TERMINAL JAWS FOR PLUG-IN METER SOCKET AND THE LIKE

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Inventor
Ernest G. Johansson
by Robert Cushman Jacks
attys.
This invention relates to interengageable electric terminal parts and more especially to a female socket of the type shown in my pending application Serial No. 164,788, filed May 27, 1950, wherein the socket comprises a pair of oppositely disposed yieldable jaws adapted to receive between them a male blade. As there pointed out installations which are to carry high current make it necessary to employ terminal jaws of large cross-sections to afford the necessary current-carrying capacity and dissipation of heat. Jaws of such large cross-sections are stiff and do not yield readily, offering a considerable amount of resistance to reception of the male blade, and yet if the jaws are made of less stiff substance they become permanently distorted in use and poor in performance.

The principal object of this invention is to provide female terminal jaws in which ease of engaging the male blade therewith is afforded without sacrifice in current-carrying capacity, strength, durability and good contact and in which rigidity of the jaws is insured after the male blade has entered therebetween.

The foregoing is attained without loss of any of the advantages referred to in the aforesaid application by provision of a pair of opposed jaw members, one of which is backed by a rigid support engaging the same from which the blade derives rigidity against deflection away from the other and the other of which is flexible with a portion thereof yieldably held against the first blade by its inherent resilience. The yieldable jaw has a convex portion substantially contacting the fixed jaw at its most convex point and a diverging portion at its upper extremity forming, with the extremity of the fixed jaw which is bent outwardly, parting lips into which the male blade may be thrust easily. Associated with the yieldable jaw is a rigid abutment located externally thereof opposite the portions of the jaws having closest proximity, which limits separation of the separate jaws to a predetermined amount, so that when the flexible jaw is separated from the fixed jaw by the presence of the male element interposed therebetween it receives and derives rigidity at the extremity of its separation from the abutment.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is an isometric view of the female terminal jaws of a socket terminal together with a bus-bar and cable-terminal post shown mounted on a fragmentary portion of the meter socket;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 3;

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2 showing the jaw members substantially in contact; and

Fig. 4 is a view corresponding to Fig. 3 showing the jaws separated by entrance of the male blade between the jaws of the female terminal.

Referring to the figures, there is shown part of a block 10 forming part of a meter socket such as shown in the aforesaid copending application, with the improved female terminal jaws 16 and a terminal post 18 mounted on spaced horizontal shoulders 12 and 14 formed at the top of the block. The jaws 16 consist of opposed jaw elements 20 and 22. One of the jaw elements 20 (Figs. 1, 3 and 4) has a straight vertical leg 24 and a right angular foot 28 and is comprised of comparatively heavy flat copper bar stock. The opposed jaw element 22 has an upstanding curved leg 30 and a right angular foot 32 and is comprised of bar stock of about half the weight of the jaw 20. The curved leg 30 is inwardly concave and the two elements 20 and 22 are mounted on the shoulder 14 with the foot 32 subjacent to the foot 28. A substantially T-shaped bus-bar 34 placed on the block with one leg 36 between the jaws above the foot 28 so that a portion thereof projects beyond the vertical face of the block 10 and the other leg 35 overlies the shoulder 12. A screw 38 is inserted through a vertically aligned hole 40 in the block which is countersunk at 42 to receive its head and is threaded into and through the feet 28 and 32 and the leg 36 of the bus-bar, which have vertically aligned threaded openings for receiving the screw, thereby to clamp the jaws and bus-bar rigidly in place.

The block 10 is adapted to carry a plurality of sets of jaws 16 and terminal posts 18 which are separated from each other by partition walls 29, each wall being formed as a part of the block or a part suitably attached thereto. The wall 29 is shown in Fig. 1 as rising substantially vertically from the shoulders 12 and 14 with one side substantially parallel to the jaw 20 and affords support for the jaw, thereby limiting its deviation from the vertical upon the application of pressure thereto, for example when a male blade is inserted between the jaws. As shown in Fig. 3 a slight clearance c is left between the wall and the jaw, near the upper extremity of the jaw by slightly tapering the wall at its top, this having the effect of allowing the jaw at its upper end to yield slightly thereby to soften the pressure required to introduce a male blade between the jaws at its initial entrance therebetween. The extremity of the jaw 20 is also rolled outwardly slightly to provide an entrance lip for the same purpose.

The curved jaw member 22 is inwardly concave, being in contact or substantially in contact with the jaw 20 along a line of tangency near the top of the jaw, converging toward the jaw 26 from its lower end to the line of tangency and then diverging from the line of tangency to its upper extremity so as to form with the rolled extremity of the jaw 20 parted lips between which the male blade has easy entrance.

