

No. 751,777.

PATENTED FEB. 9, 1904.

A. T. BLACKLER.  
FLEXIBLE CONDUIT.

APPLICATION FILED MAR. 14, 1903.

NO MODEL.

FIG. 1.

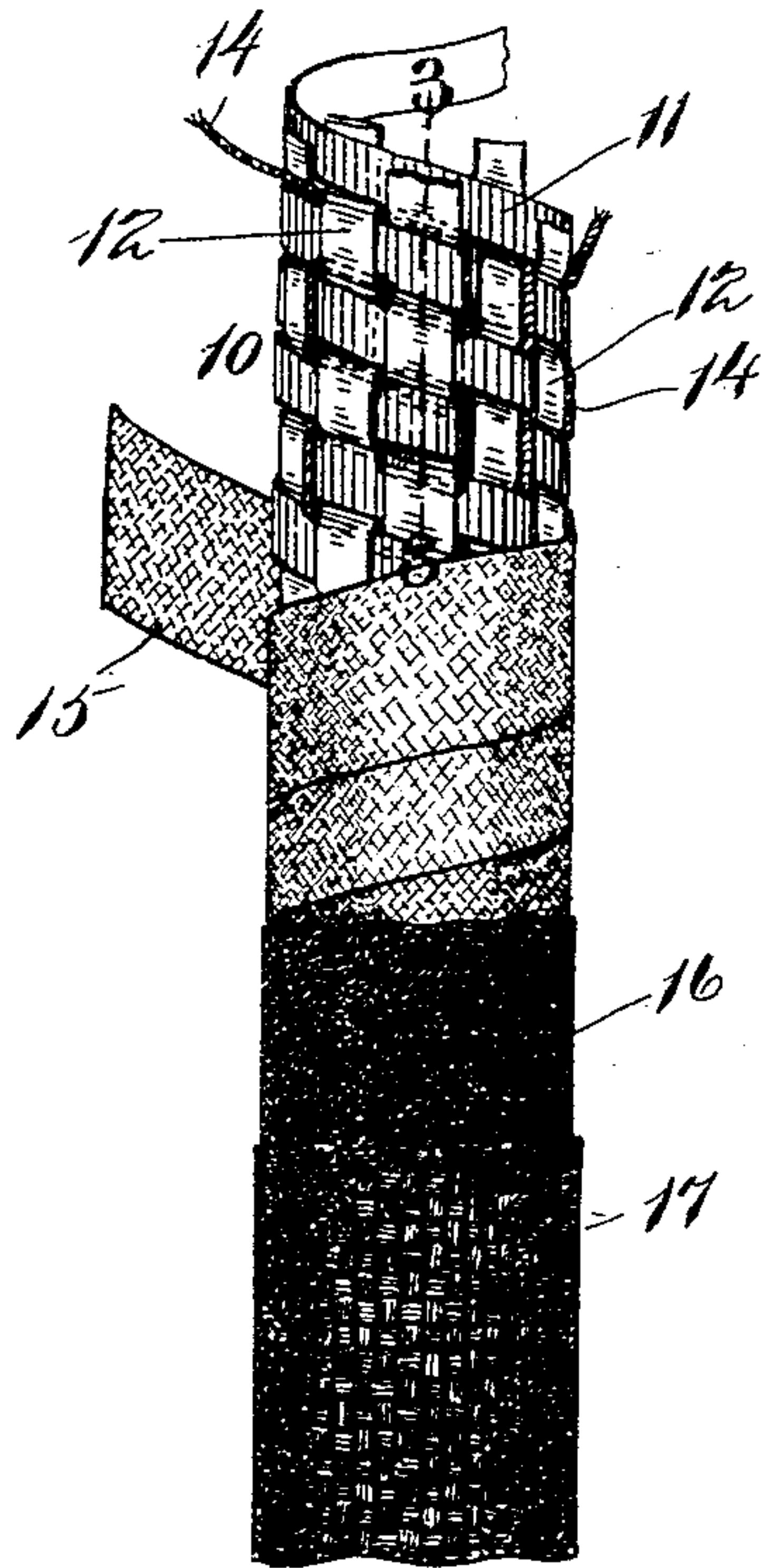


FIG. 2.

