

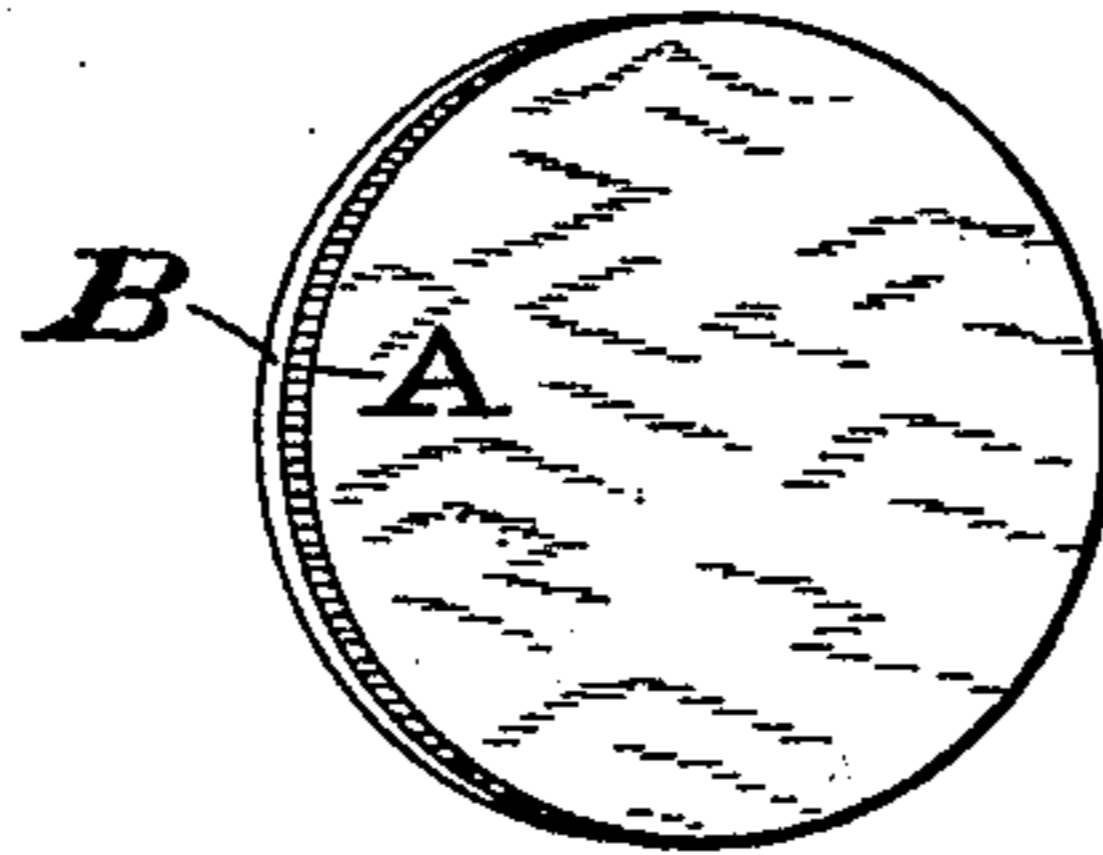
(No Model.)

J. G. WARD.

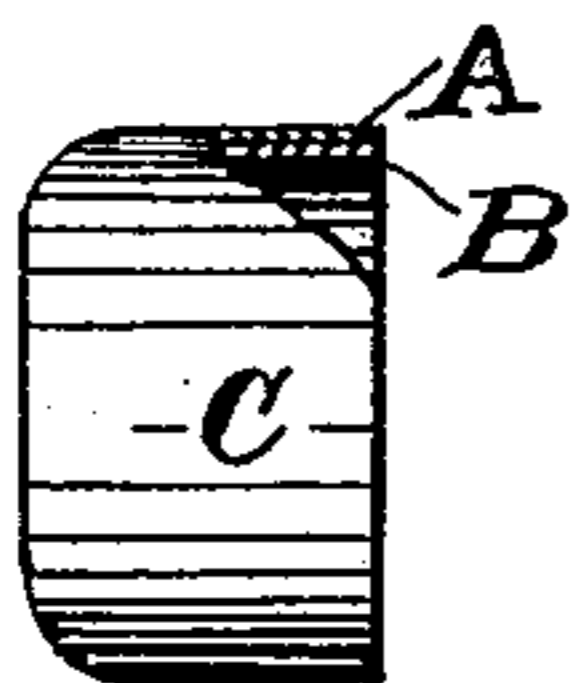
MANUFACTURE OF TUBULAR COVERINGS FOR CHAIN LINKS.

No. 389,992.

