

(No Model.)

3 Sheets—Sheet 1.

H. C. PLATTS & T. LOWTHER.
PACKING.

No. 534,575.

Patented Feb. 19, 1895.

Fig. 1.

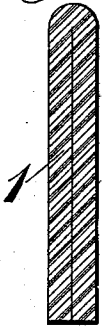


Fig. 2.

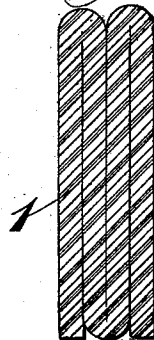


Fig. 3.

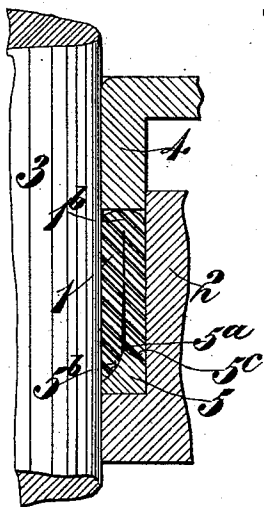


Fig. 4.

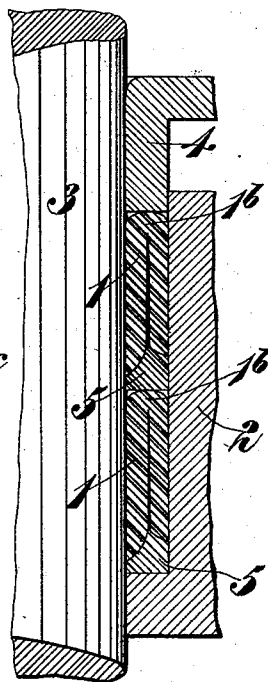
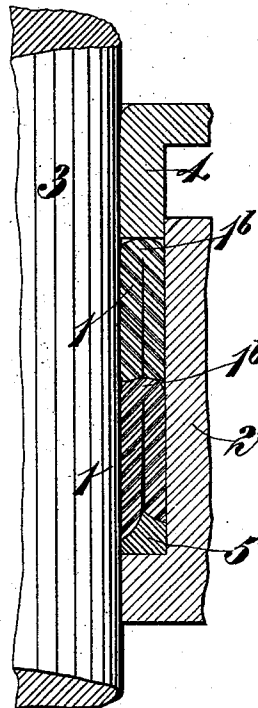


Fig. 5.



Witnesses

Alfred Raymond

James Liddon

Inventors

Harry Charles Platts

Thomas Lowther

(No Model.)

3 Sheets—Sheet 2.

H. C. PLATTS & T. LOWTHER.
PACKING.

No. 534,575

Patented Feb. 19, 1895.

Fig. 6.

Fig. 7.

