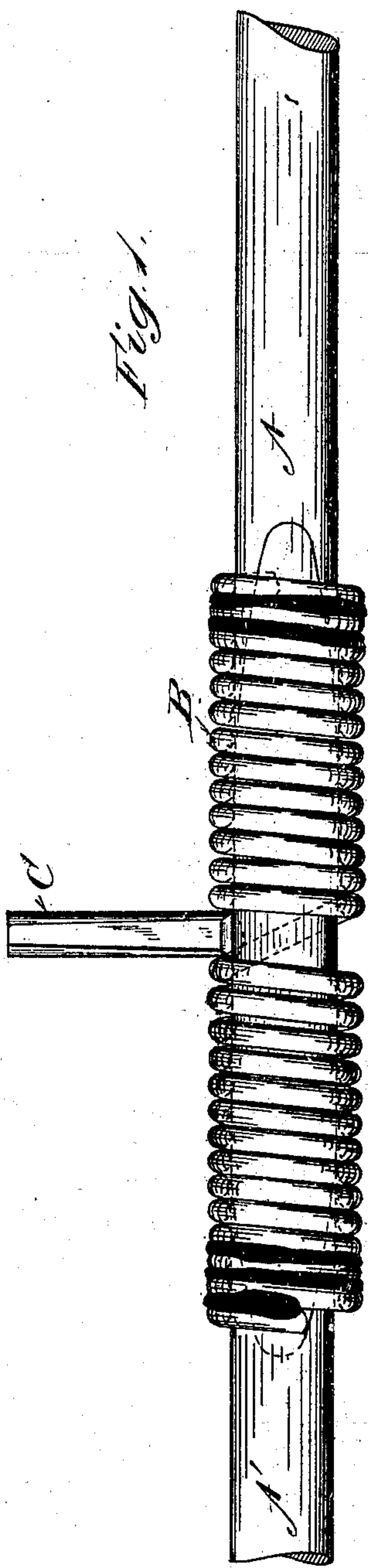


(No Model.)

W. E. BANTA.  
WIRE COUPLING.

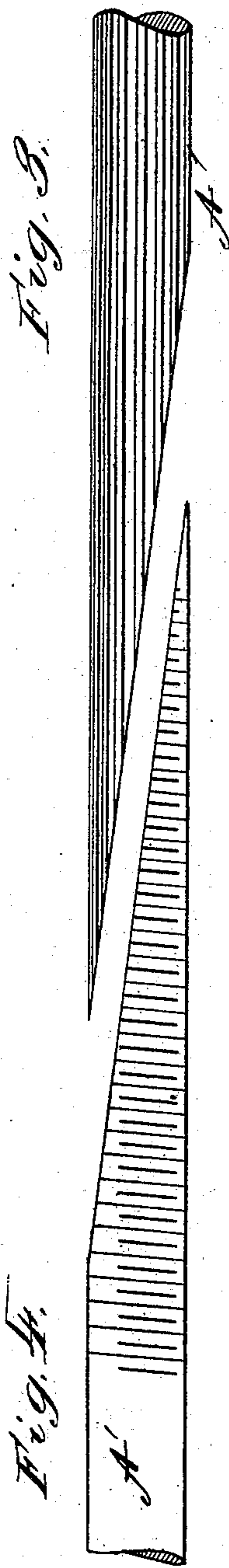
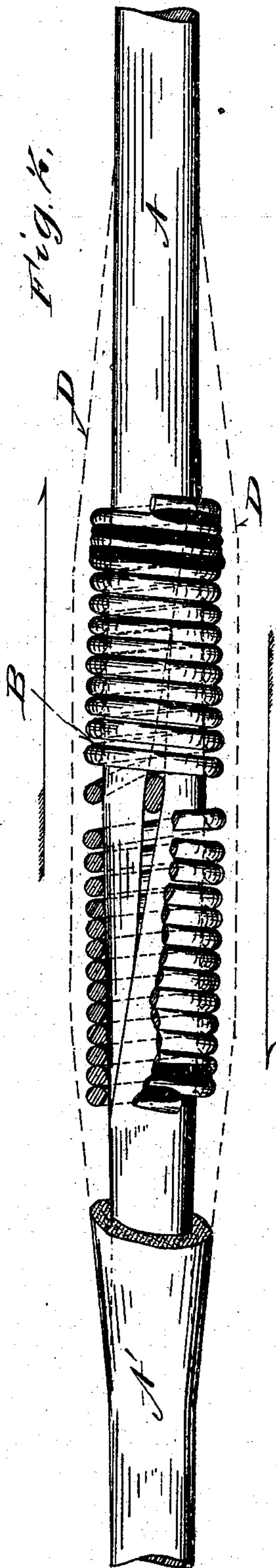
No. 503,712.

Patented Aug. 22, 1893.



WITNESSES:

*A. M. Peirce*  
*Jas. C. Hawley*



*Fig. 4.*

*Fig. 5.*

INVENTOR

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BY

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HIS ATTORNEY.



# UNITED STATES PATENT OFFICE.

WILLIAM E. BANTA, OF SPRINGFIELD, OHIO.

## WIRE-COUPLING.

SPECIFICATION forming part of Letters Patent No. 503,712, dated August 22, 1893.

Application filed October 5, 1892. Serial No. 447,938. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. BANTA, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Wire-Couplings, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in wire couplings, and is especially adapted to coupling trolley wires, and others requiring electrical contact of the matching ends, and facility of connection.

