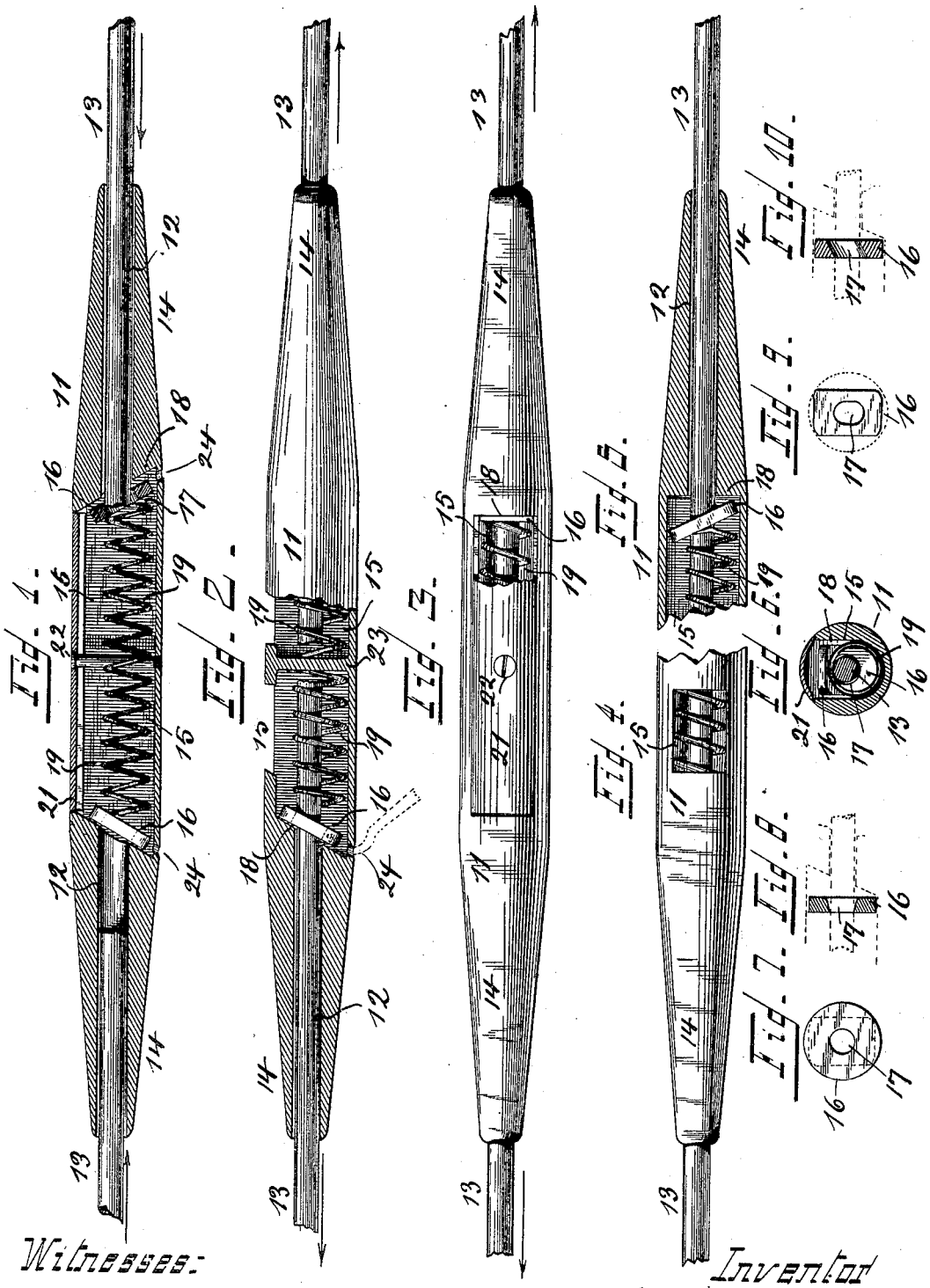
No. 649,542. Patented May 15, 1900.

W. GERARD.

WIRE COUPLING.

(Application filed Feb. 21, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

WALTER GERARD, OF ST. BERNARD, OHIO, ASSIGNOR OF ONE-HALF TO THEODORE NIEMAN, OF SAME PLACE.

WIRE-COUPLING.

SPECIFICATION forming part of Letters Patent No. 649,542, dated May 15, 1900.

