Oct. 2, 1962 C. V. ALLANDER 3,056,276

MAGNETICALLY OPERABLE LOCK

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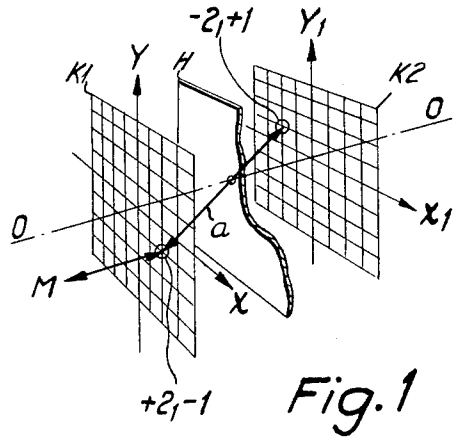


Fig. 1

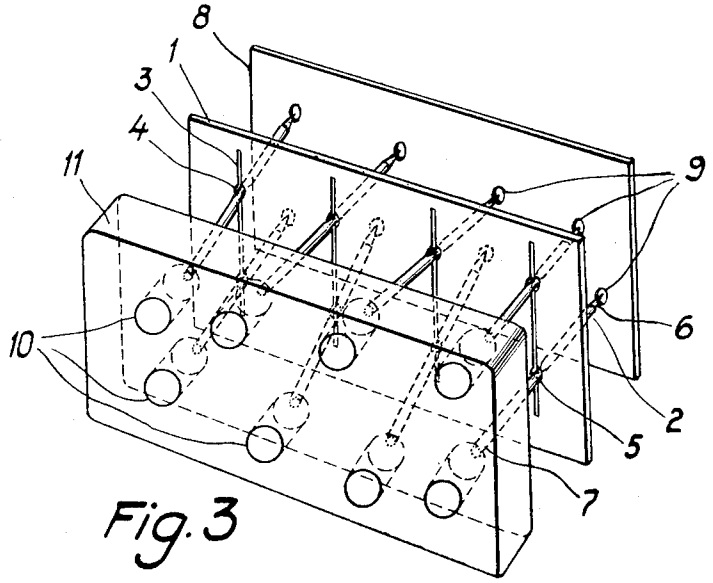


Fig. 3

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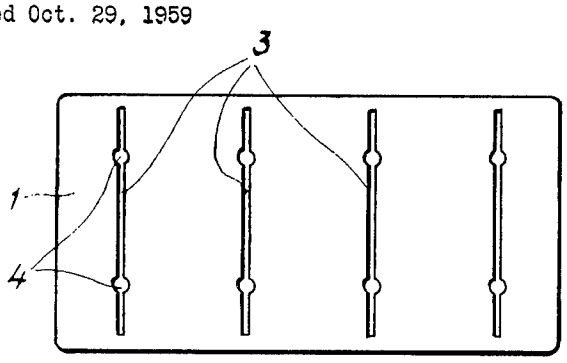


