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(54) **Tube for connection to the actuation handle and to the corresponding end of a swivel bolt for closing wings of doors of trucks, trailers or the like**

(57) A tube (1) for connection to the actuation handle and to the corresponding end (2) of a swivel bolt (3) for closing wings of doors of trucks, trailers or the like, the tube and the end of the swivel bolt having complementary cross-sections shaped like a polygon.

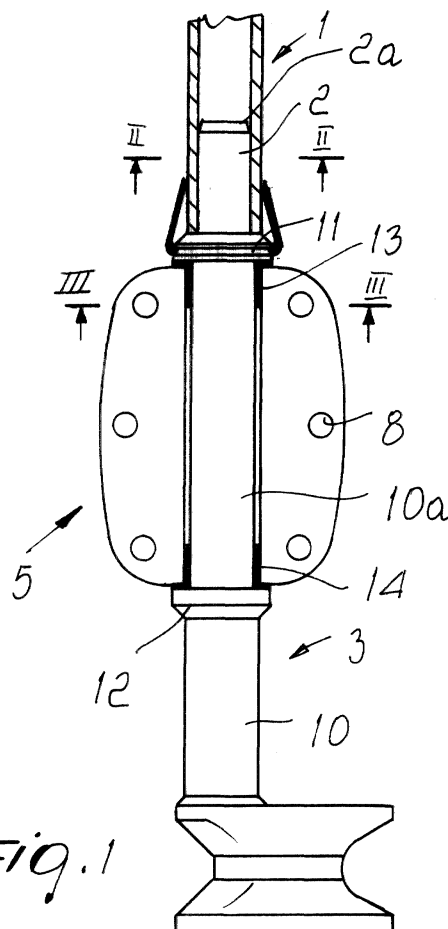


Fig. 1

Description

[0001] The present invention relates to a tube for connection to the actuation handle and to the corresponding end of a swivel bolt for closing wings of doors of trucks, trailers or the like.

[0002] It is known to use tubes having a circular cross-section for connection to the actuation handle and to corresponding ends of two swivel bolts, an upper one and a lower one, for closing wings of doors of trucks, trailers or the like: such tubes have some drawbacks in relation to their coupling to the swivel bolts and swiveling actuation handle, which usually occurs by welding to the two bolts and by means of diametrical pins or welding as regards coupling the manual grip handle to the tube; this entails a considerable waste of time and the need to use welding units or the like in order to assemble the components.

[0003] Assembling the components by welding requires some care so that the bolts turn out co-planar; moreover, the tube must be cut and welded to the bolts with an exactly measured length.

[0004] The aim of the present invention is to obviate the above-cited drawbacks and meet the mentioned needs, i.e., to provide a tube for connection to the actuation handle and to the corresponding end of a swivel bolt end for closing wings of doors of trucks, trailers or the like which can be assembled easily and rapidly without requiring particular accuracy or welding or the like.

[0005] Within this aim, an object of the present invention is to provide a tube which is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0006] This aim and this and other objects which will become better apparent hereinafter are achieved by the present tube for connection to the actuation handle and to the corresponding end of a swivel bolt for closing wings of doors of trucks, trailers or the like, characterized in that the tube and the end of the swivel bolt have complementary cross-sections shaped like polygons having convex sides.

[0007] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a tube for connection to the actuation handle and to the corresponding end of a swivel bolt for closing wings of doors of trucks, trailers or the like according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a sectional front view of a tube with the corresponding swivel bolt end and support for articulation to the wing;

Figure 2 is a sectional view, taken along the line II-II of Figure 1;

Figure 3 is a sectional view, taken along the line III-III of Figure 1;

Figure 4 is a sectional front view of a tube with a corresponding swivel bolt end and support for articulation to the wing in a provided solution which is alternative to the one shown in Figure 1;

Figure 5 is a sectional view, taken along the line V-V of Figure 4;

Figure 6 is a sectional view, taken along the line VI-VI of Figure 4;

Figures 7 and 8 are, respectively, a partially sectional front view and a bottom view of a handle preset for coupling to the tube according to the invention; Figure 9 is a sectional view of a portion of a handle, taken along the line IX-IX of Figure 7;

Figures 10 and 11 are, respectively, a front view and a side view of a bush of the handle.

