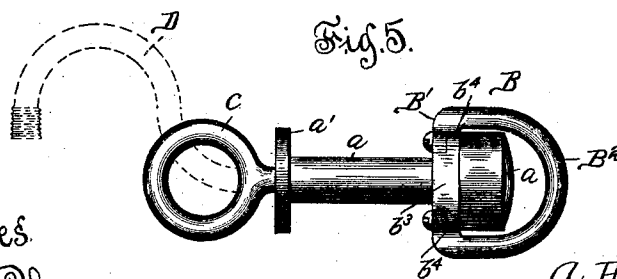
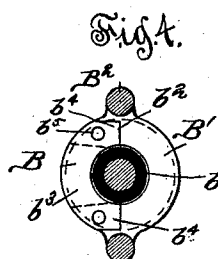
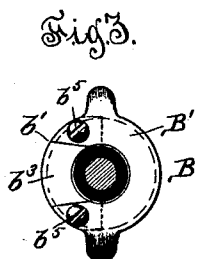
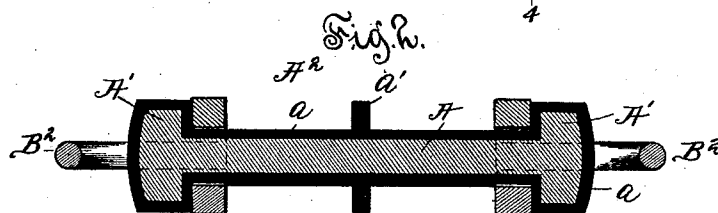
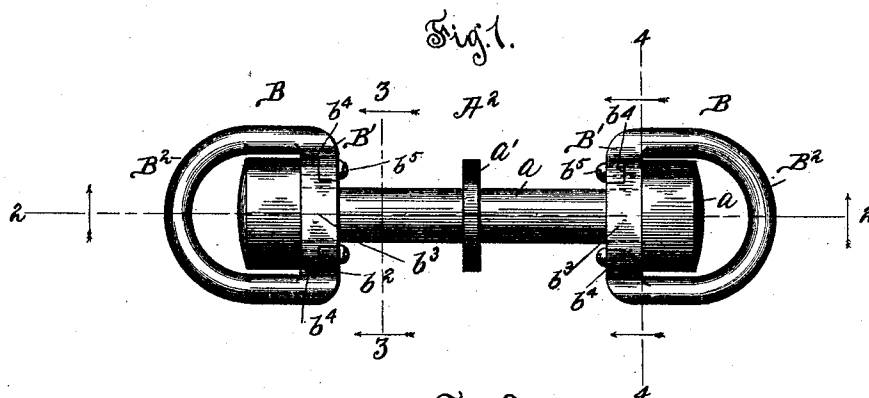


(No Model.)

A. H. ENGLUND.
INSULATING SWIVEL.

No. 468,053.

Patented Feb. 2, 1892.



Witnesses.
 Wm. M. Rhea.
 Louis M. F. Whitehead.

Inventor.
A. Helmer-Englund.

By Haytine Poole & Brown.
His Attorneys.

UNITED STATES PATENT OFFICE.

AXEL HELMER ENGLUND, OF CHICAGO, ILLINOIS.

INSULATING-SWIVEL.

SPECIFICATION forming part of Letters Patent No. 468,053, dated February 2, 1892.

Application filed October 12, 1891. Serial No. 408,463. (No model.)

To all whom it may concern:

Be it known that I, AXEL HELMER ENGLUND, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Insulating-Swivels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to insulating-swivels for supporting trolley line-wires and other conductors subject to severe mechanical strains.

The chief objects of my present invention are, first, to give to the device great strength to resist longitudinal strains; second, to facilitate the assembling of the parts and reduce the cost of manufacture, and, third, to obtain a better and more efficient insulation.

To these and other ends my invention consists in certain novel features which I will now proceed to describe, and will then particularly point out in the appended claims.

In the accompanying drawings, Figure 1 is an elevation of a double swivel embodying my invention in one form. Fig. 2 is a central longitudinal sectional view of the same, taken on the line 2 2 of Fig. 1 and looking in the direction of the arrows. Fig. 3 is a transverse sectional view taken on the line 3 3 of Fig. 1 and looking in the direction of the arrows. Fig. 4 is a transverse sectional view taken on the line 4 4 of Fig. 1 and looking in the direction of the arrows. Fig. 5 is an elevation of a single swivel embodying my invention, a modified form thereof being indicated in dotted lines.

In the said drawings, referring now more particularly to the construction shown in Figs. 1, 2, 3, and 4, A represents a cylindrical core or body, of iron or the like, provided at its ends with integral heads A' of much larger diameter than the body. This body, together with its heads, is entirely enveloped by a covering *a* of insulating material, preferably rubber molded and vulcanized on the core, although any suitable insulating material or compound may be employed for this purpose. About midway between the heads this covering is provided with an annular rib or flange *a'*, of insulating material, preferably integral with the covering *a*. It will be observed that the insulating-covering is of equal thickness

