Dec. 13, 1927. 1,652,961

W. O. SNELLING

CORDEAU CONNECTER

Filed Dec. 9, 1926

Fig. 3.

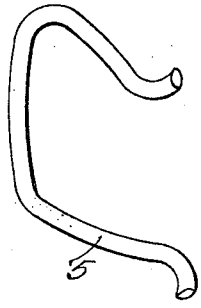


Fig. 1.

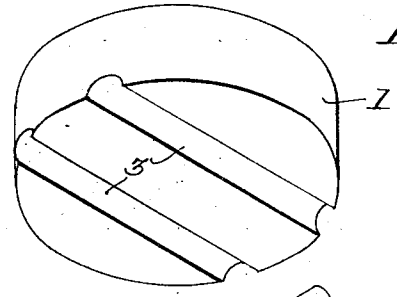


Fig. 2.

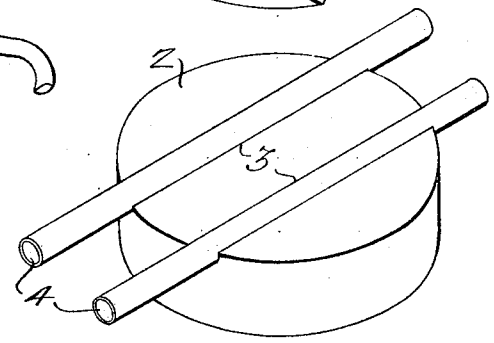


Fig. 4.

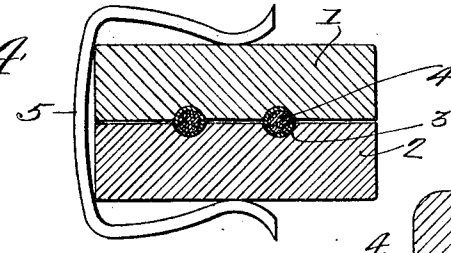


Fig. 6.

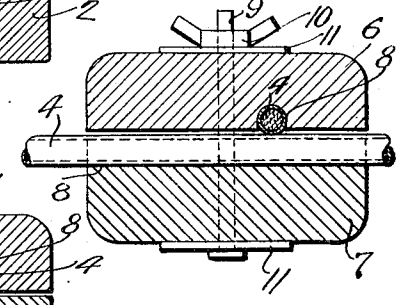
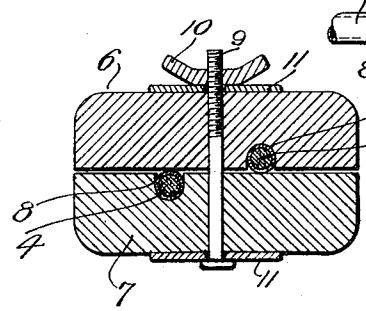


Fig. 5.



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Patented Dec. 13, 1927. 1,652,961

UNITED STATES PATENT OFFICE.

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CORDEAU CONNECTER.

Application filed December 9, 1926. Serial No. 153,629.

This invention relates to improvements in devices for connecting or establishing a union between lines of cordeau or detonating fuse, and the principal object of the invention is to provide means for quickly and safely connecting lines of detonating fuse and for increasing the certainty of detonation of the lines connected.

Preferred embodiments of my invention are illustrated in the attached drawing, in which:

Figures 1 and 2 respectively illustrate, in perspective views, the sections of a two-part union or connecter;

Figure 3 illustrates in perspective a form of clamp by which the sections may be retained in operative relation;

Figure 4 is a transverse section through the connecter illustrated in the preceding figures;

Figure 5 is a sectional view similar to that of Figure 4, but illustrating a modified form of connecter, and

Figure 6 is also a sectional view of the connecter shown in Figure 5, illustrating a different arrangement of parts whereby the relation of the retained ends of the detonating fuse, such as cordeau, is varied.

Prior to my invention various means have been employed for connecting lines of detonating fuse of the cordeau type, which in the hands of experienced and careful men have afforded satisfactory results. Great care, however, must be exercised in these prior methods to bring the two lines of detonating fuse of the cordeau type into very intimate contact at the point of junction, since otherwise failures may occur.