[0008] With reference to the figures, the reference numeral 1 generally designates a tube for connection to the actuation handle M and to the corresponding end 2 of a swivel bolt 3 for closing wings of doors of trucks, trailers or the like according to the invention.

[0009] The tube 1 and the end 2 of the swivel bolt have complementary cross-sections which are shaped like a regular polygon, particularly like a triangle having three slightly convex sides 4; the end 2 substantially forms a coupling tang with preferably curved surfaces and a slightly rounded tip 2a.

[0010] Figures 1 and 4 illustrate two alternative and preferred embodiments of the rotary coupling of the bolt 3 to a corresponding support 5.

[0011] In Figure 1, the support 5 is advantageously formed by two portions 6 and 7 (as illustrated in Figure 3) made of stamped metal plate (or aluminum section), respectively a lower portion and an upper portion, which are crossed by corresponding holes 8 for fixing to the wing.

[0012] A cylindrical seat 9 for the rotation of the stem 10 of the bolt is formed between the portions 6 and 7 in a central position.

[0013] In the embodiment shown in Figure 1, an intermediate region 10a of the stem 10 comprised between two annular raised portions 11 and 12 of the stem (known in the field as "anti-rack ridges") is placed between the portions 6 and 7: in this embodiment, two bushes 13 and 14 are fitted between the inlets of the seat 9 and the region 10a of the stem, and each bush is constituted by two bush portions advantageously made of a material such as bronze coated with PTFE.

[0014] In another embodiment, illustrated in Figure 4, the stem 10 has a single raised portion 15 and in the portions 6 and 7 there are two complementary recesses 16 and 17 for centering the raised portion 15 and two complementary recesses 18 and 19 for centering a bush 20 which is advantageously made of synthetic materials of the type known by the tradename Nylon.

[0015] The bush 20 has an internal hole, whose cross-section is shaped like an equilateral triangle with slightly convex sides so as to mate with the outer surface of the

tube 1, and is externally cylindrical so as to be arranged rotatably in the recesses 18 and 19.

[0016] Likewise, a similar bush 21 provides the coupling to the box S of the handle M; the handle is crossed by a hole F which is substantially identical to the external cross-section of the tube and requires no welding or pins.

[0017] The tube 1 can have a different cross-section than the one shown and its external cross-section need not be the same as its internal one (for example, it might be triangular externally and square internally).

[0018] The operation of the invention is self-evident: in order to couple the tube 1 to the end 2 it is sufficient to fit it, after cutting it to size, on the tip of the end 2 and fit the upper portion 7 of the support 5; any small differences in the length of the tube 1 are compensated by possible small relative movements of the tube 1 and the end 2.

[0019] It is noted that the anti-rack ridges 11, 12 and 15 keep the pawls at vertical levels which are fixed both upward and downward: accordingly, the tube 1 serves only to transmit the rotation to the pawls and has no other functions for vertical support of said pawls: assembly is simplified, since the fitter (differently from what occurs instead with conventional rods) is practically forced to leave no play between the anti-rack washers and the supports 5.

[0020] It has thus been observed that the invention achieves the intended aim and object, and in particular that it provides a tube for connection to the actuation handle and to the corresponding end of a swivel bolt for closing wings of doors of trucks, trailers or the like which can be assembled easily and rapidly without requiring particular accuracy or welding or the like.

[0021] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; thus, for example, the tube can have a hexagonal, square, oval or other cross-section and the outer cross-section can be different from the inner one.

[0022] All the details may further be replaced with other technically equivalent ones.