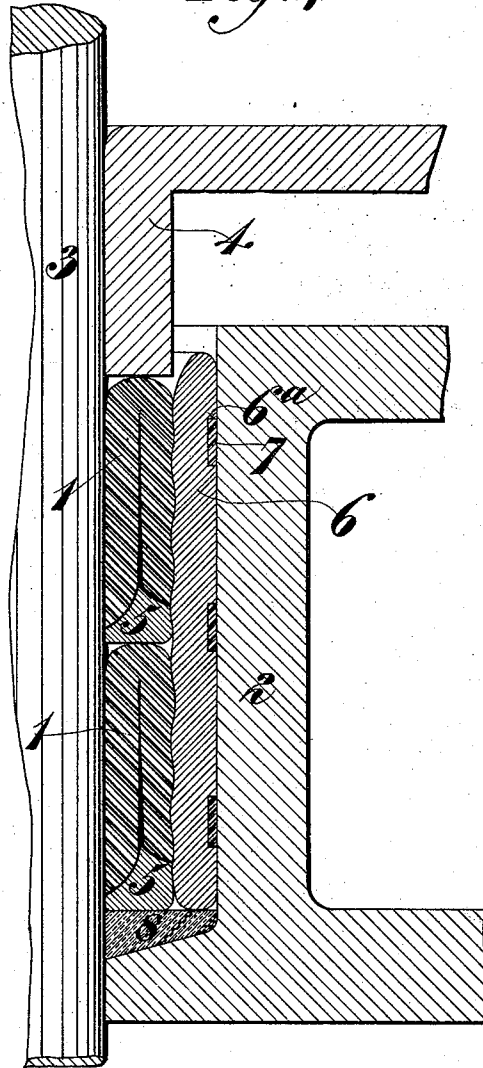
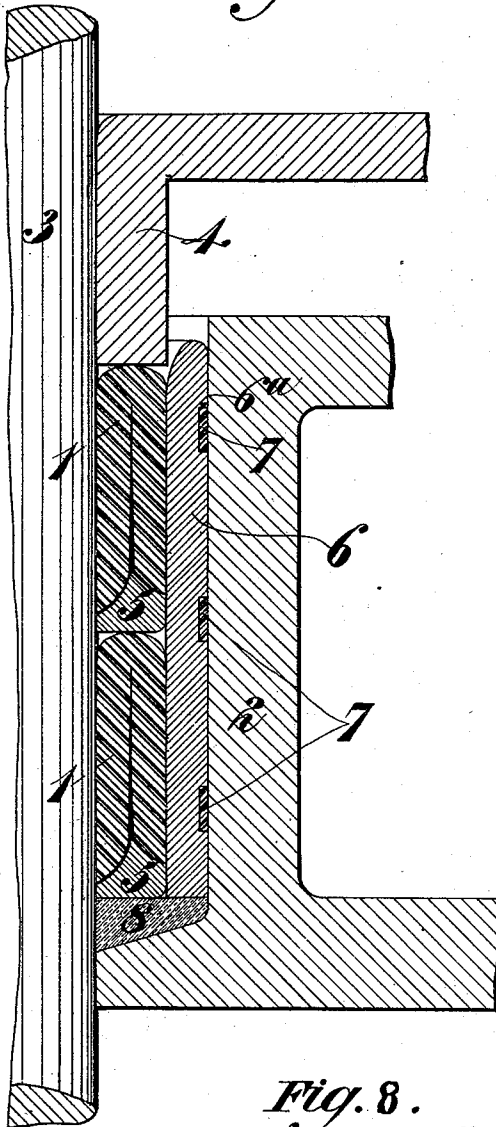
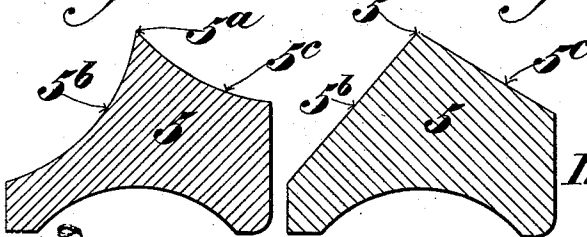


Fig. 8.

Fig. 9.



Witnesses

Alphonso Raymond

James Laddon

Inventors

Henry Charles Platts
Thomas Lowther

(No Model.)

