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F. WELLS

CONNECTING DEVICE FOR FUSES AND BLASTING CARTRIDGES AND SO FORTH

Filed March 10, 1922

Fig.5.

Fig.1.

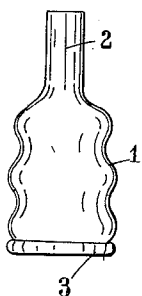


Fig.2.

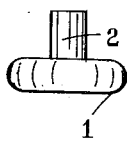


Fig.3.

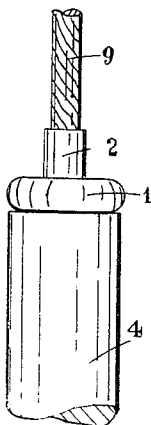


Fig.4.

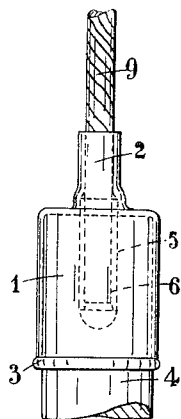
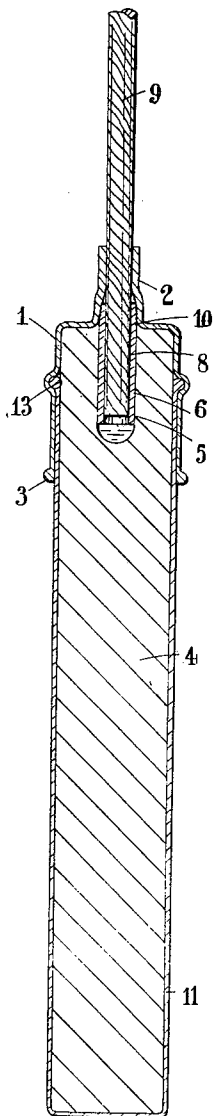
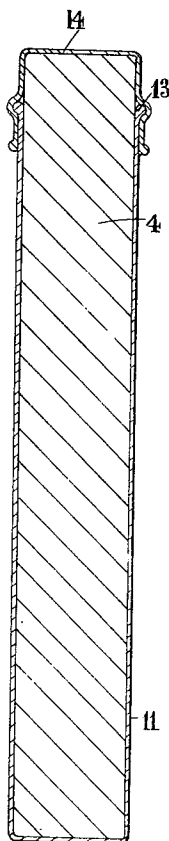


Fig.6.



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UNITED STATES PATENT OFFICE.

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CONNECTING DEVICE FOR FUSES AND BLASTING CARTRIDGES, ETC.

Application filed March 10, 1922. Serial No. 542,735.

To all whom it may concern:

Be it known that I, FRANK WELLS, a subject of the King of Great Britain, and residing at 2 Fairfield West, Kingston, Surrey, England, have invented certain new and useful Improvements in Connecting Devices for Fuses and Blasting Cartridges, Etc. (for which I have filed applications in England dated November 24th, 1921, and December 6th, 1921, respectively), of which the following is a specification.

This invention relates to appliances for connecting fuses or fuse wires, or detonators or both to primers, blasting cartridges, explosives and so forth.

One of the objects of the invention is to provide an appliance for connecting a fuse and detonator to a blasting cartridge in a simple and convenient manner so as to hold the various parts in the required relative positions whilst at the same time forming a joint which is impervious to the ingress of water or other extraneous matter.

A further object of the invention is to connect the detonator to the blasting cartridge in such a manner that the connecting appliance will form a cushion for the detonator should this be pressed through the side of the cartridge, and thus prevent premature explosion.

A still further object of the invention is to provide a suitable casing and cap for the blasting cartridge which completely enclose the cartridge in a water-tight manner and thus prevent the cartridge from being rendered useless by the ingress of water or other extraneous matter whilst the cartridge is being stored in a damp place and at the same time facilitate the handling thereof.

These and other objects are attained by the use of a connecting device and cartridge casing of which the preferred embodiments will be described hereinafter with reference to the accompanying drawings, wherein:—

Fig. 1 shows the connecting appliance in the extended position.

Fig. 2 shows the connecting appliance ready for use in attaching the fuse to a blasting cartridge.

Fig. 3 shows the connecting device attached to the fuse with the detonator inserted in the blasting cartridge.

Fig. 4 shows the device fully applied to the cartridge.

Fig. 5 shows a section of a cartridge en-

cased and fitted with the fuse and detonator ready for use, and

Fig. 6 shows a blasting cartridge with its casing.

Referring now to the drawings, the appliance for connecting a fuse with a detonator attached thereto to a cartridge consists of a tubular envelope 1, of rubber or other suitable elastic and waterproof material, provided at one end with a tubular extension 2 of reduced cross section.

At the other end the tubular envelope 1 is preferably provided with a rim 3 of greater thickness than the remainder of the envelope. The envelope is suitably moulded and coated with French chalk and is then rolled into the form shown in Fig. 2 in which condition it is cured, so that when afterwards extended into the position shown in Fig. 1 it will remain extended without any tendency to roll up. The appliance, however, is preferably maintained in the form shown in Fig. 2 as in this form it is easily fitted on to a fuse, and after the fuse with the detonator has been inserted into a cartridge 4 the envelope 1 can be conveniently unrolled over the end of the cartridge. The diameters of the sleeve 1 and extension 2 of the jointing appliance are preferably such that when they are in position on the fuse or fuse wire or detonator or both, and the explosive cartridge, the rubber or other elastic material, of which the appliance is made, is in tension and exerts a pressure on these parts so as to hold the parts in their relative positions while at the same time rendering the joint waterproof.