By the present invention, I provide perforated, grooved or recessed pellets or blocks of a moldable explosive, the perforations, grooves or recesses being of such size and so arranged as to render them adaptable for receiving and holding cordeau type detonating fuse of the usual diameter. The molded pellets or blocks in the preferred form are rigid and of sufficient strength to withstand any ordinary strains between the connected lines of detonating fuse, and to insure retention of the lines without danger of rupture. In general, any explosive material capable of being molded into a body of substantial solidity and coherence by pressure, by casting from the molten state or by bonding the brains of the explosive together by the addition of agglutinants with or without the application of pressure, and which still retains the property of accepting detonation from a No. 6 detonating cap, is suitable for use in practicing my invention. I may for example, use TNT, tetryl, or nitrostarch.

Although the blocks may be made by casting an explosive, such as tetryl for example, to form from the molten state, I prefer to employ the explosive in the crystalline or granular condition since I have found that the latter method has material advantages over and affords generally better results than the former. The sensitiveness to detonation of cast TNT, for example, is very low whereas blocks made by consolidating crystalline TNT, either with or without the aid of agglutinants, are much more sensitive and readily accept detonation from a No. 6 detonating cap.

In forming the blocks, by the preferred method the explosive crystals or granules are pressed together or mixed with an agglutinant and pressed or molded into the desired form. Where agglutinants may be required such substances as stearic acid and rosin will be found satisfactory. I have found that stearic acid or rosin mixed with crystalline explosives such as TNT and tetryl in amounts from ½% to 2% of the mixture impart increased rigidity to the molded explosive while they still retain the characteristic of being detonated by a No. 6 detonating cap. It will of course be understood that other crystalline or granular explosives than those mentioned, having sufficient sensitiveness to detonation to accept detonation from a No. 6 detonating cap and which can be molded by pressure, the use of agglutinants, or both in combination, may be used.

Although many crystalline or granular explosive materials will be found suitable for practicing the invention, I prefer to employ nitrostarch mixtures, and as two specific examples of nitrostarch compositions which will be found satisfactory, I may cite the following:

Mixtures of—	1	2
Nitrostarch	66.0	66.0
NH_4ClO_4	29.0	31.0
Stearic acid	2.0	
Diphenylamine	1.0	1.0
TNT oil	2.0	2.0
	100.0	100.0

These mixtures are made up by melting stearic acid (if present), diphenylamine and TNT oil. This combination is then mixed with the NH_4ClO_4 and sieved through a .125 mm. sieve after which the nitrostarch is added, mixed and the whole passed through a 1.0 mm. sieve. These mixtures are then pressed into the desired form using a pressure of 1125 kg. per square centimeter, when they reach a density of 1.59.

The actual form of the unions may vary widely. In Figures 1 to 4 inclusive, for example, I have illustrated a union comprising two sections, 1 and 2, each cylindrical in form and adapted to be laid and held together as shown in Figure 4. Each of the sections 1 and 2 is provided in the abutting faces, with grooves or recesses 3, which preferably are set in each face to a depth somewhat less than the radius of the cordeau, so that when the ends 4, 4 of the two lines of cordeau to be connected are laid in the grooves of one section as shown in Figure 2 and the sections are placed together as shown in Figure 4, the cordeau will be firmly gripped or clamped between the two sections. Various means may be provided for securely holding the sections together so that the pieces of cordeau are firmly retained, such for example as the spring clip 5, shown in Figure 3, which embraces the sections 1 and 2, this clip exerting sufficient pressure against the outer spaces of the sections 1 and 2 to afford the desired clamping action.

In Figure 5 I have illustrated a modified form of union comprising in this case two sections 6 and 7 respectively, each having in one face a groove 8 of somewhat less depth than the full diameter of the cordeau fuse 4 so that when the sections 6 and 7 are laid together as shown in Figure 5 with the pieces of cordeau occupying the grooves 8, the aforedescribed clamping action is obtainable. In this instance, a bolt 9 is employed which passes through a central aperture in each of the sections 6 and 7, this bolt being provided with a wing nut which may be turned down in order to draw the two sections together. In order to prevent the tendency of the wing nut to fracture or injure the sections 6 and 7 I preferably employ washers 11, 11 disposed between the heading of the bolt and the wing nut, respectively, and the faces of the union.

Instead of securing the parts 6 and 7 together as shown in Figure 5 they may be so arranged that the grooves 8 extend at an angle to each other and intersect. In this instance as shown the pieces of cordeau are made to intersect each other and actually come into close contact at the intersection.

