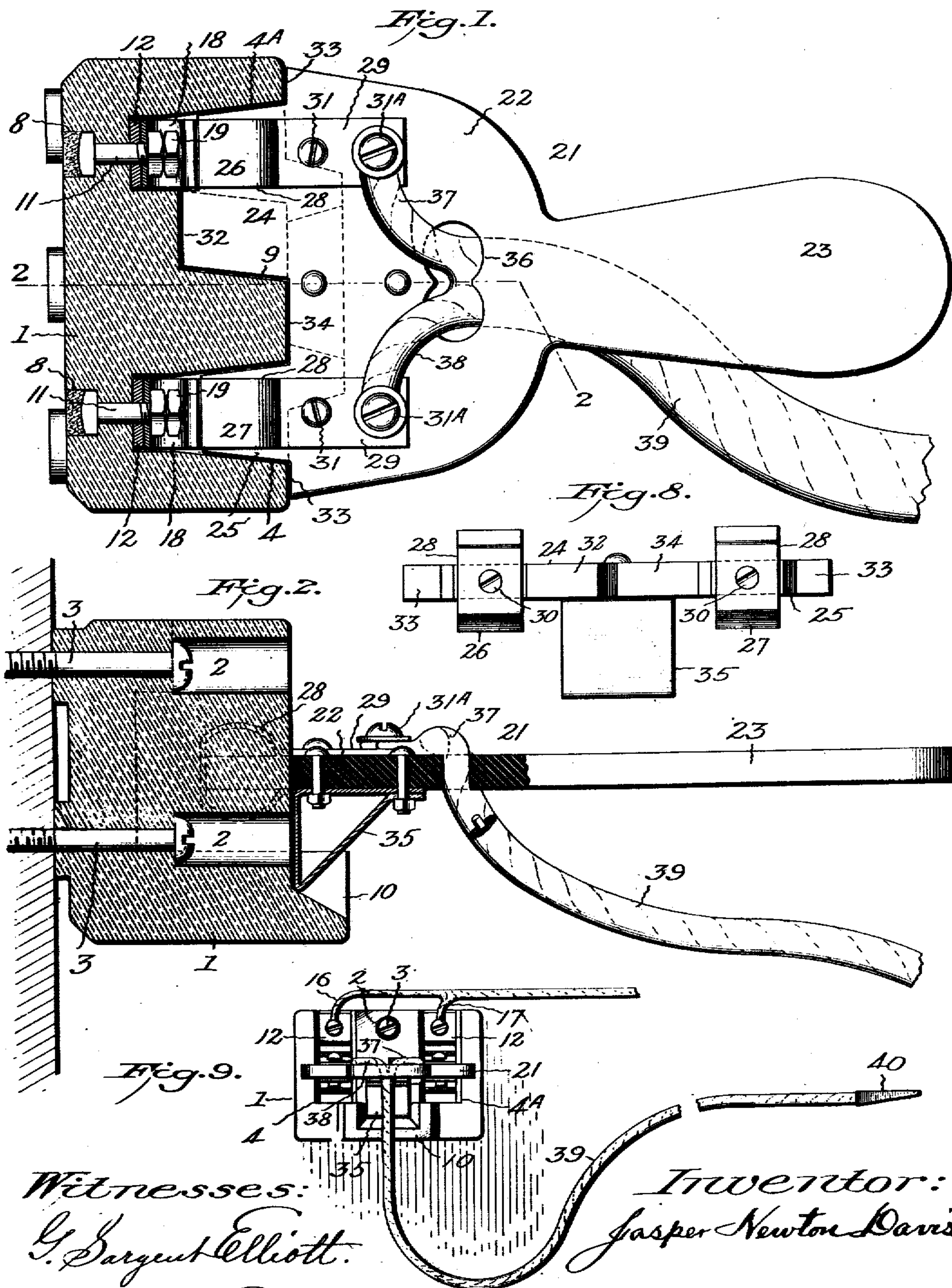


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APPLICATION FILED MAR. 9, 1908.

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Patented May 18, 1909.  
2 SHEETS—SHEET 1.