In fitting together the fuse and cartridge, a hole is first formed at 5 in one end of the cartridge 4, in any suitable manner, for example, by means of a stick of wood: The cartridge 4 may be a blasting cartridge, or a primer for exploding a main charge, and may be in the form of a stick of dynamite wrapped in waxed paper, or in the form of a cartridge containing a high explosive such as ammonium nitrate.

The detonator 6, may be of any suitable type consisting of a small cylinder preferably of copper, containing fulminate of mercury or other detonating material. The fuse 9 is fitted into the detonator 6, which latter is then secured to the fuse by crimping at 10, by means of a suitable tool, such as a pair of pliers.

The fuse and detonator are then passed through the tubular extension 2 of the connecting appliance in the rolled-up condition shown in Fig. 2, and the detonator is then fitted into the hole 5 in the cartridge 4 as shown in Fig. 3. The sleeve 1 is then unrolled on the cartridge 4 so that it assumes the position shown in Fig. 4. In this manner the fuse and detonator are secured to the cartridge or primer 4 and the whole arrangement is ready for use.

As a stick of dynamite is comparatively soft it frequently occurs that if the hole 5 is made at a slight angle the detonator 6 is liable to be pressed out of the side of the stick of dynamite when it is being inserted into the hole or when the dynamite is being forced into the exploding position by a ramming tool, when a pliable fuse is used, or by the fuse when a stiff fuse is used. The detonator may thus be brought into contact with a hard substance and cause premature explosion. As the sleeve 1 of the connecting appliance extends beyond the depth of the hole in the dynamite the detonator 6, if pressed through the side of the stick of dynamite, would come into contact with the sleeve 1 which would form a cushion therefor and thus prevent premature explosion.

In order to further protect the cartridge or primer 4 against moisture it is preferably enclosed by a casing or tubular envelope 11, of rubber or other suitable elastic and waterproof material which is completely closed at its end 12 whilst its other end is provided with a rim 13 to prevent any ingress of moisture or the like. This casing 11 is preferably placed over the cartridge 4 before use as a protection therefor when storing, and when the jointing appliance is applied to the cartridge 4, the sleeve 1 is unrolled over the casing 11 as shown in Fig. 5. The casing 11 also serves to protect the cartridge whilst it is being handled for the insertion of the fuse or otherwise, whilst it also protects the said cartridge whilst being inserted into the explosive position.

For storing purposes the other end of the cartridge or primer 4 is suitably enclosed by a cap 14 of rubber or other suitable elastic and waterproof material of a relatively shorter length than the casing or tubular envelope 11. The cartridge is thus completely closed in a water-tight manner until required for use. When it is desired to use the blasting cartridge or primer 4, the small cap 14 is rolled or slipped off the cartridge 4 so as to expose the end thereof, for the purpose of inserting the detonator 6, and connecting it thereto.

The casing 11 and cap 14 are preferably of lesser diameter than the cartridge 4 so that when in position they are drawn tightly against the cartridge and thus prevent any

ingress of moisture or other extraneous matter.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. An appliance for connecting a fuse with a detonator attached thereto to a blasting cartridge or primer having a recess for the detonator, said appliance comprising a normally extended tubular portion through which the fuse and detonator are adapted to be passed, said tubular portion being of smaller diameter than the fuse so as to grip the latter tightly when passed therethrough, and a tubular sleeve having corrugations formed therein attached to the tubular portion, said sleeve being of larger diameter than the tubular portion, but of smaller diameter than the blasting cartridge or primer, said tubular sleeve being normally rolled up upon itself and being adapted to be unrolled over the blasting cartridge or primer, the corrugations serving to retain the sleeve in the rolled up condition and prevent said sleeve from being rolled up when extended over the blasting cartridge or primer.

2. An appliance for connecting a fuse with a detonator attached thereto to a blasting cartridge or primer, comprising a tubular envelope closed at one end, said envelope being of elastic and waterproof material and of smaller diameter than the cartridge and adapted to be drawn over the said cartridge, a rim around the open end of the envelop, a tubular sleeve having corrugations formed therein and constructed of elastic and waterproof material, said sleeve being normally in the rolled up condition, but being adapted to be rolled over the cartridge and the tubular envelope, the corrugations preventing said sleeve from rolling up after it has been extended, a normally extended tubular portion attached to said tubular sleeve, said tubular portion being of smaller diameter than the tubular sleeve and also of smaller diameter than the fuse, the fuse with the detonator attached thereto being adapted to be passed through said tubular portion, and a rim at the end of the tubular sleeve.

3. An appliance for connecting a fuse with a detonator attached thereto to blasting cartridges, primers and so forth, comprising a tubular sleeve having corrugations therein, said corrugations serving to retain the sleeve in the rolled up condition while preventing it from being rolled up when extended over the blasting cartridge or primer, an enlarged rim at one end of said tubular sleeve, and a normally extended tubular portion attached to the other end of the sleeve, said tubular portion being of smaller diameter than the tubular sleeve.

FRANK WELLS.