United States Patent

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[72] Inventor **William R. Hartness**
207 E. Main St., Sanford, N.C. 27330

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[54] **RADIO CONTROLLED TRAP SHOOTING APPARATUS**
1 Claim, 3 Drawing Figs.

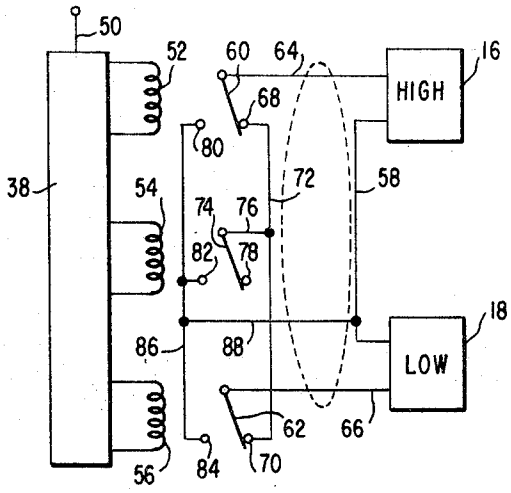
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[51] **Int. Cl.** **H04b 7/12,** F41c 19/12
[50] **Field of Search** 340/224, 225; 124/34, 32; 325/37; 200/159; 343/225

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Primary Examiner—Alvin H. Waring
Assistant Examiner—Perry Palan
Attorney—Stowell & Stowell

ABSTRACT: A portable apparatus for remotely controlling the launching of disc targets. A multichannel radio transmitter is mounted on a scoring board and a fixed multichannel radio receiver, adapted to receive selected signals from the transmitter, is connected to target launching mechanisms to provide a trigger therefor. The desired launching mechanism is triggered by the choice of the transmitting channel over which a signal is sent.