Fig. 2a

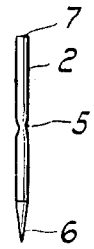


Fig. 2b

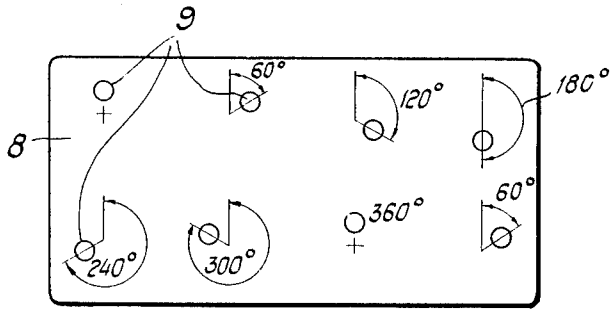


Fig. 2c

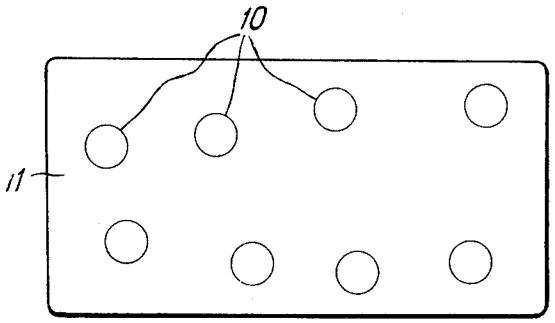


Fig. 2d

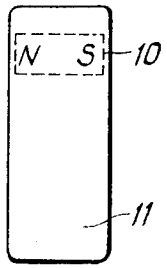


Fig. 2e

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MAGNETICALLY OPERABLE LOCK

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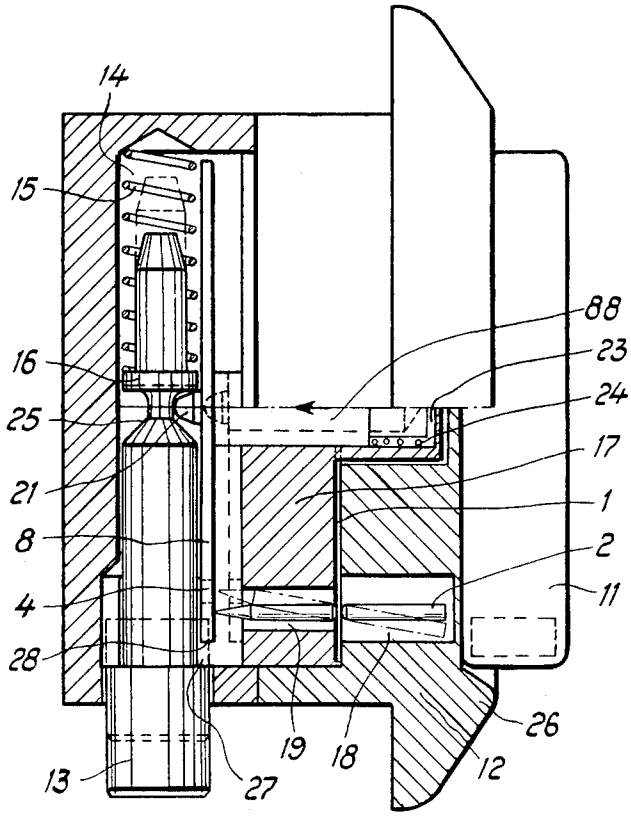


Fig. 4

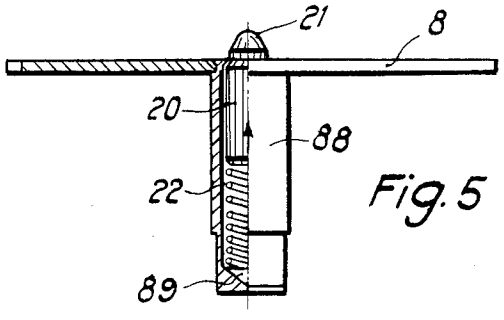


Fig. 5

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MAGNETICALLY OPERABLE LOCK

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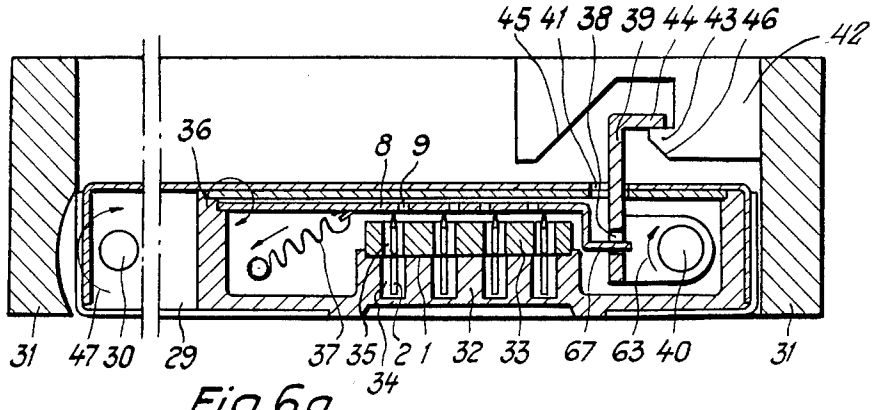


