

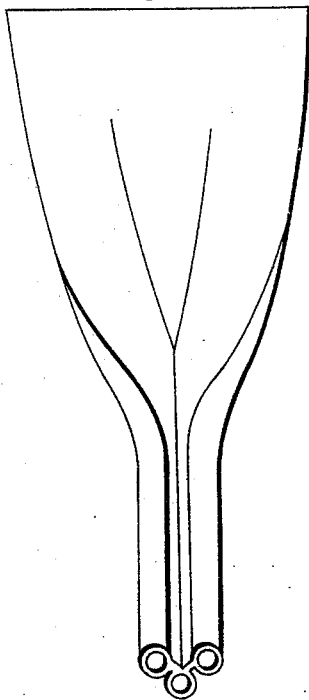
*S. M. Cate.*

*Making Metal Tubing.*

*N<sup>o</sup> 51,017.*

*Patented Nov. 21, 1865.*

*Fig 4.*



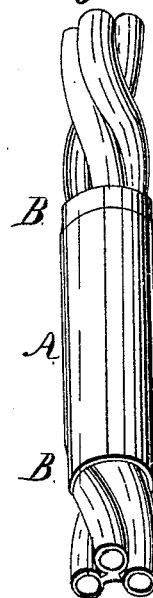
*Fig 1.*



*Fig 2.*



*Fig 3.*



*Witnesses:*

*Geo. E. Tenny*  
*J. M. Cate*

*Inventor,*

*Stephen, M. Cate*

# UNITED STATES PATENT OFFICE.

STEPHEN M. CATE, OF WATERBURY, CONNECTICUT.

## IMPROVEMENT IN FORMING SHEET-METAL TUBING.

Specification forming part of Letters Patent No. 51,017, dated November 21, 1865.

*To all whom it may concern:*

Be it known that I, STEPHEN M. CATE, of Waterbury, in New Haven county and State of Connecticut, have invented a new and useful Improvement in Metal Tubing for Lightning-Rods and for other Purposes; and I do hereby declare that the following is a full and exact description of the same.

In the accompanying drawings, Figure 4 represents the whole operation from the flat sheet metal to the finished tube. Fig. 2 represents a section of the tube. Fig. 1 represents a straight piece of finished tube, and Fig. 3 represents a piece of tube twisted about four turns to the foot, together with the coupling for fastening two pieces of the tube together.

My invention consists in the construction and combination of any number of cylinders or tubes more than one from the same piece of solid sheet metal, by means of dies, for lightning-rods, conductors of electricity, and for other purposes, in such a manner that the seams of the several tubes and the edges of the metal from which the same are formed are concealed from sight, either with or without the use of solder, and so that said combination may be twisted any number of turns to the foot without exposing the seams of the several tubes or the edges of the metal from which the same are formed to view, thus giving

greater strength for the same conducting-surface than in any other form; also, in joining two pieces of the tubing with the ferrule A, as in Fig. 3, by partially closing the ends B, so that they become indented into the tubing, forming a head or shoulder upon the tubing within the ferrule, and thus preventing any abruptness in the size of the same when so fastened. The whole is susceptible of being passed through a hole about the same diameter of the tubing without catching upon the ends B of the ferrule A.

I claim—

1. The construction and combination of any number of cylinders or tubes more than one formed from the same piece of solid sheet metal by means of dies, substantially in the manner and for the purposes above specified.

2. I do not claim the method of joining two pieces of tubing with the ferrule A, but I do claim the method of fastening the same in the manner and for the purposes above specified.

STEPHEN <sup>his</sup> + M. CATE.  
mark.

Witnesses:

AUGUSTUS H. FENN,  
GEO. E. TERRY.