

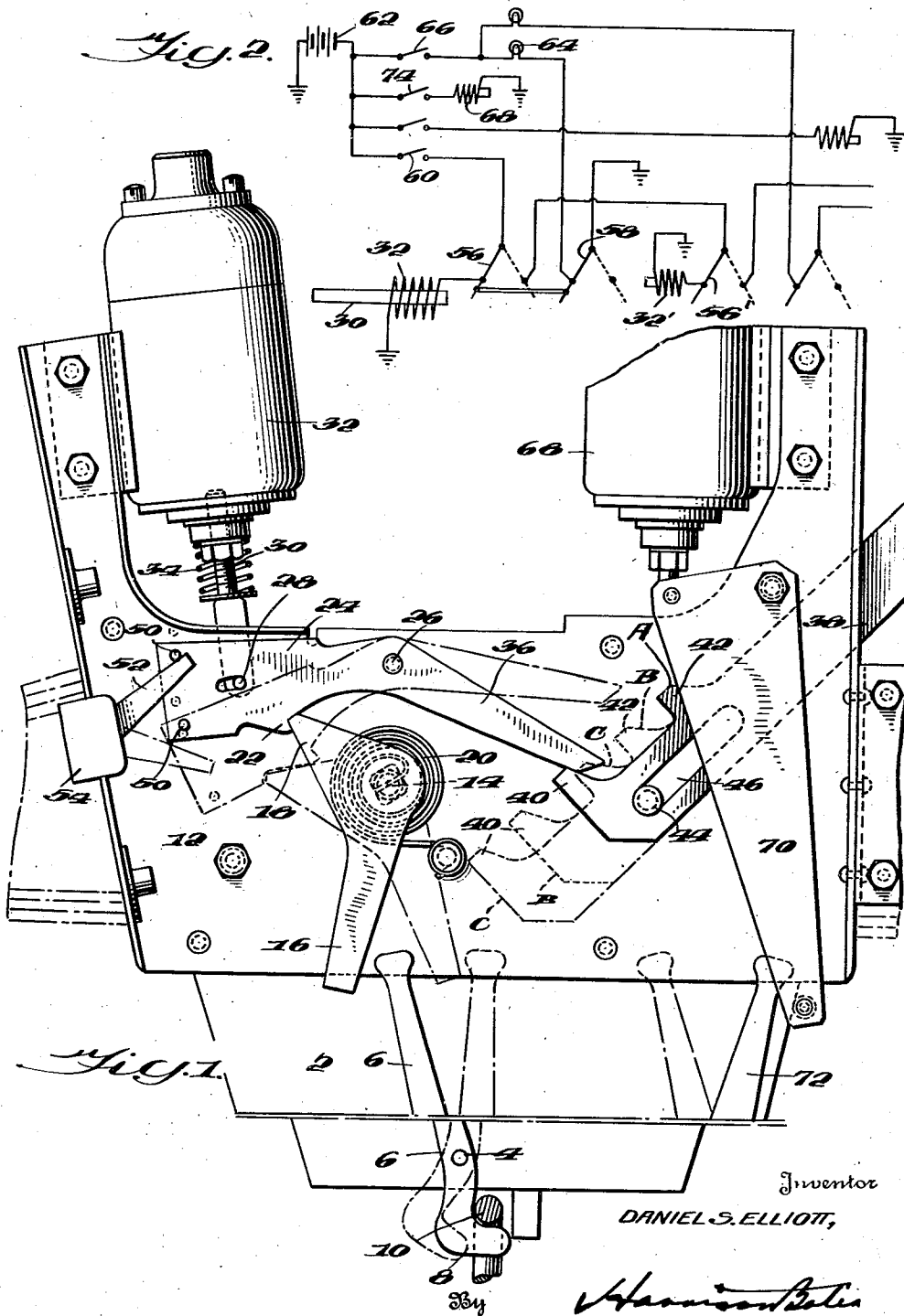
July 31, 1945.

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2,380,737

BOMB SHACKLE OPERATING MECHANISM

Filed July 1, 1941



UNITED STATES PATENT OFFICE

2,380,737

BOMB SHACKLE OPERATING MECHANISM

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Application July 1, 1941, Serial No. 400,619

5 Claims. (Cl. 89—1.5)

The invention relates to bomb shackles and especially to a novel operating mechanism therefor.

