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A. F. PIEPER

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COUPLING FOR CONDUCTORS

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Fig. 1

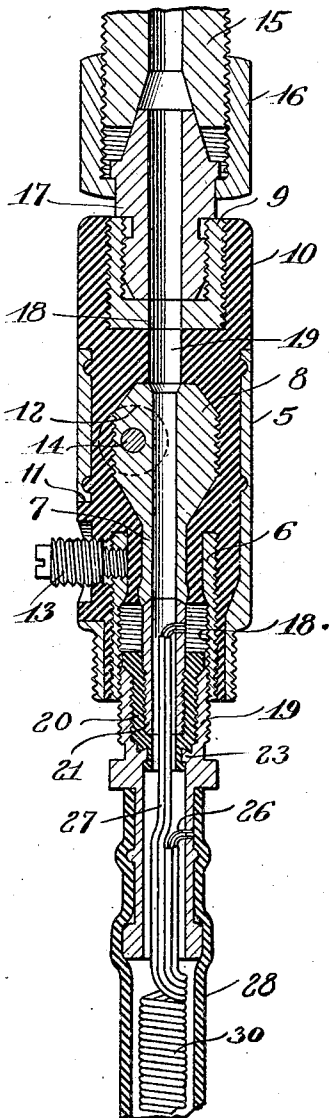
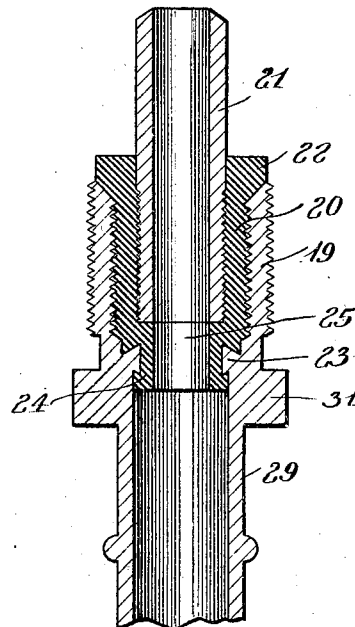


Fig. 2



INVENTOR.
Alphonse F. Pieper
BY *Fredrick F. Church*
his ATTORNEY

UNITED STATES PATENT OFFICE.

ALPHONSE F. PIEPER, OF ROCHESTER, NEW YORK.

COUPLING FOR CONDUCTORS.

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This invention relates to coupling means for supply lines or conductors, such, for example, as those employed for supplying electrical power and air or other fluids to dental syringes and other instruments, being in the nature of an improvement upon the devices of this character disclosed in the Letters Patent to O. H. Pieper and A. F. Pieper No. 1,230,213, granted June 19, 1917, and in my co-pending application for Patent Serial No. 376,467, filed April 26, 1920, for coupling for electric and fluid conductors. The chief object of the present invention is to provide an efficient coupling of the above character embodying an improved form of construction for uniting the metallic and moulded insulating parts in a more strong and durable manner. To these and other ends the invention consists in certain improvements and combinations of parts all as will hereinafter be more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a longitudinal central section through a coupling embodying the present invention;

Figure 2 is an enlarged sectional view of parts shown in Figure 1;

Similar reference numerals throughout the several views indicate the same parts.

This invention is embodied in the present instance in a coupling for supply lines or conductors of the general character disclosed in the said Letters Patent and copending application which may be briefly described for present convenience as follows. The coupling is applied in the present instance to the purpose of uniting the air supply line or tube with electrical conductors for connecting both such lines in properly insulated relation through a single conduit with the dental syringe or other instrument to be operated thereby. Referring more particularly to the drawings, the coupling is shown in Figure 1 as comprising a sleeve-like metal reinforcing jacket or casing 5 within which are disposed in spaced concentric relation with the casing and with each other an outer sleeve 6 of suitable electrically conductive metal and an inner sleeve 7 of similar material having an end projecting beyond the end of sleeve 6 and enlarged as at 8 for a purpose which will presently appear. A cup-shaped connecting device 9 is located adjacent an end of casing 5 and these va-

rious parts are integrally united in insulated relation by a body 10 of suitable non-conducting material such, for example, as bakelite or rubber. The metal parts described are suitably supported in their proper relative positions in a mould and the material of body 10 is moulded within casing 5 and between and around the metal parts to form a strong, unitary construction as shown in the drawings and at a comparatively low cost of production. The casing 5, sleeves 6 and 8 and the part 9 have the surfaces thereof engaged by the moulded material 10 roughened as, for example, by the formation of grooves or screw threads as shown, to anchor the metal and moulded portions against relative movement in securely fixed relation with each other.

