

(No Model.)

J. E. EMERSON & T. MIDGLEY.

METALLIC HOSE.

No. 386,307.

Patented July 17, 1888.

Fig. 1.

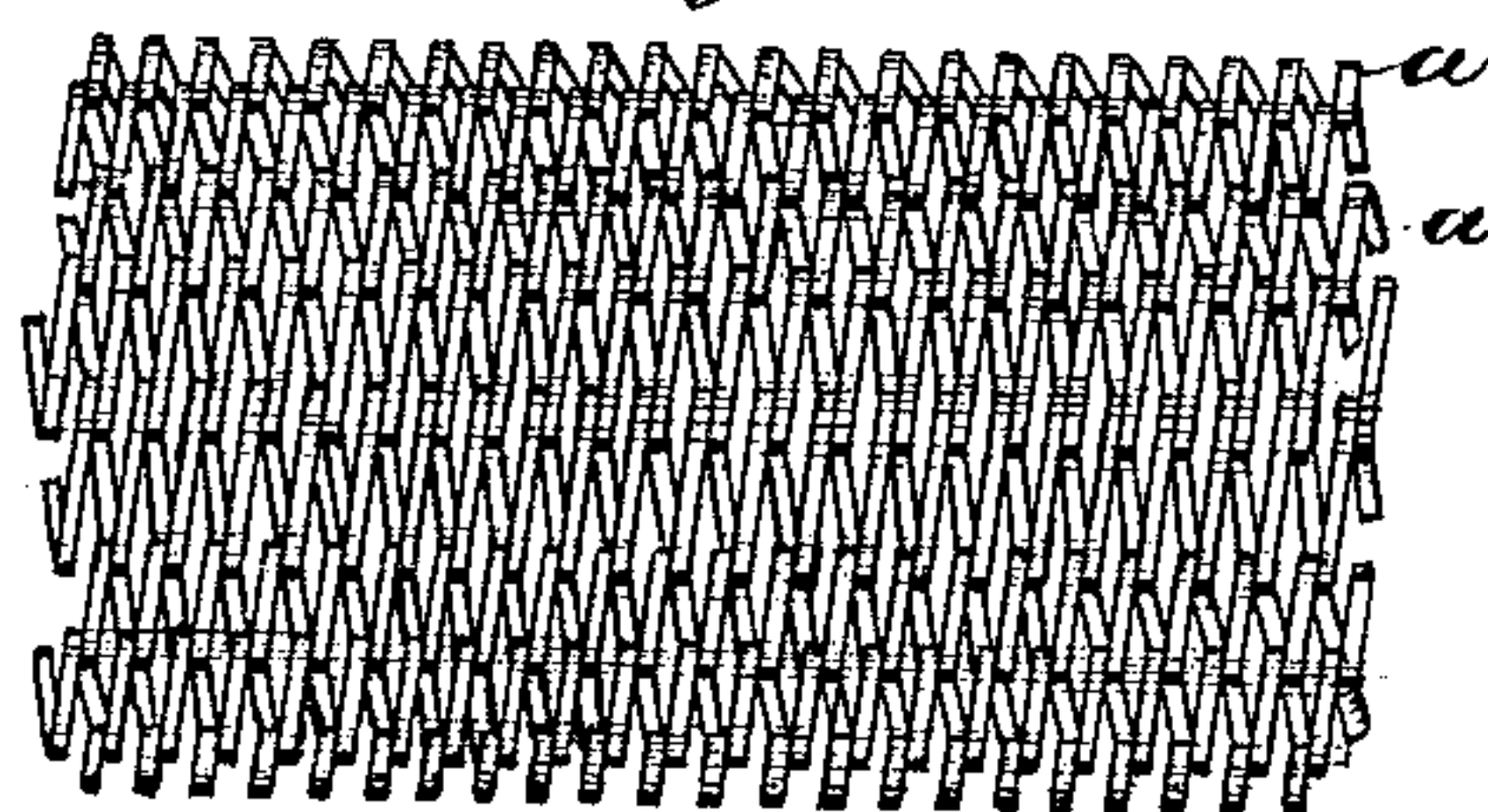


Fig. 2.

