

March 6, 1945.

R. K. KIND ET AL

2,370,800

LOCK

Filed Sept. 13, 1943

2 Sheets-Sheet 1

FIG. 1.

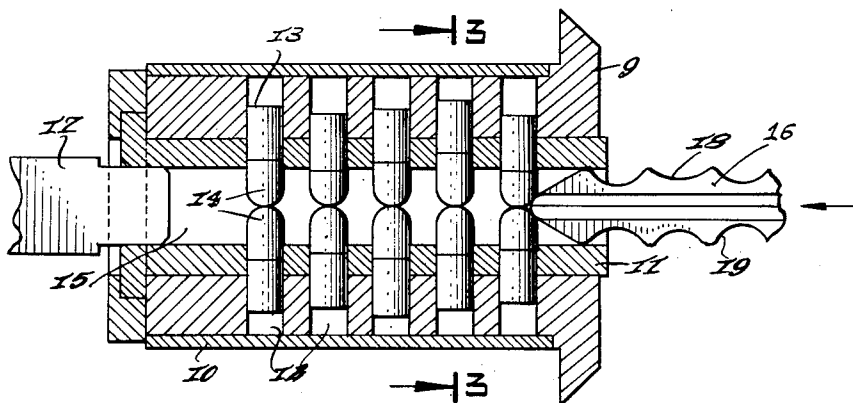


FIG. 2.

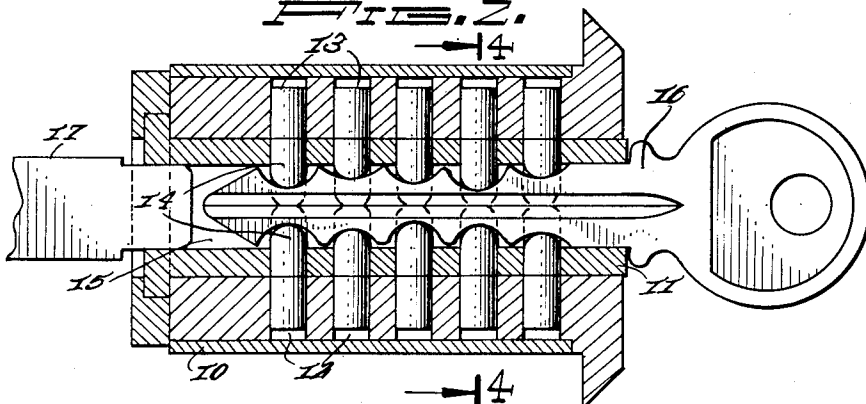


FIG. 3.

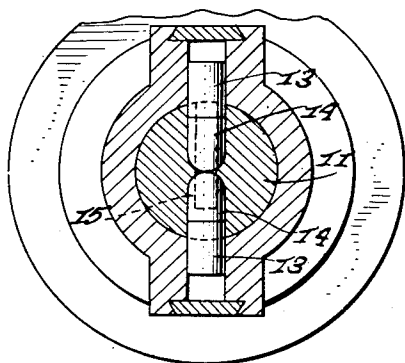
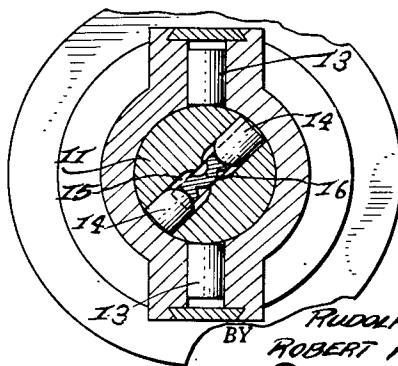


FIG. 4.



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FIG. 5.

