Nov. 11, 1924. 1,514,905

W. F. HESSEL

SWITCH CONSTRUCTION

Filed Feb. 15, 1919

Fig. 1.

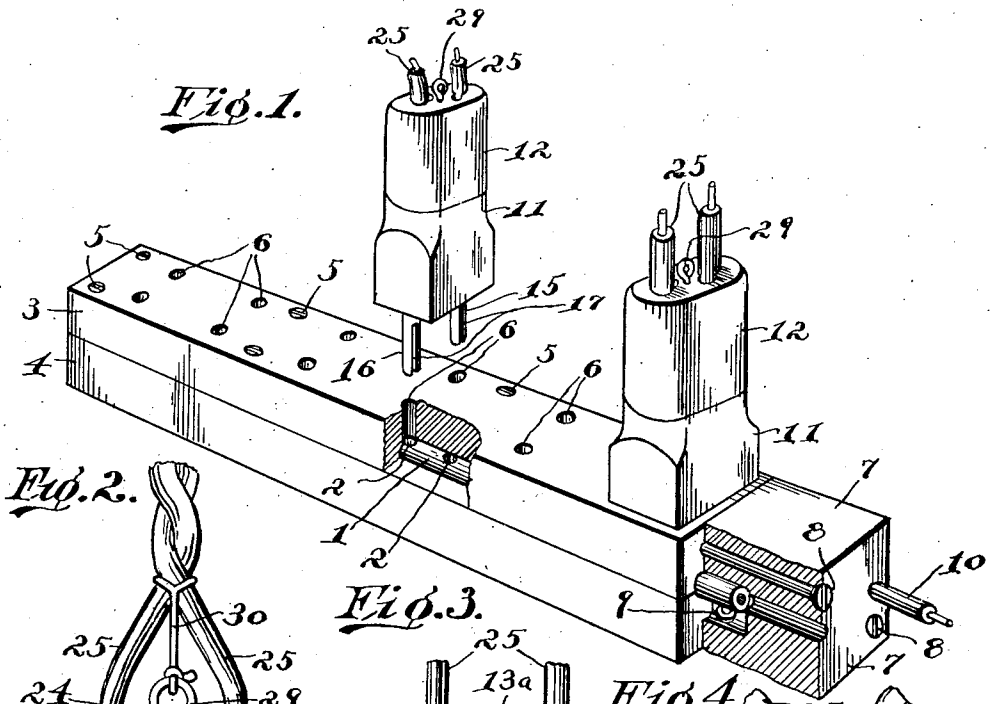



Fig. 2.

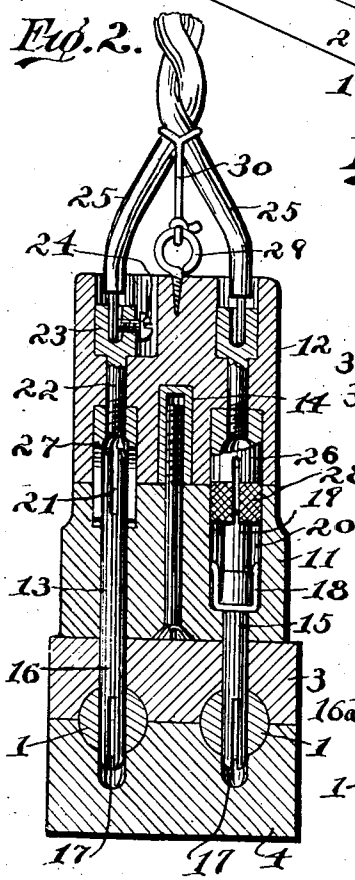



Fig. 3.