Casing 5 has openings formed therein, as indicated at 11 and 12, through which binding posts 13 and 14 enter the moulded material and are electrically connected at their inner ends with sleeves 6 and 8 respectively, the end of sleeve 8 being enlarged to more securely anchor the same in the moulded material and to afford ample material for the attachment of the binding posts which latter of course are spaced and insulated from casing 5. Electrical conductors from the source of supply are connected to the binding posts and thus transmit current to and from the sleeves 6 and 8, which are completely insulated from each other by the moulded material as described.

The coupling is attached to a fluid supply line indicated at 15 by means of a union connection 16 including a threaded nipple 17 for detachable connection with the internally threaded sleeve formed by the side walls of the device 9. The latter has an opening 18 adjacent the center of its bottom in alignment with the bore of sleeve 8 and the insulating material is also formed centrally with a bore 19 which is thus part of a continuous passage through the coupling from the air supply line 15 to the opposite end, to which is detachably connected a second coupling part through which the air and electric lines are carried in a single conduit to the instrument to be operated.

The complementary coupling part in which the invention is embodied in the present instance is formed for detachable connection with the coupling part described above to which end the sleeve 6 of the latter has its wall internally threaded as at 18 and

the complementary coupling part comprises an externally threaded, substantially tubular member 19 of suitable electrically conductive metal adapted to be screwed into the sleeve 6. Member 19 has at this end an enlarged bore 20 forming a receptacle in which is located, in concentric spaced relation, a smaller tubular member 21 having its end seated against the end of sleeve 8 in electrical contact and fluid tight relation. Into the space between the members 19 and 21 is moulded a body 22 of insulating material of the same general character as the body 10 described above, the members 19 and 21 being supported by suitable means in proper relative positions in a mould and the material 22 being moulded within the member 19 and between the latter and the member 21. The surfaces of the members 19 and 21 engaging the moulded material are preferably roughened as by grooves or screw threads to effect secure anchorage in the material 22 and prevent relative movement of the parts. Material moulded in the manner described, however, tends upon setting to shrink or contract and thus separate from an encircling member, such as the member 19, so that there is a tendency for the moulded material to work loose and become detached from the tubular portion 19. It has been found that this difficulty may be overcome by providing the bore of the member 19 with shoulder portions 23 preferably of annular extent and dovetail shape in cross-section. The material 22 is moulded about the portion 23 as at 24 providing cooperating shoulders of interlocking dovetail shape on the member 19 and the body 22 which effectively hold the latter to the outer tubular member, thereby preventing its shrinkage or contraction and maintaining it in anchored relation with the roughened inner bore of member 19. A permanently integral construction is thus afforded for this portion of the coupling, the inner and outer metal member of which are insulated by the inner material 22. The latter is formed with a central passage 25 communicating with the bores of members 19 and 21. The latter are in electrical contact with the conducting sleeves 6 and 8, respectively, of the electric circuit, and as shown in Figure 1, wires 26 and 27 are electrically connected in pairs with members 19 and 21, respectively, and extended into a flexible conduit 28, the end of which is fixed over the end 29 of member 19. The wires are provided in pairs to insure continued connection in case one of

them should break and are preferably coiled as at 30 within the tube 28 to flexibly support the walls of the latter. An angular portion or nut 31 is formed on member 19 for convenience in screwing the latter into and out of the sleeve 6.

While the improved construction for uniting members 19 and 21 with the body 22 in permanent and durable form is shown as employed in this complementary coupling part in the present instance, the same advantageous construction may obviously be employed in the first described coupling part and generally in similar constructions. This improved construction for rigidly combining the moulded and metal parts into a permanently integral element affords a coupling capable of durably withstanding the strains imposed in use as well as any deterioration in the insulating material and facilitates the production of an efficient article in an inexpensive manner.

I claim as my invention:

1. An insulating coupling for conducting members comprising a tubular conducting member, a second tubular conducting member having one end thereof located in spaced relation within the bore of said first member, a body of nonconducting material moulded in the space between said members to unite and insulate the same, interengaging portions on said second member and body for preventing relative movement therebetween, and shoulder means of dovetail shape projecting inwardly from the bore wall of said first member and embedded in said body for holding the latter against shrinkage and in integral relation with said first member.

2. An insulating coupling for electrical and fluid conducting members comprising an externally threaded tubular conducting member, a second tubular conducting member having a joint bearing at one end thereof and having its other end externally threaded and located in spaced relation within the bore of said first member, a body of moulded insulating material filling the space between said members and extending within said first member beyond the end of said second member, and an annular shoulder of dovetail shape projecting from the bore wall of said first member and embedded in said extended portion of said body for holding the same against shrinkage and in integral relation with said first member.

ALPHONSE F. PIEPER.