(No Model.) 2 Sheets—Sheet 1.

A. MacLAINE.

PISTON PACKING.

No. 298,871. Patented May 20, 1884.

Fig 1

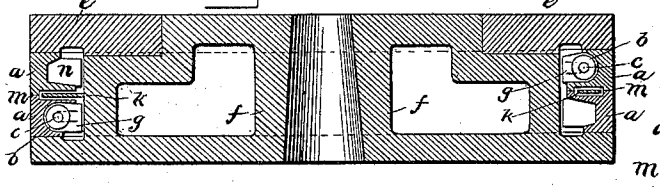


Fig 3.

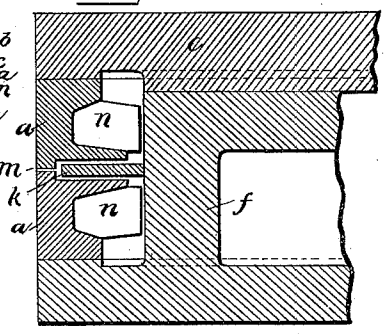


Fig 2.

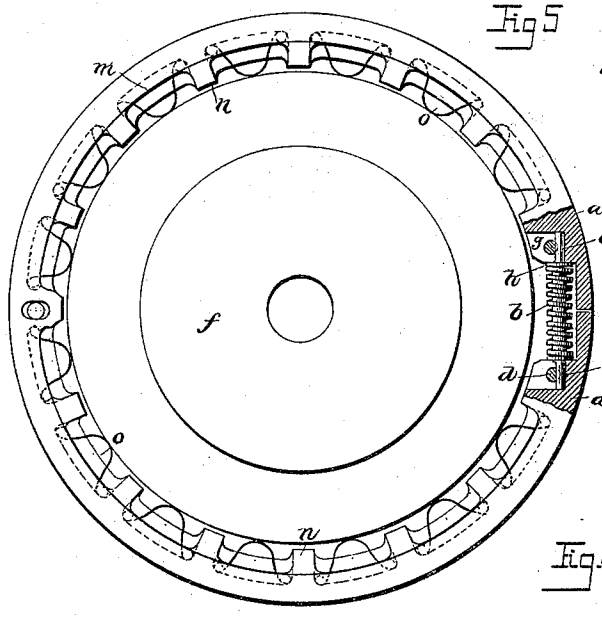
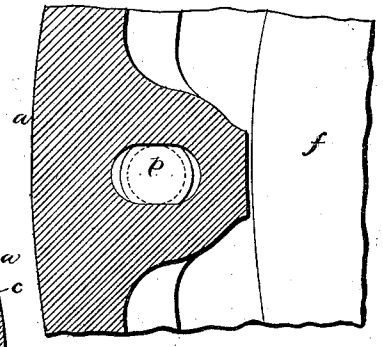


Fig 5



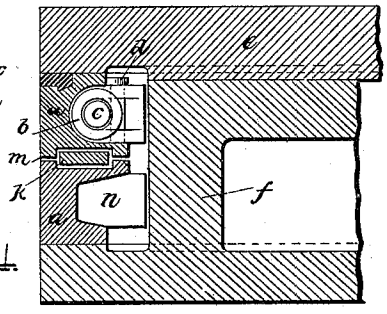


Fig 4.

Witnesses:
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Alexander MacLaine
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by Foster & Freeman

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

2 Sheets—Sheet 2.

A. MacLAINE.

PISTON PACKING.

No. 298,871. Patented May 20, 1884.

Fig. 6.

