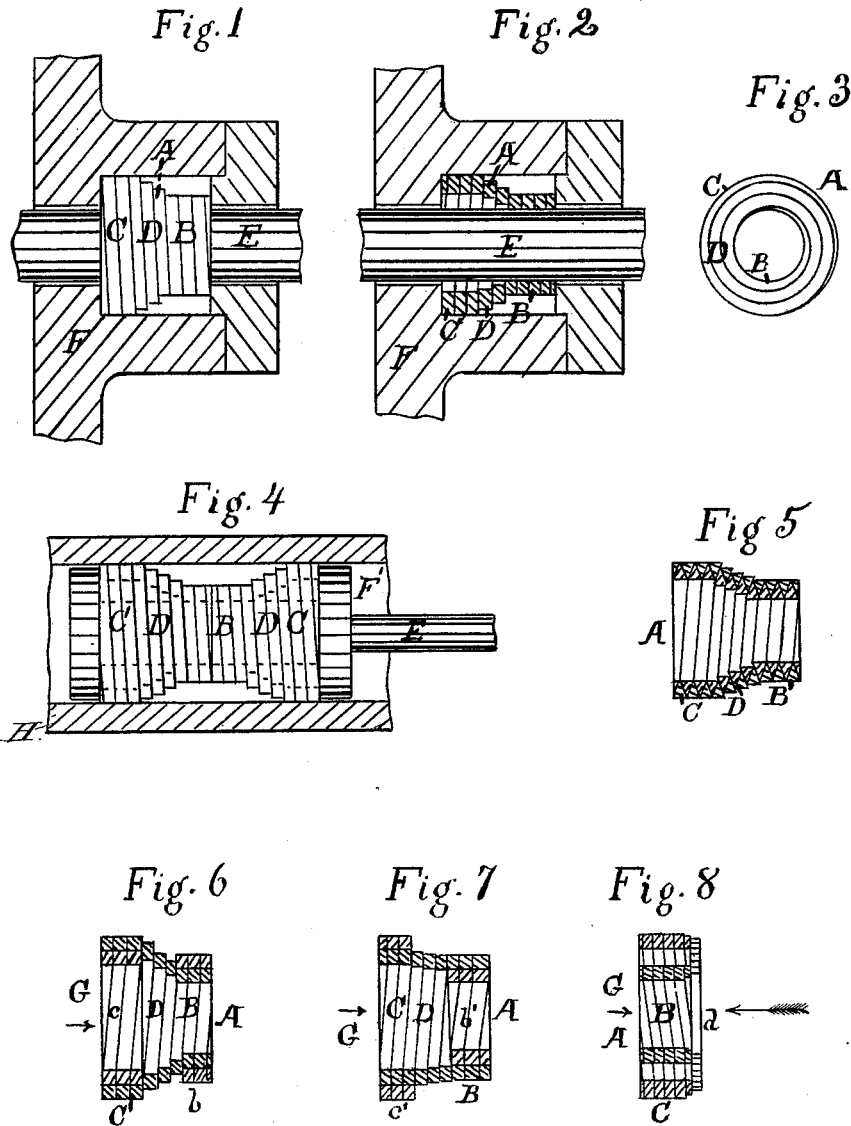


A. VIVARTTAS.  
Packing for Steam-Engines.

No. 206,695.

Patented Aug. 6, 1878.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ALOHA VIVARTTAS, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND  
MARK R. HAMILTON, OF SAME PLACE.

## IMPROVEMENT IN PACKINGS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 206,695, dated August 6, 1878; application filed  
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*To all whom it may concern:*

Be it known that I, ALOHA VIVARTTAS, of the city and county of New York, and State of New York, have invented an Improvement in Packings for Steam-Engines, of which the following is a specification:

This invention relates to packing and making tight joints in which the parts are required to be movable one upon the other, as in steam-pistons, piston and valve rods, and similar uses.

Figure 1 is a sectional view of the stuffing-box of a steam-cylinder with a part of the piston-rod, and showing the packing in position. Fig. 2 is a sectional view of the stuffing-box of a steam-cylinder with a part of the piston-rod, and showing the packing also in section. Fig. 3 is an end view of the packing. Fig. 4 is a sectional view of a portion of a steam-cylinder, showing the arrangement of the packing for a double-acting piston. Fig. 5 is a sectional view of another form of packing. Fig. 6 is a sectional view of a packing, showing the method of re-enforcing the same. Fig. 7 is a sectional view of the packing, showing a method of arming the same. Fig. 8 is a sectional view of another form of the packing.

