining band or ring D is in place the parts are held in position to be forced into the stuffing-box, where they are set up to the desired pressure by the cap and follower, as in the case of ordinary packing. The pressure of the follower against the shell tends to close the corrugations against the packing-rings and prevent the passage of the pressure fluid therebetween. As the sections of the packing-rings E have their abutting faces cut approximately tangent to the inner periphery of the rings, it is obvious that as the wear upon them will be equal they will be forced inwardly by the coiled springs e' into binding engagement with the piston-rod.

While I have shown my invention in connection with a compound cylinder, it is obvious that it may be used in connection with any cylinder and upon any shaft where it is desired to form a fluid-tight joint, and the shell may be of any desired length and may be provided with any preferred number of corrugations or folds of various shapes and I therefore do not desire to be limited in this application other than as necessitated by the prior art and as stated in the claims, as obviously many details of construction may be varied without departing from the principles of my invention.

I claim as my invention—

1. In a device of the class described the combination with a separable flexible metal shell of a plurality of sectional rings therein adapted to adjust themselves to wear.

2. In a device of the class described the combination with a resilient separable shell having recesses therein of a plurality of rings in said recesses, each comprising a plurality of approximately tangential sections.

3. In a device of the class described the combination with a longitudinally compressible shell having a plurality of peripheral recesses therein of a plurality of sectional packing-rings in each recess, a retaining-band encircling said shell and means for compressing the shell longitudinally.

4. In a device of the class described the combination with a two-part, corrugated shell adapted to be compressed longitudinally, of a plurality of packing-rings in the inner corrugations of said shell each comprising a plurality of approximately tangential sections, resilient means engaging said sections together, a retaining-band about the shell and means for compressing the shell longitudinally.

5. In a device of the class described a stuffing-box, a sectional corrugated shell therein of resilient metal, packing-rings in said shell, each comprising a plurality of approximately tangential sections, a coiled spring seated in a peripheral groove in each ring and means forcing the shell and rings longitudinally of the box.

6. In a device of the class described the combination with a rod of a stuffing-box thereon, a separable casing adapted to fit closely in said box and provided with inner and outer peripheral grooves, a self-adjusting packing in said casing and means for forcing the casing and packing longitudinally of the box.

7. In a packing of the class described, a separable casing provided with peripheral corrugations, a separable band seated in one of the outer corrugations, a plurality of sectional rings in the inner corrugations, the sections of adjacent rings being arranged staggering and means for exerting pressure longitudinally of the shell.

8. In a device of the class described the combination with a stuffing-box of a shell adapted to seat therein and provided with a plurality of peripheral recesses in the walls thereof, packing-rings in said recesses, an outwardly-directed flange at the outer end of said shell and a packing-ring at the rear of of said flange between the shell and the box.

9. A casing for the purpose specified comprising a blank of sheet metal stamped to provide a plurality of peripheral corrugations and having a conical flange at one end thereof.

10. A sheet-metal casing for the purpose specified, provided with a plurality of peripheral corrugations approximately rectangular in cross-sections.

11. A sectional sheet-metal casing for the

purpose specified comprising, a plurality of blanks of metal having a plurality of corrugations extending transversely thereof and a band adapted to hold said sections in register.

12. In a device of the class described the combination with a flexible casing of a pair of rings therein, each comprising a plurality of segments cut approximately tangential and the sections of one ring being arranged to break joints with those of the other.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

HORACE MANN

Witnesses:

C. W. HILLS,

W. W. WITHEBURY