3 Sheets—Sheet 3.

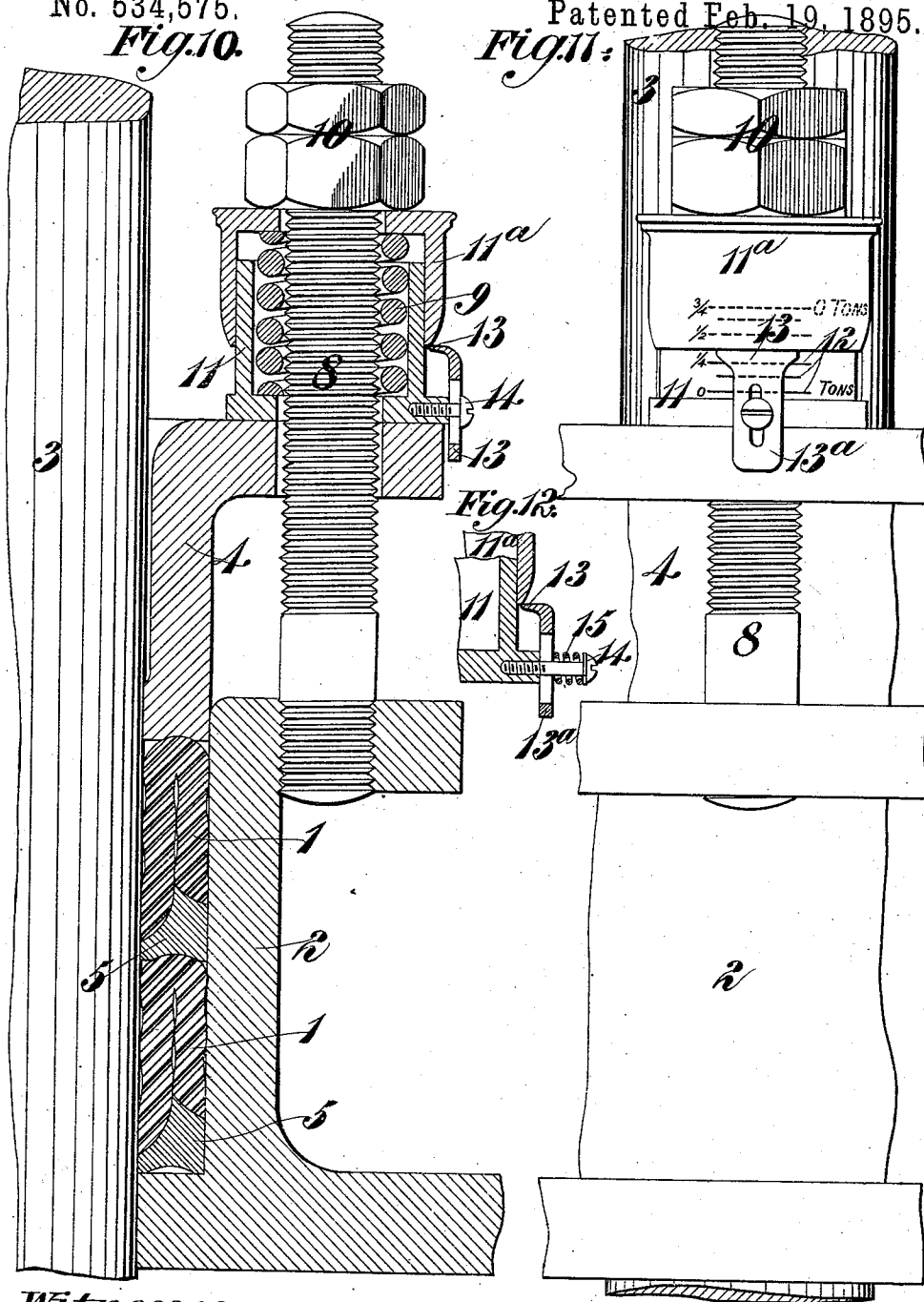
H. C. PLATTS & T. LOWTHER.
PACKING.

No. 534,575.

Patented Feb. 19, 1895.

Fig. 10.

Fig. 11.



Witnesses
Alphonso Raymond
James Giddon

Inventors
Henry Charles Platts
Thomas Lowther

UNITED STATES PATENT OFFICE.

HENRY CHARLES PLATTS AND THOMAS LOWTHER, OF HUGHESOFFKA, RUSSIA.

PACKING.

SPECIFICATION forming part of Letters Patent No. 534,575, dated February 19, 1895.

Application filed September 21, 1893. Serial No. 486,140. (No model.) Patented in England July 10, 1893, No. 13,378.

To all whom it may concern:

Be it known that we, HENRY CHARLES PLATTS and THOMAS LOWTHER, subjects of the Queen of Great Britain and Ireland, residing at Hughesoffka, Government of Ekaterinoslav, South Russia, have invented Improvements in Packing, (for which a patent has been granted in England, dated July 10, 1893, No. 13,378,) of which the following is a specification.

This invention has reference to a novel construction and arrangement of packing for use in stuffing boxes and other like devices for making fluid tight joints.

The packing is composed of suitable flexible material such as hemp, jute, cotton, asbestos or other vegetable or fibrous material; or of composite material such as hemp and asbestos, or cotton and asbestos; these fibrous materials being woven into tape-like strips of sufficient breadth, thickness and elasticity for the purpose intended; or the said strips may be cut out of sheets of woven fibrous material of the kinds mentioned of suitable thickness and elasticity. The said material may also have metallic wires woven in or combined therewith to better adapt it to withstand wear. For high pressures the flexible material may advantageously be composed of woven asbestos, or of asbestos and hemp or of asbestos and metal wire, or of asbestos, hemp, cotton and metallic wire woven together.