The jaw 22 being comprised of a thinner metal will yield more readily than the jaw 20 thus permitting easier entrance between the jaws than if they were of equal thickness. It is desirable however to limit the separation of the jaws to a predetermined amount beyond which the jaw 22 cannot yield appreciably thereby to insure firm contact after the male blade is introduced between the jaws. To this end the jaw 23 is provided with an aperture 50 in its curved portion through which the upper portion of the screw 38 passes, the latter being spaced at a predetermined distance from the wall 29 and substantially parallel thereto. The screw is so located that when the male blade is forced between the female jaw members the jaw member 22 will come up against the terminal end of the screw. Until the jaw member contacts the screw it flexes mostly at its lower end as a long lever arm but when it engages the relatively rigid screw its further flexure is confined to its upper end as a relatively short lever arm. In this latter flexing stage as a short lever arm, the radius of curvature of the upper end of jaw
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3 decreases and the line of contact between the jaw and blade shifts downwardly.

The heavier jaw 20 is preferably made of copper for good heat and current conductivity and the lighter jaw 22 is preferably made of bronze for good resilience.

The terminal post 18 for connecting a cable to the jaws rests on and is fastened to the shoulder 12 of the block. It consists of a U-shaped member 56 having a hole 58 in its bottom and aligned slots 60 near the upper ends of its legs. The leg 35 of the bus-bar is seated on the bottom of the member 56 between its legs and a screw 62 extends upwardly through the block and is threaded into registered holes in the post and bus-bar so as to secure them to the block. The lower end of the screw hole is countersunk at 64 to receive the head of the screw.

A bar 66 is placed across the legs of the post in the slots 60 and has in it a threaded hole for reception of a large terminal screw 68.

From the foregoing it will be evident that the meter blade may be started into the jaws easily because jaw 22 flexes easily until it engages screw 38 and by that time the blade is well started into the space between the jaws.

After the blade is fully inserted it is held tightly between the jaws with firm contact with the heavy jaw 24 throughout the length of the jaw because of the additional flexing of the upper end of the jaw after it engages the screw 38.

The utilization of the end of terminal post 38 as an abutment simplifies the construction and reduces the cost of production.

When the jaw 20 is relatively heavy, it does not engage abutment 29 except under abnormal conditions, as for example in the case of an abnormally thick blade or inaccuracy in construction.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A socket for receiving a contact element in the form of a blade comprising a pair of opposed jaw members, one of which is substantially straight and the other of which is curved, a supporting block having a wall, a screw fastening the jaws to the block in opposed relation with the straight jaw abutting the wall and the curved jaw in tangential contact with the straight jaw, a portion of said screw rising from the block at the lower ends of the jaws upwardly between them, spaced from and parallel to the straight jaw, and the curved jaw having a hole through it which passes the upper portion of the screw to a point externally of the curved jaw, said screw forming an abutment with which the curved jaw is forced into contact by separation of the jaws to limit separation to a predetermined amount.

2. A blade socket comprising a pair of opposed jaws having rear and forward ends, said pair including a movable jaw and a relatively immovable jaw, said movable jaw being curved lengthwise to said rigid jaw and being flexible away from the immovable jaw, the jaws being juxtaposed intermediate their ends and said movable jaw diverging from said immovable jaw toward both of said ends, a support for said rear ends and said forward ends being free to receive a blade therebetween, and a stop extending through the support from the rear, thence between the two jaws and thence through an opening in said movable jaw to a position behind the concave side of the movable jaw.

3. A blade socket comprising a pair of opposed jaws having rear and forward ends, said pair including a movable jaw and a relatively immovable jaw, said movable jaw being curved lengthwise with its convex side facing said immovable jaw and being flexible away from the immovable jaw, said jaws being juxtaposed intermediate their ends and said movable jaw diverging from said immovable jaw toward both of said ends, a support for said rear ends and said forward ends being free to receive a blade therebetween, the jaws having base means extending along said support between the jaws, and a stop extending through the support from the rear, thence through said base means, thence between the two jaws and thence through an opening in said movable jaw to a position behind the concave side of the movable jaw.

4. A blade socket comprising a pair of opposed jaws having rear and forward ends, said pair including a movable jaw and a relatively immovable jaw, said movable jaw being curved lengthwise with its convex side facing said immovable jaw and being flexible away from the immovable jaw, the jaws being juxtaposed intermediate their ends and said movable jaw diverging from said immovable jaw toward both ends, a support for said rear ends and said forward ends being free to receive a blade therebetween, the jaws having base means extending along said support between the jaws, and a screw for securing the base means to said support, the screw extending through the support from the rear, thence through said base means, thence between the two jaws and thence through an opening in said movable jaw to a position behind the concave side of the movable jaw.

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