

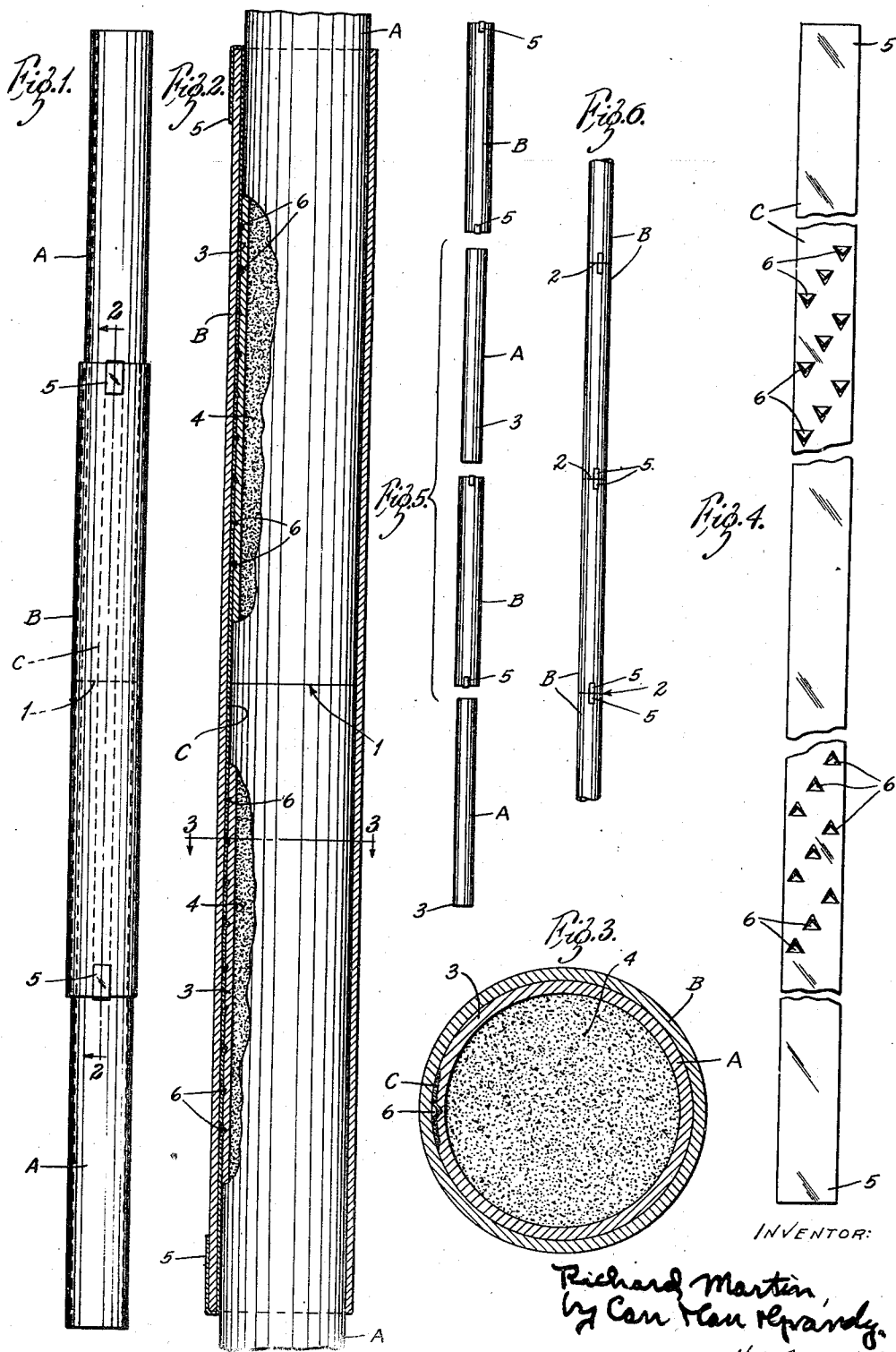
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EXPLOSIVE CARTRIDGE ASSEMBLY

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EXPLOSIVE CARTRIDGE ASSEMBLY

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2 Claims. (Cl. 102-22)

This invention relates to explosive cartridge assemblies or columns of the kind used for geophysical prospecting, particularly seismograph prospecting for oil. The invention has for its principal object to provide a simple and economical arrangement for quickly and easily securing together a plurality of cartridges of standard size and shape in end to end relation to form a strong and rigid multi-cartridge column or stick which can be easily handled and lowered into the shot hole without separation of the cartridges. The invention consists in arranging a plurality of cartridges of standard size and shape in end to end break-joint relation to a plurality of similarly arranged sleeves and in providing a strip that extends through each sleeve from end to end thereof and is formed with longitudinally spaced projections that cooperate with the cartridges in a manner that permits easy insertion thereof into the sleeves but prevents endwise separation of the sleeve and cartridges. The invention also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification and wherein like symbols refer to like parts wherever they occur:

Fig. 1 is a side elevational view of an explosive cartridge assembly embodying my invention.

Fig. 2 is an enlarged vertical longitudinal sectional view on the line 2-2 in Fig. 1, the abutting cartridges being shown only partly in section.

Fig. 3 is an enlarged horizontal cross-sectional view on the line 3-3 in Fig. 2.

Fig. 4 is a side elevational view of the cartridge retaining strip.

Fig. 5 is a side elevational view showing a plurality of cartridges and sleeves in position for assembly; and

Fig. 6 is a view showing said cartridge and sleeves assembled to form a cartridge column or stick.