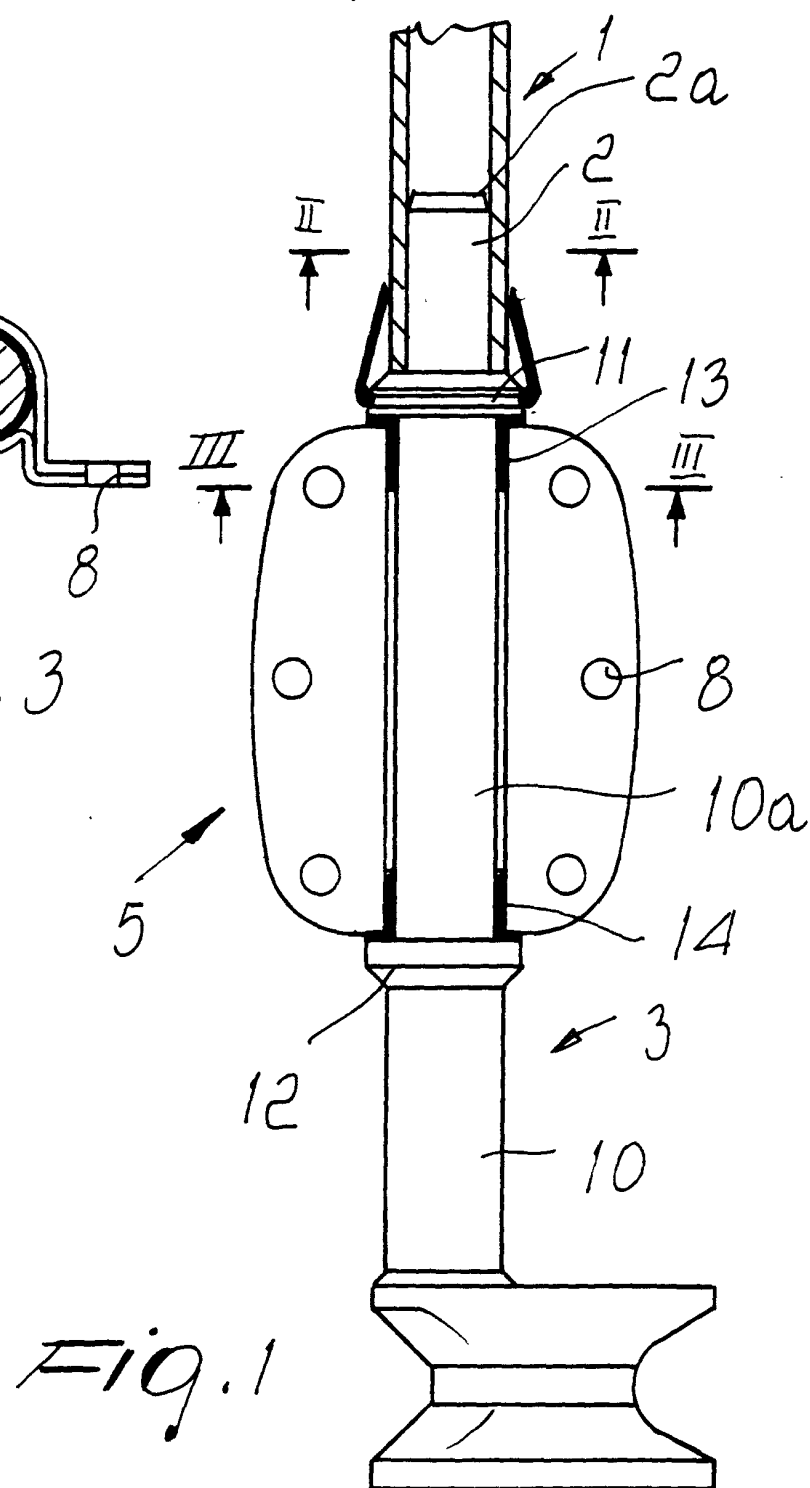
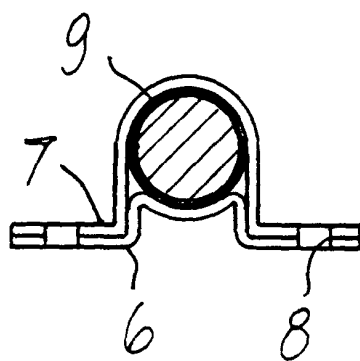
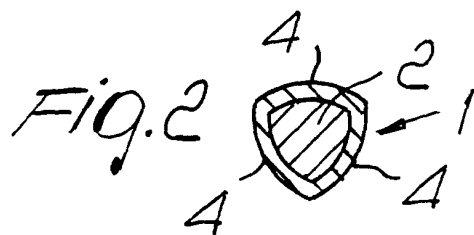
[0023] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