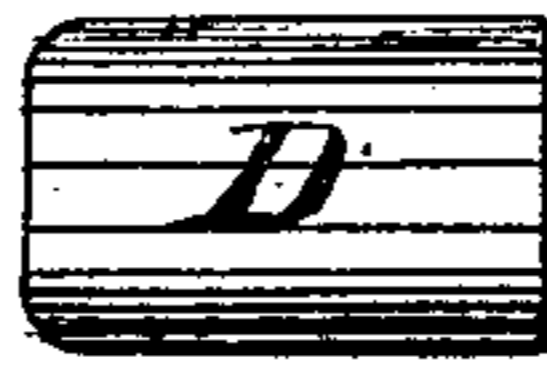
Patented Sept. 25, 1888.



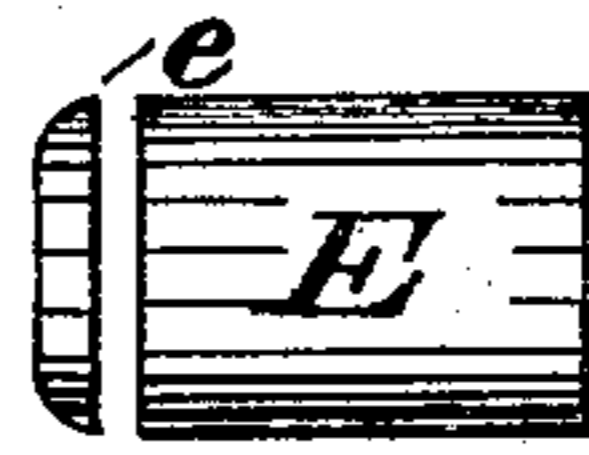
*Fig. 1*



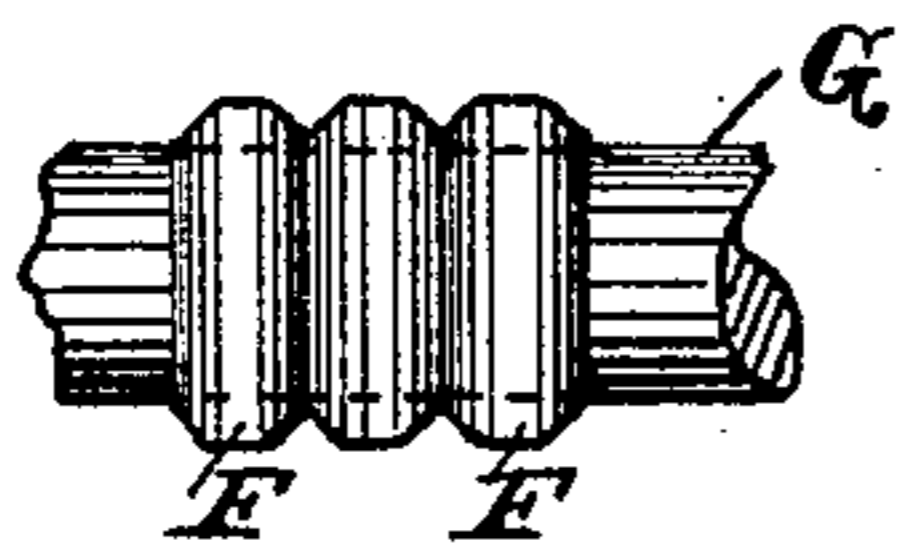
*Fig. 2*



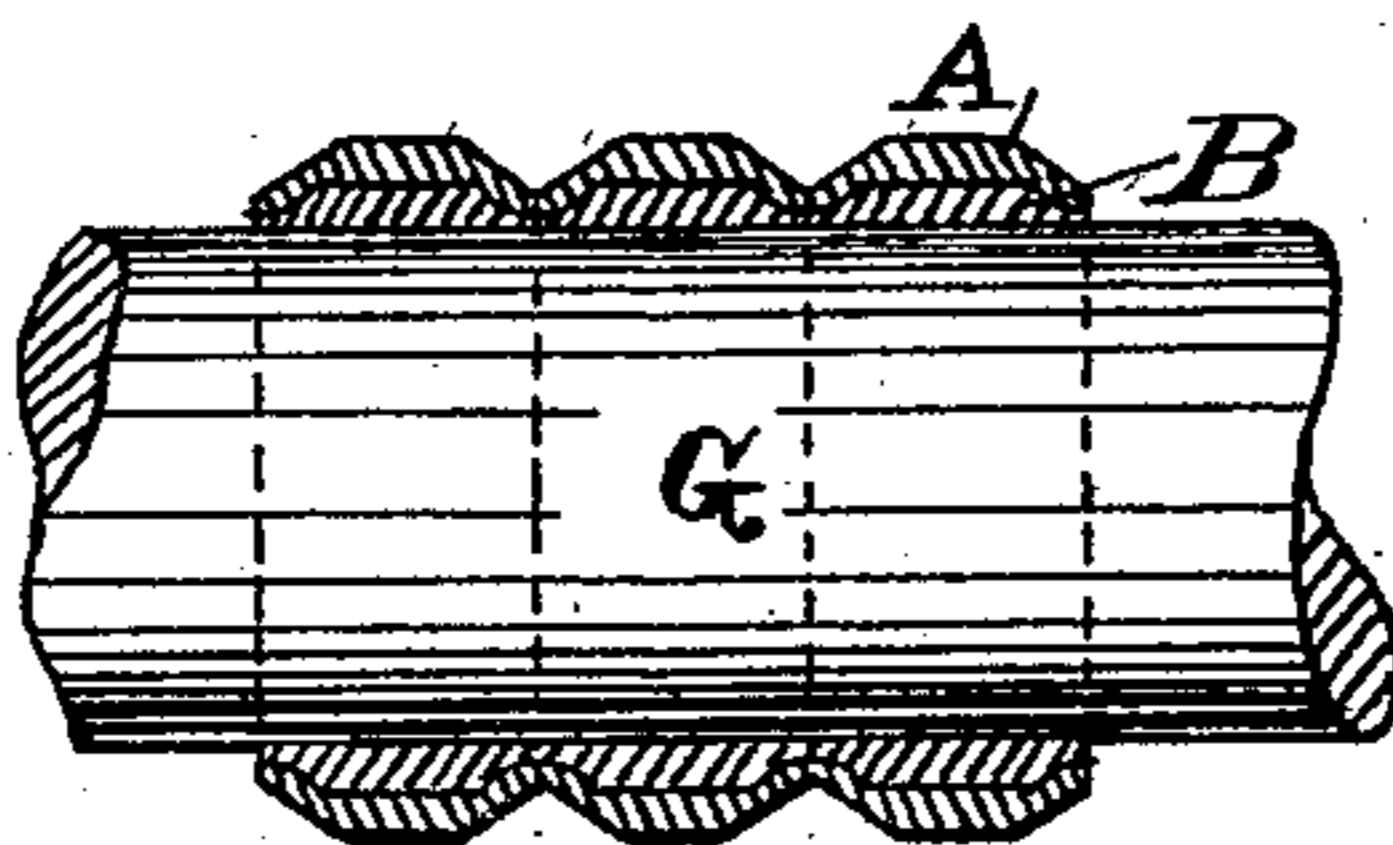
*Fig. 3*



*Fig. 4*



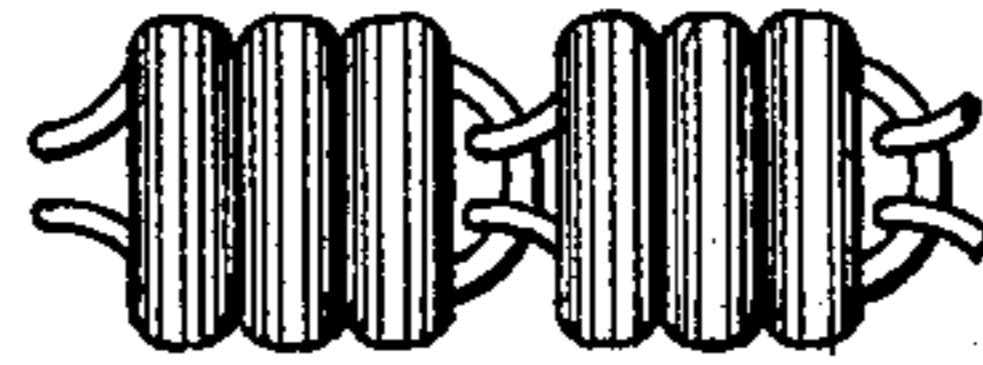
*Fig. 5*



*Fig. 6*



*Fig. 7*



*Fig. 8*



*Fig. 9*

WITNESSES:

INVENTOR:

*Fred. C. Fraentzel*  
*Frank F. Campbell*

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BY *Drake & Co.* ATTYS.

# UNITED STATES PATENT OFFICE.

JOSEPH G. WARD, OF NEWARK, NEW JERSEY.

## MANUFACTURE OF TUBULAR COVERINGS FOR CHAIN-LINKS.

SPECIFICATION forming part of Letters Patent No. 389,992, dated September 25, 1888.

Application filed June 12, 1886. Serial No. 204,932. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH G. WARD, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in the Manufacture of Coverings for Chain-Links; 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 drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel process of manufacturing corrugated links or tubes for use in that class of watch or other chains commonly known as "French chains."

The primary object of this invention is to produce said corrugated links or tubes at a reduced cost; to impart to them greater strength and beauty of finish; and, furthermore, to save time and labor in the process of manufacture as compared with the slower process of forming wire rings and then soldering them together, as heretofore.

