

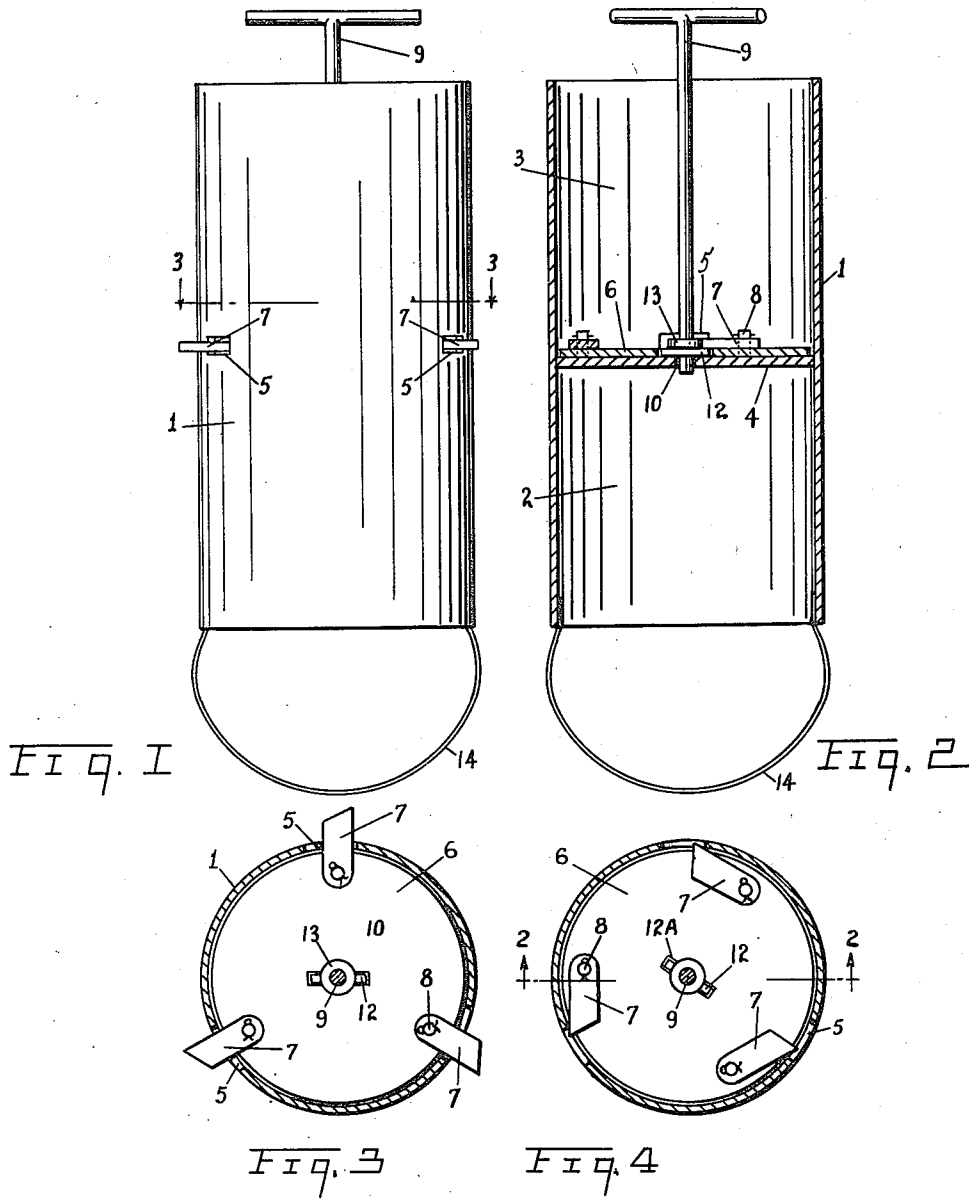
May 20, 1958

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2,835,197

PRELOADERS FOR EXPLOSIVE CHARGES

Filed Feb. 9, 1955



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1

2,835,197

PRELOADERS FOR EXPLOSIVE CHARGES

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Application February 9, 1955, Serial No. 487,124

2 Claims. (Cl. 102—22)

This invention relates to improvements in preloaders for explosives and more particularly to explosive preloaders used by seismic crews in exploration for petroleum, natural gas, etc. where there is a time delay between laying and firing of the charge.

The invention consists essentially in the provision of a safety preloader which is fitted into the charge hole to prevent unauthorized tampering with the charge during the interval between laying and firing, the preloader being readily withdrawn from the charge hole when firing is about to take place.

The practice is for exploration crews to drill numerous small diameter shallow holes in which the explosives are set for shooting. Frequently, unauthorized persons have tampered with the holes or with the explosives which have been set therein between the time of drilling and the time of firing the shot. The present invention provides a simple and tamper-proof seal for the drilled hole and the charge contained therein, and which, by the use of a simple handle can be unlocked from the ground and withdrawn just before the charge is fired.