Application filed February 21, 1900. Serial No. 5,995. (No model.)

To all whom it may concern:

Be it known that I, WALTER GERARD, a citizen of the United States, and a resident of St. Bernard, Hamilton county, State of Ohio, have invented a certain new and useful Wire-Coupling; and I do declare that the following is a clear, full, 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, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form a part of this specification.

This invention relates to a device or coupling to be used for connecting the ends of two wires. These ends may be the ends of two different wires or they may be the ends of a wire separated by fracture or otherwise.

The device is more particularly intended to reëstablish connection between the fractured ends of a broken wire, and being constructed to permit such connection to be made rapidly and without the aid of any tool it is eminently well adapted to serve as a coupling to reëstablish connection, electrical as well as mechanical, between the fractured ends of broken trolley-wires as used with electric-railway systems. Most devices now used for such purpose require considerable time until placed in position, which is very objectionable, owing to the interruption and extended delay of travel. This objectionable feature is modified by my construction in a manner that the time required to make the connection is reduced to the lowest possible minimum.

My invention consists of means arranged, used, and operating all as described in the annexed specification and pointed out in the claims following it, the construction of these means being also illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal central section of my coupling with two wire ends in position about to be connected. Fig. 2 is a similar view, partly in elevation, showing some features of modified construction. Fig. 3 is a top view of Fig. 1 with parts broken away. Fig. 4 is part of a top view of Fig. 2. Fig. 5 is part of a longitudinal section, showing some slightly-modified features. Fig. 6 is a vertical cross-section of Fig. 1. Figs. 7 and 8 and Figs. 9 and 10 are each, respectively, an elevation and cross-section of modified forms of locking-plates.

11 is a sleeve of proper dimensions and suitable metal—like brass, for instance. It has two longitudinal bores 12, which start one from each end inwardly and are centrally in line with each other. The size of these bores corresponds with the size of the wires 13, which they are expected to receive, and is such as to permit these latter to enter freely.

If my coupling is to be used in connection with electric trolley-wires, it is preferable to have the outside of the sleeve at both ends tapering, as shown at 14, to facilitate passage of the trolley-wheels. Between the inner ends of the bores and communicating with them there is a chamber 15, which contains the devices whereby the wire ends are connected and held to the coupling. These devices consist of locking-plates 16, one for each wire end and each having a perforation 17 to receive such end. These plates are of a size to freely fit into chamber 15, against the end walls 18 of which they are designed to rest. Their perforations 17 are also of a size to permit the wire to freely pass through, and the sides of these perforations are either straight—that is, at right angles to the face of the plate, as shown in Figs. 1 and 2—or they might be tapering, as shown, for instance, in Figs. 5, 8, and 10. On one side of the locking-plate, the one where the wire enters, these edges might be rounded, as shown in Fig. 8, to facilitate entrance of the wire end. The size of these openings is, however, so limited that the locking-plate is prevented from coming fully—that is, flatwise—in contact with the adjacent end wall 18 of the chamber without first impinging against the wire, when by reason of frictional contact the outwardly-pulling wire end tends to drag the locking-plate toward such end wall. This condition, which tends to cant or tilt the locking-plate, causes the edges around the perforation therein, each at a point at one side in one edge diagonally opposite to a point on the other side, to impinge against the wire, the intensity of such

impingement being directly proportional to the force or pull of the wire.

The formation and shape of the parts, and particularly the angular relations of plate 16 and wall 18, must be such that the outward pull of the wire is capable of imparting to the locking-plate a tendency to tilt or twist on the wire, so that the sides of the perforations therethrough would assume a position otherwise than parallel to the side of the wire—that is to say, the sides of perforations 17 may be parallel in fact, but there must be a tendency which would cause them to assume an angular position with reference to the sides of the wire. If such a tendency exists, then there prevails in the locking-plate a tendency to turn or twist, which causes the edges around perforations 17 at points in one diametrically opposite to a point in the other to engage the wire at opposite sides thereof, executing a clamping action against the same, which binds and holds it firmly in place. This action increases with increased demands—that is, stronger pull on the coupling—so that additional holding power reserved in the device is continually ready to enter automatically into action whenever required. The manipulation is simple and quickly performed, the wire ends being merely pushed into the bores of the coupling and let go, it being presumed, of course, that the locking-plates are in proper position, with their perforations in alinement with the bores to enable them to receive such ends. They must also be held in such proper position until the engagement has taken place, which proper position is with locking-plates 16 resting against end walls 18 of chamber 15. In places and positions readily accessible and where time consumed is not essential the locking-plates might be held in position until the engagement is completed by the fingers or by an inserted implement. In coupling ends of trolley-wires, however, which are not easily accessible and where no time can be wasted such is not suitable, and therefore I provide for such purposes a spring 19, which at all times holds the locking-plates against end walls 18, and particularly so during and right after insertion of the wire, when the entering end has a tendency to push away and displace such plate. After the engagement is completed and the locking-plate has once commenced to bind upon and clamp the wire then this spring has no further function, and it will therefore be understood that it serves merely as an auxiliary device to aid the parts in assuming their proper position and to hold them so and whereby the action of the device is rendered fully automatic in all its parts.

