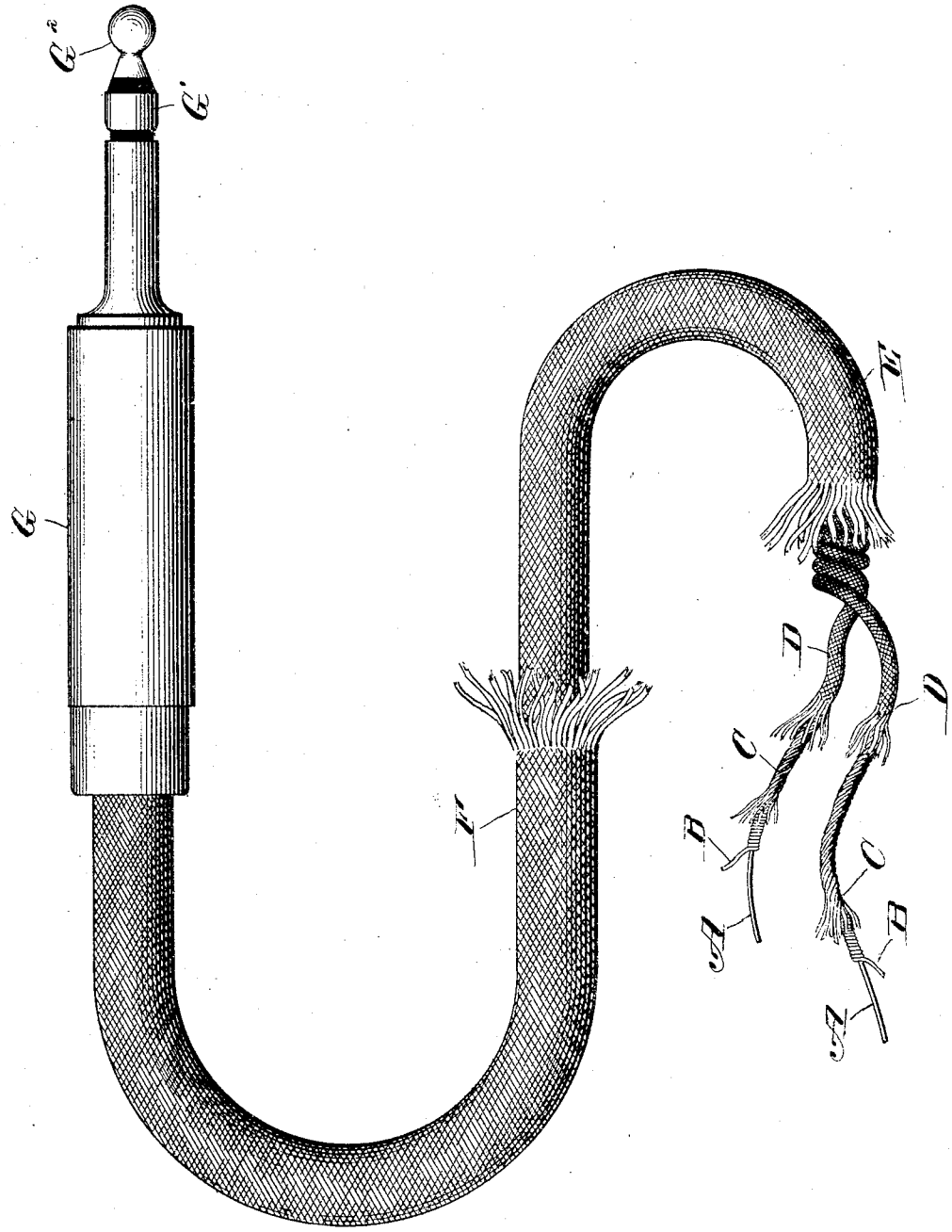
No. 789,651. PATENTED MAY 9, 1905.

C. L. BURLINGHAM & W. J. BURTON.

ELECTRICAL CONDUCTOR.

APPLICATION FILED FEB. 16, 1903.



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No. 789,651. Patented May 9, 1905.

UNITED STATES PATENT OFFICE.

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ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 789,651, dated May 9, 1905.

Application filed February 16, 1903. Serial No. 143,509.

To all whom it may concern:

Be it known that we, CHARLES L. BURLINGHAM and WILLIAM J. BURTON, citizens of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Electrical Connectors; and we 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 pertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification.

Our invention relates generally to electrical connectors, and more particularly to flexible cords—such, for instance, as are used for connecting subscribers at a telephone-switchboard.