Fig. 6a

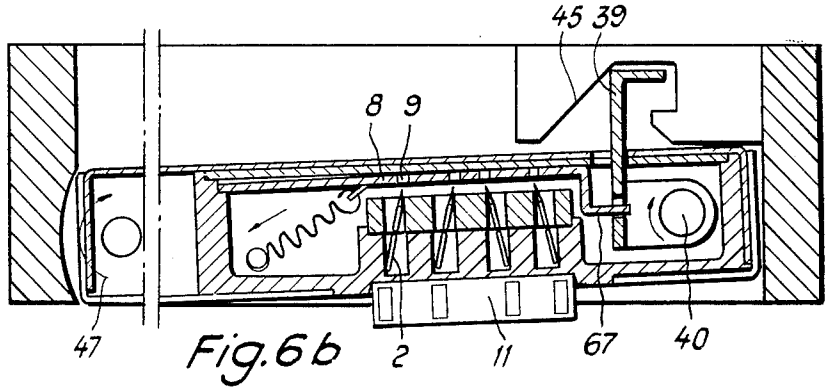


Fig. 6b

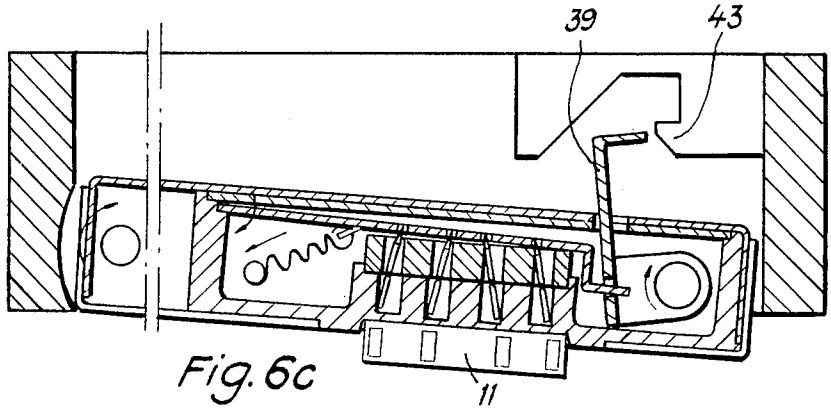


Fig. 6c

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MAGNETICALLY OPERABLE LOCK

Filed Oct. 29, 1959 5 Sheets-Sheet 5

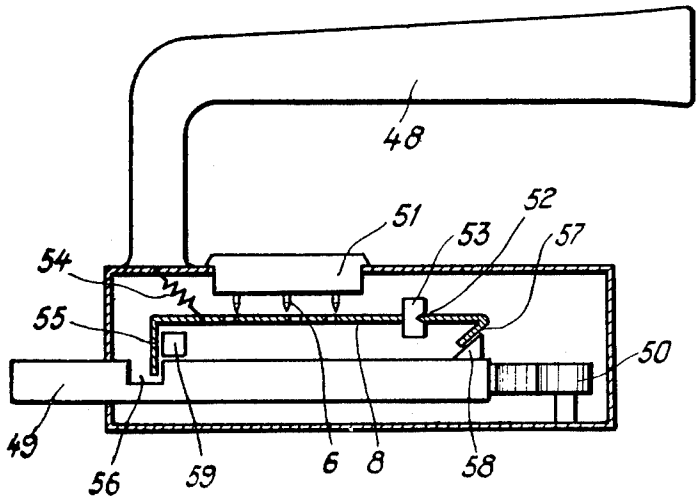


Fig. 7

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United States Patent Office

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3,056,276

MAGNETICALLY OPERABLE LOCK

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Claims priority, application Sweden Nov. 18, 1958
15 Claims. (Cl. 70—276)

The present invention relates to a magnetically operable lock.