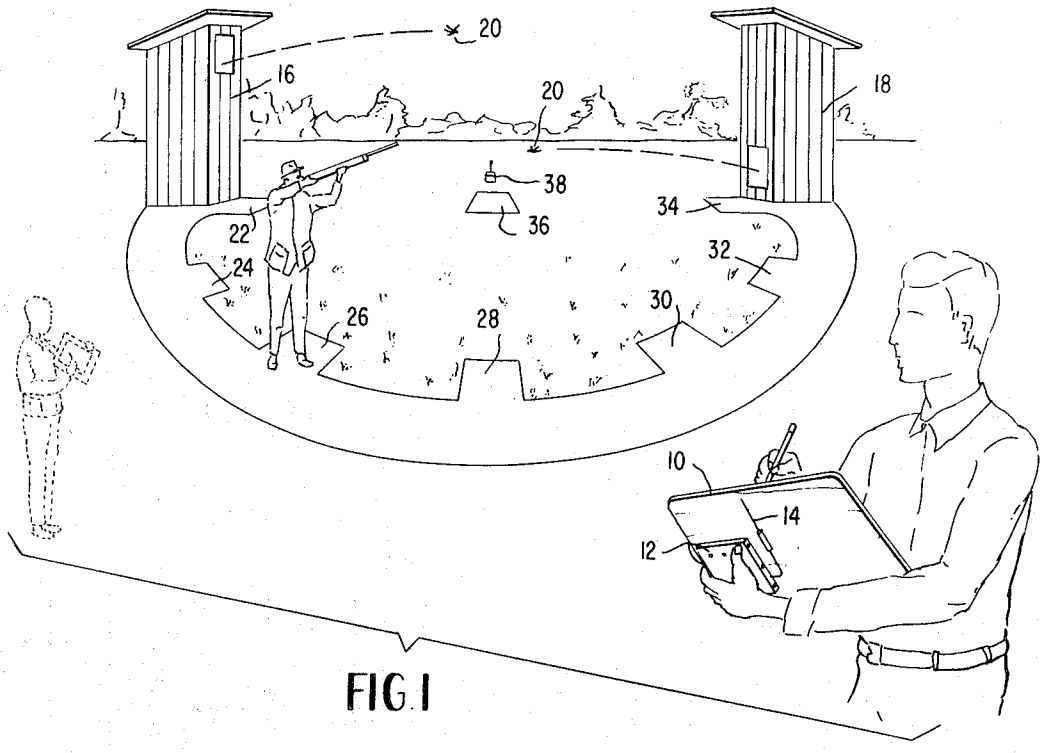


FIG. 1

FIG. 2

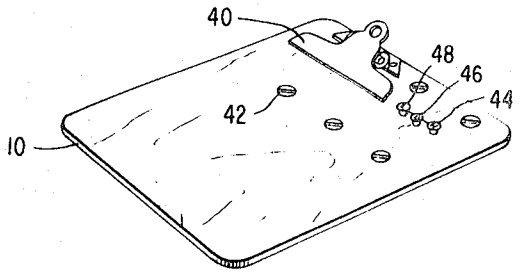
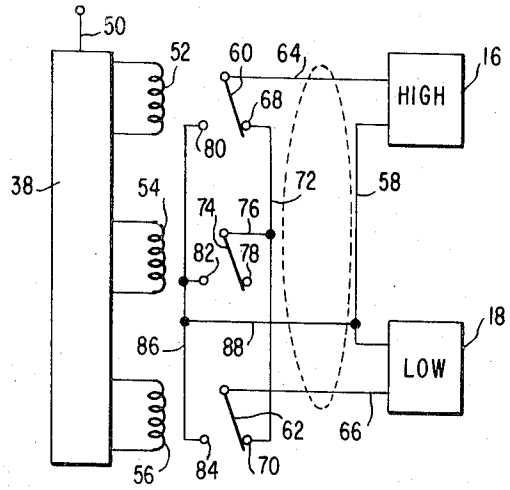


FIG. 3



INVENTOR
WILLIAM R. HARTNESS

BY Stowell & Stowell

ATTORNEYS

RADIO CONTROLLED TRAP SHOOTING APPARATUS

BACKGROUND OF THE INVENTION

This invention relates generally to the art of target shooting and more particularly to apparatus for controlling the launching disc targets in trap or "skeet" shooting. In skeet shooting, disc targets known as clay pigeons, are launched from a pair of target traps or houses usually designated by the terms "high and low houses." In utilizing a skeet range, the shooter generally assumes, in sequence, positions at shooting stations at points around an arc joining the two trap houses. On signal from the shooter, targets are released by the range operator from either one or the other of the houses or, in some cases, known as "doubles," from both houses simultaneously.

In the prior art, devices have been provided for manually releasing the targets on signal to operators in the houses, or for remotely releasing the targets from a fixed position remote from the houses. One of the problems associated with the fixed location operation is that the shooter is continually moving from shooting station to shooting station and, as his proximity to the operator decreases, the probability of a misunderstanding of signal with attendant mistake or delay is increased. The prior art also has included remote control devices, which are, to a degree, portable and tend to somewhat overcome the drawbacks of the fixed station type of apparatus. One of the latter type devices operates through a ground cable connected to the target houses to provide some degree of mobility for the operator. The use of a cable, however, still imposes some drawbacks in that such a device tends to be cumbersome. There is the problem that the trailing cable may foul or hang up on obstructions in the area and the cable or insulation is subject to mechanical injury with the attendant danger of shock or failure.

SUMMARY OF THE INVENTION

This invention provides an improved skeet target launcher control device by furnishing a novel apparatus for controlling the operation of target houses through a multichannel radio signal transmitter and receiver adapted to selectively trigger the target launching apparatus.

It is an object of this invention to provide a new and improved means for controlling skeet target launching apparatus through the use of radio signals.

It is another object of this invention to provide a control means for skeet target launching apparatus which provides the operator with complete freedom of mobility.

These and other objects and attendant advantages of this invention will become more apparent to those skilled in the art by reference to the following detailed description when viewed in light of the accompanying drawings wherein like numerals indicate like components throughout the figures thereof and wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a trap shooting range in accordance with the invention;

FIG. 2 is a perspective view of a control board in accordance with the invention; and

FIG. 3 is a schematic view of the receiver and actuating circuitry in accordance with the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to FIG. 1 of the drawings, a control board **10** is shown held by an operator. The board has, mounted thereon, a radio transmitter **12** with an aerial **14** extending therefrom in the plane of the back of the board.

The trap range comprises a pair of trap houses designated as a high house **16** and a low house **18** from which clay targets **20** may be ejected in a conventional manner. A plurality of shooting stations, **22** through **34**, are disposed on an arc extending between the houses **16** and **18** and a central shooting station **36** is disposed substantially at the center of radius of the arc. The above-described layout of the range is conventional and therefore preferred, however, other suitable arrangements could be utilized if so desired.

A radio receiver **38** is disposed substantially midway between the houses **16** and **18** for purposes to be described in greater detail below. The location of the receiver **38** is not particularly critical, however, as will be seen hereinafter, the location illustrated is preferred from a standpoint of convenience of wiring.

Referring now to FIG. 2, the control board **10**, shown in enlarged detail, comprises a standard spring loaded clip arrangement **40** for holding scoring sheets or other similar objects to the board. The radio transmitter **12** (FIG. 1) is mounted to the back surface of the board **10** through a plurality of screws **42**. Signals emitted by the transmitter **12** are controlled through the medium of pushbuttons **44**, **46** and **48** extending through the board **10**.

Although any suitable type of radio transmitter may be used in conjunction with this invention, a small battery powered, transistorized, multiple channel unit is preferred since the weight thereof is minimal. The transmitter is preferably operated on a 27 megacycle band and with a power output of less than 100 milliwatts so that Federal Communications operator's licenses will not be required. For the purposes of this invention, a three channel or frequency capability is desired.