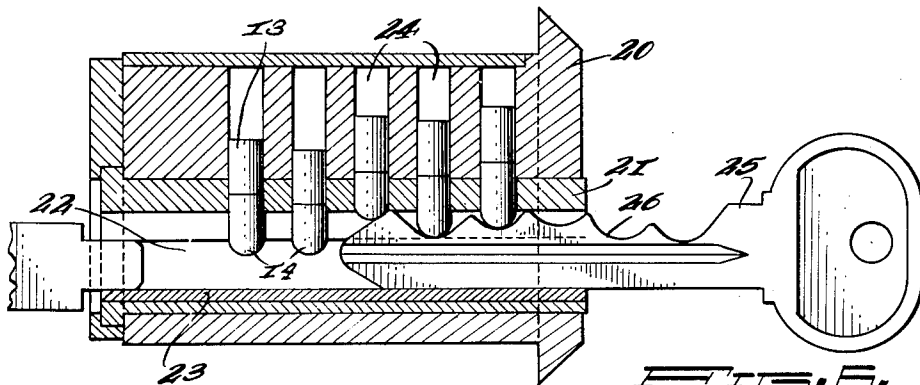


FIG. 6.

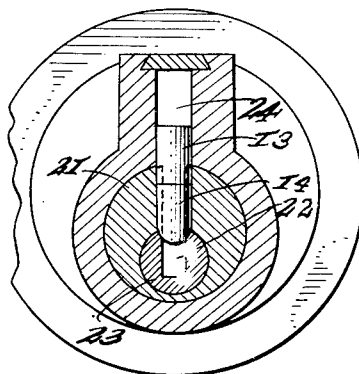


FIG. 8.

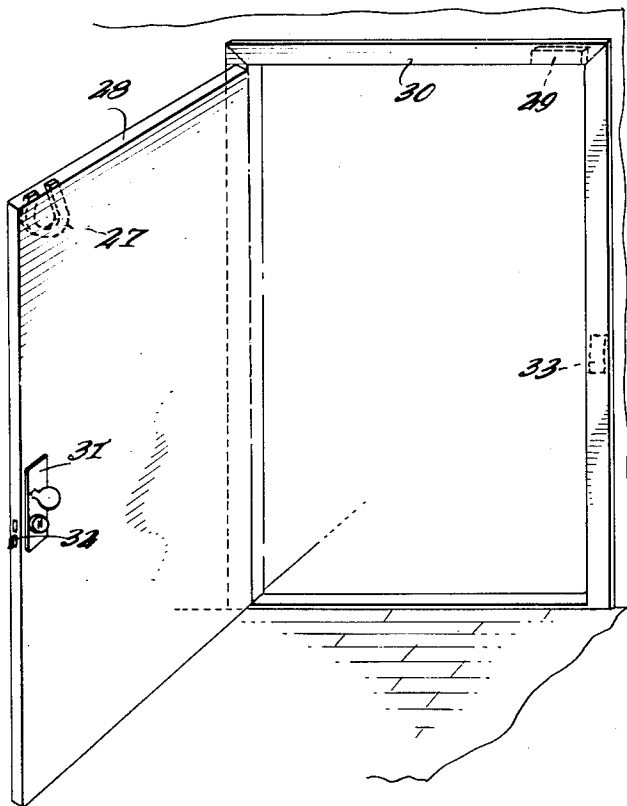
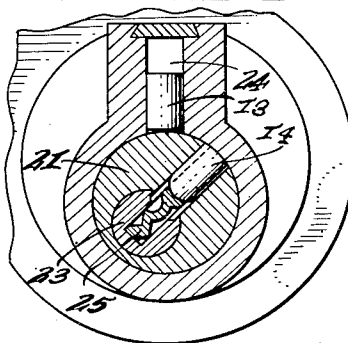


FIG. 7.



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2,370,800

LOCK

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Application September 13, 1943, Serial No. 502,126

3 Claims. (Cl. 70-276)

This invention relates to closures and refers more particularly to locks operated by magnets.

An object of the present invention is to employ magnets in the construction of locks for the purpose of simplifying and improving such constructions.

Another object is the provision of a magnetically operated closure device which is inexpensive in construction and sturdy and reliable in operation.