An object of the invention is to provide a lock which is operable by means of a magnetic key allowing a very great number of possible lock combinations and rendering it possible to have the lock entirely closed to the outside, so that it cannot be opened by violence through a key hole or similar access to the interior of the lock.

The lock according to the invention, like known locks comprises two members movable in relation to each other, one of which is provided with a number of locking elements adjustable into several positions, the adjustment of which into a predetermined combination of positions by means of a key allows a mutual movement of the said movable members for opening the lock, while in other positions such movement is rendered impossible. According to the invention the locking elements are of magnetic material and are turnably mounted in one of the said two mutually movable members, while the other member is provided with a recess (hole) for each locking element in a position corresponding to a predetermined angular position of the respective locking element in the said predetermined combination of position. The key of the lock comprises a body having a number of separate magnet poles disposed in correspondence to said predetermined combination of positions of the locking elements. When the key is placed in a predetermined position against the lock, the locking elements are moved by magnetic attraction into said predetermined combination of positions, thereby permitting one of said movable member to be moved with respect to the other member.

The invention will be described below with reference to the accompanying drawings in which:

FIGURE 1 shows a diagram illustrating the mode of operation of a magnetic lock according to the invention; FIGURES 2*a*, 2*b*, 2*c*, 2*d* and 2*e* illustrate the basic elements of the lock according to the invention; FIG. 3 shows the mutual disposition of these basic elements; FIGURE 4 an embodiment of the invention; FIGURE 5 a part of the lock shown in FIG. 4; FIGURES 6*a*, 6*b* and 6*c* show another embodiment of the invention, and FIGURE 7 still another embodiment of the invention.

The main principle of the invention is illustrated in FIG. 1 in connection with one single needle-shaped locking element. On each side of a plane H two parallel coordinate plane systems K1 and K2 are illustrated having coordinates x, y and x_1, y_1 respectively parallel with the plane H. A locking element is designated a and is supported in the plane H so as to be turnable in all directions. An axis O passing through the supporting point of the element a in the plane H is normal to the said plane and defines the origins of the two coordinate systems. The axis O thus represents the normal position of the locking element, which is presumed to be a needle. In FIG. 1 a position of the needle a is shown as an example which is represented by the coordinates $x=+2$ and $y=-1$ in the coordinate plane K1 and $x_1=-2$, $y_1=+1$ in the coordinate plane K2. A magnetic power source (not shown) is assumed to act on one end of the needle for instance the one, which lies in the plane K1, and to be so situated in relation to this end, that the needle makes the shown deviation from the neutral position when the magnet is brought into magnetizable relationship with the needle. It will be understood that if a

plate is placed in the plane K2 and is provided with a small recess or hole only in a position represented by the coordinates $x_1=-2$, $y_1=+1$ it will be possible to move this plate towards the plane H if the needle takes the position shown on the drawing, while otherwise such movement is blocked by the needle. In other words a special location of a magnetic pole in the coordinate plane K1 is necessary for rendering it possible to move the said plate a predetermined distance towards the plane H past the normal plane through the end of the needle.

By using a plurality of such needles each cooperating with a recess or hole having a predetermined position in the displaceable plate it is possible to obtain a locking device having a very large number of possible combinations, so that the displaceable plate is movable towards the center plane past the plane of the needle points only when using a key having a magnetic pole for each needle situated exactly so as to correspond to the special combination used.

