

No. 697,575.

Patented Apr. 15, 1902.

A. T. WALL.

COMPOSITE WIRE AND METHOD OF MAKING SAME.

(Application filed Dec. 29, 1900.)

(No Model.)

Fig. 1.

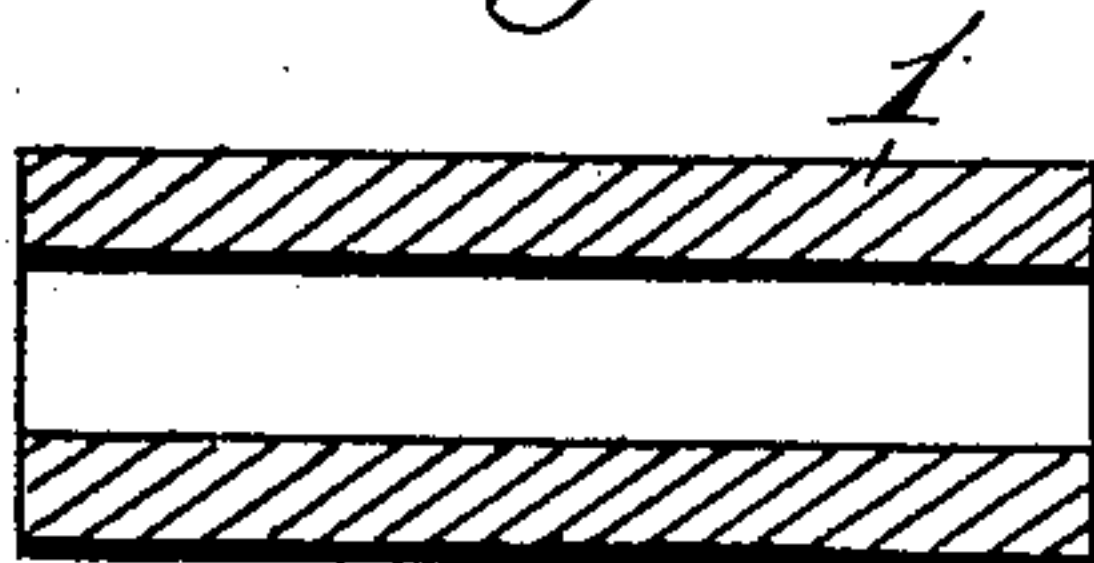
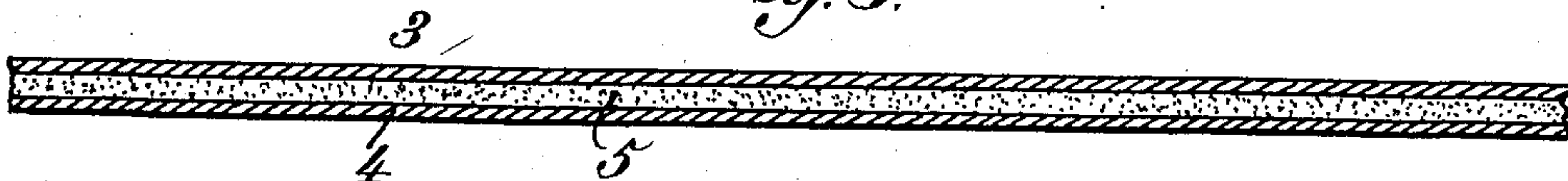


Fig. 2.



Fig. 3.



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COMPOSITE WIRE AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 697,575, dated April 15, 1902.

Application filed December 29, 1900. Serial No. 41,544. (No model.)

To all whom it may concern:

Be it known that I, ASHBEL TINGLEY WALL, a citizen of the United States, and a resident of East Greenwich, in the county of Kent and State of Rhode Island, have invented a certain new and useful Composite Wire and Method of Making the Same, of which the following is a specification.

My invention relates to a new and improved composite wire, the exterior of said wire being composed of the relatively valuable metals and the interior filled with less valuable materials.

It also relates to the method of making the composite wire.

