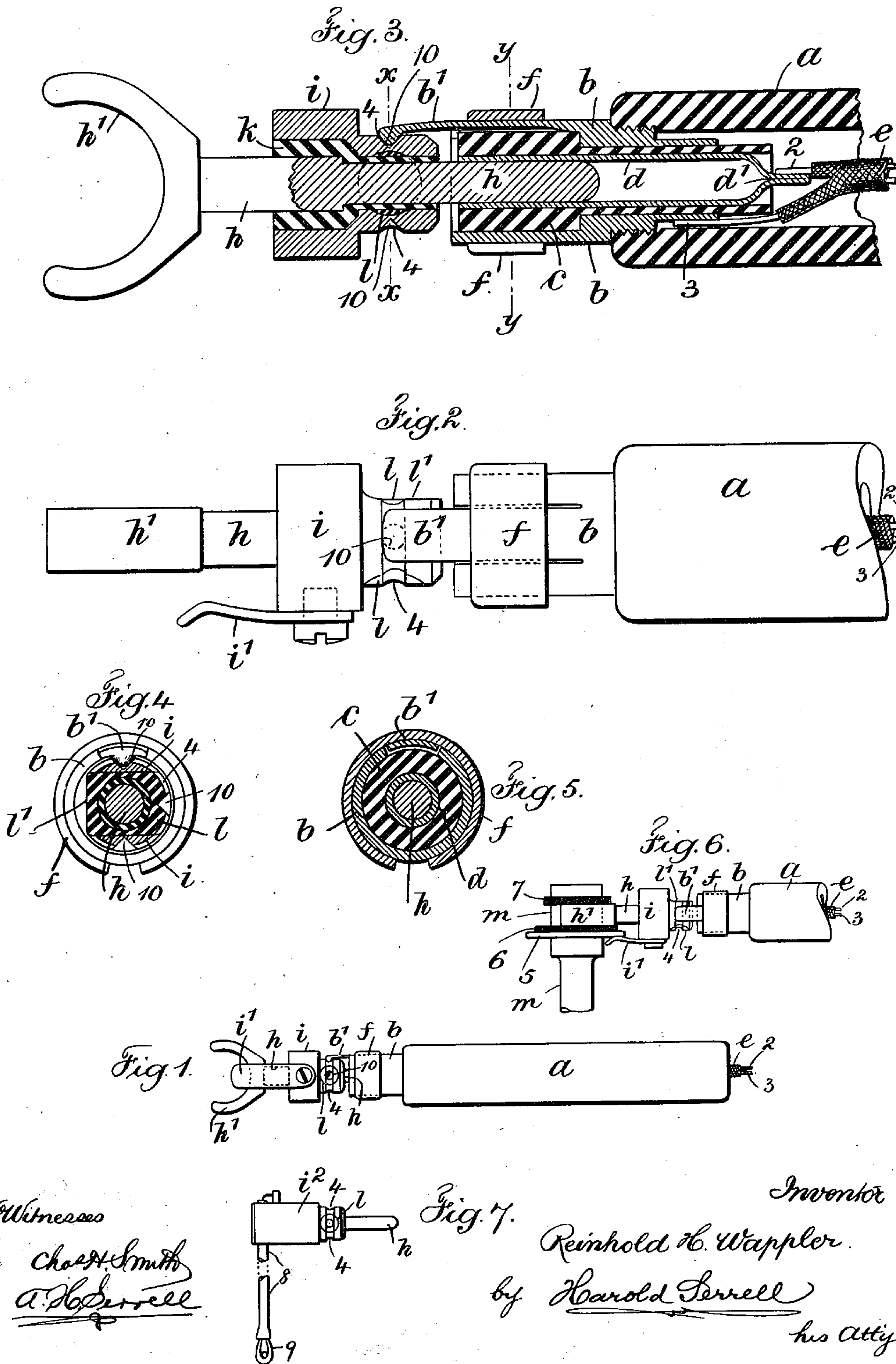


R. H. WAPPLER.
ELECTRICAL COUPLING AND SWITCH.
APPLICATION FILED MAY 25, 1910.

975,090.