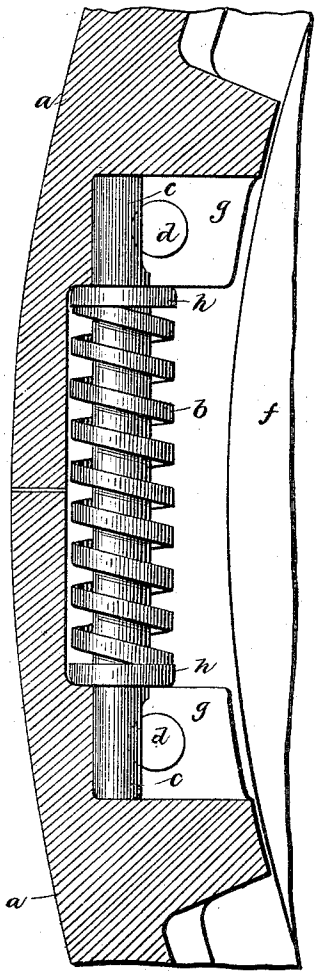
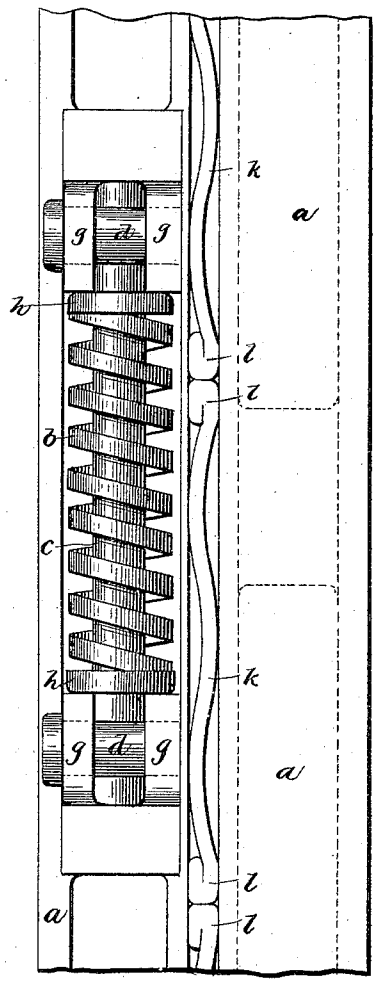


Fig. 7.



Witnesses:
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Alexander MacLaine
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UNITED STATES PATENT OFFICE.

ALEXANDER MACLAINE, OF BELFAST, COUNTY OF ANTRIM, IRELAND.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 298,871, dated May 20, 1884.

Application filed January 3, 1884. (No model.) Patented in France February 24, 1883, No. 153,918; in England June 6, 1883, No. 2,802, and August 11, 1883, No. 3,894, and in Belgium August 16, 1883, No. 62,173.

To all whom it may concern:

Be it known that I, ALEXANDER MACLAINE, of Belfast, county of Antrim, Ireland, in the Kingdom of Great Britain, by way of addition to the Improvements in Steam and other Pistons for which I have obtained Letters Patent of the United States of America, bearing date the 6th day of November, 1883, numbered 288,082, have invented certain adaptations and modifications of my said improvements, of which the annexed is the specification.

I prefer to use only two packing-rings, each having one transverse cut, and being fitted with a coil-spring, in order to expand such ring in a circumferential direction, and a bar or tube to strengthen and maintain the spring in position, as described in my principal specification. I arrange the inside of the packing-rings with grooves or jaws, by which the coil-spring and bar or tube may be placed in position from the inside without any material or injurious expansion of the ring, and I secure them in such position by means of pins or other fastenings. The pressure of the coil-spring is adjusted by the use of a steel washer of requisite thickness at each end of the spring. In some cases I employ gun-lock **C** or other like springs inside each packing-ring, and placed at or near to the part of the ring which is diametrically opposite to the transverse cut and coil-spring, so as to aid the coil-spring in expanding the packing-ring, and I may use a series of such springs extending at intervals farther or entirely round the packing-ring, and may dispense with the coil-spring altogether; or I may place one or more of such springs at each end of the packing-ring where cut through in substitution for the coil-spring, and I construct the inside of the packing-rings with ribs, blocks, snugs, or other projections cast in them, so disposed that the rings may thereby receive support from the body of the piston and resist the force of the steam or water; and in order to press the packing-rings apart in the direction of the longitudinal axis of the cylinder, I prefer to employ two or more flat steel springs having two or more waves or corrugations in each spring, and being placed at intervals around the circumference of and between the packing-rings, and inclosed within annular recesses formed on the contiguous surfaces of the packing-rings by constructing flanges on the outside and inside edges of the rings, or confined between a flange on the outside edge of the ring and the body of the piston on the inside, and I thicken or double over the ends of the flat springs, or furnish them with a bend or angle, or otherwise arrange them with a foot or stop approximating to the width and depth of the recess, to prevent such springs from slipping or shifting.

