Dec. 27, 1927. 1,654,207

J. E. BERGONZONI

WINDOW LOCK

Filed May 24, 1927

Fig. 1.

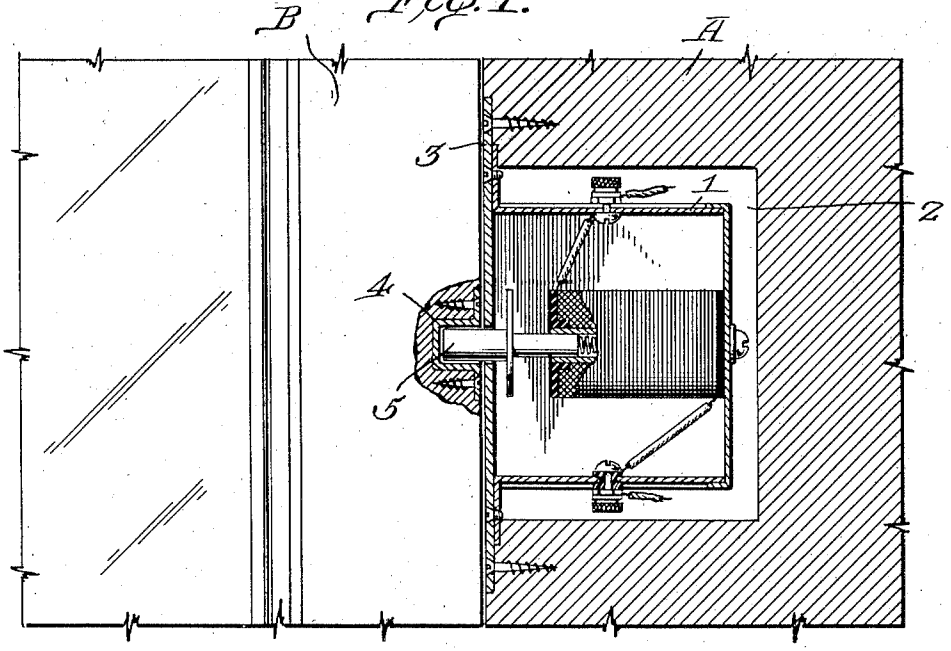


Fig. 2.

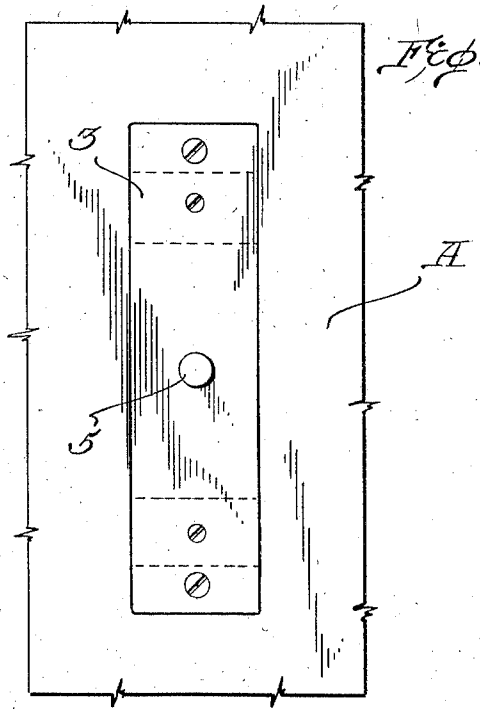
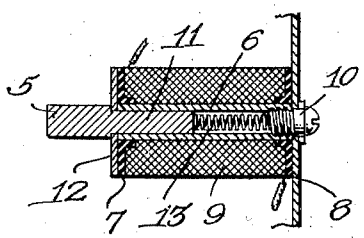


Fig. 3.



Inventor
Joseph E. Bergonzoni
By Roberts Cushman & Woodberry
Attorneys

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UNITED STATES PATENT OFFICE.

JOSEPH E. BERGONZONI, OF NEWTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO WALTER D. DUNN, OF BELMONT, MASSACHUSETTS.

WINDOW LOCK.

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This invention relates to window locks and more particularly to locks of the magnetic type in which the plunger which interlocks the window sash with the window frame is retracted or advanced by a magnet.

Objects of the invention are to provide a window lock which is entirely concealed, which may be operated near the window or at a remote location, which is constructed and arranged to operate on low voltage circuits such as ordinary bell circuits of a few volts, which is easy to construct and durable in use, and which will not only operate on low voltage but is positive and reliable in action.