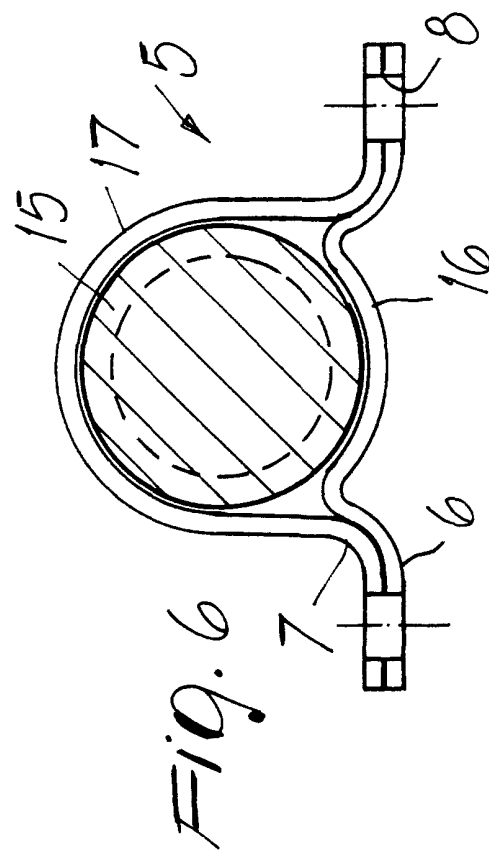
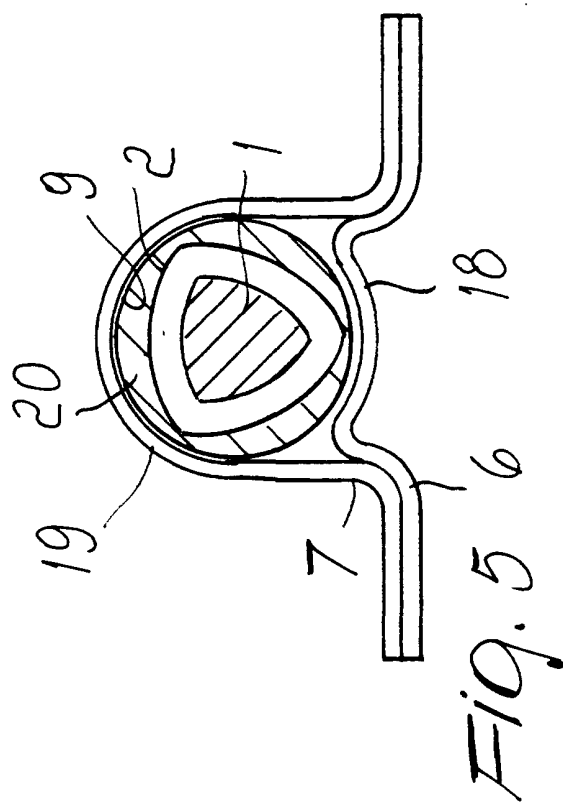
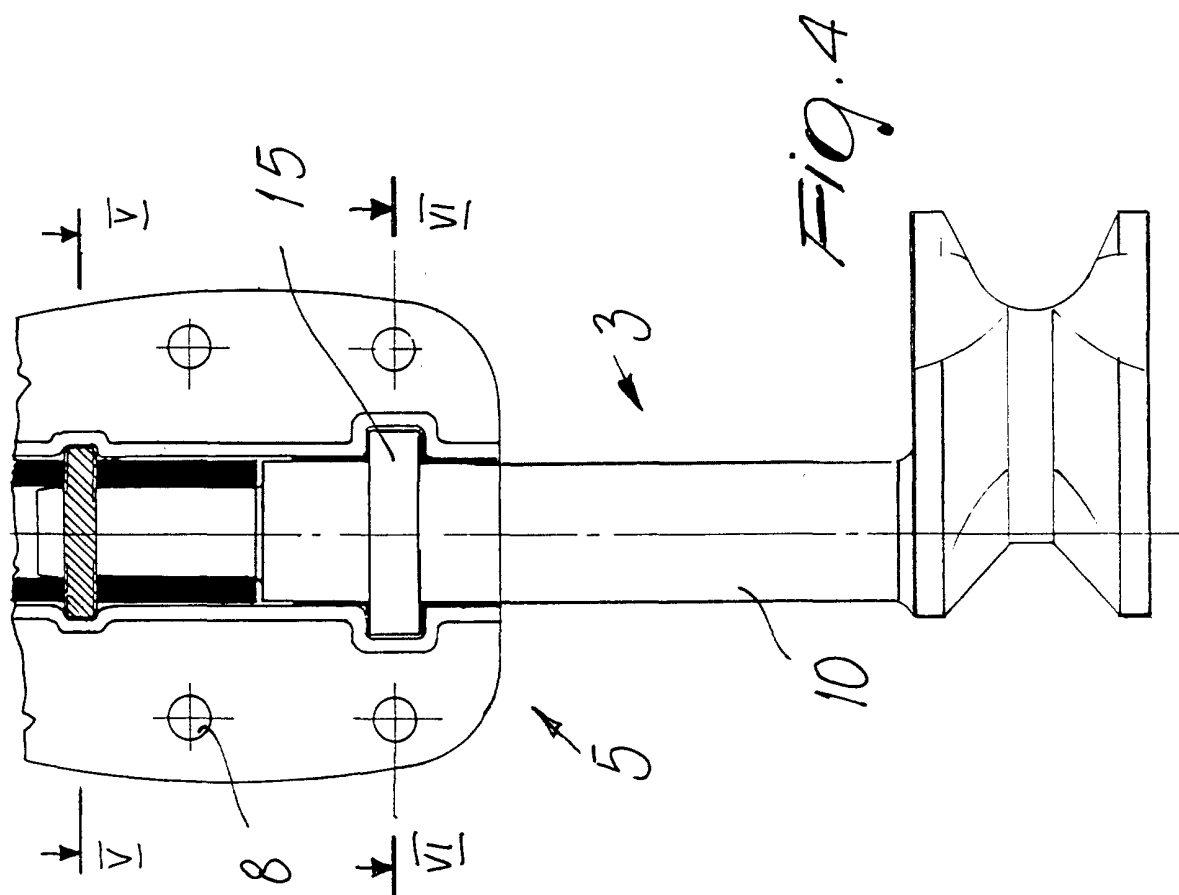
[0024] The disclosures in Italian Utility Model Application No. BO2000U000068 from which this application claims priority are incorporated herein by reference.

