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(54) Electric coupler.

(57) An electric coupler (1) for a wire armoured cable comprises a plastics housing (20); a metal head (2) at one end of the housing; at least two tubes (3) of electrically insulating material secured in the head; an electric contact (4) positioned within each tube; an opening at the other end of the housing through which an electric cable (6) passes, each conductor (5) of the cable being electrically connected to one of the contacts; and clamping means (10) positioned within the housing, and electrically connected to the head, for clamping the wire armouring (15) of the cable. The clamping means is mounted on metallic screening fins (9) which extend from the metal head to form interphase barriers both between the contacts and the conductors. The void (22) within the housing is filled with a hard-setting resinous insulating compound inserted through an aperture (13) in the housing after the coupler has been assembled, and which hardens to form a weatherproof coupler.

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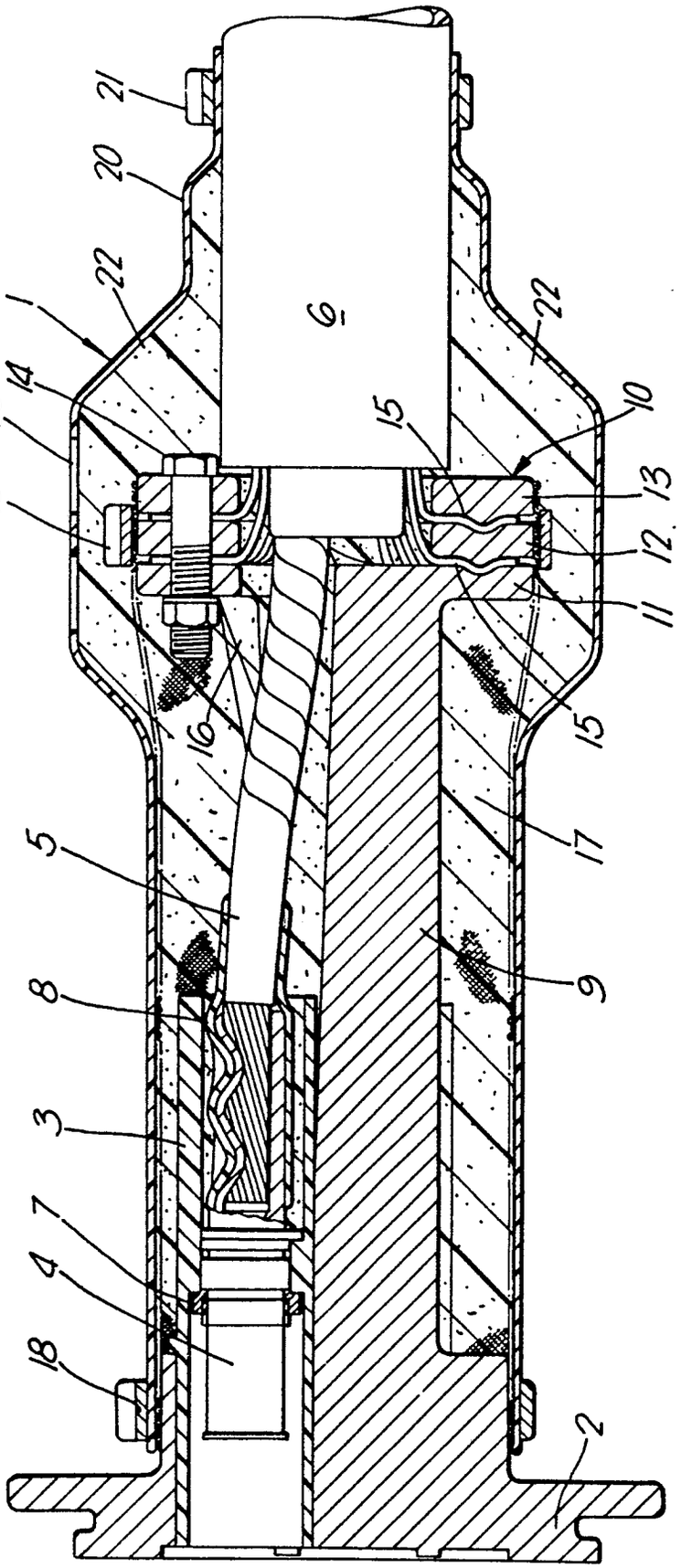

Fig. 1.

ELECTRIC COUPLER

This invention relates to an electric coupler, especially, though not exclusively, an electric coupler for use in mines and quarries.

In a known arrangement, an electric coupler comprises a metal housing; an insulator at one end of the housing within which electric contacts are secured; an opening at the other end of the housing through which the insulated conductors of an electric cable pass, the conductors being attached to the contacts; and a gland for clamping the wire armouring of the cable to the outer surface of the housing; the voids within the coupler being filled with a resin or compound passed through an aperture in the housing after the coupler has been assembled, and which hardens to form a weatherproof coupler.