Packing material of the kind mentioned, which may advantageously be made with a ribbed or corrugated surface, is, according to this invention, doubled one or more times upon itself and pressed to shape, it may be by passing it between suitable rolls, and then cut into suitable lengths to form packing rings of the required diameter. This packing which we term compensating split packing, may be made of various thicknesses to suit requirements. One layer or ring only may be used, or two or more layers or rings may be used, either superimposed directly one upon the other, or with a suitable metal washer placed between each adjacent pair. Such packing may advantageously be corrugated in a circumferential direction for which purpose the rolls used for pressing the material to shape may be suitably corrugated.

In order that the nature of our invention and the manner of carrying the same into practical effect may be clearly understood we will proceed to describe the same by aid of the accompanying drawings, in which—

Figures 1 and 2 are cross sections of different forms of compensating split packing according to this invention. Figs. 3, 4 and 5 are part vertical sections of stuffing boxes showing various ways in which the compensating split packing may be arranged therein. Figs. 6 and 7 are similar views to Figs. 3, 4 and 5 illustrating the use in conjunction with packing of the kind referred to, of an outer bush. Figs. 8 and 9 are cross sections showing two forms of rings or washers that may advantageously be used with packing of the kind referred to. Fig. 10 is a part vertical section, and Fig. 11 a part side elevation of a stuffing box fitted with compensating split packing and rings or washers and with a compensating spring arrangement adapted to constantly compress such packing in order to compensate for gradual wear thereof. Fig. 12 is a detail view showing a modification.

The several figures are drawn to different scales.

The layer or sheet of packing material 1 may be simply doubled upon itself once as shown in Fig. 1, or it may be doubled upon itself several times as shown in Fig. 2, according to the thickness of packing required.

The flexible packing pressed to shape as described is cut off in suitable length to form a ring or tube of a diameter to suit the rod, plunger or part to be packed and the ends are brought together so as to form a suitable joint such as a butt joint.

Figs. 3, 4 and 5 show the arrangement of the packing in a stuffing box. In Fig. 3, 1 is the packing; 2, the stuffing box; 3, the rod to be packed; and 4 the gland. 5 is a ring or washer of hard material upon which the packing 1 may advantageously be arranged to bear. This ring or washer, which may be of metal, is preferably formed at its upper side with a knife edge 5^a and with two downwardly inclined surfaces 5^b 5^c that may be curved as shown in Fig. 8, or straight as shown in Fig. 9, in order to split up the packing and assist the downward movement of the inner layer

or portion thereof as the same wears away. This ring or washer 5 may be made in one piece, or it may be made in segments for convenience of removal and renewal.

5 In Fig. 4 the stuffing box is deeper and provided with two rings of packing 1 each resting upon a ring 5 of the kind mentioned.

Fig. 5 shows a similar arrangement to Fig. 4 but with the metal ring 5 between the two 10 pieces of packing 1 omitted. The gland 4 may act upon the outermost end of the packing either directly as in Fig. 4, or indirectly through a washer grooved at its under side.

In the arrangements shown in Figs. 3, 4 and 15 5 the packing consists either of a single doubled over piece of packing material as shown in Fig. 3, or of two such pieces superimposed as shown in Figs. 4 and 5 but the forms of packing shown in Fig. 2 may be used if desired, as for example for heavy hydraulic work. 20 In some cases however, in order to save packing, as when the stuffing box is of large size, one or more bushes, which may be made plain or corrugated on the side next to the compensating split packing may be arranged between 25 such packing and the inner side of the stuffing box.

Figs. 6 and 7 show an arrangement of this kind, wherein 6 is the bush arranged between 30 the packing 1 and the inner side of the stuffing box, the side of the bush next the packing being plain in Fig. 6 and corrugated in Fig. 7.