Patented Nov. 8, 1910.



Witnesses

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Fig. 7.

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his Att'y.

UNITED STATES PATENT OFFICE.

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ELECTRICAL COUPLING AND SWITCH.

975,090.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed May 25, 1910. Serial No. 563,281.

To all whom it may concern:

Be it known that I, REINHOLD H. WAPPLER, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented an Improved Electrical Coupling and Switch, of which the following is a specification.

My invention relates to a device comprising in one structure an electric coupling and switch adapted for general use, but particularly adapted for use with electro-medical and electro-surgical appliances, with the object of providing an insulating holder and an on and off switch with rubbing contacts and which switch can only be readily disconnected in one position of the parts.

In carrying out my invention, I provide two series of parts which are adapted to be brought together in axial alinement and engagement; the one series of parts is adapted for rotation with reference to the other series.

The wires of an electric cable are adapted to be connected to one series and the other series are arranged for contact with other devices to form a coupling and switch; the other devices usually being electro-medical and electro-surgical appliances of one form or another.

In connection with this structure I provide a spring finger extending out from one series of parts and adapted to contact electrically with the other series of parts, and the part contacted with by this finger is provided with oppositely disposed non-electric contacts and with other oppositely disposed conducting contacts circularly arranged so that there is a sliding contact with rotation of the parts between said contacts and the end of the said spring finger; one of said non-conducting contacts being prepared especially for the axial engagement of the parts, all of which is hereinafter more particularly described.

In the drawing, Figure 1 is a plan of the device of my improvement and of about full size. Fig. 2 in enlarged size shows the same parts in a position at right angles to the arrangement in Fig. 1; the handle being broken off. Fig. 3 is a longitudinal section on the same scale of the parts shown in Fig. 2, and at right angles to the position Fig. 2. Fig. 4 is a cross section at the dotted line x, x , of Fig. 3. Fig. 5 is a cross section at

the dotted line y, y , of Fig. 3. Fig. 6 is a plan on the scale of Fig. 1 showing the connected relation of the parts of Fig. 1 with an implement engaged thereby, and Fig. 7 illustrates by a plan another application of the devices of my invention.

Similar letters or numerals of reference indicate the same parts.

The handle a is tubular, of insulating material such as hard rubber and is interiorly threaded at one end. A metal sleeve b has a threaded portion to screw into the end of the handle as shown in Fig. 3, and this sleeve is off-set both internally and externally; the portion exposed to view being larger than the threaded end received in the handle and the internal diameter smaller still. This sleeve is longitudinally slit to produce the spring finger b^1 , the free end of which on the under side is made rounded or with a rounded projection.

c represents an insulating sleeve, or in other words, a sleeve of insulating material parallel sided within and off-set exteriorly and this fits snugly into the metal sleeve b , and at one end extends beyond the end of the sleeve b , that is, the end that comes within the handle, while at the other end may or may not be flush with the end of the sleeve b .

Within the sleeve c is a tubular conductor entirely surrounded by the sleeve c and the end of this conductor which comes within the handle a is brought together or collapsed from opposite sides as shown in Fig. 3, where the contact surfaces may preferably be soldered together.

e represents one end of an electric cable with two wires; one of the wires 2 being soldered to the closed end d^1 of the tubular conductor d , while the other wire 3 is prolonged beyond the end of the wire 2 and is soldered to the reduced end of the metal sleeve b .

Referring to Fig. 3, the left hand end of the tubular conductor d extends to or near to the end of the sleeves b and c and the parts are so accurately made and fit so snugly or forcefully that they do not require any connecting pins which might interfere with the functions of the parts.

Surrounding the metal sleeve b there is a split spring ring f performing a function hereinafter described.

