No. 817,057. PATENTED APR. 3, 1906.

E. T. GREENFIELD.

FLEXIBLE METALLIC TUBE.

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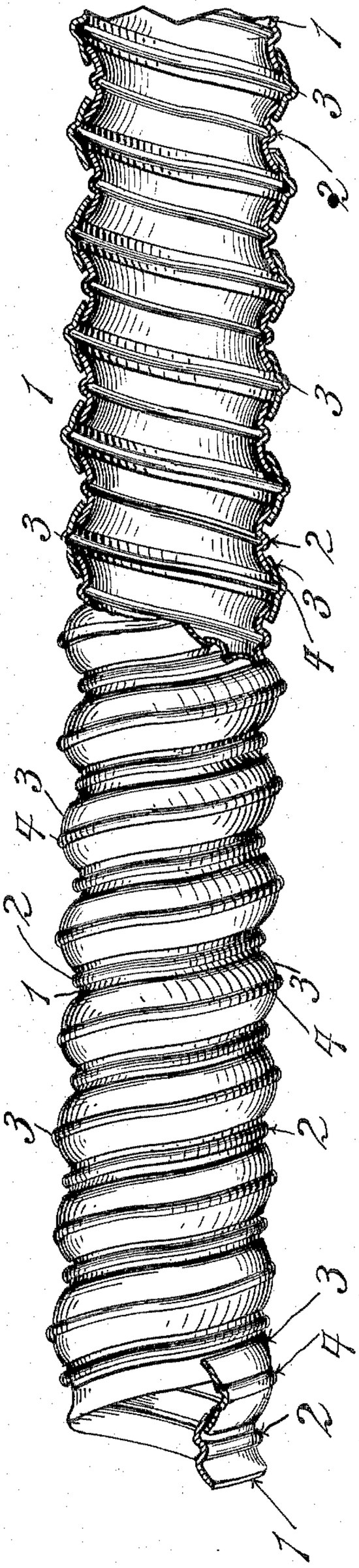

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UNITED STATES PATENT OFFICE.

EDWIN T. GREENFIELD, OF MONTICELLO, NEW YORK.

FLEXIBLE METALLIC TUBE.

No. 817,057. Specification of Letters Patent. Patented April 3, 1906.

Application filed October 24, 1904. Serial No. 229,723.

To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, residing at Monticello, county of Sullivan, and State of New York, have made a new and useful Invention in Flexible Metallic Tubes, of which the following is a specification.

My invention is directed particularly to improvements in flexible tubes like those disclosed in prior patents heretofore granted to me, and the same will be fully understood by referring to the accompanying drawing, which is a part side elevational, part sectional, view of a flexible metallic tube embodying my improvement. The tubes referred to, which are known widely in the art of flexible armored conduits, are made by the use of the mechanism and by the practice of the method disclosed in United States Patents Nos. 630,502 and 630,503, granted to me on the 8th day of August, 1899. In the manufacture of such tubes so long as the same are of reasonably small diameters, not exceeding, say, one inch in internal diameter, it is possible to construct the same with flexible convex and concave strips of comparatively thin metal, the practice of the method referred to and the use of the machine constructing a tube which is reasonably flexible and with sufficient interlocking friction to prevent the same from being drawn apart by ordinary stress or by bending. I have discovered, however, that when tubes of much larger internal diameter are required—such, for instance, as armored hose-tubes—it becomes necessary to use metal strips of comparatively much greater thickness to give to the completed tube the desired set, so that the spirals thereof will not unwind, this because of the fact that by reason of the increased diameter of the tubes there is less rigidity of the strips when formed in their interlocking relation, as will be readily appreciated by those skilled in the art of working metals. It therefore became necessary to use metal strips of greater thickness for the purpose of effecting the desired set and stability of the parts; but the use of such strips of such increased thickness necessitated also the use of dies like those disclosed in the before-mentioned patents of heavier parts and also required the utilization of greater power in forcing the material therethrough.

The present invention has for its object, therefore, the construction of an improved flexible metal tube of relatively large internal diameter and of thinner metal strips than was possible when constructed upon the mechanism and by the practice of the method before utilized, as described in the before-mentioned patents.

To this end I form a central convex corrugation upon each strip of metal, said corrugations being exteriorly and interiorly disposed upon the strips in interlocking relation in the direction of their lengths, as disclosed in the accompanying drawing, in which the numerals 1 and 3 represent the interlocking concave and convex strips, the strips 1 being provided with a centrally-disposed convex corrugation 2 and the strips 3 with a correspondingly-disposed convex corrugation 4, said strips being formed in interlocking relation in the manner disclosed in the before-mentioned patents, the feed-rolls, however, being obviously so constructed as to produce upon the strips the corrugations 2 and 4, or, if preferred, these corrugations might be effected before the strips are passed through the feed-rolls. By the disposition of such corrugations in the manner described and shown an increased strength is given to the tube and increased rigidity, and this with a minimum amount of material.

I do not limit my improvement to its use with flexible tubes like that disclosed in the drawing, as obviously the same may be used in armoring cables in the manner disclosed in a prior patent, No. 616,612, granted to me on the 27th day of December, 1898, or it may be used in connection with armored hose in the same manner as disclosed in United States Patent No. 746,630, granted to me on the 8th day of December, 1903, the especial point of novelty in the invention consisting in giving material strength to the interlocking strips by corrugating the same centrally in the manner described and shown and this with a minimum amount of metal; nor do I limit my invention to a flexible tube made of two interlocking convex and concave strips each provided with a corrugation in the direction of its length, as shown in the accompanying drawing, as obviously a flexible tube might be made of a single strip of metal having a longitudinal corrugation and constructed in the manner disclosed in my previous patent, No. 630,503, above referred to, the strip being corrugated as it is given the tubular form or previously, if preferred. It is also obvious that more than one corrugation might be made in each strip instead of a single corru-

gation, such matters being a question of degree only.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A flexible tube constructed of spirally-wound interlocking strips of metal, one of which is convex and the other concave in the direction of its length, and each having a central convex strengthening-corrugation extending also in the direction of its length, said strengthening-corrugations being disposed in interlocking relation.

2. A flexible tube constructed of interlocking metal strips one of which is convex and the other concave and each of which is provided with a convex centrally-located corrugation extending in the direction of its length, said strips having a fixed set which prevents them from unwinding and the centrally-located corrugations being disposed in interlocking relation.

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

EDWIN T. GREENFIELD.

Witnesses:
C. J. KINTNER,
M. F. KEATING.