The bush 6, or each of them when more than 35 one is used, may be made in one piece, or in segments to facilitate removal and be formed externally with grooves 6^a to contain packing material 7 to form a fluid tight joint between it and the inner side of the stuffing box. In 40 such an arrangement the gland 4 is as shown made thinner where it enters the stuffing box, as so to act against the packing 1 alone and not against the bush 6 or bushes.

A stuffing box to contain packing such as 45 hereinbefore described may in some cases be provided at its bottom or inner end with a special washer 5* (Figs. 6 and 7) of soft material, on which the innermost metal ring or washer 5 is bedded.

50 A stuffing box fitted with compensating split packing of the kind hereinbefore described may advantageously have combined therewith a compensating spring arrangement of the kind described and shown in the 55 specification of another application for Letters Patent filed by us, Serial No. 485,532.

Figs. 10 and 11 show an arrangement of this kind wherein each gland stud 8 is provided with a spiral spring 9 arranged between 60 the gland 4 and the nuts 10 on such stud the arrangement being such that upon tightening up the said nuts the springs will be compressed and caused to act continuously against the gland which will be consequently 65 forced against the packing with considerable force.

Each spring may have combined therewith

an indicator for indicating its condition. In the example shown for this purpose each spring is inclosed within a casing consisting 70 of two boxes 11 11^a arranged telescopically one within the other, the inner one being marked with suitable divisions 12 indicating say fractions of a foot or meter, and also with figures indicating the resistance of the in- 75 closed spring corresponding to the various said divisions.

13 is a pointer formed it may be on a slotted bar 13^a which is attached by suitable means such as a set screw 14 to the inner 80 box 11 either direct as shown in Figs. 10 and 11, or indirect through a spiral spring 12, as shown, so that in each case the pointer will be pressed down by the edge of the outer box 11^a as the latter is screwed down, but 85 will remain stationary when the said outer box is pressed away from the inner one by the inclosed spring as the packing material wears away, thus serving as an indicator to show the extent of wear of the packing material. The said indicators in addition to indicating the wear of the packing, serve to indicate when the compensating spring arrangement has passed the limits of useful elasticity, to prevent an injurious tightening up of 95 the compensating arrangement, and to enable all the springs to be equally tightened up.

The action of compensating split packing when used in a stuffing box provided with a compensating spring arrangement of the kind 100 hereinbefore described is as follows:—When pressure is applied to the compensating springs, the gland 4 or equivalent device is constantly and automatically forced down upon the packing 1 so as to cause the same to 105 press closely against the rod 3 or other body to be packed. As the packing wears away on the side next to the rod or body 3, it is caused by the pressure exerted by the said spring arrangement to turn over on itself at 110 the bend or bends 1^b which action is assisted by the ring or washer 5, when the same is used, so that the quantity of packing material worn away is constantly and automatically replaced and nearly the whole of 115 the packing material can be utilized. At the same time the various layers of the packing being in a state of compression, assume in a certain degree, (if not already pressed by rolls to such a shape,) a wavy or corrugated surface circumferentially whereby additional resiliency is imparted to the packing so that the packing itself assists to render the joint fluid tight, while freely allowing any necessary side play of the piston rod or other part 125 to take place. The same action will take place when the packing is arranged in two or more super imposed layers or pieces in the stuffing box.

The doubling over of the flexible material 130 to form our improved packing, tends to make the packing very resilient or springy at the place where the doubling over takes place, and this property in itself renders the pack-

ing valuable when used alone, that is to say, without a compensating spring arrangement. Thus this packing has, as already described, properties of resilience which give it a compensating action to make up for wear and tear, and although the spring arrangement serves to make a joint more perfect, there are many cases in which it is sought to make a fluid tight joint where the spring arrangement is inadmissible as for example when there is not sufficient room for the same, and in the stuffing boxes of cocks, &c., and it is in these cases, that our compensating split packing is especially valuable and can be applied alone. It is however to be distinctly understood that compensating split packing such as described can be used in stuffing boxes or equivalent devices of various constructions either alone or with a compensating spring arrangement. It may advantageously be used in packing arrangements of the kind described in the specification of our said other application for Letters Patent, wherein the packing is constantly pressed against the surface with which it is to form a fluid tight joint, by a tightening device comprising segmental pieces or bushes arranged in pairs and each adapted to act after the manner of a wedge against the other of the pair so that the one next the packing will be caused to press the same inward or outward as the case may be, the wedging action being automatically produced by a spring or springs acting directly or indirectly on one or the other of the segmental pieces of the pair or of each pair when there is more than one pair.

