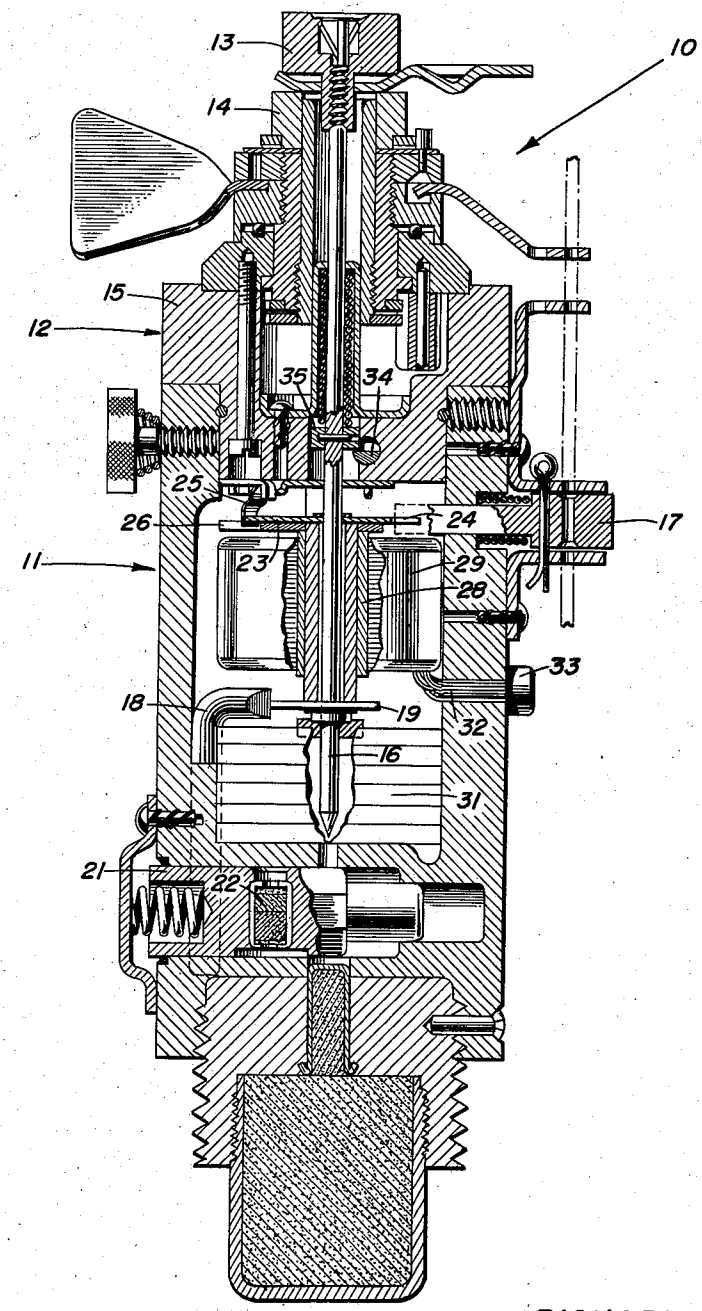
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REMOTE CONTROL FUZESETTER

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REMOTE CONTROL FUZESETTER

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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.

This invention relates to remote control fuzesetters for ordnance items and more particularly to a remote control fuzesetter characterized by the provision of a synchronous motor within the fuze body portion to set the timing disc lever responsive to input signals from a central control station.

Mechanical time bomb fuzes of the type identified as T55E1 or AN–M145 and disclosed in military publications such as the Army Manual TM–1980, Air Force Manual AFM 136–7, and Navy BuOrd OP 1548 are standard for production of bomb or missile air bursts and normally are made up of several parts rotatable with respect to each other. The fuze cap, which is generally calibrated in time increments, is manually rotated to turn a timing disc lever within the fuze body portion, and when the fuze time mechanism is activated, the disc is rotated by clockwork the preset period of time until stopped by the timing disc lever which releases the firing pin to fire the fuze detonator. The timing disc lever initiates the firing pin action by dropping into a recess provided in the periphery of the timing disc. The existing method is to set this type of fuze when the aircraft is on the ground, flying a predetermined altitude governed by the time delay set in the fuze, and releasing the bomb or missile at the prescribed altitude to effectuate an air burst of the bomb at a required height.