The description so far comprises one of the two series of the connected parts. The

other series of parts comprise the off-set stem h with its U-shaped contact h^1 formed of metal.

A portion of this stem as shown in the drawing, is surrounded by an off-set sleeve k of insulating material and this in turn is surrounded by an off-set metal sleeve i ; the parts i and k being of the same length. The reduced portion of the metal sleeve i is circumferentially grooved and passing through the same is a plug l of bone or similar non-conducting material, and when these parts are constructed I prefer to place the plug l across the reduced end of the sleeve i and then bore through the plug a hole of sufficient size to receive the reduced end of the off-set sleeve k of insulating material, as it is essential that any conductivity of the sleeve i should be kept away from the conductivity of the off-set stem h and its U-shaped contact h^1 . In the groove 4 at the centers of the plug l and end i I provide conical recesses 10. This off-set stem h is passed centrally through the off-set sleeve k of insulating material.

The groove 4 which extends around the reduced portion of the sleeve i is also formed on the surfaces of the plug l and one face of the plug l and a portion of the reduced end i is flattened by producing a surface l^1 at the left hand side of Fig. 4, at which part the groove 4 is substantially cut away. I further provide a contact spring i^1 (see particularly Figs. 1, 2 and 6) held to the surface of the sleeve i , that is, the part of greatest diameter, by a screw. These latter parts form the second of the series of engaging parts.

Figs. 1, 2 and 3 show the series of parts in their connected relation in which the right hand end of the stem h has been passed into the open outer end of the tubular conductor d , at once establishing an electric circuit from any part engaged by the U-contact h^1 through the stem h , tubular conductor d , closed end d^1 and the wire 2 of the cable e . This connection also brings the spring finger b^1 into the groove 4 in the surface of the reduced portion of the sleeve i . The parts are to be brought together by an axially sliding contact which brings the free end of the finger b^1 against the surface l^1 . A quarter revolution of either one of these parts with reference to the other, brings the rounded end of the finger b^1 into the groove 4 and seated in the recess 10 in contact with the metal of the surface of the sleeve i . Another quarter rotation brings the rounded end of the finger b^1 against the opposite end of the plug l seated in the recess 10 therein. A further quarter turn brings the end of the finger in contact with the metal surface of the sleeve i seated in the recess 10 therein and a further quarter turn brings the end of the finger into the

initial position of emplacement against the flat end of the plug l and in which position an axial movement will separate the series of the two parts.

In Fig. 6 I have shown a tubular body m with a flange 5 and two insulating flanges 6 7. These parts are illustrative of the relation of the device of my improvement for electrical contact with another member because the part h^1 as a U or yoke-member passes between the flanges 6 7 in contact with the rounded surface of the body between said contacts, while the free end of the contact spring i^1 comes against the outer surface of the metal flange 5, in which case the circuit from the other wire 3 of the cable is through the metal sleeve b and its spring finger b^1 , the metal sleeve i and its contact spring i^1 to the flange 5 of the body.

The function performed by the split spring ring f is a support to the spring finger b^1 causing the same to keep its position and maintain its spring function to a more certain extent than would be possible in the absence of the split spring ring f ; also to prevent misplacement and a possible bending back of the spring finger when the parts are disconnected; furthermore to insure the closest stationary and rubbing contacts between the spring finger b^1 and the groove 4 of the sleeve i , not only to insure the make and break of the circuit of my improved on and off switch but serve to keep the contacts clean and bright and fully efficient.

In Fig. 7 I have shown a part i^2 as a head prolonged from the off-set metal sleeve i which is also made as hereinbefore described with reference to the plug l and groove 4 for the spring finger b^1 . In this figure I have shown a slender tubular member 8 with an electric light 9 on the extremity thereof to be made incandescent in the electro-medical operation of the device.

While I have shown and described the structure and application of the contact spring i^1 the same is not an essential element of my invention and may not be employed in some applications of the generic structure of my invention.

