

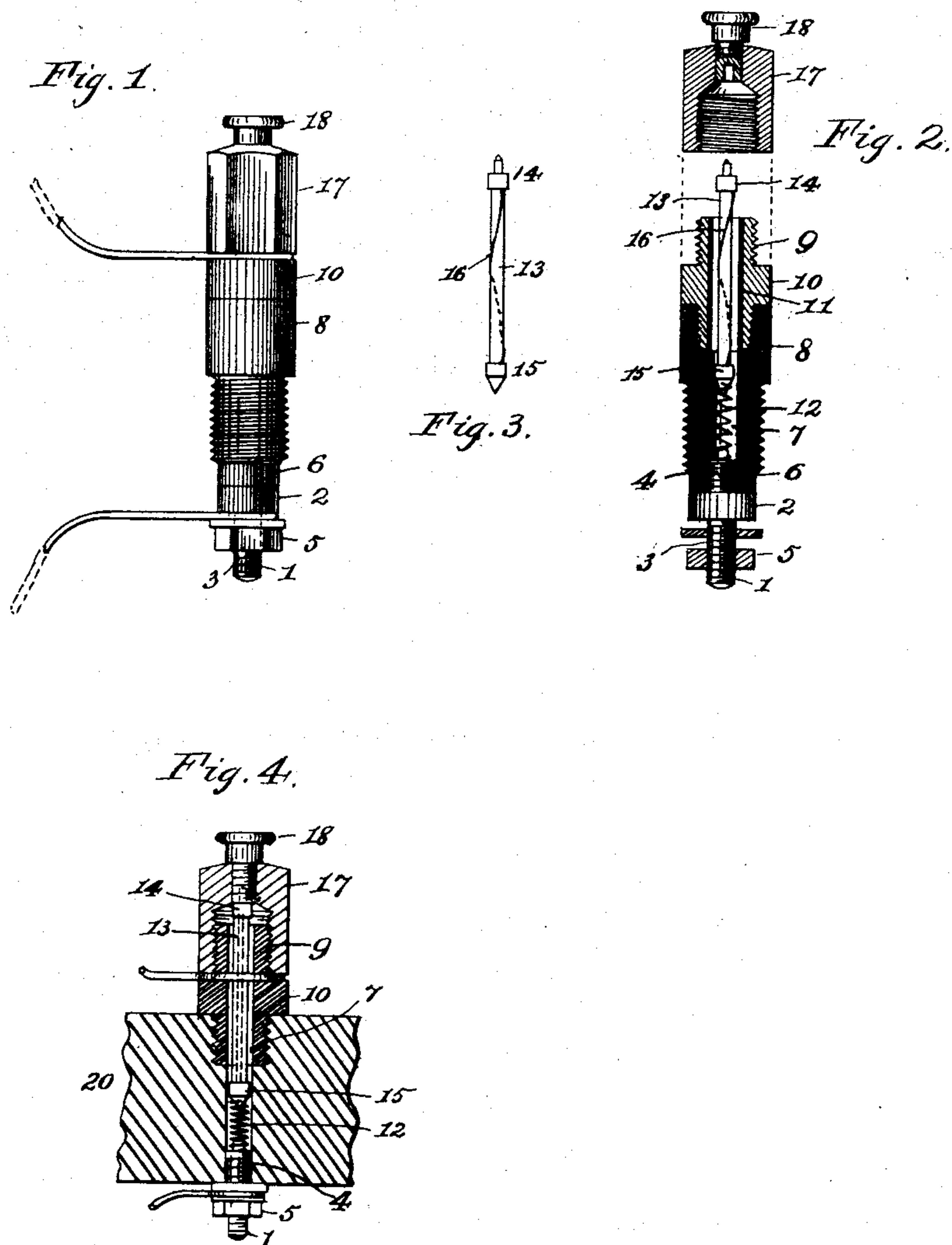
(No Model.)

H. C. ROOT.

COMBINED BINDING POST AND THERMAL CUT-OUT.

No. 413,813.

Patented Oct. 29, 1889.



WITNESSES:
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HOWARD C. ROOT, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO
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COMBINED BINDING-POST AND THERMAL CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 413,813, dated October 29, 1889.

Application filed June 17, 1889. Serial No. 314,592. (No model.)

To all whom it may concern:

Be it known that I, HOWARD C. ROOT, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Binding-Posts for Electric Circuits; and I do hereby 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 appertains to make and use the same.

This invention relates to a novel form of lightning-arrester or instrument-protector for use in such electric circuits as require the presence of a fusible connection of such character as to be fused by the action of a current in excess of the normal current which is supposed to flow in such circuit.

This invention comprises a combined protector and binding-post, and further comprises the construction and combination of parts, substantially as hereinafter fully set forth, and pointed out in the claims.

In the drawings which form part of this specification, Figure 1 is a side elevation of the complete structure when self-contained. Fig. 2 is a vertical section of the same with the cap removed, showing the self-ejecting tendency of the fuse-carrier. Fig. 3 is a detached view of the fuse-carrier. Fig. 4 is a sectional view of the device when a base-board is substituted for the insulating-stem of Fig. 1.

