

No. 768,197.

PATENTED AUG. 23, 1904.

I. B. SMITH.
SWITCH BLOCK.

APPLICATION FILED DEC. 3, 1903.

NO MODEL.

FIG. 1.

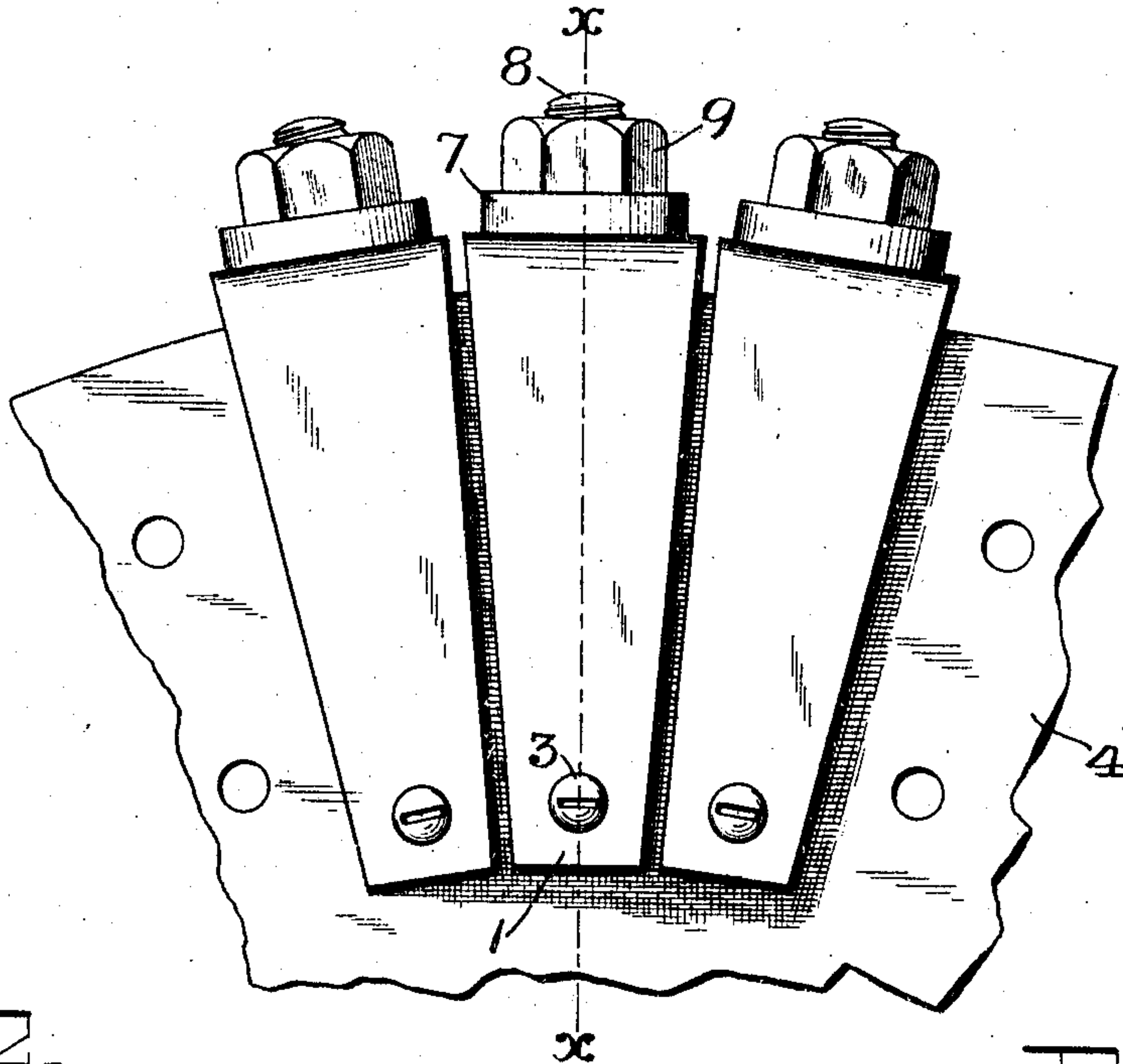


FIG. 2.

