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INTERVALOMETER CALIBRATION
CHECKER

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1 Claim. (Cl. 175-368)

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1

This invention relates to an electric testing device, and particularly to an intervalometer calibration checker.

An intervalometer as used in bombing warfare is a timing device designed for use in an electrical bomb release system to send out electrical impulses to the release units in the system, in order to obtain a desired spacing between bombs on or across the target. The intervalometer is placed in the electrical bomb release system at a point between the power source and the other operating units in the system, and is operated when the bombardier's control switch in the intervalometer circuit is closed. Operating on a condenser charge-discharge theory, the intervalometer alternately connects and disconnects the power source to and from the electrical bomb release system, thus sending out timed impulses. The impulses produced by the operation of the intervalometer are distributed throughout the electric bomb release system by the distributing units of the system. Each impulse operates a release unit in the bomb release system, thus releasing a bomb from the airplane. The number of impulses sent out by the intervalometer and the frequency at which they occur may be varied as desired by the bombardier in the airplane. This intervalometer is regarded as a single wire type, since all impulses are sent out from the intervalometer through a single wire.

The purpose of my device is to check the accuracy of the timed impulses generated by the intervalometer. My device receives said intervalometer impulses and determines their actual frequency. Said actual frequency output can be compared with the required frequency for a corresponding intervalometer setting, and any malfunctioning of the intervalometer corrected.

The figure of the drawing shows a wiring diagram of my invention.

The intervalometer 1 to be checked is electrically connected to an electrical connector plug 2 which mates with an electrical receptacle connector 3. An impulse from the intervalometer enters the checker through pin B.

Power for supplying both my checker and the intervalometer is provided by transformer 4 coupling a 115 volt 60-cycle source 5 to filter 6 through a dry disc rectifier 7 bridge connected. A single-pole single-throw power switch 13 is provided in the 60-cycle line. The positive output of said filter is connected to terminal 8; the negative output to terminal 9, and grounded at 10. A battery can be connected across terminals 9 and 11, in lieu of the above alternating source,

2

if desired. Single-pole double-throw switch 12 provides switching means for cutting in the filter 6 output or the battery source.

Pin C is connected to the positive side of the filter 6 output through switch 12 and variable resistor 14. A starting push button switch 15 is connected across pins A and C. Resistor 16 is connected to pin B and grounded at 17. Said resistor 16 is connected across a filter 18 through a selenium rectifier 19 bridge connected, and a capacitor 25.

Across the output terminals of said filter 18 is connected a milliammeter 20 through switch 21. Said milliammeter 20 is calibrated in feet of spacing between bombs on or across a target, at 100 knots of airplane speed.

The power supply voltage to the intervalometer is fixed by means of variable resistor 14 to a predetermined potential of 28 volts. This voltage is read directly on the meter 20 by a suitable electrical arrangement as follows. A resistor 22 is connected between the remaining terminal 23 of single-pole double-throw switch 21 and variable resistor 14. This multiplier resistor 22 in series with the milliammeter changes said meter to a voltmeter. The meter is also calibrated for voltage readings. The potential of 28 volts decided on was obtained by averaging the voltages of various intervalometer installations in different bombers.

In operation, electrical connector receptacle 3 is mated with connector plug 2 thereby connecting the intervalometer to be checked with my intervalometer calibration checker. The power switch 13 and switch 12 are closed to energize the checker and the intervalometer. Switch 21 is depressed on terminal 23 and the voltage adjusted by variable resistor 14 until a voltage reading of 28 appears on meter 20. The spring loaded switch 21 is then released so as to engage with terminal 24, thereby connecting the meter across the output of filter 18 for operation. The start button 15 is pressed, placing the intervalometer in operation. Impulses from the intervalometer enter the checker through pin B, and are fed across grounded resistor 16 and into capacitor 25. The resistor 16 discharges a spark condenser that is an integral part of every intervalometer which if not discharged would give a false reading.

The condenser 25 is discharged into the selenium type rectifier 19 where the pulses are rectified. The rectified pulses are then passed into a filter circuit which smooths out all slow pulses and allows the meter to read a steady

3

value. The amount of charge and discharge of condenser 25 governs the value of current flowing through the meter 20.

In actual testing, the intervalometer is set in a position, for example, corresponding to a spacing between bombs of 85 feet across a target. (Due to the designed timing characteristics of the intervalometer, a predetermined number of impulses per second would actuate the bomb release system to achieve said 85 foot spacing.) Said impulses are, however, fed into the checker for test. If the intervalometer is operating correctly "in timing," sufficient current will pass through the meter 20 to indicate 85 feet on the calibrated meter. If the meter needle indicates more or less than 85 on its scale, the intervalometer is "out of timing," correspondingly.

Next, place the intervalometer in a position corresponding to a spacing between bombs of 42, for example, feet across a target, and repeat the test. The intervalometer should be operated several times for each position to enable the operator to obtain an average for each position.

While I have shown a particular embodiment of my invention, it will be understood, of course, that I do not wish to be limited thereto, since many modifications may be made, and I, therefore, contemplate by the appended claim to cover any such modifications as fall within the true spirit and scope of my invention.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

4

What is claimed is:

An apparatus for checking an intervalometer, comprising: a direct current source having a positive and a negative terminal; an electrical connector receptacle having a first, a second and a third prong; a variable resistor connecting said positive terminal and said first prong; a switch interposed between said variable resistor and said positive terminal; a switch connecting said first and said second prongs; a discharge resistor connecting said third prong and said negative terminal; a filter circuit; a selenium rectifier bridge connected across said filter and across said discharge resistor; a capacitor interposed between said rectifier and the positive side of said discharge resistor; a milliammeter connected across the output of said filter; a single-pole double-throw switch interposed between the positive side of said filter and said milliammeter; and a multiplier resistance connecting the remaining terminal of said double-throw switch and the variable resistance.

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