I shall now refer to the accompanying sheet of drawings, in order to illustrate the adaptations and modifications of my principal invention, which I have hereinbefore described, the same letters of reference being used throughout all the figures to indicate the same or corresponding parts of my arrangements.

Figure 1 is a sectional elevation of a piston, showing, among other parts, the flanged packing-rings with blocks, the coil-springs with bars or tubes, and the flat steel springs in the recess formed between the packing-rings, shown both between the outside and inside flanges and between an outside flange and the body of the piston, &c. Fig. 2 is a plan of a piston having the junk-ring removed, and showing, among other parts, a packing-ring with blocks, the coil-spring with bar or tube through it, steel washers, jaws, and securing-pins, a series of **C**-springs all round between the body of the piston and the packing-ring, and the pin which prevents the packing-ring traveling round the piston, &c. Fig. 3 is an enlarged detail of Fig. 1, showing the packing-rings with blocks, the junk-ring, and the wave-spring confined between the body of the piston and the flanges on the outside edges of the packing-rings. Fig. 4 is an enlarged detail of Fig. 1, showing the packing-rings with blocks, and the securing-pin, the coil-spring and bar, and the wave-spring in the recess formed by flanges on the outside and inside edges of the packing-rings. Fig. 5 is an enlarged detail of Fig. 2, showing the position and application of the pin which, if desired, may be used to prevent the packing-rings traveling round the piston. Fig. 6 is an enlarged detail of Fig. 2, showing the packing-rings with jaws for receiving the coil-spring with bar through it, and the pins to

secure same in the jaws, and the steel washers to adjust the pressure of the coil-springs; and Fig. 7 is an enlarged sectional detail showing in elevation the same parts as shown in Fig. 6, and also the flat steel waved or corrugated springs with doubled-over ends in the recess formed between the packing-rings.

a a are the packing-rings; *b b*, the coil-springs; C C, the bars or tubes through the coil-springs; *d d*, the pins which secure the coil-spring bars in the grooves or between the jaws formed on the packing-rings. *e* is the junk-ring; *f*, the body of the piston. *g g* are the jaws on the packing-ring; *h h*, the steel washers by which the pressure of the coil-spring is adjusted; K K, the flat waved or corrugated springs; *l l*, the doubled-over ends of the flat springs; *m m*, the flanges on the outside and inside edges of the packing-rings; *n n*, the blocks cast on the packing-rings; *o o*, the **C** springs; and *p*, the pin through the ovaled hole in the packing-ring, which, if desired, prevents it traveling round the piston.

I claim—

1. In a steam or other piston packing, the combination, with the packing-rings having jaws, of the coiled springs, supporting bars or tubes, and means for securing the same in the jaws, whereby the springs may be introduced and secured in place without straining the rings, as set forth.

2. The combination, with the packing-rings having flanges, of the wave-springs K K, whereby the springs are held in place by the flanges, as set forth.

3. The combination, with the double expansion piston packing rings having a series of ribs, blocks, or projections, of the gun lock or other springs bearing upon the body of the piston and extending between the projections, as and for the purpose set forth.

4. In a piston-packing, the double expansion packing rings provided with a series of ribs, blocks, snugs, or other projections on the inner side of the rings, approaching the body of the piston and adapted to prevent the rings being forced inwardly too far, as set forth.

5. The combination, with the expansion-rings, of the flat wave-like springs between the adjacent sides of the rings, the ends of which are provided with feet or stops, as set forth.

6. An expansion-packing consisting of flanged rings, wave-like springs secured between the flanges, lugs or stops upon the inside of the rings, and coiled springs and means for securing the same in the jaws of the rings, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER MACLAINE.

Witnesses:
HUGH HYNDMAN,
Solicitor.
SAML. P. BROWN.