This invention consists of an elastic packing, A, having three portions, arranged as follows: first, a straight or cylindrical spiral, B, made to close by its own elasticity upon the piston-rod E, or between the heads of piston H, following and fitting its surface, however unequal, from wear or other causes, without leak or excess of friction; second, a straight spiral, C, made to expand by its own elasticity and fill the stuffing-box F or cylinder F', making a tight joint under the same variable conditions; and, third, a tapered or helical spiral portion, D, which connects the parts B and C, permitting, by its elasticity and the flexibility of its coils in sliding upon each other, the freedom of motion required by the parts B and C independently of each other, and without causing such a separation of the parts as shall permit leakage in any place.

It is obvious that this packing may be made of one or more springs, and that the section of the springs may be varied, as shown in Fig. 5,

or otherwise, without affecting the general points mentioned.

This packing may be made of some material having very little friction, as soft metal, and the part B re-enforced by an exterior spring, *b*, of steel or other very elastic material, and the part C similarly re-enforced by an internal spring, *c*, as shown in Fig. 6; or the packing may be made of a substantial and durable spring, B C D, armed in B and upon C with soft or frictionless material, as *b'* or *c'*, as shown in Fig. 7, while in either case the part D will need no re-enforcing, as the pressure of the steam in the direction of the arrow G tends to keep the coils closed one upon the other. Another form of this packing is shown in Fig. 8, where, by inserting in the helical part D a flat ring or washer, *d'*, the parts B and C may be returned upon one another in cases where economy of space is a desideratum. This also may be either re-enforced or armed, as described, and also the three portions B, C, and D may be secured together, or made separate and independent of each other, the direction of the pressure being shown by the arrow. All of the joints will be kept tight by the pressure without affecting the action of the parts, as described.

This packing may be made of any suitable material, and in some one of its forms may be applied to any case where a movable rod or connection is required to be packed, as rods of pistons, valves, water-gates, pumps, or in chemical manipulations, for which latter case the stuffing-box, rod, and packing may be all made of glass or earthenware. A packing of this kind, of suitable proportions, will operate as a valve, opening to permit the passage of liquids or fluids in one direction through the part D, and closing by pressure in the contrary direction, and when attached to the piston-rod, as of a pump, constitutes a combined piston and valve. A packing of this kind, of suitable proportions, secured to the piston-rod will make a piston of variable diameter, fitting and working smoothly, and without leakage, in a tapered cylinder, or, conversely, on a tapered rod.

The ordinary kinds of packing, where the

substance being wound around the piston-rod is forced into the stuffing-box by the gland or follower, are open to the objection that they have no gage or means of knowing how much pressure is being exerted upon the rod, and are often a cause of great waste of power—or, in other words, fuel—to overcome a friction many times in excess of what is necessary to make a tight joint. Thus engineers, by a turn or two more than is needed upon the screws of the stuffing-box, really cripple the engine by applying what is practically a very powerful brake. This is a common trouble. Also, a piston-rod naturally wears most rapidly in the middle portion of its length, and a packing of the ordinary kind, that is just fitted to be tight—that is, without leak upon the center of the rod—is unnecessarily tight at the ends thereof, acting as a brake applied at each end of the stroke, causing both loss of power and irregularity of motion, or, if the packing be fitted to the ends of the rod, it leaks when upon the center of it, while with the packing herein described the engineer cannot, by any inadvertence, increase the friction, and differences in the diameter of a worn rod are accounted for in the elasticity of the packing, and cannot be felt, thus completely obviating the difficulties mentioned.

Having thus described the nature of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The packing A, composed of two parts, either of which may be radially contracted or expanded independently of the other, as and for the purposes described.

2. The packing A, consisting of the parts B and C, combined with the helix or tapered spiral D, as described, when the convolutions of D, by overlapping, form between themselves a tight or impervious joint, substantially as herein shown and set forth.

3. The packing A, consisting of the spirals B and C, as herein shown and described.

4. The combination, with the packing A, constructed as shown, of the re-enforcement *c* or *b*, as and for the purposes set forth.

5. The combination, with the packing A, constructed as shown, of the arming *c'* or *b'*, as and for the purposes set forth.

6. The combination of the packing A, as described, with the stuffing-box F and rod E, substantially as herein shown and described.

7. The combination of the packing A, as described, with the cylinder F' and piston-rod E, substantially as herein shown and described.

8. The combination of the packing A, as described, with the plate *d*, substantially as herein shown and described.

9. The packing A, having the parts B and C, combined with the helix D, as described, when, by the elasticity and flexibility of D, the necessary freedom of motion is permitted to the parts B and C, as herein shown and described.

ALOHA VIVARTTAS.

In presence of—

E. T. TAGGARD,  
GEO. W. TENNY.