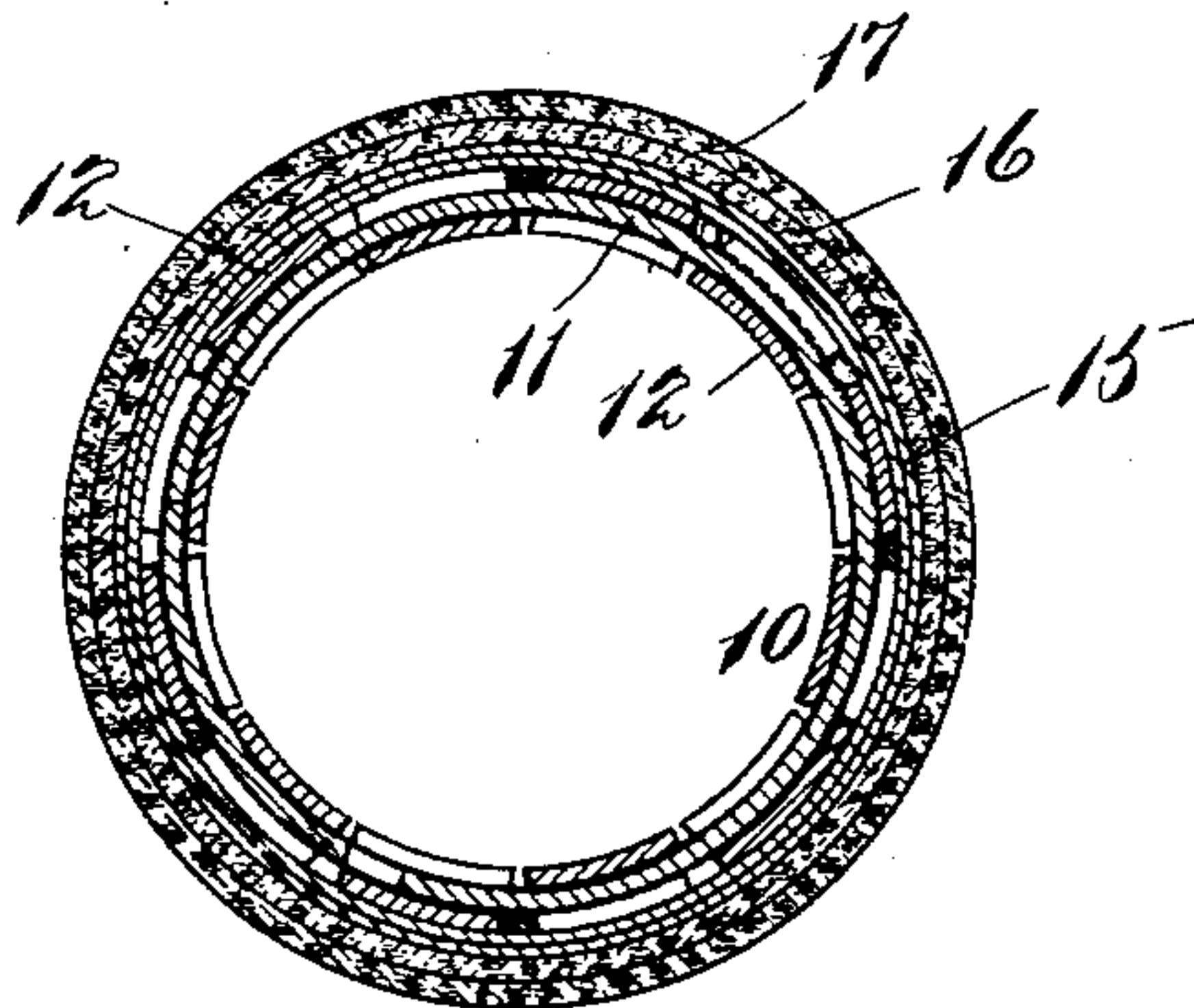
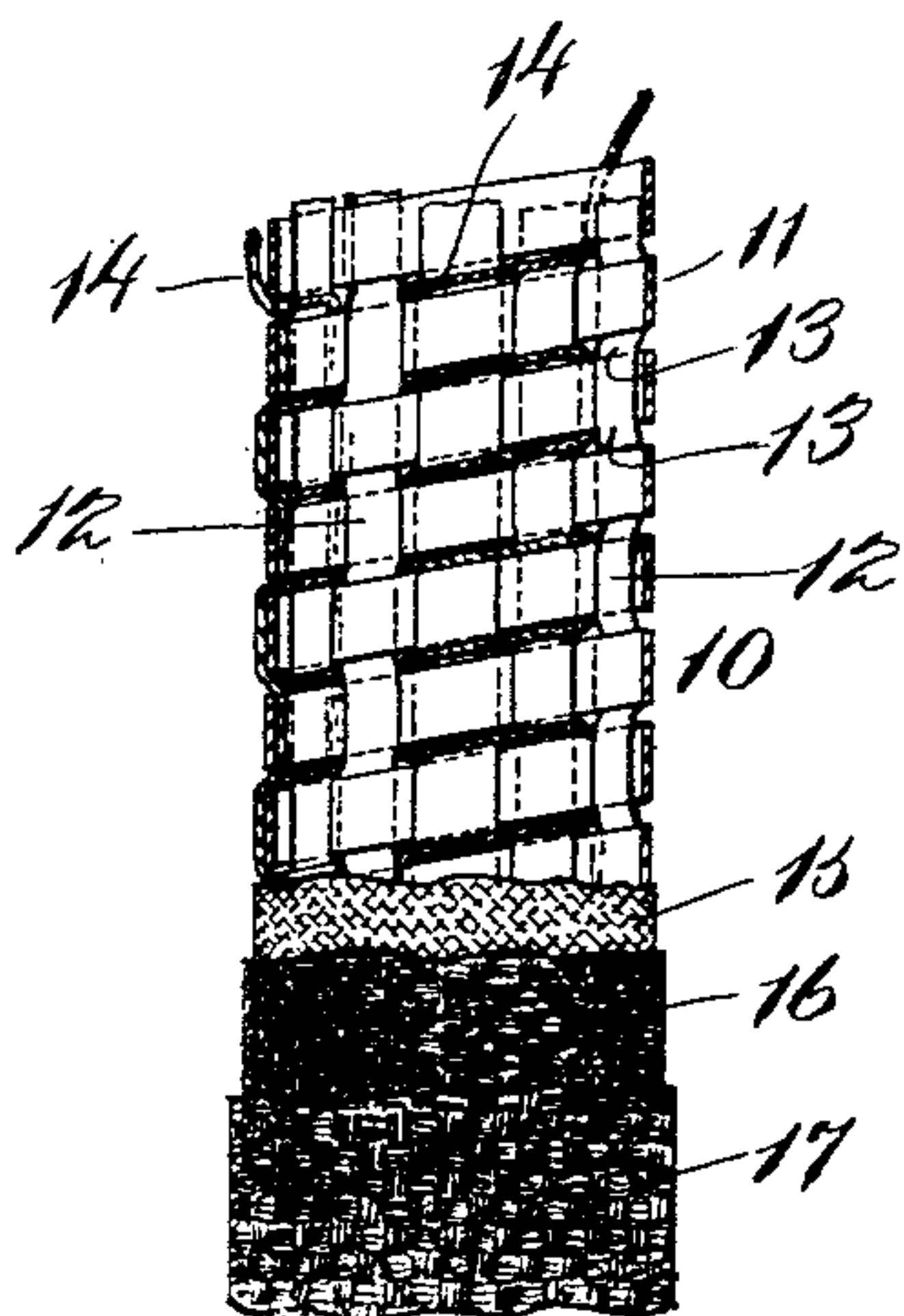