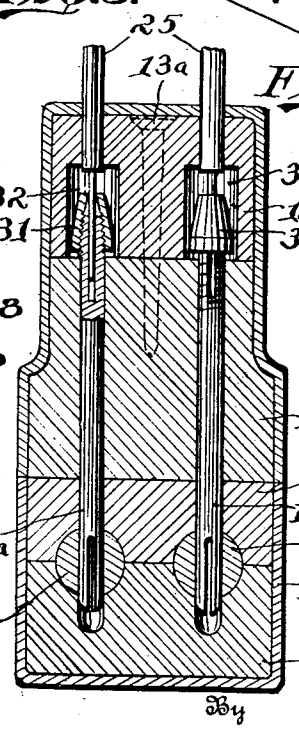
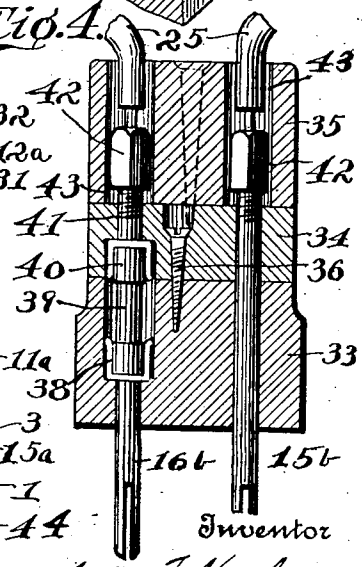



Fig. 4.




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# UNITED STATES PATENT OFFICE.

WILLIAM F. HESSEL, OF NEW YORK, N. Y.

## SWITCH CONSTRUCTION.

Application filed February 15, 1919. Serial No. 277,144.

*To all whom it may concern:*

Be it known that I, WILLIAM F. HESSEL, a citizen of the United States, residing in the county, city, and State of New York, have invented certain new and useful Improvements in Switch Constructions, of which the following is a specification.

The present invention relates to a multiple tap switch device, and has for its object to provide a device of this character which embodies novel features of construction whereby a large number of branch circuits can be connected to the main feed wires in a convenient, safe and expeditious manner.

The subject-matter of this application relates more particularly to the construction of the multiple attachment plug, and further objects of the invention are to provide a device of this character in which all of the conducting members are effectively housed and insulated so that the device can be handled and manipulated with perfect safety, which provides a substantial and convenient means for connecting the wires to the plug, and which has a strong and rugged construction so that it can be utilized to advantage in connection with portable multiple tap devices which are now extensively used in the shipbuilding industry and manufacturing plants, and which must necessarily be able to withstand a large amount of rough handling.

This application is in part a continuation of a prior application for an electrical switch device, Serial No. 185,026, which was filed by me on August 8, 1917, and which culminated March 11, 1919, in Patent No. 1,296,801, the construction of the multiple tap base being claimed in the prior application, while the purpose of the present application is to protect the construction of the multiple attachment plug.

In the accompanying drawings, I have illustrated by way of example certain preferred embodiments of the principles of my invention, in which:—

Figure 1 is a perspective view of a portable multiple tap switch device constructed in accordance with the inventions, portions being broken away to show the interior of the base, and one plug being shown as applied to the base, while a second plug is shown detached therefrom.

Figure 2 is a sectional view through one of the plugs.

Figure 3 is a similar view showing a modification and also showing a sheet metal protective housing as applied to the base and plug.

Figure 4 is a sectional view through a further modified construction of the plug.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The multiple tap base includes a pair of parallel bus bars 1 which are provided at corresponding intervals throughout their length with transverse openings 2, said bus bars being housed within an elongated insulating body which is divided longitudinally into two complemental sections 3 and 4. An insulating block or base may be formed of any suitable insulating material such as hard rubber, substitute composition, or wood. Of the latter material I have found maple to be highly suitable for the purpose. The sections 3 and 4 of the base block are grooved to receive the bus bars in such a manner as to entirely surround and insulate the same, and the sections are fastened together by suitable fastening members such as the screws 5. The upper section 3 of the base block is formed with vertical openings 6 which extend downwardly to the openings 2 of the bus bars and are in alinement therewith. An end block 7 is secured by fastening members such as the screws 8 to one end of the base block, the inner face of the end block being recessed to receive the extremities of the bus bars 1 which are shown as bored longitudinally and provided with screws 9 for attaching the main circuit wires 10 thereto, said wires extending through openings in the end block. The insulating end block 7 and sections 3 and 4 of the base block provide a portable insulating base which is substantially rectangular in formation and has a flat lower face which will hold the base in an upright position at all times. The conducting members are effectively housed and insulated at all points, so that it is practically impossible for an exterior object to be brought into contact therewith, and the base has a rugged and substantial construction which will enable it to withstand rough handling. The device is thus well adapted for use in shipyards and manufacturing plants where a portable device of this character which is safe and substan-

tially foolproof in its construction and will withstand a large amount of rough handling is desired.