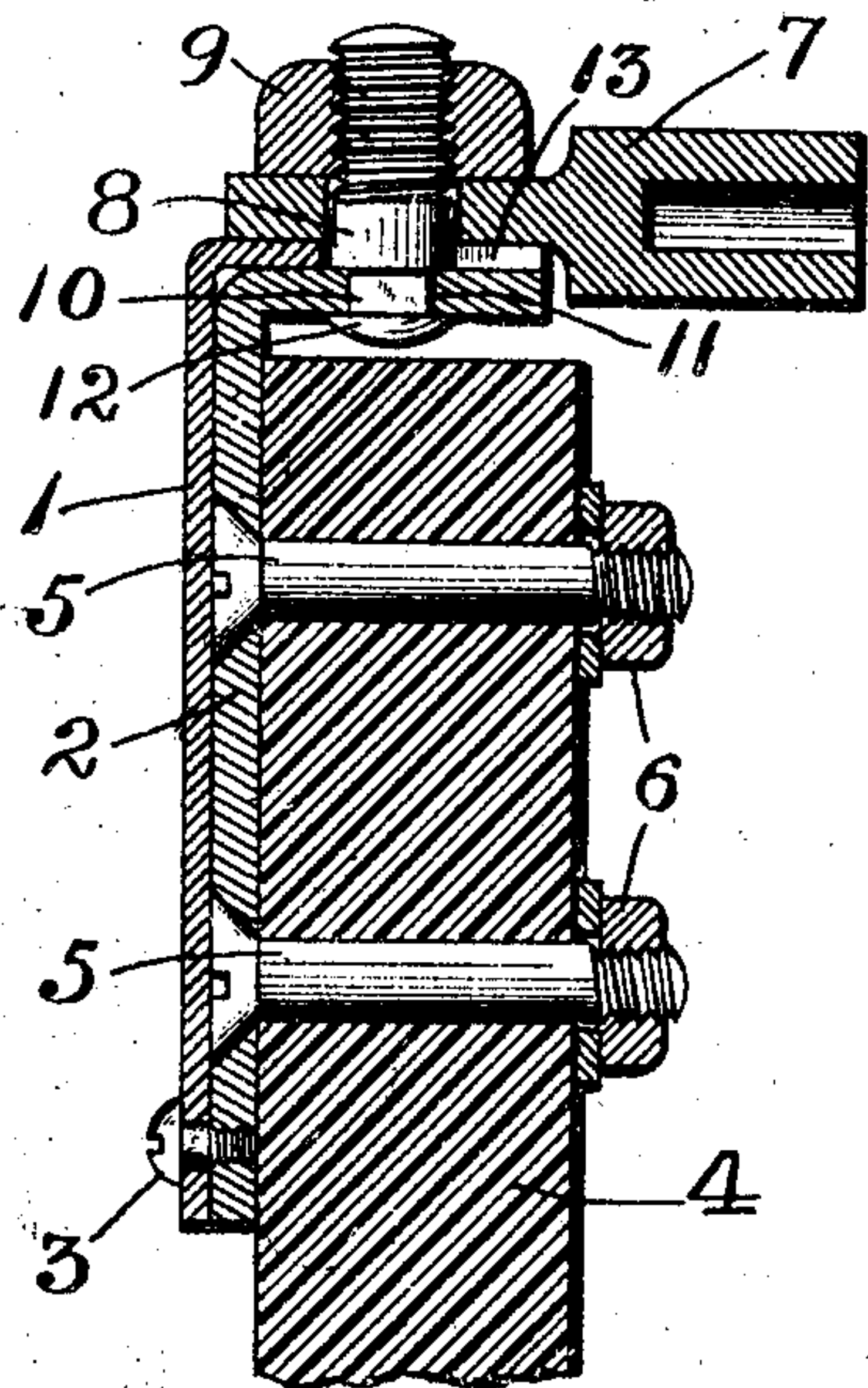