The primary object of the invention is to provide a bomb shackle mechanism with means for locking the same, for setting it for selective operation, or for operating the mechanism to release a bomb.

Another object of the invention is to combine with a selective release mechanism, preferably electrically controlled, a device, preferably mechanically controlled, which either locks the shackle, permits operation of said selective release means, or positively operates the shackle to drop the bomb held thereby in salvo with other bombs.

A further object of the invention is to provide an electric circuit with a series of bomb shackles, each shackle operating means having an arrangement thereon for completing the circuit to a succeeding shackle after a bomb has been dropped by the electrical control in selective position, these means being however inoperative when the bomb shackle is positively operated by the mechanical means in a salvo operation.

Further objects and advantages of the invention will appear more fully from the following description, particularly when taken in conjunction with the accompanying drawing which forms a part thereof.

In the drawing:

Fig. 1 is a side elevation of a bomb shackle operating mechanism embodying the invention.

Fig. 2 is a diagram of a circuit for a plurality of bomb shackles made in accordance with the invention.

The bomb shackle has a frame generally indicated at 2. On this frame is pivoted at 4 a bomb holding lever 6 having a suitable hook 8 at its lower end engageable with an eye 10 on a bomb for supporting the bomb.

An auxiliary frame 12 is carried by the frame 2. On this frame 12, a bomb release operating lever is pivoted about an axis 14, this lever having an arm 16 which is engageable with the upper end of lever 6 and a second arm 18. A coil spring 20 normally urges this lever to counterclockwise movement, towards the broken line position shown, during which movement the lever arm 16 will engage and move lever 6 to the broken line position.

Movement of lever 16, 18 under the action of spring 20 is normally prevented by engagement of the end of lever arm 18 with a hook 22 on and arm 24 of a bomb release control lever which

is pivoted at 26 on the frame 12. Arm 24 is connected by a pin and slot 28 to the core 30 of a solenoid 32, a spring 34 normally urging this core outward.

The other arm 36 of the lever cooperates with a slidable bar 38 constituting the mechanical control member. Bar 38 has two projections 40, 42 forming a notch therebetween, these projections being engageable with lever arm 36. The sliding movement of bar 38 is limited by pin 44 and slot 46, and the bar can occupy either the solid line position A, the dotted line position B, or the dot and dash line position C.

Lever arm 24 also carries two spaced pins 50 between which is located the arm 52 of a double-pole switch 54 having blades 56 and 58 (see Fig. 2). In the position shown in solid lines in the drawing, blade 56 connects solenoid 32 through switch 60 to battery 62, while blade 58 connects through light 64 and switch 66 to the battery. In the dotted line position, blade 56 connects the battery through switch 60 to blade 56' of a second bomb shackle, while blade 58 is grounded.

A second solenoid 68 is provided for moving lever 70 to operate arming lever 72 of the usual type. This is controlled by switch 74 connected to battery 62.

This mechanism operates as follows: In normal periods, bar 38 is in position A, in which nose 40 engages lever arm 36 and thereby prevents any clockwise movement of lever 24, 36, thus holding the release actuating lever 16, 18 against movement, even though switch 60 may be closed to energize solenoid 32.

When the bar 38 is moved to position B, lever arm 36 is free to swing. If now the pilot wishes to drop a bomb, he first closes switch 74 to energize the arming solenoid 68, and then closes switch 60 to energize solenoid 32 (switch blades 56, 58 being in the solid line position, Fig. 1). Lever 24, 36 is then turned clockwise far enough to release lever arm 18 from nose 22, and spring 20 turns lever 16, 18 counterclockwise. In this movement lever arm 16 rocks lever 6 to the broken line position to release the bomb.

As soon as switch 60 is released and solenoid 32 deenergized, spring 34 pushes core 30 downward and turns lever arm 24 to the broken line position shown. Upper pin 50 during this movement engages switch arm 52 and moves it, and thereby blades 56 and 58, to their broken line positions. Now, when switch 60 is again closed, it will, through blades 56 and 56', energize the solenoid 32' of a second bomb shackle.

If at any time the pilot wishes to know which

shackles are still loaded, he merely closes switch 66. If no bomb has been dropped, blade 58 will cause lamp 64 to light, but if the shackle is empty the circuit to this lamp will be broken and it will not light.