The explosive cartridge column or stick shown in the accompanying drawing comprises a plurality of cylindrical cartridges A of standard size that are disposed in endwise abutting relation in a plurality of cylindrical coupling sleeves or slip tubes B that are also arranged in end to end relation. The cartridges A and sleeves B are of substantially the same length and adjacent cartridges extend substantially equal distances into the same sleeve from opposite ends thereof, whereby the joints 1 between the abutting ends of said cartridges are located substantially mid-

way of the length of said sleeves and the joints 2 between the opposing ends of said sleeves are located substantially midway of the length of said cartridges. Thus the cartridges A break joint with the sleeves B throughout the length of the cartridge column which may comprise any desired number of cartridges. Each of the cartridges A comprises a sealed hollow cylinder 3 containing a nitro or other explosive composition 4; and said cartridge cylinder and each of the cylindrical sleeves B are preferably made of strips of convolutely or helically wound adhesively united paper or like material.

The cartridges A have a slip fit in the sleeves B; and each sleeve is provided with quick attachable and detachable means for securely locking the two cartridges therein in endwise abutting relation. This cartridge locking means for each sleeve B comprises a narrow strip C of metal or other bendable material which extends through said sleeve from end to end thereof between the latter and the two cartridges A therein and has its ends 5 bent around the corresponding ends of said sleeve to prevent endwise movement of the strip therein. As shown in the drawing, the cartridge locking strip C is provided on its cartridge opposing side with gripping elements preferably in the form of a multiplicity of prongs or barbs 6 that are struck from said strip along the length thereof. The prongs 6 are preferably arranged in two series, one in each end portion of said strip; and the prongs of each series project from the inner face of said strip and are inclined towards the prongs of the other series, whereby said prongs permit the cartridges A to be slid into the sleeves B but grip or dig into the paper walls 3 of the cartridges in a manner that prevents withdrawal of said cartridges from said sleeves.

The multi-cartridge column or stick is assembled by slipping a locking strip C into each of the sleeves B and bending the ends 5 of said strips over the ends of said sleeves. The cartridges A are then slipped into opposite ends of the sleeves B and are locked therein in endwise propagating contact by the strips C attached thereto, thereby forming a multi-cartridge column wherein the cartridges are connected and protected by the sleeves and the latter are connected by the cartridges. The inwardly projecting prongs 6 on the locking strips C are inclined in the direction in which the cartridge is slid into the sleeve and thus offer little resistance to such movement. The prongs 6, however, bite or dig into the paper wall 3 of the cartridge cylinder during the in-

section of the cartridges into the sleeves and said prongs, being disposed at a reverse inclination to the inward sliding movement of the cartridges, operate to straighten out and dig deeper into the cartridge cylinder under any force tending to cause endwise separation of the cartridges and cylinders. If desired, the cartridges A may be slightly rotated in the sleeves B after they are fully inserted therein to cause the prongs 6 to engage the cartridges at points offset from the portions of the cartridges engaged by the prongs when the cartridges are inserted, whereby the prongs are adapted to more strongly resist endwise removal of the cartridges therefrom. If, for any reason, it is desired to remove the cartridges from the sleeves, the bent end portions 5 of the strips C are straightened out against the sides of the cartridges, thereby permitting said cartridges and locking strips to be withdrawn from the sleeves.

The hereinbefore described arrangement permits a strong and rigid multi-cartridge column to be quickly and easily made up of standard cartridges and plain sleeves merely by slipping the locking strips C through the sleeves and bending the ends of the strips over the ends of the sleeves, then slipping the cartridges into opposite ends of the sleeves until the cartridges are brought into endwise abutting relation. If desired, each sleeve may be provided with a plurality of circumferentially spaced locking strips to more securely lock the cartridges therein. The locking strength of the locking strip C may be regulated by varying the number of prongs thereon; and said strip may be made of scrap metal, plastic or other inexpensive material. If desired, prongs may be provided on both sides of the locking strip, thereby providing additional means for anchoring said strip to the sleeve. The cartridges and sleeves are of the same length or the sleeves may be made shorter than the cartridge, thus permitting

the cartridges to be slipped into the sleeves to economize space in shipping. The thin lightweight locking strips C may also be included in the package without materially increasing the size and weight thereof.

What I claim is:

1. A multi-explosive cartridge column comprising a plurality of standard paper-wrapped cartridges disposed in endwise abutting relation and a plurality of sleeves disposed in end to end relation around said cartridges, said cartridges extending into said sleeves from opposite ends thereof, and metal strips extending through the respective sleeves along the inner faces of said sleeves and bent over the ends thereof, said strips having a plurality of longitudinally spaced prongs struck therefrom that bite into the paper wrapping of said cartridges when the latter are inserted in said sleeves and are inclined in a direction that will bring about an increased gripping action of said prongs under forces tending to separate said cartridges and sleeves.

2. An explosive cartridge assembly comprising a sleeve, cartridges extending into said sleeve from opposite ends thereof and having a slip fit therein, and a relatively long and narrow locking strip extending through said sleeve with its end portions bent around the ends thereof, said strip having a plurality of longitudinally spaced prongs thereon that bite into said cartridges when the latter are inserted in said sleeve and are inclined in a direction that will bring about an increased gripping action of said prongs under forces intended to separate said cartridges and sleeve, said bent-in portions of said locking strip being adapted to be straightened out against the sides of said cartridges, thereby permitting said cartridges and locking strip to be withdrawn from said sleeve.

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