FIG. 3.



WITNESSES:

*A. V. Bullock.*  
*A. C. Ratigan*

INVENTOR:

*A. T. Blackler*  
*By Wright, Brown & Quincy*  
*Attys.*



# UNITED STATES PATENT OFFICE.

ARCHIBALD T. BLACKLER, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO  
JAMES S. WILSON, OF CHELSEA, MASSACHUSETTS.

## FLEXIBLE CONDUIT.

SPECIFICATION forming part of Letters Patent No. 751,777, dated February 9, 1904.

Application filed March 14, 1903. Serial No. 147,719. (No model.)

*To all whom it may concern:*

Be it known that I, ARCHIBALD T. BLACKLER, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Flexible Conduits, of which the following is a specification.

This invention relates to the construction of flexible conduits or tubes, and particularly flexible conduits designed to contain and insulate an electric wire or wires. Among the requisites of a good conduit of this character are that it shall be of sufficient flexibility to bend freely and resume its original shape when straightened again, that it shall not freely unravel or pull out at the end when a length is cut off, and that it shall pass a wire freely without causing the end of the wire to catch on the interior of the conduit. The conduit should also be capable of being made by machine processes, so as to render its manufacture inexpensive.

The conduit forming the subject of my present invention, which I shall now proceed to describe, combines the above characteristics by virtue of its novel construction.