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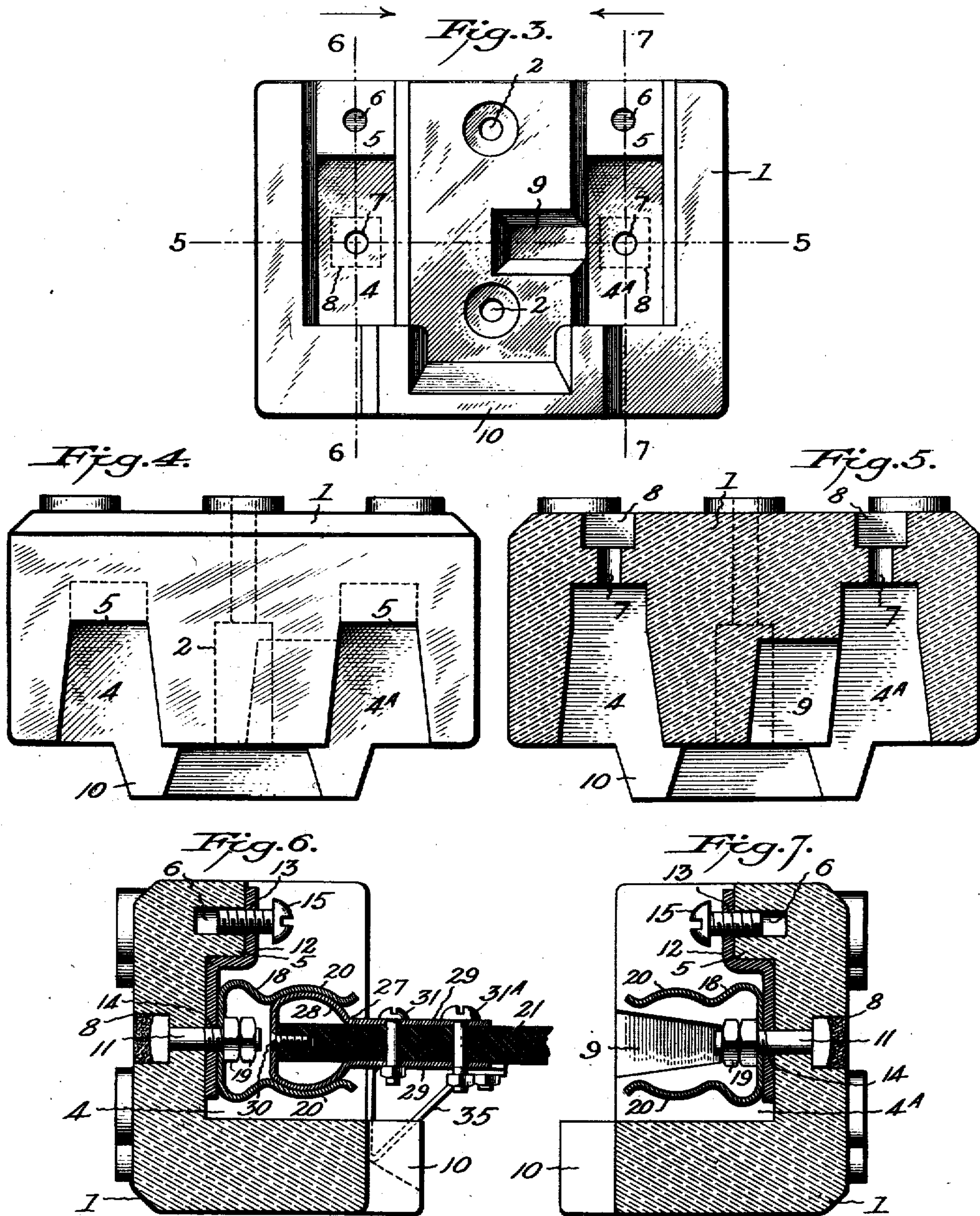
Inventor:  
Jasper Newton Davis  
By H. S. Bailey. Attorney.



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# UNITED STATES PATENT OFFICE.

JASPER NEWTON DAVIS, OF DENVER, COLORADO.

## ELECTRIC VEHICLE-CHARGING WALL-SOCKET AND PLUG.

No. 921,959.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed March 9, 1908. Serial No. 420,093.

To all whom it may concern:

Be it known that I, JASPER NEWTON DAVIS, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Electric Vehicle-Charging Wall-Socket and Plug, of which the following is a specification.

This invention relates to improvements in electric vehicle-charging wall sockets and socket plugs.