In case of emergency, bar 38 is pushed to position C. During this movement, nose 42 engages arm 36 to turn lever 24, 36 clockwise and remove nose 22 from the path of lever arm 18. This leaves lever 16, 18 free to turn and cause the release of the bomb.

While I have described herein one embodiment of my invention, I wish it to be understood that I do not intend to limit myself thereby except within the scope of the appended claims.

I claim:

1. In a bomb release system consisting of a plurality of bomb shackles, a bomb shackle operating mechanism comprising a bomb release control member movable between locking and releasing position, means to move said member to releasing position, an element cooperating with said control member and movable to two positions, said element in one position leaving said member free for operation by said first means, and having means thereon engageable with said member during movement to a second position to move said member to releasing position, said first means comprising a solenoid operatively connected to said member and circuit means to supply current to said solenoid, switch means in said current supply means adapted for alternative contact with a solenoid of a second bomb shackle, means to move said member after it has moved to releasing position in a direction opposite to that in which it is moved by said solenoid past its locking position, and means operated by such movement of said member to actuate said switch means, thereby disconnecting said solenoid from said circuit means and connecting to said circuit means said solenoid of a second bomb shackle, said element in said second position holding said member in releasing position whereby said switch remains closed in said actuated position.

2. In a bomb release system consisting of a plurality of bomb shackles, a shackle operating mechanism comprising a bomb release control member movable between locking and releasing positions, means to move said member to releasing position, an element cooperating with said control member and movable to three positions, said element having means thereon to lock said member against releasing movement in one of said positions, to leave said member free in a second position for operation by said first means, and to move said member to releasing position in the third position, said first means comprising a solenoid operatively connected to move said control member, a circuit to supply current to said solenoid, switch means in said circuit adapted for alternative contact with a solenoid of a second bomb shackle, means to move said control member after it has been moved to releasing position in a direction opposite to that in which it is moved by said solenoid past its locking position, and means operated by such movement of said control member to actuate said switch means whereby said solenoid is disconnected and said solenoid of said second bomb shackle is connected for subsequent actuation.

3. A bomb shackle operating mechanism comprising, a bomb release control member movable

between locking and releasing positions, means to move said member to releasing position, an element cooperating with said control member and movable to three positions, said element having means thereon to lock said member against releasing movement in one of said positions, to leave said member free in a second position for operation by said first means, and to move said member to releasing position in the third position, said first means comprising a solenoid operatively connected to said member and a circuit to supply current to said solenoid, a switch in said circuit, means to move said member after it has moved to release position in a direction opposite to that in which it is moved by said solenoid past its locking position, and means operated by such movement of said member to open said switch, and disconnect said solenoid from said circuit, said element in said third position holding said member in releasing position without employing said first means.

4. In a bomb release system consisting of a plurality of bomb shackles, a bomb shackle operating mechanism comprising a bomb release control member normally urged to releasing position, a bomb release control lever having means thereon engageable with said operating member to hold the same in inoperative position, means to move said lever to release said member, an element cooperating with said lever and movable to three positions, said element having means thereon engageable with said lever to lock said lever against releasing movement in one of said positions, to leave said lever free in another of said positions for operation by said second means, and to move said lever to releasing position in the third position, in which said second means comprises a solenoid operatively connected to said lever and circuit means to supply current to said solenoid, switch means in said current supply means for alternative contact with a solenoid of a second bomb shackle, means to move said lever after it has released said control member in a direction opposite to that in which it is moved by said solenoid past its locking position, and means operated by such movement of said lever to actuate said switch means and thereby disconnect said solenoid from said circuit and to connect to said circuit said solenoid of said second bomb shackle.

5. In a bomb release system consisting of a plurality of bomb shackles, a shackle operating mechanism comprising a bomb release control member movable between locking and release positions, means to move said member to releasing position, said means comprising a solenoid operatively connected to move said member, a circuit to energize said solenoid, an indicator system in said circuit, switch means in said circuit adapted for alternative contact with a solenoid of a bomb shackle, means to move said member, after it has been moved to releasing position, in a direction opposite to that in which it is moved by said solenoid past its locking position, and means operated by such movement of said member to actuate said switch means whereby the solenoid of the first shackle is disconnected, said solenoid of said second shackle is connected for subsequent actuation, and said indicator system is disconnected thereby indicating that a shackle has been released.

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