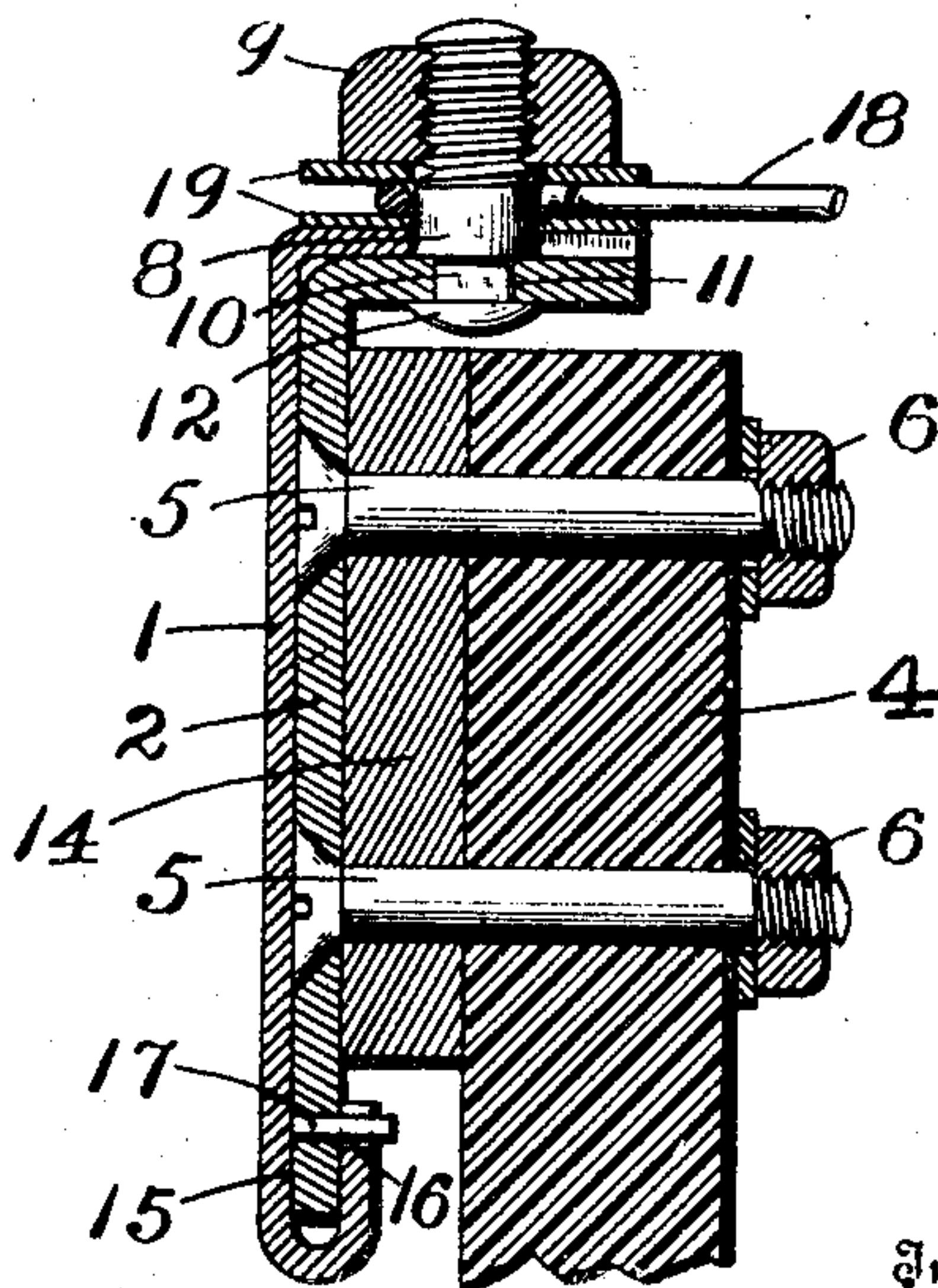


