

(No Model.)

H. C. SPALDING.
ELECTRICAL CONDUCTOR.

No. 327,482.

Patented Sept. 29, 1885.

Fig. 1.

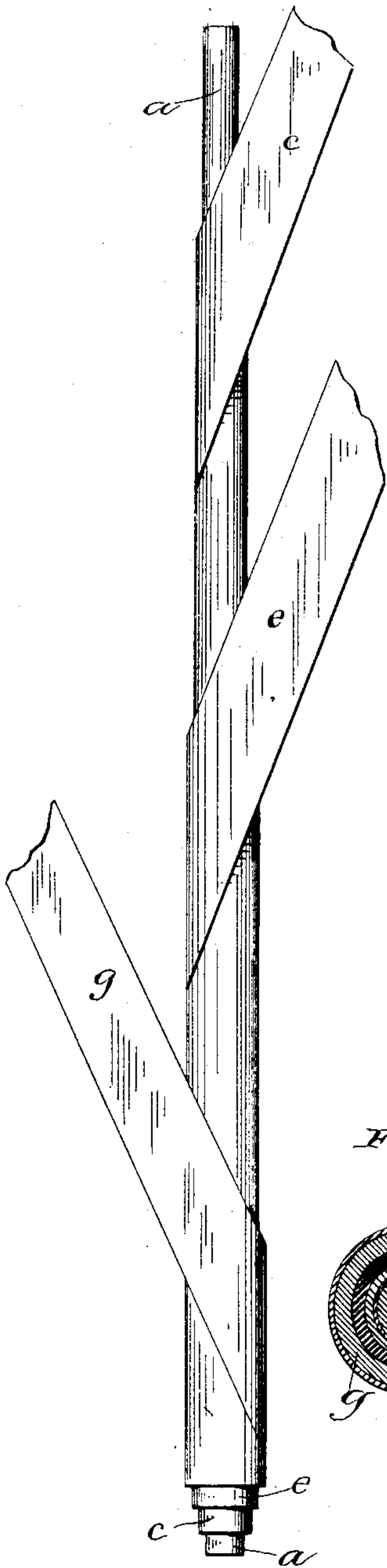


Fig. 6.



Fig. 3.

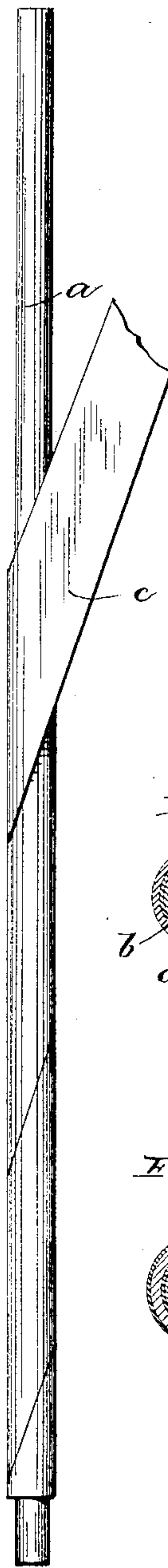


Fig. 2.

