

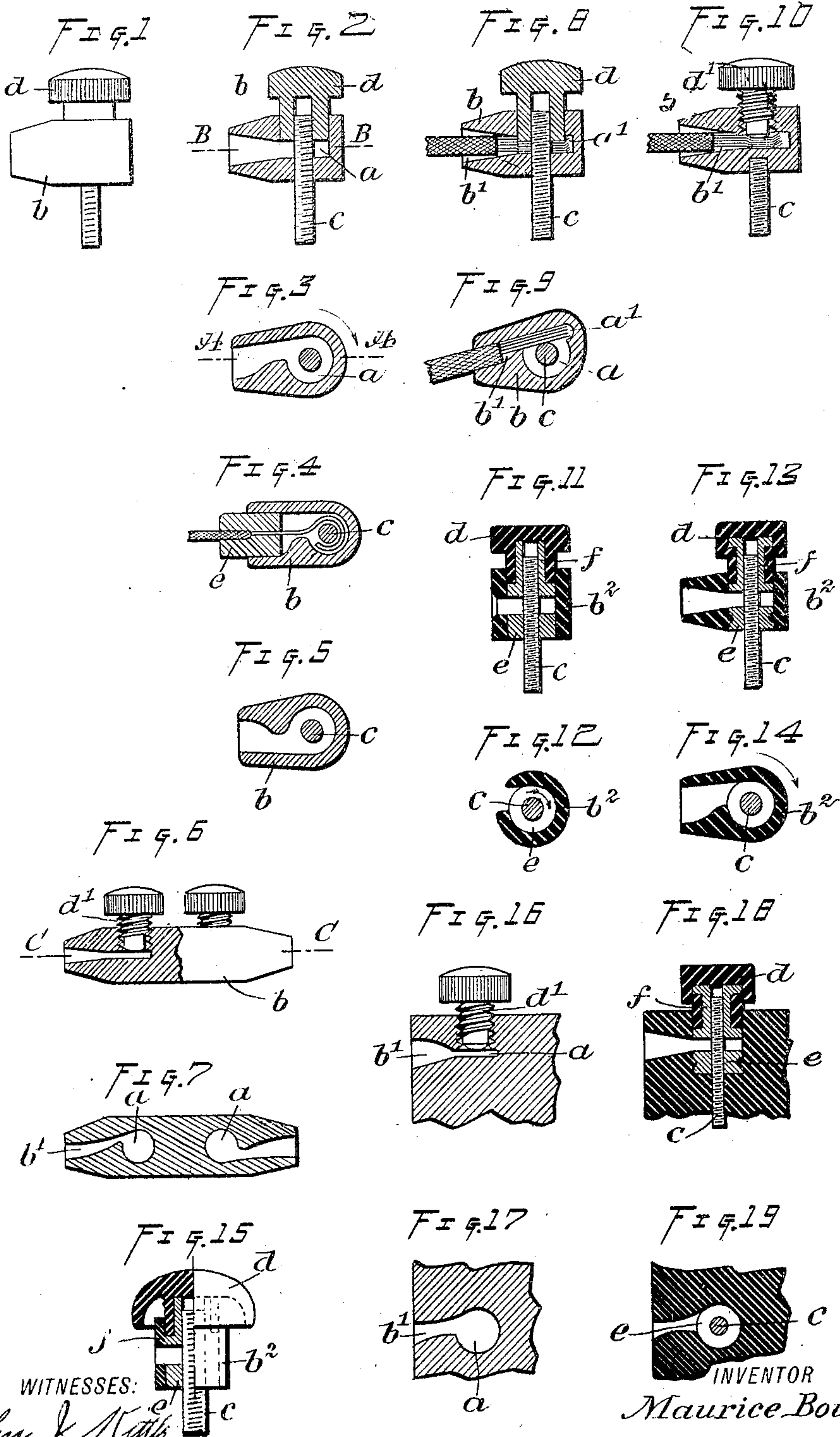
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ELECTRICAL BINDING SCREW OR TERMINAL.

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ELECTRICAL BINDING-SCREW OR TERMINAL.

No. 798,319.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MAURICE BOUCHET, of 22 Rue Alphonse de Neuville, in the city of Paris, Republic of France, have invented Improvements in Electrical Binding-Screws or Terminals, of which the following is a full, clear, and exact description.

This invention relates to an improved electrical binding-screw or terminal designed to facilitate the insertion of the conductor and to completely protect its stripped end, to insure a perfect electrical contact, and to resist any stress to which the conductor may be accidentally subjected, the device if made principally of insulating material being capable of insuring a connection completely insulated from its surroundings whatever may be the diameter of the conductor clamped therein.