The objects of the invention are: first, to provide a device of this character for use in garages or places where automobiles are stored, comprising a suitably arranged, non-conducting block attached at a suitable position upon the wall, to which a negative and a positive current wire is attached, which connect with terminal spring clips also secured to said block; and a removable non-conducting plug having terminals which are designed to be held within the said clips, said terminals being connected with circuit wires which at their opposite ends are connected to an ordinary car plug; second, to provide a non-conducting block or socket, provided with protected spring terminal clips, connected with positive and negative circuit wires; and a removable, non-conducting socket plug, having terminals which are held by the spring clips, and which are connected with circuit wires, having a car plug at their opposite ends, said socket plug being so arranged as to prevent the possibility of its being placed in the socket in a reversed position, which would result in charging the battery in a reversed manner, or in such a manner as to permit of short circuiting the current, the socket plug being so arranged with respect to the block or socket that any accidental downward or lateral pressure or pull upon the plug or its wires would release the plug from its clips without injury to either the clips or plug, and, third, to provide a charging device for electrically operated vehicles, which is so constructed that it cannot, through mistake or carelessness, be operated to charge the batteries in the opposite direction, or so as to cause short circuiting of the current. These objects are accomplished by the device herein described, and illustrated in the accompanying drawings, in which:

Figure 1, is a central, horizontal, sectional view of the socket block, the plug being secured in operative position therein. Fig. 2,

is a vertical, sectional view of the same, on the line 2—2 of Fig. 1. Fig. 3, is a front elevation of the socket block, the plug-receiving terminal clips being removed. Fig. 4, is a top view of the said block. Fig. 5, is a horizontal, sectional view of the block on the line 5—5 of Fig. 3. Fig. 6, is a vertical, sectional view of the block on the line 6—6 of Fig. 3, showing a terminal clip and securing means, and the plug clamped within the said clip. Fig. 7, is a sectional view of the block on the line 7—7 of Fig. 3, showing a similar clip to that illustrated in Fig. 6, but omitting the plug. Fig. 8, is an end view of the plug. And Fig. 9, is a reduced front elevation of the block and its circuit wire, and of the plug in operative engagement with the terminal clips, the plug being provided with the usual circuit wires having an ordinary car plug attached to their opposite ends.

Similar characters of reference refer to similar parts throughout the several views.

Referring to the accompanying drawings, the numeral 1, designates a block of the required dimensions, which is made of suitable non-conducting material—preferably porcelain. This block is secured at a convenient position upon the wall of the garage or barn, where electrically operated vehicles are housed and charged, and in practice a plurality of them are employed, and are arranged on a line at intervals so as to permit of the charging of a number of vehicles simultaneously.

The blocks are provided with screw or bolt holes 2, which are counterbored from the outer face of the block so as to house the heads of the screws 3, by which the block is secured to the wall, and on opposite sides of these counterbored holes, and a suitable distance from them, are formed chambers or recesses 4 and 4<sup>A</sup>, the sides of which chambers are outwardly flared from a point near the bottom of the said chambers. A step 5, is formed at the upper end of each chamber, and from the steps the chambers open out through the upper edge of the block. Holes 6, are formed in the faces of the steps, which pass partially through the block, and holes 7 are formed centrally through the bottoms of the chambers 4, and 4<sup>A</sup>, which open into square recesses 8, formed in the rear side of the block. A recess 9, is formed in the block on one side of its vertical center, and in line with the holes 7 of the chambers 4 and 4<sup>A</sup>. This recess is of less depth than the cham-



bers, and its sides and one end are outwardly flared or inclined, as shown, while its outer end opens into the adjacent chamber 4<sup>A</sup>.

An outward projection or lug 10, is formed centrally at the lower end of the block, which projection is substantially U-shaped, its inner faces being preferably outwardly flared or inclined, as shown.