The vital parts of such a locking device are shown in FIGURES 2*a*, 2*b*, 2*c*, 2*d* and 2*e*. FIG. 2*a* shows a carrier plate 1 for turnably supporting the needles, one of which is shown in FIG. 2*b* and designated 2. The carrier plate thus corresponds to the plane H in FIG. 1. It is provided with a number of slots 3 each having two holes 4 etc. for the needles 2. Each needle 2 is provided with a central waist 5 engaging the edges of the corresponding hole 4 when the needle is inserted into the same. The needle will then be easily turnable in all directions, and the waist 5 is positioned near to the center of gravity of the needle in order to substantially avoid the necessity of overcoming the gravity when operating the needle by a corresponding magnetic pole. One end 6 of the needle 2 is pointed while the other end 7 may be square. The pointed ends of the needles are directed towards the abovementioned laterally displaceable plate located adjacent to the plane K2 in FIG. 1. This plate is shown in FIG. 2*c* and designated 8. Holes for cooperating with the points 6 of the needles 2 supported in the holes 4 of plate 1 are designated 9. FIGURE 2*c* illustrates how each hole is successively displaced by 60° around a center represented by the position of the needle point 6 in normal position. It will be understood that the amount of displacement shown in the figure is only an example and the possible maximum number of angular positions is dependent on the attainable tolerances. In this example each hole 9 may take up any one of six different angular positions, and as there are eight holes the number of possible combinations of hole positions will be $6^8=1{,}679{,}616$.

A magnetic key for operating the lock is shown in front view and side view in FIGURES 2*d* and 2*e* respectively. It consists of a number of small permanent magnets mounted or otherwise embedded in a block 11 of insulating or non-magnetic material in such positions, that they form salient magnetic poles distributed on the surface of the block 11 in such a pattern that according to what has been described in connection with FIG. 1, the needles 6 are deviated so as to have their points 6 directed towards the holes in the displacable plate 8 in to FIG. 2*c*. The lock is preferably provided with some guiding means or markings for ensuring that the key 11 is placed in the correct position in relation to the needles 6.

In point of principle it is possible to increase the number of combinations at a given number of possible angular positions of the holes 9 as described above by also varying the radial position of the holes in relation to the center point as determined by the normal position of the respective needles. In practice it is preferable, however, to use only one radial distance of the holes.

FIG. 3 shows the relative positions of the magnetic key 11, the supporting plate 1 with the needles 6 and the dis-

placeable plate 8 with the holes 9 when the needles 6 are correctly operated for permitting an unlocking movement of the displaceable plate 8.

The above-described basic elements may be used in a variety of different lock structures for various purposes.

In the embodiment shown as an example in FIG. 4 a lock is shown, comprising as main parts a lock housing 12 and a piston 13 longitudinally displaceable in the housing 12. As will be more closely described below the lock comprises magnetically operable locking elements for releasing the normally blocked piston 13 with the aid of a magnetic key having magnetic poles disposed according to a predetermined pattern.

The housing 12, which is shown partly in section, is provided with a bore 14, in which the piston 13 is guided so as to be displaceable in its axial direction. A pressure spring 15 acts between the bottom of the bore 14 and a collar 16 on the piston 13 so as to keep the piston normally in a projecting position as shown in figure. A carrier plate 1 for supporting the locking elements consisting of needles 2 as described in connection with FIGURES 2*a* and 2*b* is arranged in a recess in the housing 12. Only one needle 2 is shown, but it is pressumed that there are a number of needles sufficient to ensure a required number of combinations. The plate 1 is interposed between the wall of the housing 12 and a block 17. The housing 12 and the block 17 are provided with bores 18 and 19 respectively for each needle. The bore 19 in the block 17 has a smaller diameter than the bore 18 and is so dimensioned that it limits the angle of deviation of the corresponding needle by the latter abutting close to its pointed end against the wall of the bore 19. The magnetic poles of the key 11 are then positioned so as always to cause the needles to deviate sufficiently to bear against this wall, whereby a high safety of operation is obtained. A position of a needle 2 having this deviation is shown in dotted lines in the figure. This limitation may also be obtained at the square ends of the needles, but in order to more easily attain the correct deviation in relation to the holes in the displaceable plate, designated 8, the first-mentioned alternative is preferable. By such limitation the radial positions of the magnets 10 of the key 11 in relation to the needles 2 need not be critical when different angular positions as described in connection with FIG. 2*c* are used as the sole variable combination elements. The plate 8 is provided with holes 4 as described in connection with FIG. 2*c*. This plate 8 is shown partly in section in FIG. 5. As is seen in this figure the plate 8 is provided with a central tubular stud 88 having a central bore 89 in which a plug 20 is axially displaceable. Plug 20 is provided with a bevelled head 21 normally projecting ahead of the plane of the plate 8 under the action of a pressure spring 22 acting between the bottom of bore 89 and the bottom surface of the plug 20.