Other objects of the present invention will become apparent in the course of the following specification.

In accomplishing the objects of the present invention it was found desirable to provide two magnets or one magnet and a magnetizable member which are located in the two parts of a closure, for instance, in the movable door and the door frame.

According to one of the embodiments of the inventive idea, the bolt of a locking device consists of a magnet and is held by magnetic forces in a locking position. This arrangement may be applied not only to ordinary locks but to safety locks as well.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings showing by way of example preferred embodiments of the inventive idea.

In the drawings:

Figure 1 is a section through a safety lock provided with magnetic tumblers.

Figure 2 is similar to Figure 1 and shows the lock when it is opened by a key.

Figure 3 is a transverse section along the line 3-3 of Figure 1.

Figure 4 is a section along the line 4-4 of Figure 2.

Figure 5 is a section through a safety lock of a somewhat different construction.

Figure 6 is a transverse section through a lock shown in Figure 5.

Figure 7 is similar to Figure 6 and shows the lock after it has been opened.

Figure 8 is a perspective view illustrating magnetic closure means for doors.

The safety lock shown in Figures 1 to 4 includes a frame 9 which is firmly connected to its support and which may be provided with an outer cylindrical envelope 10.

The frame 9 carries a revolving plug 11. The plug and the frame are provided with cylindrical passages 12. The corresponding passages in the plug 11 and the frame 9 are in alinement with

each other and extend across the entire frame. The number of these passages 12 which are located one next to the other along the frame may be varied at will.

The passages 12 contain cylindrically shaped drivers 13, as well as tumblers 14. In accordance with the present invention the drivers 13 and the tumblers 14 constitute magnets which are attracted by each other. As shown in Figure 1 the forces of a magnetic attraction suffice to maintain the tumblers 14 in engagement with each other substantially in the middle of the space 15 provided in the plug 11 for the insertion of the key 16. Furthermore the forces of magnetic attraction maintain the drivers 13 in contact with the tumblers 14.

The size of the tumblers 14 and of the drivers 13 is so selected that one of these elements extends between the plug and the frame in the normal position of the tumblers in each of the passages 12. Thus the tumblers 14 and/or the drivers 13 serve as bolts extending between the plug and the frame and preventing the rotation of the plug. This rotation is utilized for the opening of the lock by the usual means 17 which are not further illustrated.

The key 16 which is shown in Figure 2 has two opposed edges 18 and 19 which engage the tumblers located opposite each other. The tumblers 14 are provided with rounded ends so as to facilitate the insertion of the key. The key 16 may be made of steel or any other suitable material which will not interfere with the magnetic forces of attraction of the tumblers.

As shown in Figure 2 the edges 18 and 19 of the key 16 bear such relationship to the size of the tumblers 14 and the width of the plug 11 that when the key is completely inserted into the key-hole 15, the surfaces separating the tumblers from the drivers will be located directly in alinement with the outer surfaces of the plug 11.

As shown in Figure 4 the user may then turn the key 16 and thereby rotate the plug 11. The tumblers 14 will remain within the plug while the drivers 13 will be located in the passages 12 of the frame 9.

When the plug 11 is returned to the position shown in Figure 3 and the key 16 is withdrawn, the magnetic forces will cause the tumblers 14 and the drivers 13 to return to the original positions shown in Figures 1 and 3.

The safety lock shown in Figures 5 to 7 comprises a frame 20 which contains an eccentrically located plug 21. The plug 21 is provided with a key-hole 22 and contains a magnetizable body 23

which is used to attract the magnetic tumblers 14 and drivers 13.

The magnetizable body 23 rotates along with the plug 21 and is engaged by the ends of the tumblers 14 when the lock is in its closed position. In this construction the passages 24 which are formed in the frame 20 and the plug 21 are located only upon one side of the key-hole 22 while the other side of the key-hole is occupied by the magnetizable member 23.

This lock may be operated by a key 25 provided with a single operative edge 26 and made of steel or other material which does not interfere with the magnetic forces.