FIG. 3.



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UNITED STATES PATENT OFFICE.

IRVING B. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

SWITCH-BLOCK.

SPECIFICATION forming part of Letters Patent No. 768,197, dated August 23, 1904.

Application filed December 3, 1903. Serial No. 183,639. (No model.)

To all whom it may concern:

Be it known that I, IRVING B. SMITH, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Switch-Blocks, of which the following is a specification.

This invention relates to switch-blocks or contact-segments for rheostats, starters, controllers, and other apparatus to which the invention may be applied, and has for its objects the production of a switch-block or contact-segment wherein the wearing-surface may be cheaply and easily renewed, and in which a maximum area of contact is presented between the block or segment and the sliding switch-contact or brush.

Further objects of the said invention are to effect the most direct and positive connection between the cable-head, cable, or other conducting-lead connected to the block and the contact-surface which the brush engages, to secure a rigid and simple mechanical construction without impairing the electrical features, to so dispose the metal of said block or segment as to most efficiently convey the current from said brush and dissipate the heat arising therefrom, and to eliminate from the electric circuit the screws or bolts which are employed for attaching the block to its base or support.

To the above ends my said invention consists in the combination and arrangement of parts herein described, and more particularly pointed out in the claims.

Referring to the accompanying drawings, in which is illustrated one specific form of my invention and a modification thereof, Figure 1 is a top plan view of three of the switch-blocks and related parts arranged upon a suitable base, the latter being broken away; Fig. 2, a section along the line *xx* of Fig. 1, and Fig. 3 a central vertical section of a modified form of said block and its related parts.

In the embodiment of my invention herein shown the contact-surface of the block is formed of a plate or segment 1, preferably of brass or copper, and this plate is reinforced by a backing or support 2, of some

baser and preferably stiffer metal—such, for example, as iron. The plate 1 is secured near one end to the backing 2 by a small screw 3, while both plate and backing are formed with a bend of substantially ninety degrees at their outer ends where connection is made with the cable, cable-lug, wire, or other conducting-lead to which the block is connected. The electrical requirements as to current-carrying capacity determine the minimum amount of metal that may be used in forming the contact surface or plate 1, and in making the connection from such surface to the cable or cable-lug, and it is desirable usually not to exceed this minimum amount. The mechanical requirements of strength and stiffness, however, are met by reinforcing the plate 1, as shown. It is desirable that such reinforcing-piece, usually of inferior current-carrying capacity as compared with the plate 1, owing to its greater ohmic resistance, shall not necessarily form a portion of the electrical circuit leading from the brush-contact to the cable or cable-lug, unless, indeed, it forms a multiple-circuit, in which case it does no harm and may be an advantage. In other words, the plates 1 and 2 may or may not be insulated from each other, as the occasion demands. The block is secured to the slate or other insulating-base 4 by means of the countersunk bolts 5 and nuts 6, the said bolts passing through the base and the backing or reinforcing plate 2. The function of the bolts 5 is therefore purely mechanical, since they form no part of the electric circuit. This fact alone will admit of a saving of material, since the bolts 5 may in this case be made much smaller than would be the case were they employed in a current-carrying capacity, for they need have only mechanical strength and not the current-carrying capacity which each particular switch might have. An additional advantage gained by the elimination of attaching screws or bolts from the electric circuit is that numerous contacts, which their inclusion in such circuit would entail, are gotten rid of—namely, the contacts at the heads of the screws and the contacts at the nuts and also within the threads between the bolts and nuts.

The cable-head 7, cable, wire, or other conductor forming the lead to the block is attached thereto by means of a stud 8, tapped at its upper end to receive a nut 9 and provided
 5 at its other end with a preferably square shank 10, which passes through a square opening 11 in the overturned end of the plate 2. The end of a shank 10 is upset or riveted to form the head 12, whereby the stud is held rigidly
 10 upon the said plate 2. While I have shown the shank 10 square to prevent the rotation of the stud, this may be prevented just as well and more cheaply by making the shank round and upsetting it in the square hole 11 and riv-
 15 eting the end. The connecting-stud 8 passes through the overturned end of the plate 1 and preferably engages the same at that point. Preferably this contact-plate 1 is slotted, as at 13, where it so engages said stud, thereby
 20 permitting the said contact-plate to be most readily removed, since a slot will permit removing the contact-plate without removing the nut or cable-lug, cable, or other conducting-lead. It is, in fact, only necessary to
 25 loosen the nut 9 somewhat and remove the small screw 3 at the other end of the plate, when the latter may be readily removed and another put in its place. It will therefore be seen that the necessity of renewing a whole
 30 switch-block when its contact-surface becomes deteriorated is by this invention avoided, thereby effecting a considerable saving in the cost of material. Moreover, the first cost of such a block would be less than if it were made
 35 throughout of the metal of which the contact-surface is composed, since the backing may be of much less expensive material than the conducting-surface.