The detachable plug which is illustrated by Figures 1 and 2 includes an elongated insulating body which is divided transversely into a lower section 11 and an upper section 12, the two sections being normally fastened together by means of a fastening member such as a screw 13 which extends upwardly through the lower section 11 and engages a threaded socket 14 in the upper section 12. The members 11 and 12 may be formed of any tough insulating material, such as that utilized in the construction of the base, and a pair of parallel conducting rods 15 and 16 extend through the lower section 11 of the plug, being firmly anchored in position therein. The lower ends of these rods extend below the base of the plug and are split at 17, thereby providing spaced split arms which are adapted to be inserted into any selected pair of openings 6 of the base and brought into engagement with the corresponding openings 2 of the bus bars 1. The rod 15 is comparatively short and terminates at its upper end in a clip 18 adapted for engagement with one end of an ordinary cartridge fuse 19. This fuse is housed within a recess 20 which opens through the open end of the lower plug section 11, and the upper end of the fuse 19 extends slightly above the upper end of the plug section 11. The other conducting rod 16 extends upwardly through the lower plug section 11, extending slightly beyond the same, and being split at 21.

The upper plug section 12 is formed with longitudinal openings receiving stems 22 which project downwardly from wire engaging sockets 23, said sockets being housed within recesses formed in the upper end of the plug, and being provided with clamping screws 24 for engagement with the branch circuit wires 25. The lower ends of the stems 22 are threaded and engage respectively the socket members 26 and 27. The ends of these sockets project slightly beyond the lower end of the upper plug section 12 and are exteriorly roughened at 28 so that they can be firmly grasped for screwing them into or out of engagement with the threaded ends of the conductor stems 22. When these sockets are screwed into engagement with the conductor stems, it will be obvious that they will cooperate with the upper sockets 23 to clamp the stems 22 in position and thereby lock the upper sockets 23 firmly in the recessed upper end of the insulating plug. Tension on the branch wires will thus not be able to pull the upper sockets 23 away from the insulation, and the said sockets will remain at all times housed within and protected by the insulation so that it is not possible for them to be brought into contact with exterior objects. The lower sockets 26 and 27 are both split and of resilient formation, and the large socket 26 is adapted to engage the upper end of the fuse 19 and the small socket 27 to engage the upper end of the conducting rod 16 when the two sections of the plug are fastened together in operative position. When the parts are thus assembled all of the metal conducting portions are completely housed within the insulating body so that there is no danger of accident, although the split conducting arms projecting from the lower end of the plug can be readily inserted into any selected pair of the openings of the multiple tap base. If desired, the end of the plug may be provided with an eye 29 to which the branch wires can be connected by a cord 30, thereby relieving the strain upon the parts of the plug when there is a pull exerted upon the plug by tension in the wires.

A modification is shown by Figure 3, in which the two sections $11^a$ and $12^a$ of the plug body are secured together by a screw $13^a$ which passes downwardly through the top of the upper section $12^a$. The two conducting rods $15^a$ and $16^a$ extend entirely through the lower section $11^a$, the upper ends thereof being recessed and split to receive the ends of the wires 25. These split upper ends of the rods $15^a$ and $16^a$ are tapered and exteriorly threaded to receive tapered clamping sleeves 31 which are screwed thereon. By removing the screw $13^a$ the upper plug section $12^a$ can be moved rearwardly upon the wires 25 so that access can be obtained to the clamping sleeves 31 for tightening or loosening the same. These clamping sleeves enable the ends of the wires to be securely fastened within the ends of the conducting rods $15^a$ and $16^a$, and when the two sections of the plug are assembled the clamping screws are entirely housed within recessed portions 32 of the plug section $12^a$.