I construct as follows, the metallic parts being preferably made of brass, as is usual in the case of binding-posts and other electrical apparatus: The insulating portions may be hard rubber, vulcanized fiber, or any other material having the necessary qualities of insulation and mechanical strength. Starting with the brass shank 1, which is provided with a collar 2, integral therewith and having the threaded portions 3 and 4, respectively, I place on the threaded portion 3 the clamping-nut 5, for the purpose of affording a point of convenient attachment for the line or other wire to be connected to the device. Upon the threaded portion 4 of shank 1, I screw the block of insulating material 6, having the internal bore 7 and the threaded socket 8 in its upper end. Into the socket 8, I screw one

end of the brass nipple 9, which is provided with the flange 10 and is bored out and fitted with an internal sleeve 11, of insulating material, whose internal diameter and axis correspond with that of the cavity 7 in the rubber block 6. At the bottom of cavity 7, I place a spiral spring 12, which I prefer to make of German silver. Into the bore thus formed in the nipple 9 and rubber block 6, I introduce the fuse proper, which consists of a small tube or rod 13, of insulating material, having metallic tips or caps 14 15 at its ends, and these are connected electrically by means of the fuse of tin-foil or other material 16, which may be wound around the central rod or tube 13 or placed inside it. The metallic cap 17 is internally threaded to fit the nipple 9, and in its top is fitted the pressure-screw 18. I prefer to form the tips or caps 14 15 with conical or other shaped projecting ends, and the lower end of the clamping-screw 18 is recessed to correspond, so as to guide the fuse-carrier. The cap 17 is made of such length that its lower edge is adapted to form, in connection with the flange 10 of the nipple 9, an effective clamping-point for the circuit-wire, which is simply bent around the nipple 9, and the screwing down of the cap 17 completes a very effective and reliable connection. When the cap 17 is thus screwed down after the insertion of the fuse, the pressure-screw 18 is screwed in and makes contact with the tip or cap on the end of the fuse and presses the lower cap of the fuse into effective contact with the upper end of the coiled spring 12, which is thus slightly compressed. The two circuit-terminals, which are indicated by dotted lines in Fig. 1, are thus connected through the pin 1, spring 12, tip 15, fuse 16, tip 14, pressure-screw 18, and connections 10 17. I make the cap 17 polygonal externally for use with a wrench.

Thus constructed the device forms a very compact and very reliable binding-post and safety-catch combined in one complete structure, which is of small size and cheap in cost of manufacture. The fuse itself is securely incased and thus fully protected from accidental injury from workmen while arranging wires and from exposure to atmospheric changes, as are also the contacts forming part

of the fuse-circuit. Should the fuse melt at any time from passage of an excessive current, and thus produce a tendency in the latter to arc, the latter is prevented by the external high insulation afforded by the internal tube 11, of rubber.

The device has the great advantage of permitting the insertion and removal of the fuse without disconnecting any of the wires or disturbing any of the parts other than the pressure-screw 18, and the insertion of fuse need not be made until all work of arranging wires is finished. Upon removing this screw from its position the tension of spring 12 has the effect of partially or wholly ejecting the fuse 13 and its attached caps, so that a new one may be readily inserted, after which the restoration of the screw 18 to its position completes the circuit, as before.

The device affords exceptional facilities for testing. By removing the pressure-screw 18 and the fuse the two circuits or two branches of the circuit which terminate in the binding-post can be separately tested, one by contact with the binding-post portion of the structure 10 17 and the other by inserting an insulated pin in place of the fuse, such pin then making contact with the spring 12, and through it with the part of the circuit connected to the shank 1, without the necessity for disconnecting any wire whatever or using tools for the purpose of opening any circuits or branches. This latter advantage is very marked when the device is to be used as a binding-post for insertion into a switch-board or other structure—such, for instance, as a cable-terminal head, where the shank 1 and its exposed portions will be hidden and not accessible for the purpose of testing; but by the above-stated use of an insulated pin capable of reaching into the central bore and making contact with the spring 12 this test can be very readily made by the use of my structure.

Obviously the fuse 16 may be of any suitable material—such, for instance, as tin or lead foil or a thin wire—and it may be wound one or more times around the rod 13 or may be straight thereon or inserted inside, according to the circumstances of use or the will of the designer. The caps 14 and 15 are utilized for the purpose of clamping the ends of the fuse 16 in the act of placing the said caps in position on the ends of rod 13.

When a number of such binding-posts are to be applied to a common base, as in switch-boards or distributing-boards, I prefer the

form shown at Fig. 4. Here the rubber block 6 is dispensed with, and the body or substance of the base 20 used instead. The shank 1 in that case is screwed into the base 20 from the rear and the nipple 9 from the front, the bore 7 forming, as before, a communication between them and a cavity for the spring 12. In the same figure I show the fuse inclosed inside the tubular carrier 13, and this form of fuse permits me to dispense with the insulating-sleeve 11 required in Fig. 2. In other respects the construction has all the advantages and conveniences of that shown in Figs. 1 and 2.

The device may be used for protective purposes on any well-known forms of electrical apparatus, but is more especially designed for direct application to cable-terminal heads, magneto-bells, and kindred apparatus, wherein it is desirable to have the binding-post combined with the protector and the whole structure reduced to the most compact form possible.

I claim as my invention—

1. The combined connector and safety-catch comprising two metallic binding-posts insulated from each other, but rigidly in line, and a non-conducting fuse-carrier having metal tips connected by a fusible strip and held between said posts by a spring at one end and at the other by a removable abutment-screw passing through one of said posts in line with the fuse-carrier.

2. The combined connector and safety-catch comprising a sleeve of insulating material interposed between two metal binding-posts and forming a rigid structure therewith, a metal spring in contact with one binding-post, a removable abutment projecting from the other, and a non-conducting fuse-carrier having metal tips connected by a fusible strip placed between said spring and abutment.

3. The combined binding-post and safety-catch comprising, in combination, the shank 1, provided with clamping devices, spring 11, tubular nipple 9, insulated fuse 16, screw-cap 17, and pressure-screw 18, adapted to force the fuse 16 against the spring 11 and compress the latter, said shank 1 and nipple 9 being held in fixed position in a solid insulating material.

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

HOWARD C. ROOT.

Witnesses:

J. R. KANE,

JOS. S. STEELE.