Referring again to FIG. 4 the control stud 88 of the plate 8 is guided in a central bore 23 in the block 17, so that the plate 8 will be movable in the direction normal to its plane in a space between the block 17 and the piston 13. It is normally kept in a position close to the piston 13 by means of a pressure spring 24 acting between the bottom of the bore 23 and the end surface of the stud 88. The bevelled head 21 of the plug 20 engages a bevelled waist 25 on the piston 13, so that the plate 8 tends to be displaced towards the block 17 when the piston 13 is pressed in to the housing 12.

A magnetic key substantially as described in connection with FIGURES 2*d* and 2*e* is designated 11, and its proper position in relation to the ends of the needles 2 is ensured by means of a guiding collar 26.

If there is no or a wrong magnetic key actuating the needles 2 the plate 8 will be movable only a very short distance towards the block 17 because the point or points of one or several needles 2 will not penetrate into the corresponding hole or holes 9 in the plate 8 and thus they will form a barrier for such movement. When the piston 13 is pressed into the lock housing 12 it will press the plate 8 outwardly by the engagement of the bevelled waist 25 with the head 21 of the plug 20 but as this movement is effectively stopped as mentioned above the plug 20 will be pressed into the central stud 88 (FIG. 5). Thus the head 21 of the plug 20, will not in itself restrict the movement of the piston 13 and through the resilience of the plug 20 a transfer to the needle points of an unpermittedly high pressure against the plate 8 is effectively prevented. The piston 13 will however still be stopped and this takes place by engagement of the step 27 on the piston 13 with the edge 28 of the plate 8. In this direction the plate 8 may take up a considerable load, especially as it may be supported at its opposite edge by the wall of the recess in the housing 17.

If a correct magnetic key 11 is put in proper position as determined by the collar 26 all the points of the needles 2 will be directed to corresponding holes 9 in the plate 8, and when the piston 13 is pressed into the housing 17 full movement of the plate 8 will take place as indicated in dotted lines in FIGURE 4. When the piston 13 is moved into the lock housing so far as to have its step 27 at the level of the edge 28 the plate 8 will have been moved outwardly by means of the waist 25 and the head 21 such a distance, that the step 27 freely passes by the edge 28 of the plate 8. The piston 13 may thus perform a complete movement into the housing 12.

In point of principle it is of minor importance which functions the piston 13 has to fulfil. It may simply be a push button, cooperating with an electric switch for instance. It may also be a locking member cooperating with a corresponding recess or hole in another part and used as locking member for a door etc. in a way well known per se. In such case the piston 13 may be operable by handle or the like also in a manner well known per se.

FIGURES 6*a*, 6*b* and 6*c* illustrate an embodiment of the invention, in which the lock is mounted on a door and includes a locking hook cooperating with the fixed locking abutment, the parts being so disposed and cooperating that the lock is operated solely by a special movement of the door. In this embodiment no handle or other operating member accessible from outside is required, and accordingly the door may be made entirely free from openings or parts by which access to the interior of the space closed by the door may be obtained by violence. FIGURES 6*a*, 6*b*, and 6*c* show different states of the lock as will be described below.