The improved binding-screw is essentially characterized by the fact of its possessing a central circular chamber and a mouth or tubulus opening thereinto on a level with the bottom thereof and preferably tangential to the internal wall of the device in such manner that the conductor when inserted into the tubulus and pushed home, automatically coils itself round in the interior of the terminal, the clamping of the conductor being effected by means of a set-screw or its equivalent.

The terminal may be made either wholly of metal or with a body of insulating material, the two members respectively fixed and movable, in the latter case being each provided with a metallic contact piece or surface, so as to insure the transmission of current, the improved terminal when thus constructed providing means whereby complete protection may be obtained, inasmuch as the two portions made of insulating material and which engage with one another permit of perfect insulation at all points of the external surface of the terminal whatever may be the diameter of the conductor.

The annexed drawings show by way of example various practical forms of the invention.

Figure 1 is a side elevation of one form of my binding-post. Fig. 2 is a vertical cross-section through the same and is taken upon the line A A of Fig. 3. Fig. 3 is a horizontal section through the form shown in Fig. 2 and is taken upon the line B B thereof. Fig. 4 is a horizontal section similar to Fig. 3, but showing a slightly different form. Fig. 5 is

likewise a horizontal section showing a still different form. Fig. 6 is a side elevation, partly in section, showing another form suitable for connecting two wires together. Fig. 7 is a horizontal section through the same upon the line C C of Fig. 6. Fig. 8 is a vertical section through another form of binding-post somewhat similar to the one shown in Fig. 2. Fig. 9 is a horizontal section through the post shown in Fig. 8. Fig. 10 is a vertical section through another form which differs chiefly in the style of the screw d' . Fig. 11 is a vertical section through another form. Fig. 12 is a horizontal section through the same. Fig. 13 is a vertical section through a composite binding-post embodying the same general principle. Fig. 14 is a horizontal section through the same. Fig. 15 is a side elevation, partly in section, showing still another form provided with a hood d . Fig. 16 is a vertical section through another form in which the body portion is massive. Fig. 17 is a horizontal section through the same. Fig. 18 is a vertical section somewhat similar to that shown in Fig. 16, but showing a different type of fastening; and Fig. 19 is a horizontal section through the structure shown in Fig. 18.

As shown in elevation in Fig. 1, in Fig. 2 in vertical section on line A A, Fig. 3, and in Fig. 3 in horizontal section on line B B, Fig. 2, the terminal has a central chamber a and a tubulus b , through the interior of which extends a channel b' , the outer end of which is made flaring and which opens into the central chamber a on a level with the bottom of the latter and tangential to its internal wall. The internal flaring of the tubulus serves to facilitate the introduction of the conductor and even to permit of the entrance of the insulating-sheathing and at the same time protects the cut surface of the latter. The terminal is traversed by a fixed screw-threaded stud c , passing centrally through the chamber a and projecting externally from the terminal. This stud c serves a double purpose: first, to secure the terminal in place to any apparatus on which it is required to mount it, and, secondly, to engage with a female-screw cap d , which passes into the chamber a and is adapted to exert pressure on the extremity of the conductor.

On the introduction of the conductor into the tubulus b its extremity encounters the curved wall of the chamber a and is caused

to glide along it and to consequently coil itself up around the central stud *c*. Then by screwing down the cap or nut *d* the conductor will be powerfully clamped, the grip of the nut on the conductor being increased, if necessary, by roughening the lower face of the nut, so the better to avoid slipping of the conductor should the conductor be suddenly subjected to any tensile stress. The stripped extremity of the conductor is thus completely imprisoned in the chamber *a*, and under these conditions it cannot escape laterally from the grip of the nut *d*, which is a constant source of annoyance with ordinary screw-terminals. Further, the extremity of the insulation by engaging with the tubulus *b* completely closes the chamber *a*, and thus protects the naked conductor from the air, and so arrests oxidation.

In order that the closure may be as nearly hermetical as possible, the tubulus *b* may be provided with a stopper *e*, of caoutchouc, for example, having a central hole for the passage of the conductor in the manner shown in Fig. 4.

The tubulus *b* may be arranged in such manner that the conductor coils itself up in the chamber *a* in either the same or in the inverse sense as that in which the screw-cap or nut *d* turns when tightened up. This is shown in Figs. 3 and 5, respectively. The latter arrangement would be adopted if the conductor were liable to be subjected to longitudinal stress, as any force in such case tending to withdraw it would tend to tighten up the nut *d*.

The present invention may be equally well applied to couplings for a pair of wires, as shown in elevation and in horizontal section in Fig. 6 and in Fig. 7 in longitudinal section on line C C, Fig. 6, or for any suitable number of connections.