The blocks are manufactured in the form above described, and they are equipped for service in the following manner: Screws or bolts 11, having square heads, are passed through the holes 7, so that their heads will lie within the square recesses 8, whereby the screws are prevented from turning, and the recesses 8 are then filled with a suitable cement, which will protect the heads of the bolts against contact. Metal plates 12, bent to conform to the bottoms of the chambers 4 and 4<sup>A</sup>, and steps 5, are placed in the said chambers, the strips being provided with holes 13 and 14, which register respectively with the holes 6 and 7 of the block. The holes 14, are smooth, and through them pass the bolts 11, while the holes 13 are threaded, and receive binding screws 15, which extend loosely into the holes 6, and secure positive and negative current wires 16 and 17 respectively, in contact with the step portion of the plates 12. Spring clips 18, are then secured upon the bolts 11, by check nuts 19, and these clips, as illustrated in Figs. 6 and 7, comprise flat base portions having apertures through which the screws 11 pass, and forwardly extending spring arms formed with outward segmental curves 20, which are oppositely disposed with respect to each other, the curved surfaces thus formed being adapted to clamp the terminals of a plug 21, to be presently described. The extremities of these curved arms are outwardly flared, as shown, to enable the plug to be more readily inserted. The block thus equipped is secured to the wall, as illustrated in Fig. 2, and is ready for use.

The plug 21, is made of non-conducting material, preferably fiber, and is of the form shown in Fig. 1, comprising a body portion 22, from the rear of which extends a handle 23. Upon one corner of the forward edge of the body portion is formed a wedge shaped projection 24, which is adapted to lie partly within the recess 9, and partly within the adjoining chamber 4<sup>A</sup>, and upon the opposite corner is formed a narrower wedge shaped projection 25, which is adapted to lie within the chamber 4, and upon these projections are secured terminal contacts 26 and 27 respectively, comprising substantially circular band portions 28, which are flattened on their forward ends, and arms 29, which form continuations of the band portions. The band portions inclose the projections 24 and 25, and are secured thereto by screws 30, which extend through the flattened ends of

the bands and into the forward ends of the projections 24 and 25, while the arms 29 straddle the body portion and are secured thereto by bolts 31 and 31<sup>A</sup>. The contact 26, is secured to that part of the projection 24, which is adapted to extend into the chamber 4<sup>A</sup>, and these contacts are of the same width as the spring clips 18. The portion of the projection 24, which is adapted to extend into the recess 9, extends slightly beyond the forward end of the contact 26, as shown at 32, for a purpose to be hereinafter explained, and shoulders 33 and 34 on the forward edge of the body, prevent the plug 21 from being pushed into the block beyond a predetermined point. When the plug is inserted in the block, the contacts 26 and 27, enter the spring terminal clips 18, and are clamped therein, and the plug is maintained in a horizontal position by a triangular bracket 35, which is secured to the under side of the plug by bolts in such position that one of the points of the triangle will rest against the inclined horizontal edge of the U-shaped lug 10, at the point where it joins the face of the block. Should the plug be accidentally struck or trodden upon, the bracket 35 will act as a fulcrum, whereby the plug will be disconnected from the clips without injury to them or it. The flattened ends of the terminal bands 26 and 27, will leave sufficient space between the said bands and the ends of the clip-securing bolts 11, to permit of a securing nut and a lock nut for securing the clip; and when it is necessary to put in a new clip, it can be done without removing the clip from the wall by removing the two nuts.

An aperture 36, is formed through the body of the plug 21, and circuit wires 37 and 38 are clamped to the arms of the contacts 26 and 27, by bolts 31<sup>A</sup>. These wires pass down through the aperture 36, after which, for convenience, they are inclosed in a single wrapping 39, and are of any desired length, and upon their opposite ends is secured a metallic plug 40, which is termed the car plug, and which is adapted to connect with the battery of a vehicle, when inserted in an aperture in the side of the battery casing, as will be understood.

With the device constructed as herein described, it is impossible to insert the plug in the socket in a reversed position, or cause the terminals 26 and 27 to touch the terminal clips 18, when the plug is in a reverse position, as the projection 24 is so much wider than the projection 25 that it cannot be inserted in the chamber 4, and moreover, the extended end 32 of the projection 24, will first contact with the face of the block, and prevent contact of the plug terminals with the terminal clips, the said clips being entirely within the chambers 4 and 4<sup>A</sup>, their forwardly extending arms being shorter than the depth of the said chambers.



