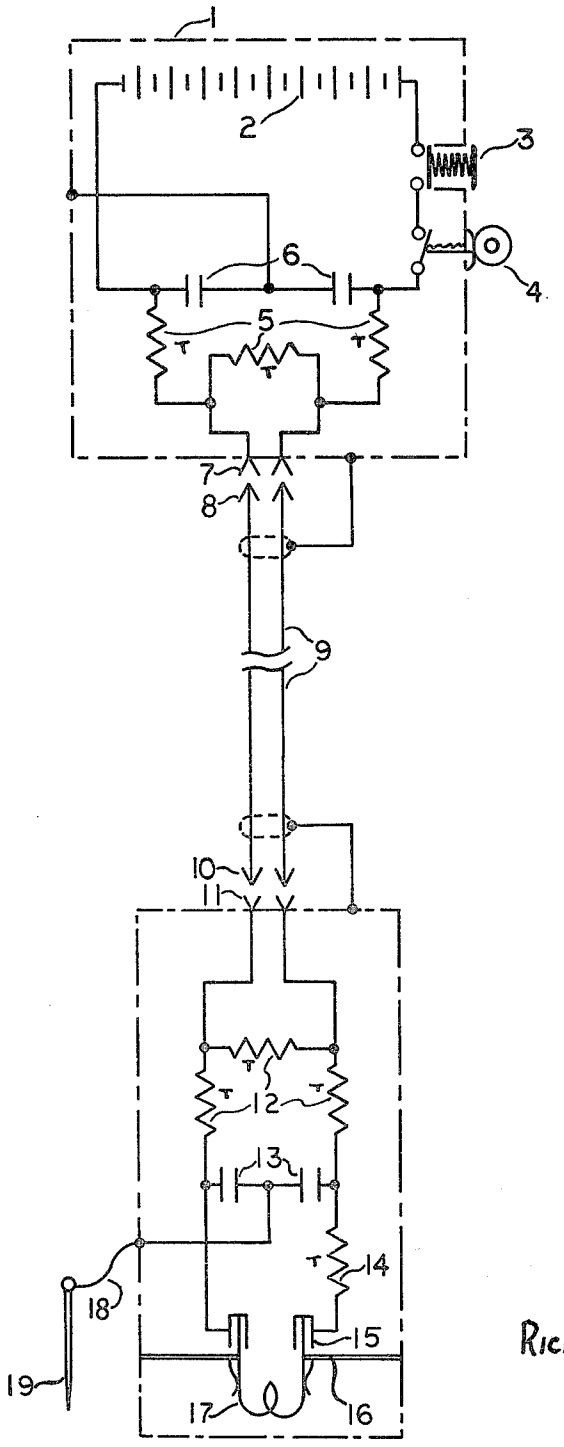
Jan. 14, 1969 R. N. SNYDER 3,421,440

ELECTROMAGNETIC ATTENUATED DETONATING SYSTEM

Filed April 11, 1967



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United States Patent Office

3,421,440

Patented Jan. 14, 1969

3,421,440

ELECTROMAGNETIC ATTENUATED DETONATING SYSTEM

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Filed Apr. 11, 1967, Ser. No. 630,131
U.S. Cl. 102—70.2 1 Claim
Int. Cl. F42c 15/00

ABSTRACT OF THE DISCLOSURE

This invention relates to a firing circuit for a remotely controlled explosive charge wherein circuitry is rendered immune to ambient RF energy. The circuitry is comprised of an initiation circuit having a battery; spring loaded plunger switch; a safety interlock switch; and an RF filter network utilizing thermistors being housed in a control box and a shielded transmission line feeding a shielded initiator containing a second RF filter network and wherein the resistive elements are thermistors. All circuitry is balanced to ground.

This invention generally relates to explosive detonators and more particularly to the attenuation of electromagnetic radiation induced into the detonating wire via proximity radio frequency radiation.

An object of this invention is to provide electromagnetic shielding and a method to release the detonating charge safely and inexpensively.

Another object of this invention is to detonate the explosive by using conventional detonators.

Still another object of this invention is to provide a means to detonate the explosive using a DC battery and switching system, located in a remote position, which will fire the detonator through a shielded, balanced line which will allow only direct current (DC) to pass and will either attenuate or shield all undesirable radiation currents and pass them to a neutral or ground point. This pertains mainly to the radiation emitted by radar and communications equipment which release radiation voltages capable of initiating premature and unwanted detonation of explosives (i.e. two-way communications cease in area of detonating explosives). Premature or unwanted detonation is caused by present use of inadequate radio frequency (RF) shielding and attenuation of ambient electromagnetic waves. This produces an antenna-like effect, picking up the radiation voltage due to either a corresponding wavelength characteristic or static electricity which is terminated into the low impedance point of the detonator cap causing radio frequency (RF) current to raise the temperature above the threshold level and releasing the charge.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

The figure illustrates an electrical schematic diagram upon which this invention is based.

In carrying out this invention, referring now specifically to the drawing, there is provided a control box **1**, which houses a battery **2**, a spring loaded detonator switch **3**, a safety interlock switch **4**, which must be switched "on" to complete the circuit before switch **3** is depressed. This is an additional safety device which prevents the detonator from being accidentally actuated and may be in the form of a guard protected switch, key switch, or any other switch which is electrically capable of carrying the DC current supplied by battery **2**.

The low impedance thermistor attenuator network **5** and the radio frequency (RF) filter capacitor network **6**, join together to form the primary filter attenuator network. A two wire, shielded balanced cable **9**, linked to the primary filter attenuator network by shielded wire plugs female **7** and male **8**, and by shielded wire plugs male **10** and female **11**, to the secondary filter attenuator network consisting of thermistor attenuator network **12** and radio frequency (RF) filter capacitor network **13**, contained in detonator housing **16**. The impedance matching thermistor **14**, in the detonator housing **16**, keeps the low resistance of the detonator at the specified impedance to maintain a balanced line between control box **1**, and the detonator cap **17**. The detonator cap **17** is not a part of this invention but is shown to illustrate its relative position, and may vary depending upon the size of the explosive charge. The detonator cap connector **15**, accommodates the wire ends of the electrical detonator cap **17**.

The bonding ground strap **18**, grounds the shielded end of the detonator housing **16** to copper plated grounding rod **19**, which places the shielded detonator housing **16** at electromagnetic ground when ground rod **19** is driven into the ground.

In the operation of this device the detonator housing **16**, would become an integral unit of the detonator cap. The shielded coaxial cable **9**, is inserted into the detonator housing via the shielded wire plugs **10** and **11**. The shielded coaxial cable **9**, is then run the length required to control box **1** and connected by shielded wire plugs **7** and **8**. The safety switch **4** may now be switched "on" and the system is now ready for use. At the discretion of the operator, the detonator switch **3**, is depressed and the explosive charge is initiated through direct current (DC) from battery **2** in control box **1**, flowing through the conductors in the shielded coaxial cable and releasing the charge in the detonator cap.

Having thus completely and fully described the invention, what is now claimed as new is as follows:

1. A control box containing a battery; control switches; and circuitry comprised of an impedance matching thermistor RF attenuator network to initiate a detonator located at a remote location from said control box, and a second impedance matching thermistor RF attenuator network contained within a remote detonator housing and connected to said control box by shielded two wire cable, thus providing a battery operated D.C. device which will safely initiate a remote explosive charge.

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