Referring to FIGURE 6*a* 29 designates a door of for instance a safe-deposit box. The door is hinged at 30. The fixed walls of the box are shown in section and designated 31. The portion of the door on which the lock according to the invention is mounted is also shown in section. The lock comprises a plate 1 supporting the needle-shaped locking elements 2. As described in connection with FIG. 2*a* and FIG. 2*b* the supporting plate 2 is interposed between a base block 32 and a top block 33, both blocks being provided with bores 34 and 35 respectively for the needles 2. These bores are similar to those designated 18 and 19 respectively in FIGURE 4. The locking plate 8 is provided with holes 9 for the pointed ends of the needles 2, and is pivotally mounted at 36 so as to act as a lever. The pivot is provided by an edge portion bearing against the frame of the lock in a guiding recess. A retractile spring 37 acts obliquely on the plate 8, so that this is pressed with its edged portion at the pivot 36 against the frame at the same time as it imparts to plate 8 a turning moment by which the plate 8 tends to move towards the block 33.

At its free end the plate 8 is provided with a lug 67, which passes through an opening 38 in a locking hook 39, which is swingably mounted about a pivot at 40. The hook 39 passes through an opening 41 in the lock and coacts with locking abutment 42 attached to the wallsh of the box. The member 42 is provided with a projec-

tion 43, with which the locking hook 39 has its end 44 in engagement when in locking position. The member 42 is further provided with a guiding path 45, the purpose of which will be described later on. The hook 39 is actuated by a spring (not shown) in the direction indicated by the arrow 63. This spring has a tension which is so chosen that the turning moment imparted by it to the hook 39 in the direction indicated by the arrow 63 is overcome by the turning moment in the opposite direction caused by the spring 37. Furthermore the door 29 is actuated by a spring towards open position as indicated by the arrow 47. The door 29 is assumed to have a certain play inwardly, and the spring indicated by the arrow 44 holds the door in a predetermined outer position when locked as indicated in FIGURE 6*a*, and besides said spring has for its purpose to open the door, at least to some extent, when it is unlocked so that it will be possible to get hold of the door for opening it entirely.

The locking hook 39 has its pivot so situated in relation to the end 44 that if the door is pulled outwardly when the hook is in engagement with the projection 43 the hook obtains a turning moment directed opposite to the direction of movement of the hook when released from the projection 43.

In the normal condition shown in FIG. 6*a* the plate 8 rests upon the points of the non-operated needles 2. Alternatively in this condition the plate may be elevated and at a distance from the points of the needles, which is effected if the turning moment imparted to the locking hook 39 by the spring force indicated by the arrow 47 together with the turning moment caused by the spring indicated by the arrow 63 overcomes the turning moment component caused by spring 37. The spring force indicated by arrow 47 may for instance be generated by a spring buffer acting on the outer edge of the door. It may be assumed however that the plate 8 has the position shown in FIG. 6*a*.

When the door is to be opened it is pressed inwards as shown in FIG. 6*b*. The hook 39 will then engage the guiding path 45 and will be rotated in clockwise direction about its pivot 40 to the position shown in this figure. The locking hook will then by engagement with the lug 67 turn the plate 8 in counter-clockwise direction, so that the points of the needles 2 are released, and if a proper magnetic key is positioned in the guiding depression on the outerside of the door, the needle points will be situated in front of their corresponding holes 9. When the door is now let free, the spring indicated by arrow 47 will turn it outwards again. Now the plate 8 passes by the plane of the needle points, so that the locking hook 39 slides along the guiding path 45 and finally gets out of contact with it as the plate 8 completes its turning movement in clockwise direction. The parts will then assume the mutual positions shown in FIG. 6*c*, so that the hook 39 passes freely by the projection 43 and the door may be opened.

In order to lock the door again the magnetic key 11 is removed and the door is closed and pushed into the position shown in FIG. 6*b*. By a turning imparted to hook 39 caused by its engagement with the guiding path 45 the plate 8 is again turned in counterclockwise direction until the points of the needles 2 get entirely out of engagement with the holes 9 in the plate 8. The needles 2 are hereby restored to their normal positions, and when the door is released the parts will resume the mutual positions shown in FIG. 6*a*, the hook 39 engaging the projection 43 by its end 44, so that the door is again effectively locked.