I claim as my invention:

1. In an electric coupling and switch, two series of axially engaging parts capable of rotation of one series with reference to the other series, and means extending from one series and connecting with the other series and in the rotary movement making and breaking the circuit with a rubbing contact.

2. In an electric coupling and switch, two series of engaging parts adapted for axial engagement and for rotation of one series with reference to the other series, and means extending from one series and connecting with a member of the other series, oppositely disposed non-conducting contacts and other oppositely disposed conducting contacts cir-

cularly arranged and in the rotary movement making and breaking the circuit thereof with a rubbing contact.

3. In an electric coupling and switch and in combination, a handle of insulating material, a metal sleeve adapted to be connected therewith, a spring finger formed from and as a prolongation of said sleeve, an insulating lining to said sleeve and a tubular conductor lining to the insulating sleeve, a cable passing into said handle, the one of its wires connected electrically and mechanically with the tubular conductor and the other connected electrically and mechanically with the metal sleeve, and a part including a stem adapted for axial mechanical and electrical contact with the aforesaid parts and for rotation in connection therewith, in which the free end of the spring finger is adapted in the rotary movement of said part for making and breaking the circuit with a sliding or rubbing contact.

4. In an electric coupling and switch and in combination, a handle of insulating material, a metal sleeve adapted to be connected therewith, a spring finger formed from and as a prolongation of said sleeve, an insulating lining to said sleeve and a tubular conductor lining to the insulating sleeve, a cable passing into said handle, the one of its wires connected electrically and mechanically with the tubular conductor and the other connected electrically and mechanically with the metal sleeve, a split spring ring surrounding said metal sleeve and its spring finger and a part including a stem adapted for axial mechanical and electrical contact with the aforesaid parts and for rotation in connection therewith, in which the free end of the spring finger is adapted in the rotary movement of said part for making and breaking the circuit with a sliding or rubbing contact.

5. In an electric coupling and switch and in combination, an off-set sleeve provided with a circumferential groove, a plug passing diametrically across through said sleeve of insulating material and the sleeve and plug made tubular, an off-set sleeve of insulating material passing through said parts and fitting the same snugly, a stem of metal passing through said parts and continued beyond the same at either end and

one of said ends provided with a U-shaped contact, a tubular conductor adapted to receive said metal stem at its end opposite to the end having the U-shaped contact, a metal sleeve and spring finger adapted at the free end thereof for a rubbing contact in the groove of the aforesaid off-set metal sleeve, an insulation between the tubular conductor and the metal sleeve and the wires of a cable secured mechanically and electrically to the said tubular conductor and metal sleeve.

6. In an electric coupling and switch and in combination, an off-set sleeve provided with a circumferential groove, a plug passing diametrically across through said sleeve of insulating material and the sleeve and plug made tubular, an off-set sleeve of insulating material passing through said parts and fitting the same snugly, a stem of metal passing through said parts and continued beyond the same, a tubular conductor adapted to receive said metal stem at its end, a metal sleeve and spring finger adapted at the free end thereof for a rubbing contact in the groove of the aforesaid off-set metal sleeve, an insulation between the tubular conductor and the metal sleeve and the wires of a cable secured mechanically and electrically to the said tubular conductor and metal sleeve.

7. In a coupling and switch for electro-medical and electro-surgical appliances, two series of engaging parts adapted for axial engagement and for rotation of one series with reference to the other series, a circular member associated with one of said series, an insulating plug passing diametrically across through the circular member and said parts provided with a circularly arranged circumferential groove and oppositely disposed central recesses in line with said groove, and a spring finger associated with the other series of parts and having a free end adapted to engage said groove and move through the same with a rubbing contact and to stop in and engage the said recesses in making and breaking the circuit.

Signed by me this 17th day of May 1910.

REINHOLD H. WAPPLER.

Witnesses:

GEO. T. PINCKNEY,
E. ZACHARIASEN.