A further modification is shown by Figure 4, in which the plug body is divided transversely into three superposed sections 33, 34 and 35, the intermediate section 34 being secured to the lower section 33 by a screw 36, while the upper section 35 is in turn secured to the intermediate section 34 by means of a screw 37. Conducting rods $15^b$ and $16^b$ extend through the lower section 33, both of the rods projecting downwardly below the lower section to provide the necessary arms for engagement with the multiple tap base, while the long arm $15^b$ also extends through the intermediate section 34, projecting beyond the same into the upper section 35. The short rod $16^b$ terminates in a clip 38 adapted to engage the lower end of a fuse cartridge 39, the upper end of the cartridge being engaged by a clip 40 at the lower end of a stem 41 which extends through

the intermediate plug section 34. Clamping nuts or sleeves 42 are threaded upon the upper ends of the stem 41 and rod 15[b] for the purpose of connecting the circuit wires 25 thereto, said clamping nuts 42 being entirely housed within recesses or openings 43 in the upper plug section 35, so that there are no uninsulated metal portions exposed when the plug is assembled and operatively applied to the multiple tap base.

In order to increase the ruggedness of the device the parts may be enclosed within a sheet metal housing 44, as indicated by Figure 3. Such a sheet metal covering would enable the device to withstand greater accidental abuse and would be particularly desirable when insulation of brittle or easily destructible material is used.

While I have illustrated in the accompanying drawings preferred embodiments of the principles of my invention I have done so in an illustrative rather than definite sense, and I therefore desire to cover by the appended claims those principles in whatever form they may find embodiment.

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

1. A switch plug including an insulating body divided transversely into complemental sections which abut against each other, means for detachably fastening the sections together, a conductor rod extending through one section and projecting from the end thereof to provide an arm for engaging a base, a corresponding stem extending through the other section and having an enlarged wire engaging socket at the outer end thereof, and a slip joint connection between the rod and the stem, said slip joint including an inner socket threaded to the stem and cooperating therewith to anchor the outer wire engaging socket upon the plug section, said socket being provided with a roughened surface extending beyond said other section so as to be readily accessible when said sections are separated.

2. A switch plug including an insulating body which is divided transversely into complemental sections which abut end to end against each other, means interior to the said sections for detachably securing the same together, a conductor rod extending through one section and projecting from the outer end thereof to provide an arm for engaging a base, a corresponding stem extending through the other section of the body and provided at its outer end with a wire engaging socket, and an inner split socket detachably associated with the inner end of the stem and cooperating therewith to engage the said other section and anchor the outer wire engaging socket in position upon the said section of the body, said inner split socket having a slip joint connection with the rod.

3. A switch plug including an insulating body which is divided longitudinally into complemental sections, said sections abutting end to end against each other and being interiorly recessed to receive a fuse which is accessible when the sections are separated, means for detachably fastening the sections together, a pair of conductor rods interior to one of the sections and projecting beyond the end thereof to provide arms for attachment to a base, a pair of corresponding stems extending through the other section of the body and provided at their outer ends with wire attaching means, and means for establishing electrical connection between the corresponding rods and the stems and including the fuse in the circuit.

4. A switch plug including an insulating body divided transversely into separable sections, a pair of longitudinal conductor rods extending through one section and projecting from the end thereof to provide spaced arms adapted to engage a base, one of the rods also projecting from the other end of the section while the other rod terminates within the section in fuse engaging means, stems corresp nding to the conductor rods and extending through the other section of the body, the outer ends of the stems being provided with wire attaching means, and sockets detachably applied to the inner ends of the stems and embedded in the section, one of the sockets being adapted to engage the projecting end of the conductor body while the other socket is adapted to engage the other end of the fuse when the two sections are assembled.

5. A switch plug including an insulating body divided transversely into sections, a pair of conductor rods extending longitudinally through one of the sections and projecting from the free end thereof to provide spaced arms for engagement with a base, one of the rods also projecting from the other end of the section while the other rod terminates within the section in a fuse engaging clip, stems corresponding to the rods and extending through the other section of the body, wire engaging sockets at the outer ends of the stems, and inner sockets detachably applied to the inner ends of the stems and serving to hold the wire engaging sockets in position, one of the inner sockets being adapted to engage the projecting end of the conductor rod while the other inner socket is adapted to engage the fuse when the sections are assembled.

WILLIAM F. HESSEL.