Referring now to FIG. 3 of the drawings, the receiver **38**, shown in schematic, is provided with an antenna **50** and, as with the transmitter **12** (FIG. 1), is provided with three channels for receiving radio signals of different frequencies.

The receiver may also be of the transistorized type with a superheterodyne circuit to reduce the amount of interference. The receiver may be operated from either battery power or from a regular 110 volt line and is attached to the target launching units, preferably with standard type plug arrangements so that, on existing cable controlled units, the control cable may be unplugged and replaced by the wire from the receiver. The receiver is preferably housed in a waterproof box for purposes of protection.

Solenoid coils **52**, **54** and **56**, individually connected to each channel, are energized when a signal is received from the transmitter **12** (FIG. 1) on the corresponding channel. Such actuation may be accomplished through resonant reed relays, actuated by the signal received from the transmitter, the relays, in turn, actuating servos to close the switches. Such arrangements are well-known in the art. The high and low houses **16** and **18** are interconnected by a conductor **58** and are individually connected to switches **60** and **62** through conductors **64** and **66** respectively. The switches **60** and **62** are normally biased against contacts **68** and **70** which are interconnected by a shunt **72**. A switch **74** is connected to the shunt **72** by a conductor **76** and is normally biased against a neutral contact **78**. The switches **60**, **62** and **74** are mechanically connected to the solenoid coils **52**, **54** and **56** respectively for actuation thereby on energization thereof. Contacts **80**, **82** and **84** are disposed in opposed relationship to the contacts **68**, **78** and **70** respectively and are interconnected by a power bus **86**. The bus **86** is connected to the conductor **58** by a conductor **88**.

It should be obvious that forms of wiring other than that specifically illustrated may be used in conjunction with the invention without departing from the teaching thereof.

In operation, the operator, on signals from the shooter, actuates the apparatus by depressing the desired button on the control board **10**. For example, when a target is desired from the high house **16**, the button **44** on the control board **10** is depressed thereby transmitting a radio signal of a first frequency from the transmitter **12**. The signal is received by the receiver **38**, which energizes the coil **52**. Energization of the coil **52** closes the switch **60** against the contact **80** to complete the circuit from the bus **86** through the conductor

64 to the high house **16** thereby triggering the trap or launching mechanism therein and firing a target **20** from the high house. When a target from the low house **18** is desired, the button **48** is depressed sending a signal of a second frequency from the transmitter **12**. This signal is received by the receiver **38** and the coil **56** is energized thereby. Energization of the coil **56** closes the switch **62** against the contact **84** thereby completing the circuit between the bus **86** through the conductor **66** to the low house and, in a manner identical to that of the high house, triggers the trap or launching mechanism to fire a target **20** from the low house **18**. When doubles or simultaneous launching of targets from both the low house and the high house are desired, the button **46** is depressed sending a signal of a third frequency from the transmitter **12** for reception by the receiver **38**. On receipt of the signal of the third frequency, the coil **54** is energized thereby closing the switch **74** against the contact **82** and completing the circuit between the bus and both the high house **16** and low house **18** through the shunt **72**, switches **60** and **62** and conductors **64** and **66**.

Since each of the above-described buttons are spring loaded, release of pressure thereon terminates the radio signal initiated thereby, thereby deenergizing the respective coils to allow the switches to return to their illustrated positions.

Launching mechanisms intended for use in conjunction with this invention are well known in the art and, since they do not constitute a portion of this invention, are not described in greater detail herein.

By utilization of the above-described invention it is readily seen that the operator is completely free to move to any position on the field with a control board which is light and freely movable. There are no wires to obstruct either the shooter or the operator and there is no danger of electrical shock to the operator. By utilization of different frequencies on adjacent ranges, interference between ranges can be avoided.

I claim:

1. A portable control device for first and second skeet traps comprising a rectangular board for supporting a score card, a radio transmitter having first, second and third transmitting channels mounted on said board, means to selectively transmit radio signals from each channel of said transmitter, a radio receiver having first, second and third reception channels corresponding to each of the channels said transmitter, power means including first, second and third normally open switches corresponding to each of the channels of said receiver actuated upon receipt of a signal by the corresponding reception channel, circuit means connecting said first switch to said first trap, said second switch to said second trap and said third switch to both of said traps for release of the trap connected thereto upon actuation of the corresponding switch, said circuit means comprises a bus having first, second and third contacts thereon, said bus being connected to both of said traps, fourth, fifth and sixth contacts opposing said first, second and third contacts respectively, a shunt between said fourth and fifth contacts, said first and second switches being normally biased against said fourth and fifth contacts and actuated to contact said first and second contacts respectively, said third switch being connected to said shunt and normally biased to contact said sixth contact, said third switch, when actuated, contacting said third contact.