The present invention overcomes the prior art deficiencies above-noted by affording a means adapted for use in mechanical time fuzes of the nature described which permits the fuze to be set either manually, or to be set by remote control after take-off of the aircraft. Thus, the aircraft pilot may deviate his flight pattern to meet the tactical situation without interfering with effective bomb release. This is possible because the fuze settings may be changed in all or a remaining part of the bomb load until time of release by virtue of the instant invention.

An object of the present invention is the provision of a fuzesetter for time fuzes for airborne bombs, missiles, or the like which may be operated from a remote position at any time prior to launching.

Another object is to provide means for adapting standard mechanical time bomb fuzes for a selective combination of either remote control or manual setting.

A further object of the invention is the provision of a remote controlled time fuze which contains a signal responsive means within the fuze housing to time set the fuze.

Still another object is to provide a fuzesetter which may be operated either with others or individually from a remote control station.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following

detailed description when considered in connection with the accompanying drawing wherein the drawing shows a longitudinal sectional view of the apparatus installed in a standard mechanical time bomb fuze.

The drawing, which illustrates a preferred embodiment of the invention, shows a standard mechanical time fuze **10** having a body portion **11**, and a cap portion **12** rotatably mounted therewith. Conventional fuze elements such as firing pin striker **13**, safety block **14**, calibrated head **15**, firing pin **16**, arming pin **17**, arming lever **18**, arming cam **19**, detonator slider **21**, and detonator **22** are positioned within the fuze structure in their normal fashion and as such do not comprise a part of this invention.

Timing disc **23** contains a notched portion **24** to receive the timing disc lever **25** which in turn releases the firing pin **16** to explode the detonator **22**. The timing disc lever **25** releases the firing pin **16** by releasing a stop on half-round pin **34**. This enables the half-round pin to be rotated out of the path of the firing pin by pressure of a spring-loaded collar member **35** fixed to the firing pin. The action of the movement of the timing disc lever **25** into the slot or notched portion **24** is translated by means of a mechanical linkage such as a pawl, not a part of the present invention, to release the stop on the half-round pin **34**. A synchro disc **26** is coaxially mounted immediatelly below timing disc **23**, and is engaged with timing disc lever **25** so that the lever **25** may be carried and positioned about the periphery of disc **23** by rotation of the synchro disc **26**. A drive shaft **28**, which may be fixed to synchro disc **26** by means such as brazing, operatively connects the synchro disc **26** with a synchro motor **29** which is coaxially positioned within the fuze body portion **11** above conventional time mechanism such as clockwork **31** of fuze **10**. Wiring **32** connects synchro motor **29** with a quick disconnect socket **33** for connection with a master synchro (not shown) which is located in the aircraft convenient to the operator. A manual control on the master synchro may be provided to allow the fuze setting on a dial calibrated in units of time, for example, quarter seconds, which setting is relayed to the timing disc lever **25** through synchro receivers or motors **29** by suitable wiring plugged into socket **33** of the individual fuzes The synchros **29** will operate on suitable A. C. current such as 110 volts, or 24 volts.

The principle of operation of the instant invention makes possible fuze setting either manually or by remote control. The timing disc lever **25** which may be carried within a slotted portion of disc **26**, for example, is rotated when remote control setting is desired by motor **29** which turns synchro disc **26** and timing disc lever **25** responsive to a signal from the master synchro. This setting may be changed at will by the operator until the release of the bomb, rocket, or missile which contains fuze **10**. Upon release, the quick disconnect socket **33** pulls away from its connection with the master synchro, and the plug (not shown) for the socket **33** may be utilized again in a new fuze. When arming pin **17** is ejected in the conventional manner, clockwork **31** turns the timing disc **23** at a uniform rate the peripheral distance between lever **25** and notch **24** provided in the timing disc **23**. When the timing disc notch **24** is brought to the location of lever **25**, the timing disc lever **25** drops into the notch **24**, and this action causes the stop on half-round pin **34** to be moved which in turn releases the firing pin **16**. The time is set by locating the timing disc lever **25** at a distance from the notch **24** provided in timing disc **23** which distance determines the time delay before the lever **25** drops into notch **24** to release the firing pin **16**. The timing disc lever may be positioned by rotation of the fuze cap portion **12** relative to