A cardinal feature of the invention consists in the use of a locking plunger which extends into the electromagnet and which is formed of diamagnetic material either wholly or at least that portion which extends into the electromagnet so that this portion cannot become magnetized, whereby the plunger has no tendency to stick in the magnet and is therefore more reliable in action. Moreover, since the plunger is entirely released from the action of the electromagnet when the magnet is de-energized, a very light spring is sufficient to advance the plunger to locking position; and, by using a very light spring, the current required to retract the plunger when the magnet is energized is very small so that the device may be operated by current of low voltage such as is found in the bell circuits of house wiring systems. By employing current of such low voltage the wiring need not be enclosed in pipes or cables and the cost of the wiring is thereby greatly reduced.

For the purpose of illustration a concrete embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a longitudinal section of the lock applied to a window;

Fig. 2 is a face view of the lock; and

Fig. 3 is a central longitudinal section of the locking plunger and actuating mechanism.

In the particular embodiment of the invention illustrated in the figures, A represents the window frame and B the window sash. The lock comprises a casing 1 set into a reset 2 in the frame A and a face plate 3 fast to the casing 1 and mounted flush with the face of the frame A. The window sash B is provided with a recess to receive the locking plunger when it is advanced to locking position and this opening is preferably fitted with a metallic socket member 4 slightly larger than the locking plunger 5. The locking plunger occupies the position shown in Fig. 1 when the window is locked and the position shown in Fig. 3 when it is retracted to unlocked position.

The magnet for operating the locking plunger comprises a core 6 of iron or other suitable material, disks or rings 7 and 8 fast on the core, and a winding 9 on the core between the end rings. The magnet may be mounted on the casing 1 by means of a screw 10 threaded into the end of the core member 6.

In the preferred embodiment of the invention illustrated in the drawings, the locking plunger 5 has a rear portion 11 of reduced diameter adapted to slide loosely in the core member 6. The armature 12 is mounted on the plunger at the junction between the portions of different diameters, the armature being secured in any suitable manner as by welding or brazing or a pressed fit. While the armature 12 is formed of paramagnetic material such as iron, the plunger, or at least the portion 11 of reduced diameter which extends into the core of the magnet, is preferably formed of brass or other diamagnetic material so that it does not become magnetized and therefore does not tend to stick in the magnet after the magnet is de-energized. A spring 13 is provided in the core member to advance the plunger to locking position when the magnet is deenergized.

The magnet may be connected in any suitable circuit, as for example, when employing locks on a plurality of windows, a switch may be associated with each lock for operating the lock of the associated window and a master switch may be provided to actuate all of the locks of a plurality of windows.

By forming the plunger of diamagnetic material so that the plunger has no tendency to stick in the magnet when the magnet is de-energized a very light spring may be employed at 13 to advance the plunger into locking position when the magnet is de-energized. And, owing to the fact that a light spring may be employed, a weak current is sufficient to retract the locking

plunger against the action of the spring, whereby the device may be operated on a few volts such as low voltage bell circuits.

I claim:

1. A window lock comprising a casing constructed to be mounted in a window frame, a plunger movable through the face of the casing for engagement with the window sash, an electromagnet in the casing having a hollow paramagnetic core, and a coiled compression spring in said core, said plunger being formed of diamagnetic material and having a ring of paramagnetic material extending over the end of said core.

2. A window lock comprising a casing constructed to be mounted in a window frame, a plunger movable through the face of the casing for engagement with the window sash, an electromagnet in the casing having a hollow paramagnetic core, and a coiled compression spring in said core, said plunger having a diamagnetic portion extending into said core against said spring and a paramagnetic portion extending laterally over the end of said core.

3. A window lock comprising a casing constructed to be mounted in a window frame, a plunger movable through the face of the casing for engagement with the window sash, an electromagnet in the casing having a hollow paramagnetic core, and a coiled compression spring in said core, said plunger having a diamagnetic portion extending into said core against said spring and a paramagnetic portion near the end of said magnet.

4. A window lock comprising a casing constructed to be mounted in a window frame, a plunger movable through the face of the casing for engagement with the window sash, a spring for advancing the plunger, and an electromagnet in the casing for retracting the plunger, the plunger being formed of diamagnetic material and having a ring of paramagnetic material extending over the end of the magnet.

5. A window lock comprising a casing constructed to be mounted in a window frame, a plunger movable through the face of the casing for engagement with the window sash, a spring for advancing the plunger, and an electromagnet in the casing for retracting the plunger, the plunger having a diamagnetic portion extending into said core and a paramagnetic portion extending laterally over the end of the magnet.

Signed by me at Boston, Massachusetts, this 18th day of May, 1927.

JOSEPH E. BERGONZONI.