Of the accompanying drawings, Figure 1 represents an elevation of a flexible conduit constructed in accordance with my invention with the successive layers or wrappings partly unwound or turned back at different points. Fig. 2 represents a transverse section of the conduit. Fig. 3 represents a longitudinal section on the line 3 3 of Fig. 1.

The same reference characters indicate the same parts in all the figures.

The conduit, as shown, consists of a series of tubular layers, of which the inner tube 10 is constructed by interweaving a helical flat strip 11 of a smooth, compact, flexible insulating material, such as thin fiber-board, with a series of longitudinal flat strips 12 12 of the same or a similar material or materials. I do not, however, confine myself to the particular material mentioned. This weaving may be done in any suitable manner, as by hand or by means of a circular loom for weaving tubes. The peculiarity of a conduit of the above-described construction is that it will pass a wire freely without allowing the end of the wire to

catch on the interior of the tube. The longitudinal strips 12 being parallel, or substantially so, to the length of the tube and of a smooth compact material form tracks on which the wire slides easily.

In the process of weaving the tube those portions of the circumferential elements or convolutions of the helical strip 11 which lie exposed on the inside of the tube between the exposed squares or patches of the longitudinal strips lie in nearly the planes of the said squares or patches or in more outward planes. Thus the abrupt bends 13 13 of the longitudinal or warp strips give an easy transition to and from the intervening exposed portions of the helical weft-strip 11, so that the passing wire is not allowed to engage the edges of the said strip 11. As the strips 11 12 are flat, smooth, and of a compact material, the end of the wire does not catch in them. This catching is not readily avoided in the case of a tubular conduit whose interior has a warp or weft composed of threads. A further advantage of the construction described is that if the tube is bent or kinked it will upon being straightened out resume its original cross-sectional shape, this being due to the fact that both warp and weft are composed of flat strips of a certain stiffness which mutually support each other.

I have shown longitudinal threads 14 overlying the helical weft-strip 11 on its outer side and located between it and the longitudinal warp-strips 12 12, each thread passing in zig-zag fashion back and forth, so as to include a pair of adjacent warp-strips. These threads serve to interlock the warp and weft strips and prevent the helical weft-strip from unraveling or pulling out from the warp-strips at the end of the conduit.

In the drawings the tube is shown somewhat more open-meshed than it need be in practice for the purpose of fully displaying the locking-threads 14.

15 is a helical winding or wrapping of waterproof fabric which covers the interstices of the tube 11 and protects the interior of said tube from the entrance of water or moisture.

16 17 are outer tubular layers of woven fab-



ric to further protect the inner tube. After the outer layers are applied the outside of the conduit is preferably treated with a waterproofing composition—such as pitch, coal-tar, or other suitable preparation—and is then dusted with mica. The wrapping 15 is of an adhesive material, such as rubber tape or friction-cloth, wound on the tube 10 in a direction opposite to that of the helical strip 11. One of its functions is to adhere to the warp-strips 12, bridging the outwardly-exposed squares or patches of the helical weft 11, and thereby preventing the latter from raveling at a cut end of the conduit.

I claim—

1. An insulating-conduit for electric wires consisting of circumferential elements, and longitudinal, substantially flat warp-strips interwoven therewith and composed of smooth, flexible, compact, insulating material.

2. An insulating-conduit for electric wires consisting of substantially flat circumferential elements composed of smooth, flexible, compact, insulating material, and longitudinal warp-strips of a similar character interwoven therewith.

3. An insulating-conduit for electric wires consisting of a substantially flat helical weft-

strip composed of smooth, flexible, compact, insulating material, and longitudinal warp-strips of a similar character interwoven with the weft-strip and abruptly bent in crossing the edges of said strip.

4. An insulating-conduit for electric wires consisting of circumferential elements composed of smooth, flexible, compact, insulating material, longitudinal strips of a similar character interwoven with said elements, and an inclosing adhesive wrapping adhering to said longitudinal strips.

5. An insulating-conduit for electric wires consisting of a helix composed of smooth, flexible, compact, insulating material, longitudinal strips of a similar character interwoven therewith, and one or more longitudinal locking-threads.

6. An insulating-conduit for electric wires having an interior exposed surface consisting of interwoven strips, composed of smooth, flexible, compact insulating material.

In testimony whereof I have affixed my signature in presence of two witnesses.

ARCHIBALD T. BLACKLER.

Witnesses:

R. M. PIERSON,  
JAMES S. WILSON.