the body portion **11** by hand, or by the turning of synchro disc **26** by remote control. More specifically, inasmuch as the timing disc lever **25** is carried in a slot or opening in the synchro disc **26** a manual setting of the fuze by rotation of calibrated head **15** necessarily turns the synchro disc **26** and the armature shaft **28** of the synchro motor **29**. Conversely, when the fuze is set by means of the synchro motor **29**, the hollow shaft **28** is caused to rotate the synchro disc **26** which carries therein the timing disc lever **25**. The movement of the lever **25** by synchro disc **26** causes the calibrated head **15** to rotate. Thus, it can be seen that the setting of the fuze manually by rotation of calibrated head **15** rotates the shaft **28** of motor **29** through the mechanical connection of the synchro disc **26** with the lever **25**.

This invention makes possible the setting and change in setting of time fuzes installed in bombs, rockets, or missiles of any nature, particularly those to be released or launched from aircraft.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. In a mechanical time fuze of the type having a timing disc provided with a notch and a timing disc lever for time setting the fuze, a synchro motor having a shaft and positioned within the fuze, an actuating disc operatively connected to and rotated with the shaft of said synchro motor in response to the operation of said motor, means on said actuating disc in engagement with the timing disc lever to position said lever about the periphery of the timing disc in predetermined spaced relation with respect to the notch in the timing disc so as to time set the fuze in response to operation of said motor, and electrical connecting means for connecting said synchro motor to the exterior of the fuze.

2. In a mechanical time fuze of the type having a firing pin, clockwork, a manually rotatable head, a timing disc lever connected to the head, a timing disc provided with a shaft rotatably driven by the clockwork, said disc having a peripheral notch provided therein adapted to receive the timing disc lever, said timing disc lever being settable about the periphery of said disc in response to and in accordance with rotation of the fuze head, and firing pin retaining means releasably engaged with the firing pin and biasing the timing lever against the periphery of the disc for urging the lever into the notch of the disc when the latter is rotated by the clockwork to a position in which the notch is in juxtaposition with the lever, the biased movement of said lever into the disc notch releasing the firing pin retaining means to thereby release the firing pin; the combination comprising a drivable electrical signal receiving means positioned within the fuze between said clockwork and said timing disc, said signal receiving means having a rotatable hollow shaft coaxially disposed with respect to the shaft of said clockwork, disc means coupled to said signal receiving means via said hollow shaft and rotated thereby in response to operation of said signal receiving means, and means on said disc means and drivingly engaged with the fuze timing lever for moving and setting the timing lever about the periphery of the timing disc in predetermined spaced relation with respect to said notch in said timing disc to thereby set the time of release of the firing pin in accordance with a signal received at the signal receiving means.

3. In a mechanical time fuze of the type having a firing pin, clockwork, a manually rotatable head, a timing disc lever connected to the head, a timing disc shaft rotatably driven by the clockwork, a timing disc connected to said shaft and provided with a peripheral notch adapted to receive the timing disc lever, said timing disc lever being settable about the periphery of said disc in response to and in accordance with rotation of the fuze head, and firing pin retaining means releasably engaged with the firing pin and biasing the timing lever against the periphery of the disc for urging the lever into the notch of the disc when the latter is rotated by the clockwork to a position in which the notch is in juxtaposition with the lever, the biased movement of said lever into the disc notch releasing the firing pin retaining means to thereby release the firing pin; the combination comprising a drivable electrical signal receiving synchro motor positioned within the fuze, said synchro motor having a hollow rotatable shaft, and a synchro disc coupled to said hollow shaft and rotated thereby in response to operation of said synchro motor, a slot formed in said synchro disc and having means bordering thereon and drivingly engaged with the fuze timing lever for moving and setting the timing lever about the periphery of the timing disc in predetermined spaced relation with respect to said notch in said timing disc to thereby set the time of release of the firing pin in accordance with the signal received at the synchro motor.

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