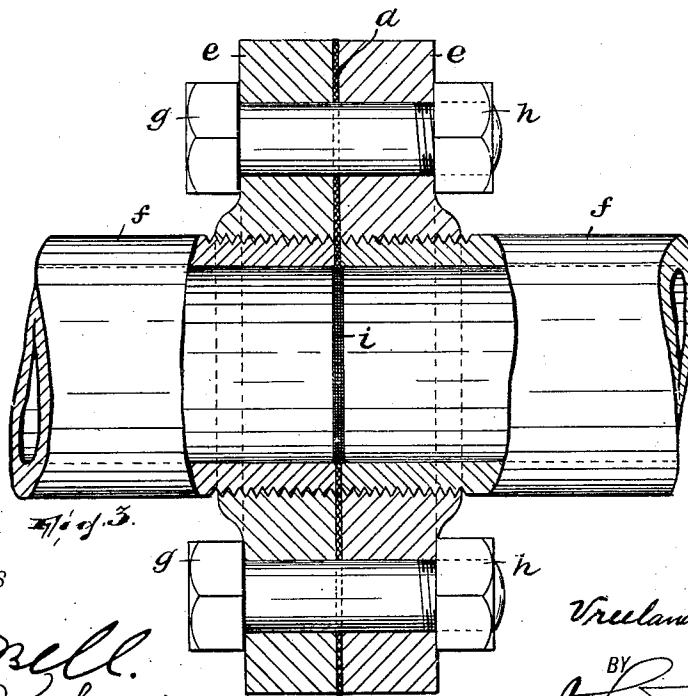
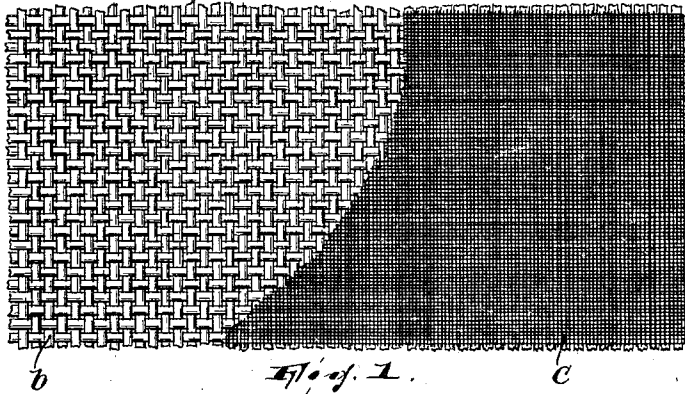


V. TOMPKINS.
 SHEET PACKING.
 APPLICATION FILED MAR. 30, 1908.

920,502.

Patented May 4, 1909.



WITNESSES
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SHEET-PACKING.

No. 920,502.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed March 30, 1908. Serial No. 424,132.

To all whom it may concern:

Be it known that I, VREELAND TOMPKINS, a citizen of the United States, residing in Jersey City, Hudson county, New Jersey, have invented a certain new and useful Improvement in Sheet-Packing; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to means for packing metal joints, such as the joints of hydraulic, steam or other similar metallic pipes or conductors, where hermetic inclosing of the liquid conducted thereby is required, and it has reference particularly to sheet packing.

The object of the invention is to provide a packing which may have a wide range of application to the different purposes for which an article of the general nature indicated is likely to be called into use and which shall therefore possess, among other qualities, the ability to resist deterioration by heat or moisture and the effects of such gases as the metal of the conductors themselves may be calculated to withstand.

In carrying out my invention, I apply to a sheet of preferably pliable material, such as a woven fabric, a substance containing in relatively large proportion an oxidizable metal, preferably iron, in a more or less finely divided condition, and also containing an ingredient calculated to serve as a convenient and practical vehicle for the application of the metallic particles. It will be understood that the ingredient referred to may very appropriately be a viscous liquid adapted, on hardening after application, to possess a certain degree of elasticity as well as of strength, whereby the finished product can be subjected to a reasonable amount of bending, distending or other extraordinary strain without affecting materially the continuity of the metal-laden body with which the sheet is treated, it being remarked that, in general, it is important that said body present such unbroken and substantial formation after it has once set that were the fabric, for instance, entirely destroyed, it would still remain intact throughout; the finished product should, furthermore, not lack a certain degree of compressibility, which quality may be de-

rived from the fabric, or the metal-laden substance, or from both, the object of this being to cause the packing to adapt itself to surface irregularities of the bodies between which the packing is placed. A common type of fabric employed in the manufacture of packing is woven from asbestos fibers, asbestos being desirable, of course, because of its heat-resisting and other qualities which make it well adapted to the purpose; I employ preferably woven asbestos as the fabric material of my packing and when this is so used it will be found that, in addition to securing the advantages above alluded to, the metal-laden substance which forms one of the essential features of this invention will act to render the asbestos proof against moisture, strengthen the packing as a whole and protect the wire filaments with which, for certain reasons, the asbestos fabric may be reinforced.

I shall now proceed to describe my invention with specific reference to the preferred form thereof.

Figure 1, in the accompanying drawing, shows a fragment of asbestos fabric partially treated with the metal-laden substance; Fig. 2 is a sectional view of what is shown in Fig. 1; Fig. 3 shows a pipe-joint in section having my improved packing applied thereto.

a in the drawing, Fig. 3, designates the packing.

b in Figs. 1 and 2 designates the asbestos fabric and *c* the metal laden substance.