Making the cable connections around the
 40 outer end of the blocks in the manner shown admits of the use of an insulating-base of much smaller diameter for a given piece of apparatus than would by the usual constructions be required.

In Fig. 3 is shown a form of the invention in which the backing 2 is raised from the base 4 and supported upon an intervening block 14 of any suitable metal or other material, beyond which the plate 1 and backing 2 pass to
 50 form the extension 15. If desired, this block 14 may be simply an extension of the base 4. The contact segment or plate 1 is shown in this case as bent at its inner end and hooked around the end of the backing 2 and is provided at such end with a small slot 16, which
 55 engages a pin 17 in the backing to prevent sidewise play or slipping. In other respects this construction is the same as shown in Fig. 1. In Fig. 3, however, the cable-lug is shown
 60 replaced by a wire 18, held between the washers 19. The primary object of the form of the invention shown in Fig. 3 is to provide a construction whereby the switch-arm may

be provided with means for engaging the block both on top of the plate 1 and on the under
 65 side of the extension forming the hooked portion, thereby equalizing the strain on the shaft which carries the switch-arm. This extension of the block may or may not assist in conducting the current from the contact-blocks
 70 to the switch-arm. Hence the end of the plate 1 may be made as shown in Fig. 1, or as otherwise desired.

Other modifications of the invention herein described may be made without departing from
 75 the spirit thereof.

What I claim is—

1. In a switch-block, a supporting-plate or backing, a removable contact-plate carried thereby, and means independent of said con-
 80 tact-plate for securing the block to a support.

2. In a switch-block, a supporting-plate or backing, a removable contact-plate carried thereby, means for attaching the said contact-plate to the backing near one end of the block,
 85 and a cable connection adapted to hold the said contact-plate in position at the other end of said block.

3. In a switch-block, a supporting-plate or backing, a removable contact-plate carried by
 90 said backing and having at one end an open-end slot, a screw attaching the contact-plate to the backing at the end of said block opposite said slot, and a binding-post carried by said back-
 95 ing and engaging said slot in said contact-plate.

4. In a switch-block, a supporting-plate or backing, a removable contact-plate carried by
 100 said backing and having an open-end slot at one end thereof, said backing and contact-plate forming at the end of the block at which said slot is located an angle with the main body of the block, detachable means for attaching the said contact-plate to the backing at the
 105 end of said block opposite said slot, a binding-post carried by said backing and engaging said slot, and attaching-screws secured to the said backing independently of said contact-plate, for securing said block to a support.

5. The combination with a switch-base of
 110 the character described, of a switch-block mounted thereon, said switch-block comprising a supporting-plate or backing, a removable contact-plate carried thereby and provided at one end with an open-end slot, said
 115 backing and contact-plate forming a bend at their outer ends where they extend over the edge of the said base, a binding-post secured to the portion of the backing extending over the edge of said base and adapted to engage
 120 the said slot, and attaching-screws passing through said base and said backing.

6. The combination with a switch-base, of the character described, of a switch-block comprising a supporting-plate or backing, a
 125 removable contact-plate mounted thereon,

means for connecting said contact-plate to a
conducting-lead, a block interposed between
said backing and said base and beyond which
the said backing extends at one end thereof to
5 form a space between it and the said base, and
means for securing said switch-block to said
switch-base.

In testimony whereof I have signed my name
to this specification in the presence of two sub-
scribing witnesses.

IRVING B. SMITH.

Witnesses:

WM. O. HOWELL,
LINDA COPE SMITH.