In the position shown in Figure 6 the tumblers 14 engage the magnetizable member 23 and some of these tumblers 14 and/or some of the drivers 13 serve as bolts extending between the plug 21 and the frame 20 and preventing the rotation of the plug 21.

The surface 26 of the key 25 is so formed in relation to the size of the tumblers 14 and the width of the plug 21 that when the key 25 is fully inserted into the key-hole 22, the contacting surfaces between the tumblers 14 and the drivers 13 will be in alinement with the outer surfaces of the plug 21.

Then the user may turn the key 25 and rotate the plug 21 thereby opening the lock. As shown in Figure 7 the tumblers 14 will then be located within the plug 21, while the drivers 13 will remain in the passages 24 of the frame 20.

The parts resume the position shown in Figure 6 as soon as the key is withdrawn.

Figure 8 illustrates a closure device including a magnet 27 which is embedded in the door 28. Although the magnet 27 is shown as being of horse-shoe form, it may be of any other suitable shape or may consist of an electro magnet. Whenever the door 28 is closed the magnet 27 will be located close to a magnetizable member 29 which is carried by the door frame 30. This attraction between the magnet 27 and the magnetizable body 29 will suffice to hold the door 28 in its locking position and to prevent it from rattling or being opened unintentionally.

The door 28 carries a lock 31 which may be of the usual construction and which is provided with a bolt 32. The bolt 32 is adapted to be inserted into a recess formed in the bolt receiving member 33 which may be of standard construction and which is located within the door frame 30.

In accordance with the present invention the bolt 32 may consist of a magnet while the bolt receiving member 33 is made of a magnetizable material.

This construction has the advantage that whenever the bolt 32 is extended into the bolt receiving member 33, the forces of magnetic attraction between these elements will hold the door 28 firmly in place and will prevent the rattling of the door. These forces of magnetic attraction may be operable whenever the door 28 is closed and even though the door is not locked so that

the bolt 32 is located within the lock 31. In that case the magnetic bolt 32 fulfills the same purpose as the magnet 27, thus making it possible to achieve the same results without the use of the members 27 and 29.

It is apparent that the examples shown above have been given by way of illustration and not by way of limitation and that the illustrations shown above are subject to wide variations and modifications without departing from the scope or intent of the present invention. All of such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. In a safety lock, in combination, a frame of non magnetic material, a revolving plug of non magnetic material located in said frame, passages formed in said plug and frame, said passages extending on opposite sides of said plug, the passages in the plug and frame being in alinement when the plug is in its locking position, and tumblers and followers in said passages, said tumblers and followers consisting of magnetising and magnetisable materials, said tumblers attracting one another whereby the tumblers are maintained across said plug and frame in a locking position, said followers being pushed aside and into said frame by the correct key to free said plug for rotation.
2. In a safety lock, in combination, a frame of non magnetic material, a revolving plug of non magnetic material located in said frame, passages formed in said plug and frame and extending in alignment with each other when the plug is in its locking position, tumblers and followers in said passages, and a keyway plug totally enclosed in said revolving plug, said tumblers, followers and keyway plug consisting of magnetising and magnetisable materials, and attracting one another, whereby said followers are maintained across said revolving plug and frame in a locking position, said followers being pushed into said frame by the correct key to free said revolving plug for rotation.
3. In a safety lock, in combination, a frame of non magnetic material, a revolving plug of non magnetic material located in said frame, passages formed in said plug and frame and extending in alignment with each other when the plug is in its locking position, tumblers and followers in said passages, and a keyway plug totally enclosed in said revolving plug, said keyway plug being formed to provide a keyway and also to provide seats for those portions of the end of the tumblers extending beyond the width of the keyway, said tumblers, followers and keyway plug consisting of magnetising and magnetisable materials, and attracting one another, whereby said followers are maintained across said revolving plug and frame in a locking position, said followers being pushed into said frame by the correct key to free said revolving plug for rotation.

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