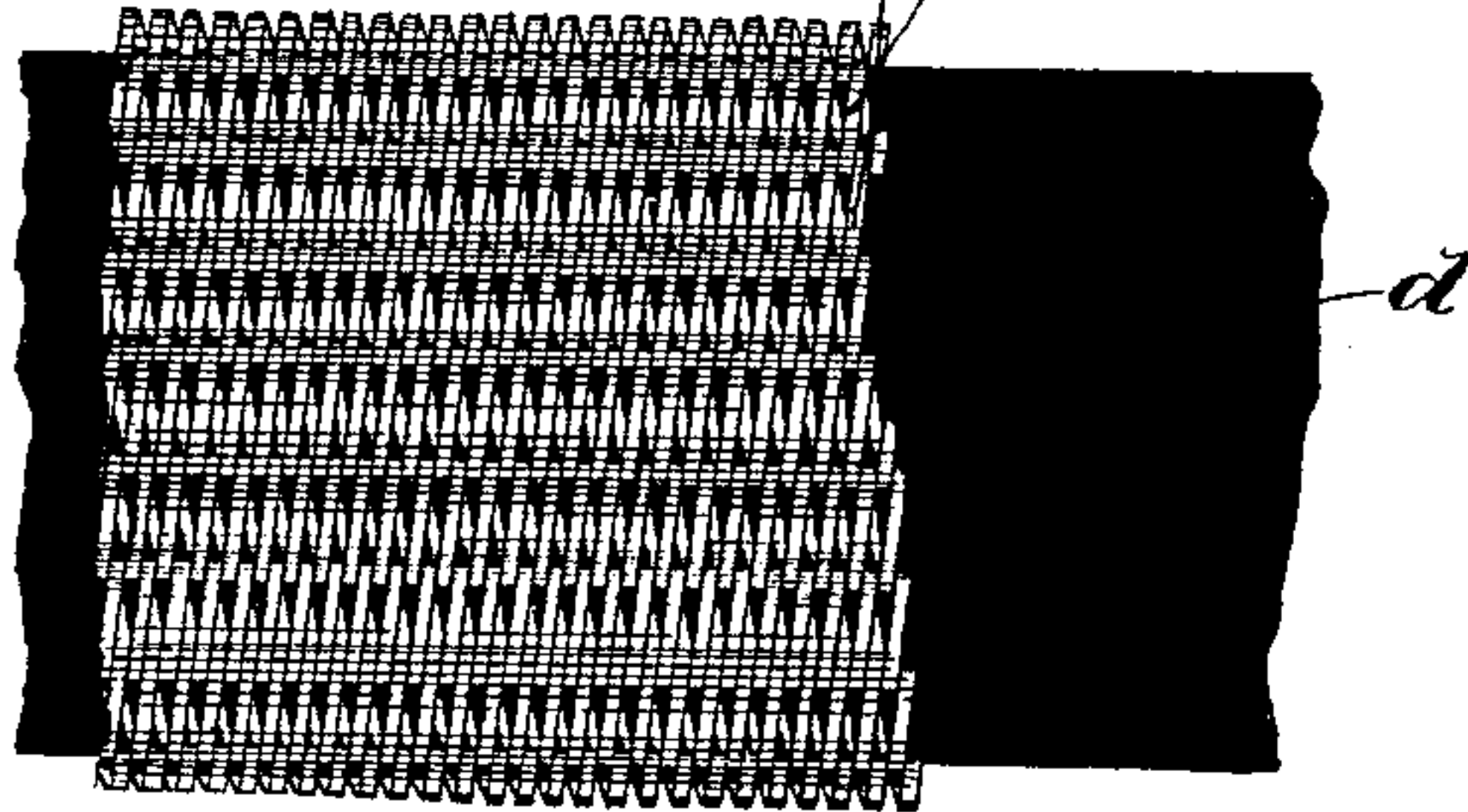
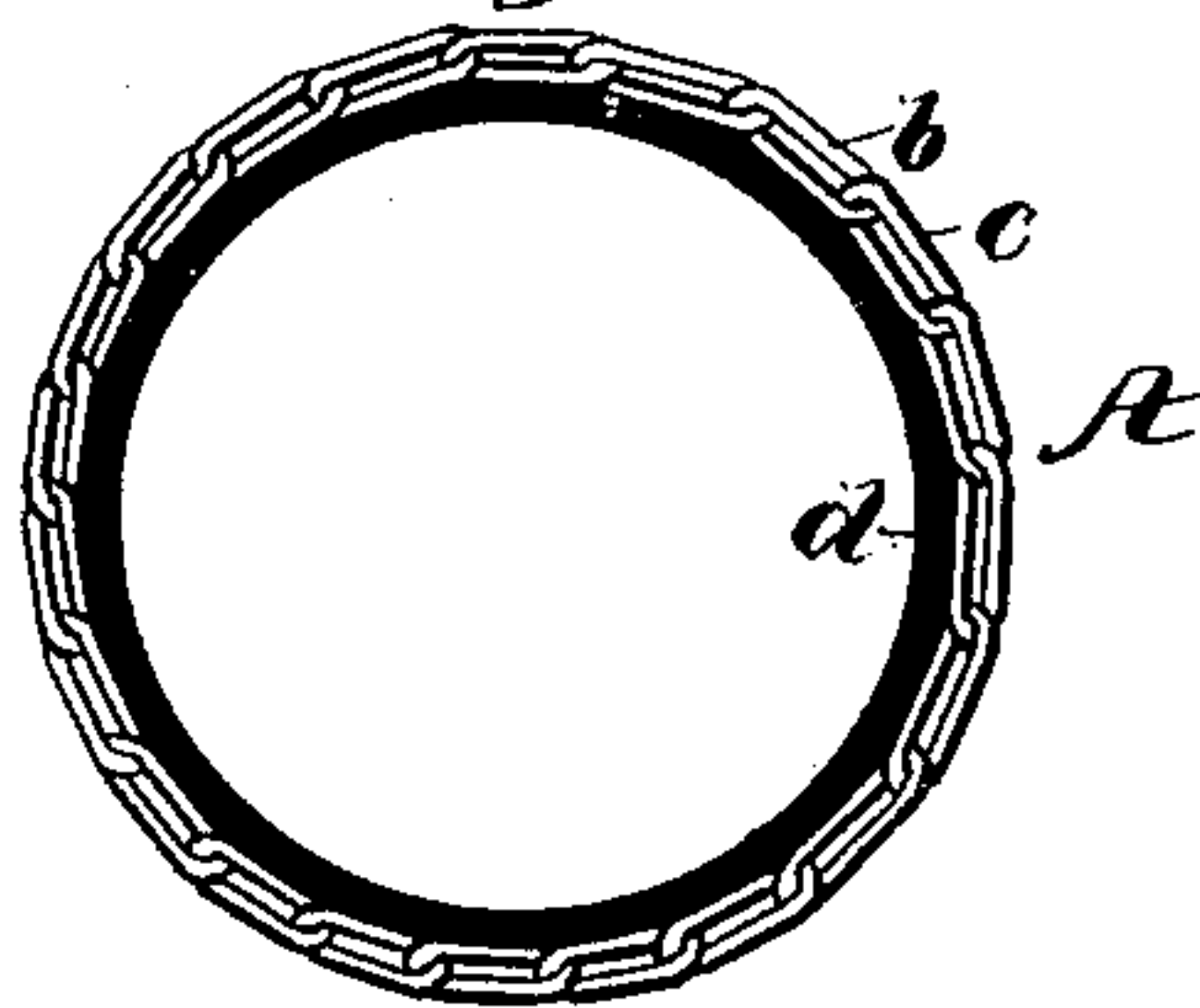


