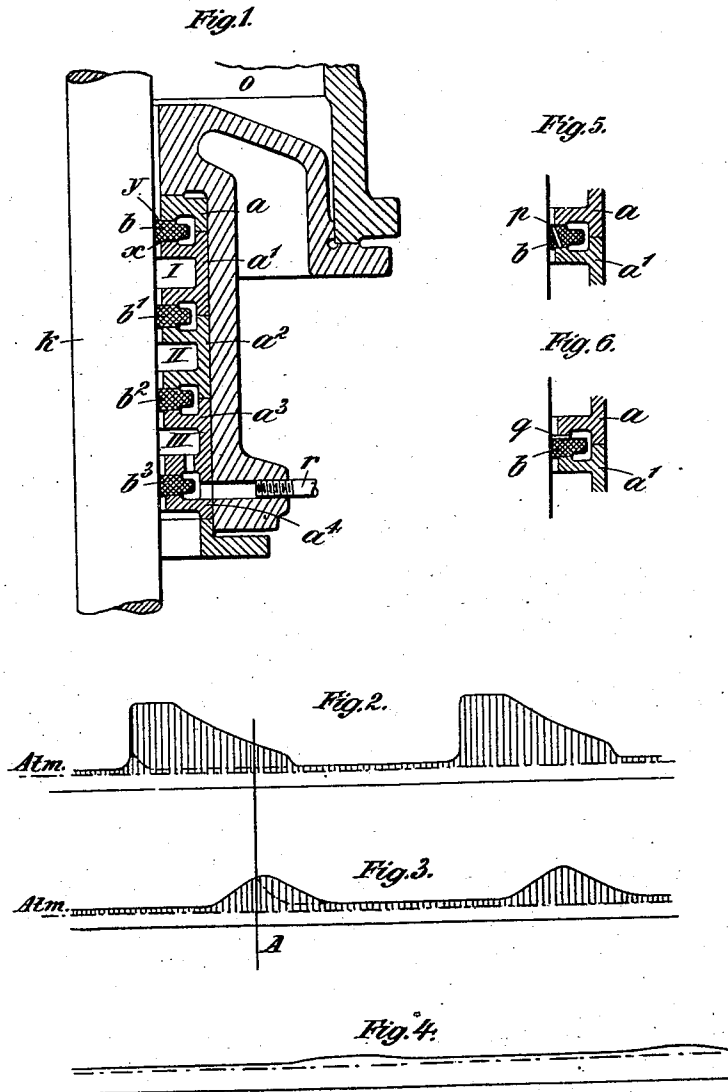


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H. LENTZ.
DEVICE FOR PACKING RODS, &c.
APPLICATION FILED FEB. 13, 1902.

NO MODEL.



WITNESSES:

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HUGO LENTZ, OF MAGDEBURG, GERMANY.

DEVICE FOR PACKING RODS, &c.

SPECIFICATION forming part of Letters Patent No. 726,953, dated May 5, 1903.

Application filed February 13, 1902. Serial No. 93,835. (No model.)

To all whom it may concern:

Be it known that I, HUGO LENTZ, a subject of the King of Prussia, German Emperor, and a resident of Magdeburg, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Devices for Packing Rods, Spindles, Shafts, and the Like, of which the following is a full, clear, and exact description.

10 This invention has for its object a device for packing rods, spindles, shafts, and the like without the use of pressure-springs and the like, which device is adapted to admit of lateral movement of the shaft without injury to the maintenance of a tight packing.

The arrangement is characterized by the separate chambers of a so-called "labyrinth-gland" being closed by laterally-movable easily-fitted rings.

20 The arrangement is shown in the accompanying drawings, Figure 1 being a longitudinal section, and Figs. 2, 3, and 4 pressure-diagrams, while Figs. 5 and 6 are details of construction.

25 The arrangement consists of rings a a' a^2 a^3 a^4 and b b' b^2 b^3 . The rings marked a a' a^2 a^3 a^4 are so bored out that between them and the shaft k a space for play exists and chambers I II III are formed. The rings indicated by b b' b^2 b^3 surround the shaft k in such a way that the latter can still move easily, and they are so fitted between the outer rings a a' a^2 a^3 a^4 that they can adjust themselves between these latter in the event of lateral movement of the shaft k . One of the last chambers communicates with the outer air or with a condenser, for instance, by means of a pipe r .

35 The mode of action of this arrangement is as follows: As the diagram Fig. 2 shows, assuming pressure to exist in the chamber o , which is to be closed—for instance, a steam-cylinder—a small portion of the power medium—for instance, steam—will in time force itself during the charging period through the fine interstices between the separate rings a and b and between the shaft k and the rings b , so that an excess pressure also is formed in the chambers I II III; but this pressure is considerably less than that in the chamber o by reason of the great throttling which this

pressure medium undergoes in forcing its way through the interstices. Figs. 3 and 4 show the diagrams of the pressures which exist in the succeeding chambers I II. As the power medium requires a certain time to penetrate the interstices, the maximum pressure in one of the chambers, for instance, will only be reached later than in the preceding one, and the succeeding diagrams are thus relatively displaced—that is to say, it may happen that in the following chamber momentarily a greater pressure exists than in the preceding one, as is shown, for instance, at A in Figs. 2 and 3. The smallest part of the power medium which has penetrated into the chamber III, together with condensed water and lubricant or lubricating-oil, is finally removed through the pipe r in order not to foul the machine. Should the rings b be too loosely fitted or the shaft become worn by reason of lateral play, the interstices between them and the rings a increase. This has, however, no deleterious influence on the tightness of the packing, as if the pressure in o be greater than the pressure in I the ring b is pressed against the ring a' and rests closely thereon. If it then happens that—for instance, in the ordinates A , Figs. 2 and 3—the pressure in chamber I is greater than in the chamber o , the ring b is first lifted off the ring a' in the same way as an automatic valve is lifted from its seat, so that spaces for play result at x y , Fig. 1, by means of which spaces the medium at a higher pressure may return from the chamber I into the chamber o . The dotted diagram in Fig. 3 corresponds to this return-flow of the medium. The ring b is then only pressed against the ring a . Similar actions take place between each of the two succeeding chambers. In order to facilitate the discharge of the higher pressure from the following chambers into the previous ones, some holes p , Fig. 5, or grooves q , Fig. 6, may be formed in the rings b . These do not affect the other actions of the device, as with a higher pressure in the chamber o than in the chamber I the rings b are pressed against the following rings a' , &c., and thereby the necessary tight packing is produced. The grooves instead of being made in the rings b may also be made on the surface of the pre-

ceding rings *a* adjoining them. When all the parts fit properly, the loss by leakages will be of itself extremely small. If the separate rings be worn or badly fitted, the return-flow takes place and causes what would otherwise be large losses from leakage to remain very small.

Any suitable number of rings may be employed.

10 Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a rod or shaft, a packing-box comprising a plurality of packing-rings, chambers in which said rings are
15 loosely held, and a plurality of free pressure-

chambers alternating with the holding-chambers, substantially as described.

2. In combination with a rod or shaft, a packing-box comprising a plurality of packing-rings, chambers in which said rings are loosely held, and a plurality of free pressure-chambers alternating with the holding-chambers, said packing-rings having conduits therein for the passage of the pressure fluid,
25 substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HUGO LENTZ.

Witnesses:

HEINR. KIHN,

LUDWIG LICHTENSTEINER.