It is essential that flexible electrical connectors which are subjected to frequent use in completing circuits should possess the requisite electrical conductivity and at the same time be sufficiently strong and resilient structurally to stand constant bending without breaking or destroying the conductivity. Owing to the lack of resiliency and strength of copper, considerable difficulty has been experienced heretofore in constructing flexible connectors—such, for instance, as switchboard-cords—which will stand constant usage without wearing out or short-circuiting in a comparatively short while, especially when the diameter of the connector is necessarily of limited size. A conductor commonly used in making switchboard-cords is composed of a number of strands of tinsel—that is, a fibrous thread and a filament of copper twisted together. The constant flexure of tinsel, however, soon breaks the filaments of copper and results in a short circuit when the cord consists in more than one conductor. It has been proposed to avoid the objection to tinsel by constructing cords of an interior conductor of copper and an exterior surrounding conductor of a metal possessing greater strength and resiliency; but such cords are open to the objection that the exterior conductor being of greater resistance than the interior copper conductor unbalances the circuit.

The primary object of our invention is to provide a flexible electrical connector which will avoid the objections above pointed out and which will possess the requisite conductivity and at the same time be resilient and durable.

A further object of our invention is to provide a flexible electrical cord comprising a plurality of insulated conductors so arranged as to render the cord thoroughly flexible and at the same time of small diameter.

A still further object of our invention is to provide a flexible connector which will be efficient and durable in use.

Our invention generally described consists in an electricial cord comprising one or more spirally-disposed conductors, each consisting in a central wire possessing structural strength and resiliency surrounded by a material possessing high electrical conductivity.

Our invention further consists in an electrical connector comprising a plurality of insulated conductors coiled in a single spiral.

Our invention will be more fully described hereinafter with reference to the accompanying drawing, in which the same is illustrated as embodied in a convenient and practical form.

The figure in the drawing illustrates a cord constructed in accordance with our invention and united to a plug.

We have shown the cord as comprising two conductors; but it is evident that one or more than two of such conductors may be wound spirally together to constitute the cord. Each conductor consists in a wire A, of a metal possessing strength and resiliency—such, for instance, as brass, aluminium, or steel. In practice a steel wire, such as is commonly known as a "piano-wire," has been found preferable.

B indicates a fine copper wire, which is wound around the wire A to impart to the conductor the necessary electrical conductivity.

C designates an insulating-covering around each conductor, which may conveniently consist in silk wound around the same.

D indicates a covering for retaining the silk insulation in place around each conductor and may conveniently consist in braided thread.

The conductors are wound together in the form of a spiral the diameter of which is approximately that of the thickness desired for the cord. The spiral is surrounded by an outer covering E, which may conveniently consist in braided cotton thread. A second covering F, surrounding the first covering E, is also preferably provided, which is composed of braided linen thread.

When the connector is to be used as a switchboard-cord, its opposite ends are secured within a plug G, comprising conducting portions G′ and G², insulated from each other and to which the ends of the conductors are separately connected.

It is evident that by winding a plurality of conductors which are to constitute a cord in the form of a spiral a number of conductors may be employed without increasing the diameter of the cord. It is also evident that by arranging the conductors in the form of a spiral the cord is rendered thoroughly flexible and capable of continued usage without breaking or short-circuiting. By constructing each conductor of an interior wire possessing structural strength and resiliency and of a surrounding material possessing high electrical conductivity a conductor results which possesses the requisite conductivity and at the same time possesses sufficient structural strength to render the cord durable and capable of hard usage without breaking or short-circuiting.

While we have described more or less precisely the details of construction, we do not wish to be understood as limiting ourselves thereto, as we contemplate the changes in form, the proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit of our invention.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A switchboard-cord consisting of a flexible conductor wound in parallel convolutions and composed of a strong resilient wire around which is wound a copper wire.

2. In a switchboard-cord, the combination with a plug, of a spiral flexible conductor connected to the plug and composed of a strong resilient wire surrounded by a good conducting material.

3. In a switchboard-cord, the combination with a plug, of a plurality of insulated conductors wound in parallel convolutions to form a single continuous spiral, each conductor being composed of a strong resilient wire around which is wound a copper wire.

In testimony whereof we sign this specification in the presence of two witnesses.

CHARLES L. BURLINGHAM.
WILLIAM J. BURTON.

Witnesses:
E. H. BELL,
GEO. L. WILKINSON.