In Fig. 1 a wire is seen entering the bore of the sleeve from the left end. At the right side the wire is seen further advanced and pushing against the locking-plate thereat, showing tendency to displace the same, which tendency is, however, counteracted by spring 19, which holds the plate to its proper position, so that as soon as the parts are let go it grips instantly the wire end, as shown in Fig. 2, whereby the connection is completed.

In Fig. 1 one chamber 15 is shown and one spring 19 between the locking-plates bearing against them with each of its ends and holding them apart and against ends wall 18. In Fig. 2 two springs are shown, each occupying a separate chamber. The openings through which these springs are introduced may be closed by a cover 21 to be held in place in any suitable way—as, for instance, by a screw connection. In Fig. 1 a screw 22 is shown for such purpose, which passes through between the coils of the spring and enters the opposite wall of the sleeve.

There should be a stop limiting the extent to which a wire may enter the coupling, so that, for instance, one wire cannot pass in farther than the other, and thereby prevent the latter from assuming its proper position. This stop should be centrally between the locking-plates and inner ends of the bores, and in Fig. 1 it is constituted by screw 22. In Fig. 2 partition 23, separating the chambers, serves for such purpose.

Cessation of pull in the wires, provided it causes sufficient slack, would of course permit release of the locking-plates, so that the coupling may be readily disconnected and obtained—as, for instance, for reuse—by simply cutting them out from between the wires.

If cutting of the wire ends is not desirable, the coupling may be disconnected by means of a hooked implement, as shown in dotted lines in Fig. 2, which is inserted through an opening 24, and whereby the locking-plates may be pulled to a position in which they release the wires.

Having described my invention, I claim as new—

1. In a wire-coupling, the combination of a perforated abutment and a locking-plate having a perforation adapted to receive a wire end projecting beyond the perforated abutment, the arrangement, disposition and construction of the parts being such that upon pull of the wire toward the abutment, the locking-plate at oppositely-located points in the edges around its perforation will engage the wire as set forth and for the purpose described.

2. In a wire-coupling the combination of a perforated abutment and a locking-plate having a perforation adapted to receive a wire end projecting beyond the perforated abutment and engaging the same at opposite sides when the locking-plate rests against the abutment.

3. In a wire-coupling, the combination of a perforated abutment, a locking-plate having a limited angular engagement therewith and a perforation therein adapted to receive and engage a wire end projecting beyond the abutment.

4. In a wire-coupling, the combination of

a perforated abutment, a locking-plate having a perforation adapted to receive a wire end projecting beyond the abutment, resting against this latter and held so by the outward pull of the wire, the engagement between the two being such as to impart to the locking-plate a tendency to tilt and twist on the wire so as to cause it to impinge against this latter on opposite sides.

5. In a wire-coupling, the combination of a sleeve bored at each end to receive a wire, a chamber at the inner end of each bore, which latter is enlarged thereat to form an abutment 18 and a perforated locking-plate 16 adapted to receive a wire end projecting beyond the abutment and impinging against the same at opposite sides thereof when held by it against the abutment.

6. In a wire-coupling, the combination of a sleeve having bores 12 at each end intended to receive each a wire, a chamber at the inner end of each, an abutment 18 thereat, a perforated locking-plate 16 at the inner end of each bore and a spring 19 whereby these locking-plates are each normally held against abutment 18.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

WALTER GERARD.

Witnesses:
C. SPENGEL,
THEO. NIEMAN.