Figs. 8 to 10 show a modification suitable for use when it is not desirable for the conductor to be coiled up in the interior of the terminal or when its rigidity does not permit of this. This modification consists, essentially, in providing the interior wall of the terminal with a recess *a'* in alignment with the passage *b* of the tubulus *b'*, (which opens laterally into the chamber *a*), so that the conductor passes along one side of the screw-stud *c*, its extremity entering the recess *a'*. In this case the wire does not coil around the stud *c*, but is held in position by the pressure of the set-screw, the conductor being composed of flexible wires, the extremity of the conductor expanding within the recess *a'*, and thereby forming an enlargement which interlocks with the recess and prevents the withdrawal of the conductor by a pull on it. The arrangement is, however, also applicable to rigid conductors.

The terminal may, as shown in Figs. 8 and 9, be provided with a screwed stem by means

of which the device may be fixed in place and adapted to receive the binding-nut *d*, or the conductor may be fixed in the terminal by a set-screw *d'* screwing into the latter.

When the body of the device is made practically wholly of a non-conducting material, as seen in Figs. 11 to 15, it is provided at its lower part with a conducting-ring *e*, and the binding-nut *d* is provided with a metal lining *f*, threaded, so as to screw on the stem *c*, and shouldered, so as to present a larger surface to contact with the conductor, the terminal either presenting a plain opening, as seen in Figs. 11 and 12, or being furnished with a tubulus, as seen in Figs. 13 and 14. The head *d*, which is made of insulating material, may have flattened sides or it may be of other suitable form—for example, of bell shape, as seen in Fig. 15.

The terminal instead of being detachable may be in one piece with the apparatus in connection with which it is to be used, in this case the arrangement shown in section in Figs. 16 and 17, when the apparatus is wholly made of metal, being used and when the apparatus is made of insulating material the arrangement shown in Figs. 18 and 19 being used.

It will be understood that where the body portion is made of insulating material the inner metal parts are placed in the mold or matrix, being thus secured in position by the plastic material being cast around them.

The form, dimensions, and details of construction of the improved device will vary according to the particular use to which it is to be put, the heads of the set-screws or clamping devices being milled, flat, or of other form.

I claim—

1. An electrical terminal comprising a cylindrical inner chamber and an opening or tubulus for introducing the conductor and merging into the chamber tangential to the internal circular wall of the latter, substantially as described.

2. An electrical terminal comprising a cylindrical inner chamber and an opening or tubulus merging into the chamber on a level with the bottom thereof and tangential to the internal circular wall of the latter, substantially as described.

3. An electrical terminal comprising a cylindrical inner chamber and an opening merging into this chamber on a level with the bottom thereof and tangential to the internal circular wall thereof, this opening being in a plane at right angles to the axis of the chamber, substantially as described.

4. An electrical terminal consisting of a fixed portion having a cylindrical chamber which is provided with an opening merging into the chamber on a level with the bottom thereof and tangential to the internal circular wall so that when the conductor is passed

into the chamber its extremity is compelled to coil up within it, and a binding-screw engaging the fixed portion and capable of exerting pressure on the coiled end of the wire, the inlet-orifice being formed in the body of the terminal, substantially as described.

5. An electrical terminal comprising a cylindrical inner chamber, an opening merging into this chamber tangential to its circular inner wall, and a binding-screw movable in the direction of the axis of the cylindrical chamber, substantially as described.

6. An electrical terminal comprising a cylindrical inner chamber, an opening merging into this chamber, tangential to its circular inner wall, a threaded rod secured in the axis of this chamber, the lower end of this rod protruding and being used for securing the terminal, and a nut screwed upon this rod within the chamber, substantially as described.

7. An electrical terminal comprising a cylindrical inner chamber, an opening merging into the latter tangential to its circular internal wall, and a recess provided in the wall of this chamber opposite the opening, substantially as described.

8. An electrical terminal, the body of which is of insulating material and has a cylindrical inner chamber, this terminal being provided with an opening formed in the same mass as the body and merging into this chamber tangential to its internal wall, a binding member also of insulating material, a threaded metal rod passing through the axis of the chamber, and a metal contact arranged at the center of the bottom of the

chamber and traversed by the axial metal rod, substantially as described.

9. An electrical terminal, comprising a body of insulating material provided with a cylindrical inner chamber, this terminal being further provided with an opening formed in the same mass as the body and merging into this chamber tangential to its internal wall, a binding-piece also of insulating material, a threaded metal rod passing through the axis of the chamber, a metal contact arranged at the center of the bottom of the chamber and traversed by the axial metal rod, and a second metal contact being mounted upon the lower face of the binding-piece, substantially as described.

10. A binding - post, comprising a body portion of insulating material provided with a funnel-like passage and with a chamber into which said passage merges tangentially, and contact members mounted within said body portion.

11. A binding - post, comprising a body portion provided with a passage and with a chamber, said passage merging into said chamber tangentially thereof for the purpose of coiling a conductor when the latter is forced endwise through said passage and into said chamber.

The foregoing specification of my improvements in electrical binding-screws or terminals signed by me this 16th day of July, 1904.

MAURICE BOUCHET.

Witnesses:

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