Fig. 3.



Witnesses

Wm. H. Scott.
Wm. E. Dye.

Inventor

James E. Emerson,
Thomas Midgley,
By Johnston, Reinohl & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES E. EMERSON AND THOMAS MIDGLEY, OF BEAVER FALLS,
PENNSYLVANIA.

METALLIC HOSE.

SPECIFICATION forming part of Letters Patent No. 386,307, dated July 17, 1888.

Application filed March 17, 1888. Serial No. 267,539. (No model.)

To all whom it may concern:

Be it known that we, JAMES E. EMERSON and THOMAS MIDGLEY, citizens of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Metallic Hose; and we 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.

Our invention relates to hose or tubing, and has for its object an improvement on the hose shown, described, and claimed in our application filed February 10, 1888, Serial No. 263,902.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a plan view of a tube of coiled sections of wire. Fig. 2 is a side view, partly in section, of the completed hose; and Fig. 3 is a cross-section of the hose.

Reference being had to the drawings and the letters marked thereon, A represents a tube formed of sections *a* of coiled-wire helices interwoven longitudinally, as shown in Fig. 1, which form links *b c*. In forming this tube the sections *a* are coiled of a diameter to adapt them to the size of hose desired to be made, and are cut into lengths of about one-third longer than the section of finished hose.

In making tubes for sections of hose of greater length than fifty feet the sections *a* of wire may be made to overlap or terminate at different points in the length of the tube. The tube is formed on a core by screwing the sections *a* into each other until sufficient sections have been interwoven to form a complete tube, A, of any desired length and diameter. The tube is then placed upon a mandrel and compressed longitudinally to crowd the coils or helices together and form a close body of metallic links, which renders the tube flexible and enables the hose made from it to be wound upon an ordinary hose-reel.

In constructing our hose we use fine wire, about No. 19 to 25, and coil it into small coils or helices, which are interwoven, as

shown, and in compressing the tube made from the wire it is shortened about one-third of its length. After the tube has been compressed longitudinally it is drawn over a mandrel tapered at one end, (as shown in our application hereinbefore referred to,) and expanded about one-third of its diameter. The metallic tube A is then lined with a tube, *d*, of rubber, gutta-percha, or other suitable material, the external diameter of which is about equal to the internal diameter of the tube A, and drawing it through the metal tube. A piece of gas or steam pipe or steam-hose is then passed through the lined tube, which distends it, and steam or hot water admitted thereto until the rubber is heated to about 170° or 172° Fahrenheit, when the rubber becomes sufficiently plastic to embed itself in the interstices of the metallic tube A and adhere thereto; or it may be coated with a plastic material, which will adhere to and incorporate itself with the body A and form a fluid-repellent lining.

We are aware that ordinary rubber hose has been provided with a metallic armor.

Having thus fully described our invention, what we claim is—

1. Metallic hose or tubing consisting of an outer body or tube of interwoven sections of coiled wire, and a lining of rubber or its equivalent material incorporated with the body, substantially as described.

2. Metallic hose or tubing consisting of an outer body or tube of interwoven sections of coiled wire having the helices compressed in the direction of the length of the tube, and a lining of rubber or its equivalent material adhering to the metallic tube, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES E. EMERSON.
THOMAS MIDGLEY.

Witnesses as to J. E. Emerson:

D. C. REINOHLE,
WM. E. DYRE.

Witnesses as to T. Midgley:

J. F. MERRIMAN,
J. M. MAY.