My improvements have reference to a connector composed of encircling pieces or coils which are caused to grip upon the overlapping or matching ends of the line wire at both sides of a common point, by the spreading apart or enlargement of the matched ends of the line wire at said point; have reference to a key or wedge adapted to effect said spreading of the matching ends between the ends of the gripping connector; have reference to a special form of said gripping connector consisting of a continuous coil having its ends of fixed diameter and adapted to allow an increase of the normal diameter between said ends, in the act of coupling, as will be fully described and claimed hereinafter and shown herewith.

In the accompanying drawings on which like reference letters indicate corresponding parts: Figure 1, represents a side view of my device applied to the matching ends of a line wire and about to be secured thereon; Fig. 2, a plan view and partial section, showing the joint completed; Fig. 3, a line wire having longitudinal grooves; Fig. 4, a spiral groove formed on the matching end of a line wire; and Fig. 5, transverse serrations as another form.

The letters A, A', designate the meeting ends of a line wire which are matched by chamfering off as shown, or otherwise matched and overlapped. Such overlapping of the meeting ends is preferably without any interlocking construction whereby shoulders are formed at which breaking of the wire is apt to occur. Upon the meeting ends is slipped a gripping connector B consisting, in the form illustrated, of a coil of wire of any convenient length, having its ends soldered, or otherwise

secured, to constitute a constant diameter at each end of the coil. The connector fits loosely upon the overlapped wires, as shown in Fig. 1, when first placed thereon; to effect a gripping contact of the connector with the wires, the said wires are separated or otherwise enlarged in diameter, at a point between the ends of the connector, by inserting a key or wedge piece C, between the overlapped ends of the line wire to take a double-cone form, tapering both ways from the key or wedge. The swell or enlargement at the key will expand the coil and draw up its ends till they engage with the lapped wires and prevent any further unwinding of the coil, which then grips the matching wires from end to end of the connector. In the act of expanding by the key or wedge, the coil unwinds more or less till said gripping engagement of the ends is effected by the fixed diameter thereof. All the coils of wire between the ends of the connector are thus gripping upon the matched ends of the line wire, and any pull in opposite directions on the line wire will cause the parts of the connector to move with the respective parts of the wire they are gripped upon. Thus in Fig. 2, the parts of the coil gripping the end A, move in the direction of the arrow to the right, while the parts gripping the end A' will move to the left; the gripping contact of the connector upon the double-cone shaped or swelled portion at the joint, will be increased by oppositely acting strains on the line wire.

When a coupling is to be used with a trolley wire, the connector and key are inclosed by a protecting layer of solder as indicated at D by the dotted lines, thus forming a gradual approach and departure for the trolley, and presenting a smooth well protected joint. If it be desired to disconnect the coupling it may be readily done by removing the key; or the ends of the connector may be cut and the coil stripped off. The facility of application of this coupling, its efficiency and simplicity, are advantages which will be apparent to the maker and user.

While it is preferred to form the matching of the meeting ends of the line wire by simply rasping or swaging off the ends as indicated, without other special adaptation for use with the connector, yet if desired the ends



may be grooved or slotted as shown in Figs. 3, 4, and 5. In Fig. 3, the grooves or serrations are lengthwise; in Fig. 4 they are spiral, forming a thread, and preferably of the same twist as the coil of the connector; and in Fig. 5 the serrations are simply circumferential grooves with which the coils of the encircling piece engage.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wire coupling, the combination with overlapping ends of a line wire, of a gripping connector encircling and mounted on said overlapping ends, and divided into connected portions, and means to swell the size of the joint at the place between said portions of the connector, and effect the gripping engagement thereof.

2. In a wire coupling, the combination with the overlapping ends of a line wire, of a gripping connector consisting of an encircling piece or coil of fixed diameter at or near its ends, and of expansible diameter between said ends, and means to effect the swelling or enlargement of said overlapped ends of the line wire between the ends of the gripping connector mounted thereon.

3. In a wire coupling, the combination with overlapping ends of a line wire, tapered and matching substantially as described, of a gripping connector consisting of an encircling coil having its ends of fixed diameter mounted on said overlapping ends of the line wire, and a key or wedge to enlarge or swell the size of the jointed ends between the ends of said connector, to effect the gripping engagement thereof.

4. In a wire coupling, the combination with overlapping ends of a line wire having serrations thereon, of a gripping connector mounted on said overlapping ends and consisting of encircling pieces adapted to engage with the serrations of the line wire when the overlapping ends of the line wire are swelled or enlarged between the ends of the connector, and a key or wedge to effect said swelling or enlargement.

5. In a wire coupling, the combination with overlapping ends of a line wire, halved and matched substantially as shown and described, of a gripping connector consisting of a coil of wire having its end coils respectively fixed in diameter and adapted to slip readily upon said overlapping ends, a key or wedge adapted to be engaged transversely between said matched ends of the line wire, to expand or swell the joint between the ends of the connector, and an inclosing covering for said coupling, substantially as and for the purpose described.

6. In a wire coupling, the combination with the overlapping ends of a line wire, and means to effect the swelling or enlargement of said overlapped ends, of a gripping connector encircling such overlapped ends or portions of the wire, and expansible so as to enlarge correspondingly to the enlargement of the overlapped ends, whereby the connector grips strongly upon the entire overlapped portions.

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

WILLIAM E. BANTA.

Witnesses:

V. Y. SMITH,

WARREN M. MCNAIR.