What we claim is—

1. Compensating split packing composed of woven fibrous sheet material of the kinds herein referred to doubled upon itself so that, as seen in cross section, it consists of two or more straight and parallel layers in close contact with each other and each of which will be parallel with the surface of the rod or other body to be packed, the adjacent layers being connected at one end only by a curved or bent portion by means of which the elasticity of the packing is produced and whereby the layer that is subject to wear, when in use, is permitted to slide upon the adjacent layer when subjected to pressure in an endwise direction, substantially as described and shown.

2. An elastic packing ring composed of two or more tubular layers or pieces of woven fibrous material adapted to fit around the rod or other body to be packed, and which, as seen in cross section, consist of straight and parallel layers in close contact with each other, the adjacent layers being connected at one end only by a curved or bent portion that permits the layer subject to wear to slide upon the adjacent layer, substantially as herein described for the purpose specified.

3. A stuffing box provided with a compensating split packing composed of woven fibrous sheet material of the kinds herein referred to doubled upon itself so that as seen in cross section, it consists of two or more

straight and parallel layers arranged in close contact with each other and extending lengthwise of the stuffing box so as to be concentric therewith, the adjacent layers being connected at one end only by a curved or bent portion by means of which the elasticity of the packing is produced and whereby the layer that is subject to wear, when in use, is enabled to slide upon the adjacent layer when subjected to pressure in an endwise direction, substantially as described and shown.

4. A stuffing box provided with packing composed of woven fibrous sheet material doubled upon itself so as to form two parallel annular layers concentric with the axis of the stuffing box and connected by a bent or curved portion, and one or more bushes arranged between said packing and the inner side of said stuffing box substantially as herein described.

5. A stuffing box provided with packing composed of woven fibrous sheet material doubled upon itself so as to form two parallel annular layers concentric with the axis of the stuffing box and connected by a bent or curved portion, and with a ring or washer adapted to support the outermost layer of said packing and to permit of downward movement of the innermost layer thereof substantially as herein described for the purpose specified.

6. A stuffing box provided with packing composed of woven fibrous sheet material doubled upon itself so as to form two parallel annular layers concentric with the axis of the stuffing box and connected by a bent or curved portion, and with a supporting ring or washer for each piece of said packing, said ring or washer being formed at its upper side with a knife edge and with two downwardly inclined surfaces substantially as described and shown for the purpose specified.

7. The combination in a stuffing box of packing composed of woven fibrous sheet material doubled upon itself so as to form two parallel annular layers concentric with the axis of the stuffing box and connected by a bent or curved portion, a supporting ring or washer for each piece of said packing, said ring or washer being formed at its upper side with a knife edge and with two downwardly inclined surfaces, a gland to compress said packing, and springs arranged to be compressed by the tightening up action of the nuts on the gland studs and to constantly exert an inward pressure through said gland on said packing substantially as herein described for the purpose specified.

8. The combination with a stuffing box of compensating split packing composed of sheet material of the kind herein referred to doubled once or more upon itself and a compensating spring arrangement comprising springs arranged to be compressed by the tightening up action of the nuts on the gland studs of said stuffing box and to constantly exert an inward pressure upon said packing and an

indicating device adapted to be moved when the springs are tightened up but to remain stationary when the springs expand substantially as herein described for the purpose

5 specified.

9. In a stuffing box, compensating split packing composed of sheet material doubled once or more upon itself, a bush arranged between said packing and the inner side of said
10 stuffing box, a gland arranged to act only on said packing, and springs arranged to force

said gland against said packing substantially as herein described.

In testimony whereof we have signed our names to this specification in the presence of 15 two subscribing witnesses.

HENRY CHARLES PLATTS.
THOMAS LOWTHER.

Witnesses:

JOHN FILBEY PALMER,
GEORGE ROBERT MARTIN.

Both of Rostov-on-the-Don.