This known arrangement has the disadvantages that the metal housing makes the coupler heavy and expensive to produce; no screening is normally provided between the contacts; and that a different size of gland has to be used for each size of cable.

In our copending British patent application No. 8423873 (not yet published) we have proposed a coupler which comprises a plastics housing; a metal head at one end of the housing; at least two tubes of electrically insulating material secured in the head; an electric contact positioned within each tube; an opening at the other end of the housing through which an electric cable passes, each conductor of the cable being electrically connected to one of the contacts; and clamping means positioned within the housing, and electrically connected to the head, for clamping the wire armouring of the cable; the voids within the housing being filled with a hard-setting resinous insulating compound inserted through an aperture in the housing after the coupler has been assembled, and which hardens to form a weatherproof coupler.

Such couplers would be much lighter than their equivalent metal cased couplers and would also be less expensive to produce.

The present invention provides a new form of plastics-cased coupler that is of simpler and more satisfactory structure needing fewer parts and a smaller volume of resin (which reduces cost further and helps to limit the mechanical stresses that arise on curing).

According to the present invention an electric coupler for a wire armoured cable comprises a plastics housing, a metal head at one end of the housing; at least two tubes of electrically insulating material secured in the head: an electric contact positioned within each tube; an opening at the other end of the housing through which an electric cable passes, each conductor of the cable being electrically connected to one of the contacts; metallic screening fins forming interphase barriers extending from the metal head both between the contacts and between the conductors; and clamping means mounted on at least one of the screening fins, and thereby electrically connected to the head, for clamping the wire armouring the cable; the voids within the housing being filled with a hard-setting resinous insulating compound inserted through an aperture in the housing after the coupler has been assembled, and which hardens to form a weatherproof coupler;

Preferably, the wire armour clamping means comprises at least two metal rings through which the cable conductors pass, the rings being drawn together to grip the wires. The rings may be drawn together by nuts which are screwed onto threaded spigots or studs extending from the screening fins. Alternatively, one ring may be formed integrally with the screening fins and at least one separate ring is fastened to it by screws.

The invention is further described, by way of example, with reference to the accompanying drawing which is a longitudinal cross-section of an electric coupler in accordance with the invention.

The electric coupler (1) shown in Figure 1 comprises a metal head (2) having three tubes (3) secured within it. The tubes (3) are of a thermoset dough-moulded polyester insulating material and are secured in the head by an epoxy adhesive.

Each tube (3) forms an insulator for a contact - (4) on the end of a respective screened conductor - (5) of a three core wire armoured cable (6). The contact (4) is made of copper and is crimped on to its conductor (5) and held within the corresponding tube (3) by a contact securing ring (7) screwed on to the contact. An insulating sleeve (8), formed from a heat shrinkable plastics material, surrounds each crimped joint to keep the interstices of the stranded conductor free from the insulating compound with which the coupler will in due course be filled.

Formed in one piece with the metal head (2) are three screening fins (9) which extend from the metal head to form a complete interphase barrier between the contacts and between practically the whole length of the separated end parts of the cable conductors.

At the end of the fins is a clamp (10) which comprises three rings (11, 12, 13) through which the cable conductors pass. In this particular example, one ring (11) is formed in one piece with the

screening fins (9) and metal head (2). The rings - (11, 12, 13) are fastened together by (three) screws (14) so that the armour wires (15) of the armoured cable (6) are clamped between the rings.

The conductor screens (16) are also mechanically and electrically connected to the clamp (10).

A brass phase-to-earth screening mesh (17) is positioned around the contacts, screening fins and conductors, the mesh being mechanically and electrically connected to the clamping rings (11, 12, 13) by a worm-drive clip (19).

A plastics housing (20) formed from two similar parts made of a "rigid" PVC composition, is clamped by worm-drive clips (18, 21) to the head - (2) and to the cable (6).

All void space (22) within the housing (20) is filled with a polyurethane casting resin which is poured through an aperture (23) in the housing after the coupler has been assembled. When the resin has hardened, the worm-drive clips 18 and 21 can, if desired, be removed.

Claims

1. An electric coupler for a wire armoured cable comprising a plastics housing; a metal head at one end of the housing; at least two tubes of electrically insulating material secured in the head; an electric contact positioned within each tube; an opening at the other end of the housing through which an electric cable passes, each conductor of the cable being electrically connected to one of the contacts; metallic screening fins forming interphase barriers extending from the metal head both between the contacts and between the conductors; and clamping means mounted on at least one of the screening fins, and thereby electrically connected to the head, for clamping the wire armouring the cable; the voids within the housing being filled with a hard-setting resinous insulating compound inserted through an aperture in the housing after the coupler has been assembled, and which hardens to form a weatherproof coupler,

2. An electric coupler as claimed in Claim 1, wherein the wire armour clamping means comprises at last two metal rings mounted upon threaded spigots or studs extending from the screening fins.