In operation the blocks, which are all of one design, are secured along the wall at a convenient distance above the floor, and are each connected with a source of electric power through the wires 16 and 17, which are attached to the plates 12 by the binding screws 15. The circuit wires, with the socket plug at one end and the car plug at the other end, when not in use, are hung upon the wall, and as each make of car has its own design of car plug, it is only necessary to select a plug of a design to fit the particular make of car to be charged, and as all the wall sockets and socket plugs are of one design, the socket plug at the opposite end of the wires will fit into any one of the sockets. The vehicle to be charged is stationed at a convenient position relatively to one of the blocks, and the car plug 40, on one end of the wires secured to the socket plug 21, is placed in the socket of the vehicle, communicating with the batteries, and the plug is inserted in the block. The current is then turned on and flows to the batteries, the positive wire in the charging current being connected to the positive terminal of the battery, through the wall socket, and the negative wire of the charging current being connected to the negative terminal of the battery, and thus the batteries are charged. If, however, the socket plug were so constructed that through carelessness, it should be inserted in the socket in a reverse position, the positive terminal of the charging current would be connected to the negative terminal of the battery, and the negative terminal of the charging current would be connected to the positive terminal of the battery, which would result in charging the battery in the reversed direction, thereby injuring the said battery. My improved socket block and plug prevents the occurrence of mistakes of this kind, and the construction of the block enables the plug to be easily inserted and withdrawn, while the bracket 35 on the plug acts to release the plug from the block, should the plug be accidentally struck, or the plug wires trodden upon, without injury to the plug or the terminal clips.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a battery charging device as specified, a non-conducting block having chambers in its front face with inclined sides; terminal spring clips secured in said chambers, and connected by circuit wires with a source of power; a non-conducting plug having wedge shaped projections which fit into said chambers, one of which projections is wider than the other; terminals secured upon said projections which are engaged by the spring clips, circuit wires connected to the terminals, and means for supporting said non-conducting plug in a horizontal position.

2. In a battery charging device as specified, the combination with a non-conducting block, having chambers in its front face with inclined sides and a wedge shaped recess forming a continuation of one of said chambers; spring terminal clips secured in said chambers, and circuit wires connected with said clips and with a source of power; of a non-conducting plug having wedge shaped projections of unequal width, the wider of which projections is designed to lie within one of the chambers, and the adjacent wedge shaped recess; terminals on said projections adapted to be engaged by the spring clips; circuit wires connected with the terminals, and means for supporting the non-conducting plug in a horizontal position.

3. In a battery charging device as specified, the combination with a non-conducting block having chambers in its front face, and a wedge shaped recess opening into one of the chambers; spring terminal clips secured in the chambers; circuit wires connected with the terminal clips and with a source of power; and an abutment on the lower end of the block; of a non-conducting plug having projections which are adapted to extend into the chamber, one of which projections is wider than the other and extends into the adjoining recess; circular terminal bands on said projections which are adapted to be engaged by the spring clips; circuit wires connected to the terminals, and a bracket on the under side of the non-conducting plug which engages the said abutment.

4. In a battery charging device as specified, the combination with a non-conducting block having chambers in its face, which open out through the upper end of the block, and a recess leading into one of said chambers; plates in said chambers; spring terminal clips on said plates and bolts for securing said plates and clips to the block; binding screws in the plates and circuit wires connecting with a source of power, and with said binding screws; of a non-conducting plug having projections of unequal width which are adapted to extend into the chambers of the block, the wider of said projections extending into the adjoining recess; terminals in the form of circular bands, which straddle said projections and are adapted to be clamped within the clips, the portion of the wider projection which extends into the recess being extended to project beyond the end of the adjacent plug terminal; shoulders on the plug which prevent it from being inserted in the block beyond a predetermined point; circuit wires connected with the plug terminals, which extend down through an aperture in said plug, an abutment on the lower end of the block, and a bracket on the under side of the plug, adapted to rest upon said abutment.

5. In a battery charging device as speci-



fied, the combination with a fixed non-conducting block; terminal spring clips secured in chambers of unequal width in said blocks, and circuit wires connected with said terminals and with a source of power, of a non-conducting plug having terminals adapted to be engaged by said clips, said plug being provided with projections of unequal width which are adapted to enter the said chambers and prevent the insertion of the plug in the block in a reversed position; circuit

wires connected to the plug terminals, an abutment on the lower end of the block; and a bracket on the plug adapted to rest upon the abutment.

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

JASPER NEWTON DAVIS.

Witnesses:

G. SARGENT ELLIOTT,  
ADELLA M. FOWLE.