It will be obvious that the actual form of the connecter may vary widely, and although in the present instance I have shown a preferred type involving sections which are adapted to be held together and to clamp between them the pieces of detonating fuse, it will be apparent that the union may take the form of a solid block or pellet adapted to have secured thereto or thereinto by any means, the lines of cordeau to be connected, and having in particular a recess or recesses, perforation or perforations in the form of apertures, grooves, or other deformation calculated to receive said lines. Besides using the various forms of the connecters for cordeau as herein described I may use the connecters for any detonating fuse comprising a column of a suitable explosive sheathed by a containing tube, similar in construction to cordeau.

I claim:

1. A connecter for lines of detonating fuse of the cordeau type comprising a rigid self-sustaining block of explosive composition with means for attaching thereto a plurality of pieces of detonating fuse.

2. A connecter for lines of detonating fuse of the cordeau type comprising a rigid block of explosive composition with means for inserting thereinto a plurality of pieces of detonating fuse.

3. A connecter for lines of detonating fuse of the cordeau type comprising a rigid block of explosive composition having a recess or recesses for the reception of detonating fuse.

4. A connecter for lines of detonating fuse of the cordeau type comprising a rigid block of explosive composition having one or more perforations for the reception of the detonating fuse.

5. A connecter for lines of detonating fuse of the cordeau type comprising a rigid block of explosive composition having a recess or recesses for reception of detonating fuse and means for retaining the detonating fuse in said recess or recesses.

6. A connecter for lines of detonating fuse of the cordeau type comprising a rigid block of explosive composition having one or more perforations for the reception of detonating fuse and means for retaining the detonating fuse in said perforation or perforations.

7. A connecter for lines of detonating fuse of the cordeau type, comprising a rigid block of an explosive composition containing nitrostarch, adapted to receive and retain a plurality of pieces of detonating fuse.

8. A connecter for lines of detonating fuse of the cordeau type, comprising a rigid block consisting of adherent particles of an explosive composition and adapted to receive and retain a plurality of pieces of the detonating fuse.

9. A connecter for lines of detonating fuse of the cordeau type, comprising a rigid block consisting of adherent particles of a fine grained explosive composition and adapted to receive and retain a plurality of pieces of the detonating fuse.

10. A connecter for lines of detonating fuse of the cordeau type, comprising a rigid block consisting of agglutinant bonded particles of an explosive composition and adapted to receive and retain a plurality of pieces of the detonating fuse.

11. A connecter for lines of detonating fuse of the cordeau type comprising a rigid block of hard and coherent explosive composition sensitive to detonation from a No. 6 detonating cap and adapted to receive and to retain a plurality of lines of detonating fuse.

12. A connecter for lines of detonating fuse of the cordeau type comprising separable blocks of hard and coherent explosive composition sensitive to detonation from a No. 6 detonating cap, and means for holding the separable blocks together..

13. A connecter for lines of detonating fuse of the cordeau type, comprising separable rigid blocks of an explosive composition, and means for securing the blocks together so as to retain a plurality of pieces of said detonating fuse.

14. A connecter for lines of detonating fuse of the cordeau type, comprising separable blocks consisting of adherent particles of an explosive composition, and means for holding the separable blocks tightly together.

15. A connecter for lines of detonating fuse of the cordeau type, comprising separable blocks consisting of adherent particles of a fine grained explosive composition, said blocks being adapted to receive and retain a plurality of lines of detonating fuse, and means for holding the separable blocks together.

16. A connecter for lines of detonating fuse of the cordeau type, comprising separable blocks consisting of agglutinant bonded particles of an explosive composition and adapted to receive a plurality of pieces of detonating fuse, and means including a clamp for holding the separable blocks tightly together for retaining said fuse.

17. A connecter for lines of detonating fuse of the cordeau type, comprising separable blocks of an explosive composition containing nitrostarch, and means for holding the separable blocks tightly together.

18. A connecter for lines of detonating fuse of the cordeau type, comprising separable blocks consisting of adherent particles of an explosive composition, said blocks having recesses or grooves in their abutting faces adapted for the reception of the detonating fuse, and means for holding said blocks together.

19. A connecter for lines of detonating fuse of the cordeau type comprising separable blocks consisting of adherent particles of an explosive composition, each block having a recess or groove in the face that abuts the other block adapted for the reception of detonating fuse and being slightly less in depth than the diameter of the detonating fuse, and means for holding said blocks together.

20. A connecter for lines of detonating fuse comprising separable blocks consisting of adherent particles of an explosive composition, each block having a recess in the face that abuts the other block for reception of detonating fuse, but said recesses being slightly less in depth than the diameter of the said detonating fuse, and means for securing the blocks together with said recesses intersecting.

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