The objects of the invention are to provide a safety device for explosive charge holes which will effectively seal and prevent unauthorized tampering with the charge before it is fired.

A further object is to provide a safety device for explosive charge holes to which cap-leads are attached and which are protected against the weather or being tampered with and are withdrawn with the device to the surface of the ground when the charges are ready to be fired.

A further object is to provide a safety device which can be quickly identified on the ground and which will prevent the falling in of earth on top of the charge.

Referring to the drawings, Fig. 1 is a vertical outside elevation of the device showing the locking arms extended.

Fig. 2 is a vertical sectional elevation on the line 2—2 of Fig. 4.

Fig. 3 is a plan view on the line 3—3 of Fig. 1 showing the locking arms extended for locking the device in the surrounding ground.

Fig. 4 is a plan view similar to Fig. 3 but showing the locking arms retracted.

In the drawings, the cylinder 1 is sealed off into two compartments 2 and 3 by means of the solid plate 4 which can be either welded in place or otherwise secured. Immediately above the plane of the top surface of the plate 4 a series of circumferential slots 5 are provided. For the purpose of this application three slots are shown but two or more could be provided if necessary. A movable plate 6 fits into the top compartment 3 of the cylinder and has attached thereto adjacent its periphery the arms 7 pivoted on the pins 8. These arms are equal in number to the number of slots 5 in the wall of the cylinder 1. When the plate 6 rests on the plate 4 the arms 7 are in the same plane as the slots 5 and are adapted to be positioned in the slots 5 and then be projected there-

2

through and locked in the surrounding earth by rotation of the plate 6.

The plate 6 is rotatable on top of the plate 4 by means of the removable handle 9. The bottom end of the handle 9 fits into the hole 10 in the plate 6 and the hole 11 in the plate 4 while a crosspin 12 in the handle fits into the transverse slot 12A in the plate 6 to provide a means for rotating the plate 6 with respect to the cylinder 1. In order to hold the cross pin 12 in the plane of the plate 6 a shoulder 13 is provided on the handle 9.

Attached to the bottom edge of the cylinder 1 is a bail 14 which may be in the form of a spring wire or strap to which can be attached the cap leads (not shown). This bail 14 is formed to extend slightly over the external diameter of the cylinder 1 so as to dig into the earth and provide an anchor to prevent rotation of the cylinder in the hole when the handle is rotated.

In the operation of this invention the procedures normally followed in the laying out of the explosive charges by a seismic crew are not changed. However, when the charge holes have been completed and the explosive charge has been set, the safety device covered by this application is set in place in the charge hole. The cap leads from the charge are first connected to the bail 14 of the device and the cylinder is then inserted in the charge hole. The loose plate 6 with its arms 7 retracted is then inserted in the top compartment 3 of the cylinder 1. The ends of the arms 7 opposite the pivots 8 are set by hand into the slots 5 of the cylinder 1 and can be pushed out into the surrounding earth by engaging the lower end of the handle 9 with the plate 6. Rotation of the handle 9 and the plate 6 will cause the pivot pins 8 to rotate with respect to the slots 5 in the cylinder thus driving the arms out through the slots into the surrounding earth and thereby lock the cylinder in the charge hole. The handle 9 can now be withdrawn. The charge hole is now effectively sealed against unauthorized tampering and the cylinder 1 cannot be withdrawn from the charge hole until the handle 9 is again inserted to rotate the plate 6 sufficient to cause retraction of the arms 7 inside the cylinder. Withdrawing the cylinder 1 from the charge hole simultaneously pulls out the cap leads which are attached to the bail 14 thus expediting the work of firing the charges.

By the use of the above described device the laid explosive charges are effectively sealed against both unauthorized tampering and the effects of weather which might otherwise cause the surrounding earth to fall inwards and bury the charge and its cap leads. In addition the tops of the cylinders can be used to quickly identify the location of the various charges in the area under investigation.

What I claim is:

1. In a safety preloader for explosive charges set in pockets in the ground, a cylinder adapted to fit in the prepared charge pockets, said cylinder having a sealed plate dividing the cylinder into upper and lower compartments, a series of circumferential slots in the wall of the cylinder located immediately above said division plate, a removable rotatable plate of slightly less diameter than the inside of said cylinder located in the upper compartment of the cylinder and resting on the said division plate, removable handle means adapted to engage with and rotate said rotatable plate adjacent the periphery thereof and on an axis parallel with the axis of said cylinder, said retractable arms adapted to be rotated about their pivots and be projected against one end of the circumferential slots in the wall of the cylinder and guided thereby to be projected outwardly of said cylinder to lock said cylinder in the surrounding earth when the said plate is rotated relative to the said cylinder and

means to anchor the explosive charge wires below said cylinder and protected by the sealed plate closing the lower compartment of the cylinder.

2. In a safety preloader for explosive charges as set forth in claim 1, in which the anchor means for the explosive wires comprises a spring loop secured to the sides of the cylinder and projecting downwardly therefrom. 5

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