The invention consists in the process of manufacturing corrugated links or tubes, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a perspective view of a blank cut from a sheet of bimetal which has been previously formed by soldering or sweating a sheet of gold or other precious metal to a softer base metal, as copper or brass, said sheet being subsequently reduced to a proper or desired thickness. Figs. 2 and 3 represent the different steps of drawing out said blank into tubes of desired sizes; and Fig. 4, a tube or hollow cylinder, the closed end being cut away. Fig. 5 is an elevation, and Fig. 6 an enlarged section, which illustrate the method of forming grooves or depressions in the above-mentioned tube. Fig. 7 represents a section of the corrugated link or tube as it appears when finished; and Fig. 8, a view of part of a chain with said links or tubes secured thereto. Fig. 9 represents another form or pattern of a link or tube having the essential features of the above.

All the accompanying drawings are exaggerated in size, so as to illustrate more clearly my process of producing the corrugated links or tubes.

The links when finished are soldered very closely together on the chains, so that the small links of the chain are hardly perceptible to the casual view.

In the drawings, A, Fig. 1, designates the face of gold or other precious metal in a blank cut from a sheet of bimetal, having previously been formed by soldering or sweating a sheet of gold or other precious metal to a softer base metal—as copper or brass—and reducing the same to a desired thickness.

B designates the base metal or a softer metal, such as copper or brass. Said blank is drawn out into a tube, as indicated by C in Fig. 2, part of the tube being broken away and showing the sheet of precious metal A and the base metal B in section. The next step in the operation is to reduce or draw out the tube to the size desired, as indicated by D in Fig. 3, after which the closed end is cut off or filed away, as represented at e in Fig. 4, thus completing a hollow cylinder or tube, E. Said tube is then placed on a mandrel, G, Figs. 5 and 6, and grooves or depressions are then formed or swaged into the metal by means of suitable dies or other tools.

By the above process of forming or swaging the grooves or depressions the outer shell, A, is forced partially or nearly through the inner shell or base metal, B, as shown in Fig. 6, due to the softness of the latter, and is made thinner and weakened at such depressions. The tube is now prepared for the last or finishing operation by removing it from the mandrel and eating or biting out the base metal B by means of acid solution, thus leaving only the outer shell of gold or other precious metal.

After having removed the base metal from the tube in the manner described above, the latter is then placed in a closely-fitting aperture in a steel plate and subjected to a carefully-adjusted pressure of one or two plungers which are brought to bear upon one or both ends of the tube while in said aperture, the effect of such pressure being to turn over or inward the beveled ends of the link or tube and to bring the raised parts F, Fig. 5, formed thereon by the process of swaging, closely to-

gether in the manner and form indicated by H in Fig. 7, which gives to the tube the appearance of several wire rings arranged and soldered side by side, as by the old method.

5 The links or tubes are secured on a chain at intervals, as shown in Fig. 8, by soldering them on the chain, in the usual manner, so closely to each other that the small links of the chain are hardly perceptible.

10 The object of using a base metal in connection with the precious metal during the process of making the corrugated links or tubes is to enable me to use a thinner shell of gold or other precious metal than I otherwise could, 15 and to secure the requisite rigidity and avoid any risk of the link or tube breaking or collapsing during the process of forming the grooves or depressions upon said tube.

It is evident that other forms of links or 20 tubes, such as shown in Fig. 9, may be constructed in a similar manner, but having the essential features heretofore described, and may be used for various purposes—such, for example, as a pencil-case, &c.

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

1. The process herein described, which consists in first uniting two plates of differing 30 metals and drawing the same into a tubular form, then impressing the said tube, by means

of suitable dies or tools, with the desired form or design, and finally dissolving and removing the inner of said metals, substantially as and for the purpose set forth.

35 2. The process herein described of forming corrugated tubular coverings—to wit, forming a tube from a blank composed of two layers of differing metals, of which the inner layer is the softer, then impressing or corru- 40 gating the said tube by means of suitable tools, then dissolving or removing the said inner layer, and finally compressing the tube endwise, under carefully-adjusted pressure, into the required shape or form, as and for the 45 purpose set forth.

3. The process herein described of forming tubular coverings for chains, which consists in forming a tube from a suitable blank, then im- 50 pressing the same over soft metal, by means of suitable tools or dies, with a desired design or ornamentation, and removing said soft metal, leaving the impressed tube ready for the chain, as and for the purpose set forth.

In testimony that I claim the foregoing I 55 have hereunto set my hand this 3d day of June, 1886.

JOSEPH G. WARD.

Witnesses:

OLIVER DRAKE,  
CHARLES H. PELL.