3. An electric coupler as claimed in Claim 1, wherein the wire armour clamping means comprises at least two metal rings one of which is formed integrally with at least one screening fin.

4. An electric coupler substantially as hereinbefore described with reference to and as shown in the drawing.

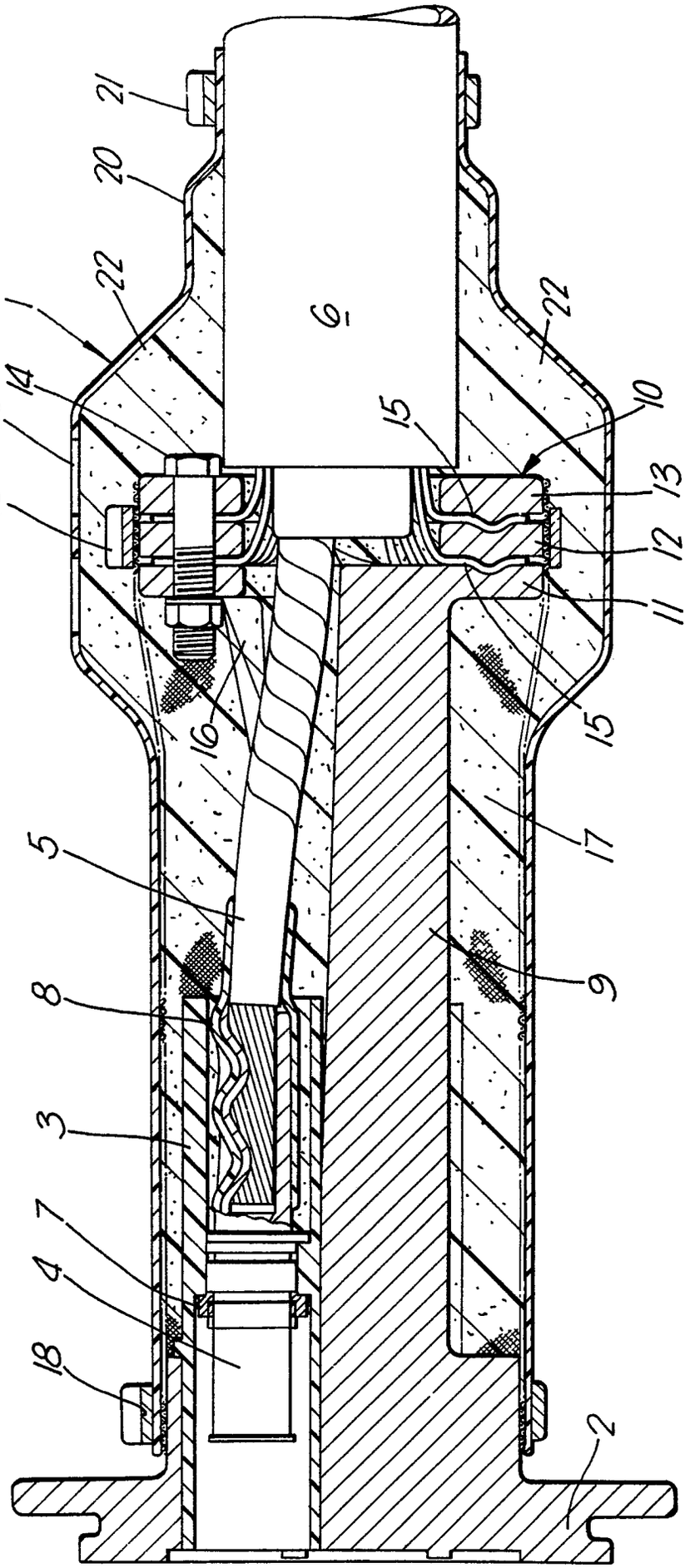

Fig. 1.

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EUROPEAN SEARCH REPORT

Application number

EP 86 30 2440

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	GB-A-1 119 830 (HACKBRIDGE-FARADAY) * Page 2, line 49 - page 3, line 22; figures 1-4 *	1,4	H 01 R 13/527 H 01 R 13/648
Y	GB-A-1 362 270 (B.I.C.C.) * Page 2, lines 69-80; figures 1,4 *	1,4	
A		2	
P,X	EP-A-0 136 156 (B.I.C.C.) * Page 5, line 21 - page 8, line 3; figures 1,2 *	1,2,4	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

H 01 R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10-07-1986	LOMMEL A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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