The fabric *a*, whose main function in the present invention is to serve as a support for the metal-laden substance *b*, is preferably an open-mesh fabric, the idea being to reserve in the fabric a relatively large proportion of space so that when the metal-laden substance *c* is applied it may be worked freely through the fabric and between the strands or threads thereof and thus the desired continuity of said substance as a layer-like body in all parts of the ultimate product provided for; the asbestos fabric I employ is that now commonly used for the purpose of making packing gaskets of the kind herein generally referred to, its weave formation being substantially the same as that of ordinary bur-lap.

The essential ingredients of the metal laden substance, as already indicated, are an oxidizable metal in a more or less finely divided form and a liquid adapted to hold the metal in a state of suspension, at least until

such metal-laden substance can be applied to the fabric; it is preferred that the liquid should have the quality, after the substance is applied to the fabric, to produce a more or less permanent binding of the particles together and to the fabric, for which reason the liquid should be a viscous one. Accordingly, in the adaptation of my invention now being specifically referred to, I mix a large proportion of powdered oxidizable iron (and, in general, the more finely divided the particles of this powder are, the better) with a solution comprising rubber or caoutchouc and a solvent thereof, such as benzine. This substance has about the consistency of paint. The proportions are by weight and are: 4.8% rubber, 43.2% benzine, 144.00% iron particles. It is applied to the fabric *c* with a brush or other suitable implement, and should be well worked into the meshes of the fabric sufficiently so that it will penetrate or ooze through the fabric and appear on its opposite face; preferably the fabric is then coated on said opposite face with the substance *b*, again working the latter into the meshes of the fabric thoroughly. One or more applications may be employed, according to the particular purpose for which the packing is to be used. The resulting product will be substantially what is shown best in Figs. 1 and 2; the salient feature of the product will be a layer-like body *c* having a large proportion of comminuted oxidizable iron particles in a state of distribution through the now set or hardened rubber solution. The said product will be capable, on compression, of yielding to irregularities in the surfaces between which the packing may be placed, due largely to the broken or divided condition of its metal constituent, whereby each particle retains a limited degree of mobility, as well as also, of course, to the fabric and to the material (such as the rubber substance) affording the means for binding the particles together and to the fabric; so that the packing is well adapted to serve its fundamental purpose as a means for hermetically closing joints.

I am aware that red oxid of iron has been applied in the manufacture of packing to asbestos and similar fabrics; but my invention is to be distinctly differentiated from anything of that nature, for the reason that in that case the iron, having passed through the process of oxidation, is dead and inert, whereas the live or active principle of oxidation remains according to the present invention to perform valuable functions after the packing has been put to service. For instance, on introducing a gasket *a* of my packing between the rings *e* forming the joint portions of pipes *f* and clamping them together by means of the bolts *g* and nuts *h*, once moisture comes in contact with the iron particles of the packing, a condition of oxida-

tion will at once be set up with respect to the iron particles in the packing, forming an annular excrescence *i* at the inner seam between the rings *e*, and producing a kind of swelling or expansion of the packing wherever the moisture penetrates; this hermetically seals off any interstice both by completely filling every space or leak-opening which might otherwise be left and by, in effect, knitting the two rings *e* together as one, and even should the excrescence of rust thus produced be broken away at any point, it will start to form anew. Again, a joint provided with a packing of the nature of that herein particularly described will be hermetically tight, without regard to the oxidizing quality of its iron constituent, because of the impermeable character of the material in which the powdered metal is bound; the integrity of the joint in this particular depends largely, of course, on the thoroughness of the impregnation of the fabric, and if this impregnation is properly effected, so that the fabric is not merely coated with the metal-laden substance, the joint will be proof against all leakage, even under high hydraulic pressures.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. As an article of manufacture, a packing for pipe joints and the like consisting of a sheet-like support and a layer-like body adhering thereto and comprising an oxidizable metal in comminuted form, substantially as described.
2. As an article of manufacture, a packing for pipe joints and the like consisting of a sheet-like support and a lever-like body adhering thereto and comprising oxidizable iron in comminuted form, substantially as described.
3. As an article of manufacture, a packing for pipe joints and the like consisting of a permeable sheet-like support and a layer-like body applied in impregnating disposition on said support and comprising an oxidizable metal in comminuted form, substantially as described.
4. As an article of manufacture, a packing for pipe joints and the like consisting of a permeable sheet-like support and a layer-like body applied in impregnating disposition on said support and comprising oxidizable iron in comminuted form, substantially as described.
5. As an article of manufacture, a sheet packing for pipe joints and the like having a copious interspersed of oxidizable metal in comminuted form, the respective particles of the metal being distributed and maintained in a normally fixed state, substantially as described.
6. As an article of manufacture, a sheet packing for pipe joints and the like compris-

ing powdered oxidizable metal and a viscous substance maintaining the respective metallic particles distributed and in a normally fixed state, substantially as described.

5 7. As an article of manufacture, a sheet packing for pipe joints and the like comprising a pliable support, powdered oxidizable metal and a viscous substance applied to said support and maintaining the respective metallic particles distributed and in a normally fixed state, substantially as described.

10 8. As an article of manufacture, a sheet packing for pipe joints and the like com-

prising a permeable pliable support, powdered oxidizable metal and a viscous substance impregnating said support and maintaining the respective metallic particles distributed and in a normally fixed state, substantially as described. 15 20

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of March, 1908.

VREELAND TOMPKINS.

Witnesses:

JOHN W. STEWARD,
WM. D. BELL.

Correction in Letters Patent No. 920,502.

It is hereby certified that in Letters Patent No. 920,502, granted May 4, 1909, upon the application of Vreeland Tompkins, of Jersey City, New Jersey, for an improvement in "Sheet-Packing," an error appears in the printed specification requiring correction, as follows: In line 104, page 2, the compound word "lever-like" should read *layer-like*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of June, A. D., 1909.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.