throughout, so that the general form of the bolt A², considered as an entirety and comprising the core, consisting of the body A and heads H' and the insulating-covering, is of the desired external conformation. B B are shackles, of iron or the like, mounted on the bolt A², one at each end thereof and each consisting of a strain-collar B' and a link portion B², arranged at a right angle thereto. The collar portion B' has an aperture *b* of sufficient size to receive the body A of the bolt A² and its insulation and permit the shackle to turn freely thereon. It will be noted that the metal heads A' of the bolt overlap or extend over the strain-collars for a considerable distance, and, in fact, for almost their entire width, for the purpose hereinafter set forth. The strain-collar B is slotted or cut away radially from its aperture *b* to its periphery, as shown at *b'*, the slot being of a width equal to or slightly greater than the diameter of the bolt A², so that the said collar may be readily slipped over the said bolt in order to place it on or remove it from the same. The inner face of the collar B is rabbeted or cut away, as shown at *b²*, and a removable section *b³*, fitting the slot or cut-away portion *b'*, is provided with lateral lugs or flanges *b⁴*, which fit the rabbets *b²*. This removable section thus completes and is flush with the surfaces of the collar B', and is secured in place, after the collar has been applied to the bolt, by means of screws *b⁵*, or in any other suitable manner. The screws are shown as passing loosely through the outer face of the disk and into the threaded holes in the lugs or flanges *b⁴*.

Heretofore in devices of this character it has been usual to construct the strain-collar of the shackle with an aperture of sufficient size to allow it to pass over the head A' of the bolt A² before the insulation is applied thereto, in order to permit the assembling of the parts. The insulation being then applied increases the diameter of the body A, so that it fits the aperture of the strain-collar and also increases the diameter of the head to such an extent as to form a shoulder against which the collar bears and which is intended to prevent it from slipping off from the bolt under strain. It will be observed, however, that in this construction the resistance to the collar is offered only by the insulating-covering, the metallic head not being of sufficient size to

overlap and come opposite the collar, so that in practice it is found that the construction first described is inefficient and objectionable, the inherent weakness of the insulating material being such that it cannot satisfactorily resist the strain to which it is subjected and the shackles frequently "strip off" from the bolt. This objection is obviated in the construction which I have devised, in which the head A' is of larger diameter than the aperture *b* of the strain-collar, and, overlapping the said collar, presents a rigid metallic shoulder to resist the strain of the shackle, which is amply adequate to withstand the action of the forces to which it will be in practice subjected, and will therefore prevent the "stripping off" of the shackle.

As far as that feature of my invention is concerned which relates to the construction of the strain-collar with a separable or removable section, so as to permit it to be readily applied to and removed from the bolt without passing it over the head thereof, I prefer this construction for the reason that it renders it possible to apply the insulating-covering to the bolt before the shackles are placed thereon, thus permitting the use of molds for this purpose, and thereby facilitating and cheapening the construction and at the same time insuring a better article. I have, however, heretofore assembled the parts by welding the collar around the bolt before the insulation is applied thereto, and I contemplate using this mode of assembling the parts in some cases, although it is in some respects not so advantageous as the mode first described, since the insulating material cannot be applied by means of molds in this case, but must be applied by hand with less satisfactory results and at an increased cost. Moreover, in case the insulation is applied at a point distant from the point where the rest of the work is done it involves the expense of shipping the shackles along with the bolts, which adds materially to the cost of the device. I also in some cases contemplate welding the collar around the bolt after the insulating material is applied.

The annular rib or flange *a'* forms an insulating water-shed which prevents water, moisture, snow, or the like from establishing electrical communication between the exposed metallic parts, (the two shackles in the one case and the shackle and eye or goose-neck in the other,) thereby rendering the insulation useless.

It is obvious that my invention is not limited in its application to the particular form of swivel shown in Figs. 1, 2, 3, and 4 and hereinbefore described. As an illustration of this, I have shown in Fig. 5 a form of swivel embodying my invention, in which only one shackle is used. In this case one-half of the device is constructed in the manner described. The remaining portion, however, is formed into or provided with an eye C, as shown in full lines, or a goose-neck D, as indicated in

dotted lines. Moreover, I do not wish to be understood as limiting myself strictly to the precise details of construction shown and described, as it is obvious, for instance, that the separable section of the strain-collar may be made and connected in various ways without departing from the principle of my invention.

What I claim is—

1. An insulating-swivel comprising a metallic bolt having a body provided with an enlarged head, a covering of insulating material surrounding said body and head, and a metallic shackle with a strain-collar having an aperture of less diameter than the head of the bolt, substantially as described.

2. An insulating-swivel comprising a metallic bolt having a body, an enlarged head, and a covering of insulating material, and a metallic shackle provided with a strain-collar having an aperture of less diameter than the metallic head of the bolt, said collar being provided with a removable portion to permit its application to the bolt, substantially as described.

3. In an insulating-swivel, the combination, with a metallic bolt comprising a body portion and an enlarged head and provided with a covering of insulating material, of a shackle having a strain-collar radially slotted or cut away to admit the bolt and provided with a removable section to fit said slot and close the collar on the bolt, substantially as described.

4. In an insulating-swivel, the combination, with a metallic bolt comprising a body and enlarged head and provided with an insulating-covering, of a metallic shackle having a strain-collar radially slotted and with its inner face rabbeted, as described, a removable section to fit said slot having lateral lugs to fit the rabbets, and means for securing said removable section, substantially as described.

5. In an insulating-swivel, the combination, with a metallic bolt comprising a body and enlarged head and provided with an insulating-covering, of a metallic shackle having a strain-collar radially slotted and with its inner face rabbeted, as described, a removable section to fit said slot having lateral lugs to fit the rabbets, and screws passing loosely through the collar and screwing into the lugs of the removable section, substantially as described.

6. In an insulating-swivel, the combination, with an insulated bolt having exposed metallic connecting devices at its ends, of an intermediate annular rib or flange of insulating material, forming an insulating water-shed, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

A. HELMER ENGLUND.

Witnesses:

IRVINE MILLER,
C. A. NEALE.