

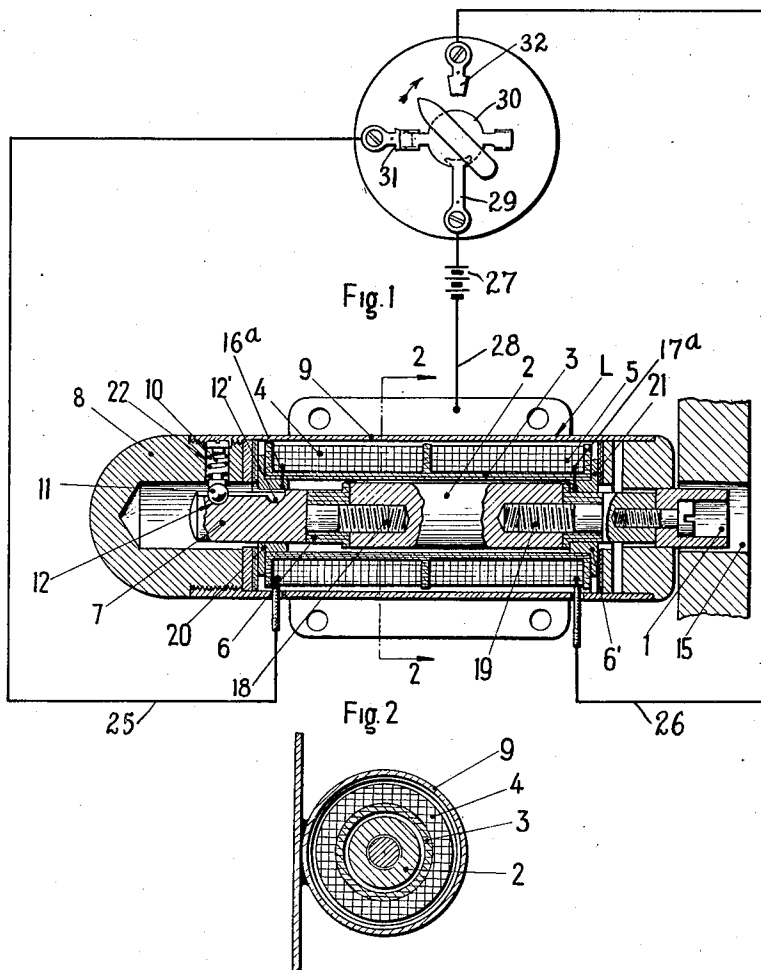
May 2, 1939.

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2,156,387

ELECTROMAGNETIC LATCH BOLT

Filed May 5, 1936



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## UNITED STATES PATENT OFFICE

2,156,387

## ELECTROMAGNETIC LATCH BOLT

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Application May 5, 1936, Serial No. 78,062

In Italy May 7, 1935

2 Claims. (Cl. 292—144)

The present invention has for its subject matter an electro-magnetically operated latch bolt.

The arrangement according to the invention is characterised by the fact that it comprises a bolt which can be moved toward the closing or toward the opening position in consequence of the displacement of a magnetisable plunger influenced, alternately and in opposite directions, by two electromagnetic fields, the displacement of said plunger causing partial closure of the circuit of one of the electromagnets while it causes the opening of the circuit of the other electromagnet and conversely.

The invention will now be described with reference to the accompanying drawing which illustrates, merely by way of example, one form of the electromagnetic bolt.

Fig. 1 is a longitudinal section through a bolt constructed in accordance with the invention.

Fig. 2 is a cross section on the line 2—2 of Fig. 1.

The electromagnetic closing device L comprises a bolt 1 carried by a soft iron piece 2 which constitutes a movable plunger adapted to slide in the hollow core 3 of an electromagnet having two independent windings 4 and 5. The ends of the plunger 2 are provided with insulating sleeves 6 and 6', which are fixed to the plunger 2 by means of screw-threaded pins 18 and 19. The sleeve 6 is located between the plunger 2 and the terminal stem 7 fixed thereto and the sleeve 6' is interposed between said plunger and the bolt 1. The core is lodged in a casing 9 and fitted with two washers 20 and 21 at the ends of its axial bore to serve as contact guides for the slidable portion. The rear end of the casing 9 is closed by a cover 8 having socket for reception of the stem 7 when the bolt is retracted. In a cross bore 22 a spiral spring 10 is lodged; this spring acts upon a ball 11 intended to engage one or the other of the two notches 12 and 12' in order to lock the bolt in its two positions. 15 is the socket into which the bolt 1 enters when it is projected.

One end of the coil 4 is connected at 16<sup>a</sup> with the contact washer 20 and the opposite end of said coil is connected with a conductor 25. One end of the other coil 5 is connected at 17<sup>a</sup> with the contact washer 21 while the opposite end of said coil is connected with the conductor 26. One pole of a source of current 27 is grounded at 28 on the casing of the lock and the opposite pole of said source is connected by a conductor 29 with a movable switch contact 30. Conductors 25 and 26 are connected with stationary contacts 31 and 32 alternately engageable by the contact 30 during rotary movement of the latter about its axis.

When the bolt lock is projected as shown in Fig. 1, the contact washer 20 is in contact with the stem 7 and hence one pole of the source of current 27 is connected over the conductor 28, casing 9, contact washer 20, stem 7 and connection 16<sup>a</sup> with one terminal of the coil 4. Electrical connection between the grounded pole of the source of current and the other coil 5, however, is interrupted due to the fact that the contact washer 21 connected therewith is in contact with the insulating sleeve 6'.

In order to retract the bolt 1, the movable contact 30 is moved to the position shown in Fig. 1 and current is thereby permitted to flow from one pole of the source 27 over the stationary contact 31, conductor 25, coil 4, connection 16<sup>a</sup>, contact washer 20, casing 9 and the conductor 28 grounded thereon. Being thus energized, the coil 4 causes the plunger 2 to be moved to the left thereby retracting the bolt 1, the plunger coming to rest with the ball 11 engaging in the notch 12'. In the retracted position the electrical connection between the grounded conductor 28 and the connection 16<sup>a</sup> to the coil 4 is interrupted by the insulating sleeve 6 which, in this position of the bolt, engages the contact washer 20. By turning the contact 30 through a quarter of a revolution the contact member 31 is opened and the contact member 32 closed, and owing to the fact that the contact washer is in engagement with the conducting portions of the bolt 1 the coil 5 is energized and the bolt is restored to its projected position.

Of course the execution and application details as well as the utilisations of the device may be varied in practice within the spirit and scope of the invention and without exceeding the range of the patent.

Having now described my invention and how the same is to be carried out, what I claim as my invention is:

1. In combination, a plunger, a latch bolt carried by said plunger, two coils surrounding said plunger and adapted to be alternately energized to move the plunger in opposite directions to project and retract said bolt, means controlled by said plunger to interrupt the flow of current to each coil subsequent to energization thereof, said means including combined guide and contact members for the plunger connected with one end of each coil, and insulating members carried by the plunger alternately engageable with the respective contact members.

2. An arrangement as claimed in claim 1 characterized in that said guide and contact members are substantially annular in form and are disposed in sliding contact with said plunger.

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