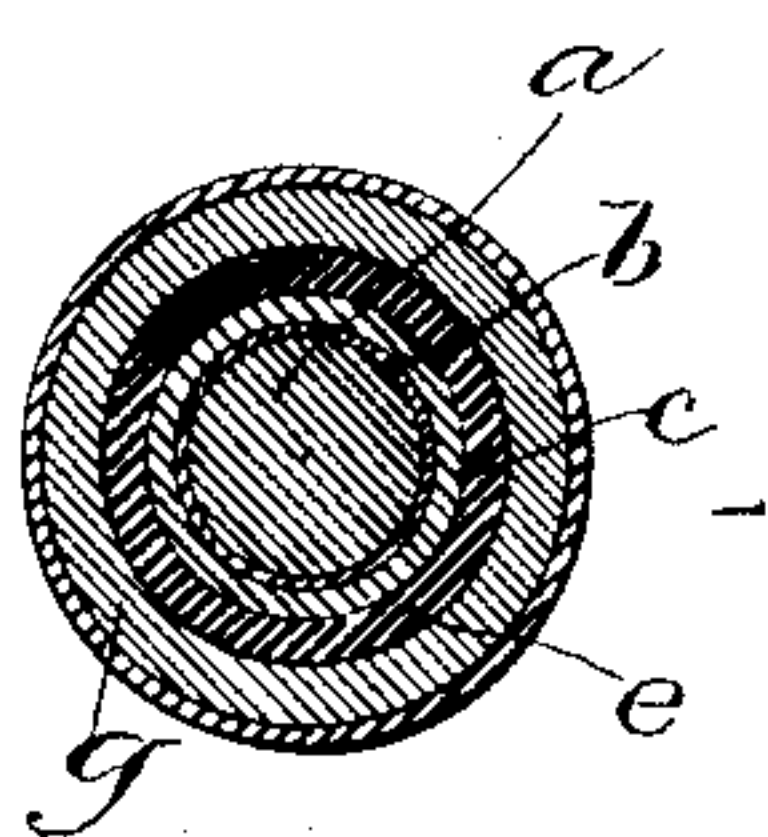


Fig. 4.

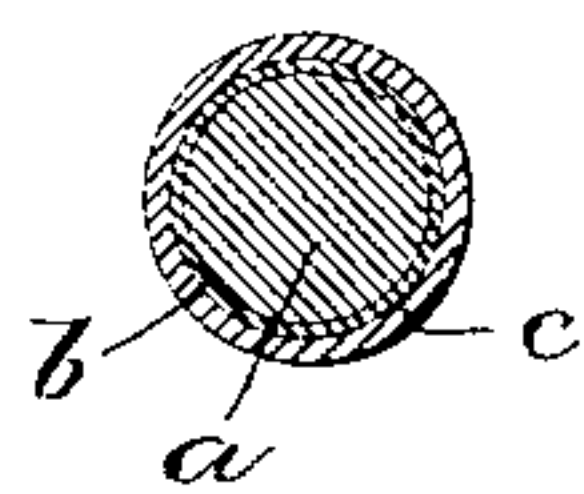
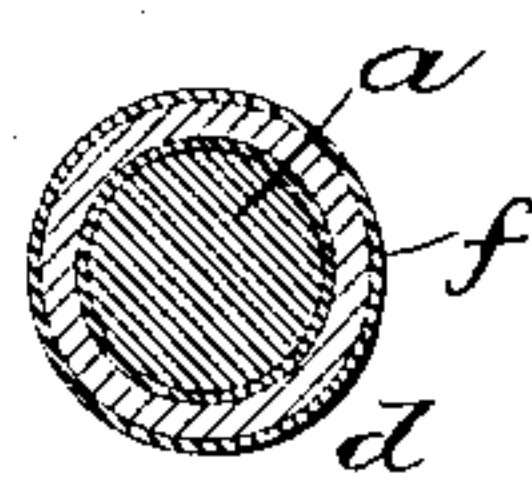


Fig. 5.



Witnesses:

H. N. Low
E. T. Dick

Inventor

H. C. Spalding
by Marshall B. Bailey
Att'y

UNITED STATES PATENT OFFICE.

HENRY C. SPALDING, OF BOSTON, MASSACHUSETTS.

ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 327,482, dated September 29, 1885.

Application filed April 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SPALDING, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electrical Conductors, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

10 In my present invention it is my object to produce simply and economically an electrical conductor provided with an insulated metallic sheath or screen, forming a medium for intercepting induced currents from other lines in the immediate vicinity of the said conductor. To this end I employ, as a cover for the wire or conductor, paper, which, in the form of a strip or ribbon, is wound spirally upon the wire, to which preliminarily has been applied a coating of shellac or other like adhesive substance. The paper is wound upon the wire while the adhesive coating is moist or soft, and in this way is most firmly and permanently united thereto. Upon the exterior of the paper covering is applied a sheathing or coating of metal, which is in turn covered by a coating that insulates and protects it.