[0025] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A tube for connection to the actuation handle and to the corresponding end of a swivel bolt for closing wings of doors of trucks, trailers or the like, **characterized in that** the tube and the end of the swivel bolt have complementary cross-sections shaped like a polygon.
2. The tube according to claim 1, **characterized in that** said polygon is regular and has convex sides.
3. The tube according to one or more of the preceding claims, **characterized in that** said polygon is three-sided.
4. The tube according to one or more of the preceding claims, **characterized in that** for the rotary coupling of the bolt to a corresponding support fixed to the wing and for the box of the handle a bush is provided which is made of synthetic materials, has an internal hole whose cross-section is complementary to the cross-section of the tube, and is externally cylindrical.





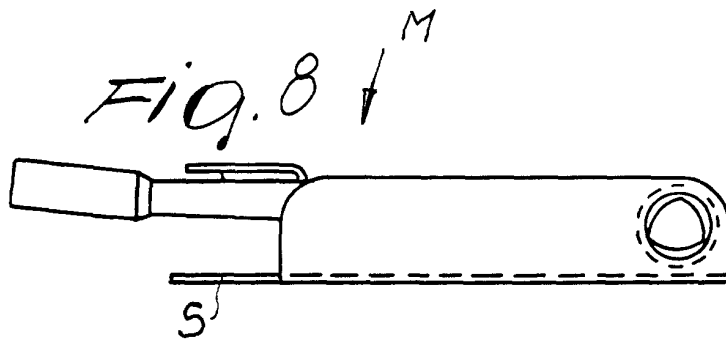
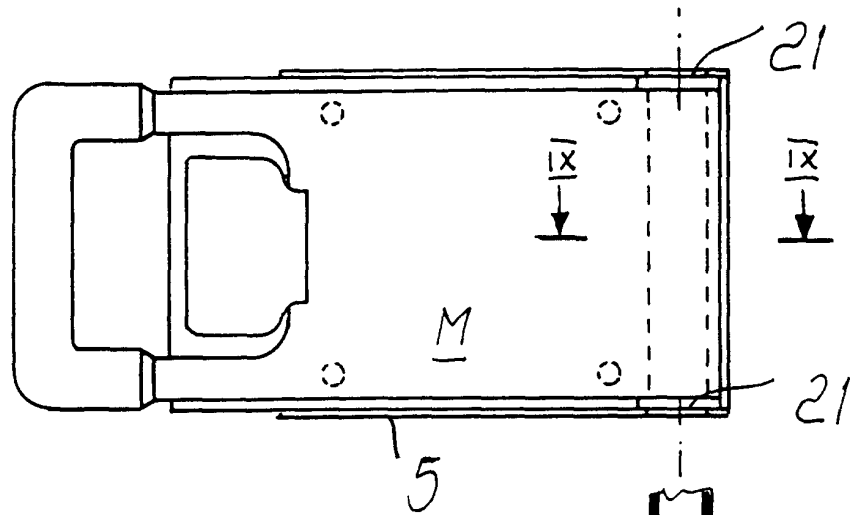


Fig. 8

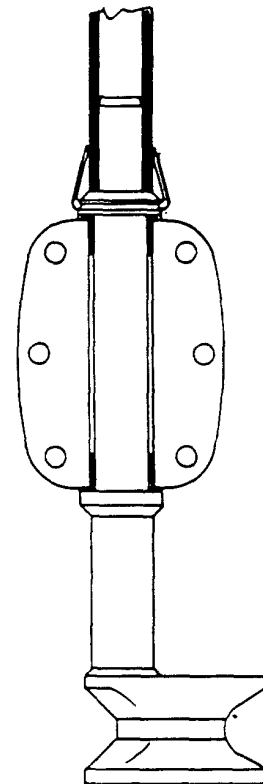


Fig. 9

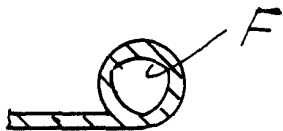


Fig. 10

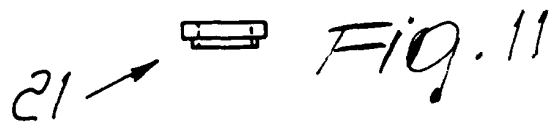
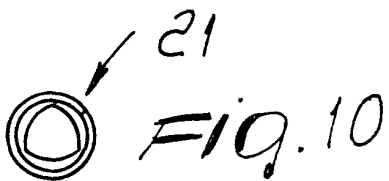


Fig. 11