It relates especially to the production of wires or cylinders of the metals, the interior of said wires or cylinders being a cheap and inexpensive material in a finely-divided state, preferably, though not necessarily, of non-metallic composition.

Another way of stating my invention is to say that it is for making a substance primarily without ductility or tenacity into a wire, using a metal for the sustaining-walls, the pressure to which it is subjected in the process of drawing it down making it into a wire or cylinder.

My invention consists, therefore, in an improved composite wire and in the method of making the same, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a longitudinal central sectional view of a hollow metallic cylinder before the same is provided with its filling or packing of finely-divided material. Fig. 2 is a similar view of the cylinder packed with the filling material and before it has been subjected to the drawing operation, and Fig. 3 is a similar view of the finished composite wire.

To carry out my invention, I take a cylinder of the desired metal, which is malleable and ductile, and pack it closely with magnesia, graphite, or similar materials. The materials used for packing the cylinder will vary according to the purpose for which the wire is to be used. The materials chosen for the internal packing must be of such as preferably not to be decomposed by the heat of

annealing. The filling must be closely packed, and any air, moisture, or occluded gases should be driven off from the filling material or they may cause rupture of the external walls when subjected to heat or treatment. The cylinder when packed is treated in the usual manner employed in wire drawing and reducing, or it may be subjected to rotary hammering devices to reduce it to the form of wire. When the composite cylinder has been thus treated and the metallic shell removed, there will remain a core of the filling, which having been subjected to the very great pressure employed in reducing the cylinder to shape retains the form of a wire, more or less strong, according to the degree to which it has been compacted in the wire-drawing process. If it is desired to have a thin coating left on the inner core, a second cylinder can be forced on over the first before the wire-drawing operation takes place, this second cylinder being afterward removed by means of solvents or otherwise.

By my invention I can produce a wire of conducting and non-conducting material, one of an expensive and non-expensive material, both having heat-resisting qualities.

In the drawings the numeral 1 indicates the metallic cylinder before the same has been subjected to the drawing operation; 2, the filling of finely-divided material with which the cylinder is packed; 3, the finished composite wire after it has been drawn out into attenuated shape; 4, the thin tubular shell or metallic covering, and 5 the core in the finished article.

My invention can be used for filling gold wire so that the carat value can be retained and still have less weight. This is especially advantageous in certain ornaments, such as bracelets, in which valuable metal and light weight are desired. To maintain the carat value, an extra amount of fine gold may be added to the alloy of the gold, so that an assay of this gold will show the desired carat value to the same extent as would be shown if the entire weight of the gold and of the filling is required to assay a certain carat value.

My invention can also be used for the manufacture of tubing in any shape, such as half-round, square, &c. I take a tube of large

size and fill it with one of the cheap materials mentioned above, and then by subjecting such composite tube to the drawing-down process I can make it of any shape desired.

5 The filling furnishes the necessary resistance to allow the inclosing metal to be gradually reduced in thickness as the wire-drawing proceeds and to assume and preserve the desired shape. If it is desired to have as the result
10 of the process a very thin metallic tube of any particular shape, the internal filling can be removed by means of solvents.

My invention also allows gold tubing to be wound without flattening and to be chased,
15 swaged, or struck in dies, my tightly-packed filling material furnishing the stiffening quality to enable these operations to be carried out.

Having thus fully explained my invention
20 and how it is to be carried out, what I claim is—

1. As a new article of manufacture, a composite wire comprising a thin and attenuated metallic tubular shell filled throughout its interior with a non-metallic substance in a
25 finely-divided state.

2. The method of making composite wire, consisting in filling a hollow cylinder of ductile metal throughout its interior with a non-metallic substance in a finely-divided state,
30 and then drawing said metallic cylinder into an attenuated wire to form a thin tubular outer metallic shell inclosing a finely-divided substance.

Signed at New York, in the county of New
York and State of New York, this 8th day of
December, A. D. 1900. 35

ASHBEL T. WALL.

Witnesses:

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