30 The nature of my invention and the manner in which the same is or may be carried into effect will be understood by reference to the accompanying drawings, in which a conductor insulated and protected in the manner described is shown in the successive stages of its manufacture.

35 I use an ordinary copper wire of required diameter, designated *a*, Fig. 6. To this I apply a coating of shellac or any substance possessing similar characteristics, and while it is still soft or moist I wind around the wire spirally a strip or ribbon of paper, preferably thin Manila paper, drawing it tightly around the wire, so as to cause it to adhere most strongly and firmly thereto through the intermediacy of the intervening coat of adhesive material. The edges of the spirally-wound strip should overlap and be united together by the same process that causes the strip to adhere to the wire. Neither the adhesive material nor the paper would be effective alone. The paper would not retain its place, and the adhesive

material, even if a good non-conductor, would be liable to break off.

Fig. 3 represents a section of coated wire with a ribbon of paper, *c*, partially wound thereon, the relation of these elements being better exhibited in Fig. 4, which shows in enlarged cross section the wire *a*, the coating *b*, and the paper strip *c*. I may then apply a second coating of adhesive material, *f*, (shown in enlarged cross-section in Fig. 5,) over the paper covering, though this may be omitted, if desired. I next apply a metal coating, sheathing, or screen, *e*, for which I may use powdered metal or metal foil, the latter and the manner of its application being illustrated in Fig. 1, the same being a strip or ribbon of tin-foil wound spirally around the covered wire.

70 Around the metal sheathing is laid a covering of insulating material, *g*, preferably of paper, wound spirally in an opposite direction to the metal strip, and caused to adhere thereto by an intervening adhesive substance. In lieu of the paper, cotton, tape, or the like may be used. When the metallic foil is thus wound with overlapping edges and is compressed by the outer insulating-tape, it becomes a continuous conducting-sheath, insulated from the wire which it surrounds, and serves as a screen for intercepting induced currents when the wire is used with others in close proximity thereto.

85 The relations of the several layers are shown in Fig. 2, which is an enlarged cross-section, *a* being the wire; *b*, the coating of adhesive substance; *c*, the inner fibrous cover; *e*, the metallic sheath, and *g* the exterior winding of paper.

90 In some cases I omit the exterior insulating-strip and simply varnish the metal sheath, so as to protect and insulate the same; but I generally prefer to wind the outer strip, *g*, around it.

95 As above stated, I regard as the equivalent of the metal foil a metallic powder—such as powdered copper—deposited upon the inner covering, and held in place by the outer strip, the object in either case being to obtain by the use of the metal protection against electrical induction rather than abrasion or wear.

100 By combining in the manner described a

spirally-wound covering of paper with a similarly-applied sheathing or screen of metal the diameter of the wire is but slightly increased and a protected conductor obtained at a very low cost, qualities particularly valuable in underground systems, where a large number of wires are confined to a very limited space.

What I claim as my invention is—

- 10 1. The combination of the wire *a*, the coating *b* of adhesive material, the spirally-wound strip *c* of paper, the spirally-wound strip *e* of metal foil, and the insulating cover *g*, all as described.
- 15 2. The wire *a*, coating *b* of adhesive material, and the strips of paper *c g*, in combina-

tion with the metallic sheath or screen intervening between said strips, substantially as and for the purpose set forth.

3. The combination of the electrical conducting-wire, an insulating coating therefor, consisting of adhesive material and spirally-wound paper consecutively applied, an induction-screen of metal surrounding the insulated conductor, and an outer layer of insulating material, all as described.

In testimony whereof I have hereunto set my hand this 5th day of April, A. D. 1882.

H. C. SPALDING.

Witnesses:

EWELL A. DICK,

W. C. CROSS.