The opening 41 is so dimensioned in relation to the range of movement of the hook 39 as defined by opening 41 that it is not possible to press the plate 8 against the needle points by actuating by hand the hook 39 when the door is open. The projection 43 is provided with a guiding path 46 for restoring the hook 39 when the door is closed for the event the hook should have been changed over by hand when the door was open.

In the embodiment according to FIG. 4 an unduly high pressure on the needle points is prevented by means of a resilient intermediate member limiting the force transferred from an actuating member to the plate 8.

In the embodiment according to FIGURES 6*a*, 6*b* and 6c the plate 8 can only be actuated by means of a retractile spring, which determines the pressure exerted on the needle points. In this embodiment there is no external operation member by which the lock is operated.

The embodiment according to FIG. 7 is an illustration how this principle for limiting the force acting upon the recessed plate 8 also may be used in cases where the lock is operated by a handle or the like. In FIG. 7 the handle is designated 48. The lock, which is shown as seen from above in section comprises a lock piston 49, which is shown in its projecting position and is mechanically coupled to handle 48 so that it is retracted into the lock when the handle is operated. The piston 49 is acted upon by the spring 50 so as to tend to take the position shown on the drawing. The magnetic locking device 51 is in accordance with those previously described. The needle points 6 cooperate with a recessed plate 8 in the same way as in the previously described embodiments. The plate 8 constitutes a two-armed lever pivotally mounted as 52 by means of an edge engaging a groove in a frame portion 53 and kept in position by a retractile spring 54. This spring also imparts to the plate 8 a tendency to turn in clockwise direction. The plate 8 is provided with a projecting lug 55, which in locking position engages the piston 49 in a recess 56. The plate 8 is on the other side of its pivot at 52 provided with an oblique portion 57 cooperating with an oblique projection 58 on the piston 49.

When the lock is in normal position as shown in the figure, the projection 58 is pressed against the portion 57 by the spring 50, so that the plate 8 takes the position shown in the drawing with the lug 55 projecting into the recess 56. If the handle 48 is operated without the proper magnetic key being placed in the key guiding means, the needle points 6 will prevent movement of the plate 8 so as to remove the lug 55 from the recess 56 as the projection 58 releases the end portion 57 of the plate 8. The lug will thus engage the lefthand edge of the recess 56, and the load will be taken up by a stop 59 rigidly connected with a housing of the lock.

If a propr key is used the plate 8 will perform a complete clockwise movement when released by the projection 58, and the lug 55 will then be entirely removed from the recess 56 so that the piston 49 can be retracted into the housing.

The invention may be applied and varied in many respects within the scope of the inventive idea. Thus for instance a magnetic lock according to the invention (or several such locks) may be mounted at a place not visible from outside, and the outside may be provided with secret markings, by which a person who knows the correct position of the key is able to put it on this place, while other persons are not able to find this place and accordingly not to open the lock even if they get hold of the key. Furthermore a key may be divided in two or more portions in cases where the presence of several persons is prescribed for opening a lock.

What is claimed is:

1. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of

movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a pre-determined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a pre-determined pattern for the attraction of the pins so as to cause the pins to take the pre-determined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free convergent movement of said members.

2. In a lock, a pair of members mounted for movement between a divergent locking position and a convergent unlocking position, a magnetic pin universally pivoted upon one of said members and projecting toward the other of said members, the end of said pin adjacent said other member being movable to any position in a circular path, said other member having an aperture in the face thereof adjacent said one member at a pre-determined position in alignment with a pre-determined position of said pin end in said circular path, a key having a magnet thereon adapted to position said pin with its end in said predetermined position to align said pin and said aperture to permit convergent movement of said members.

3. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a predetermined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a predetermined pattern for the attraction of the pins so as to cause the pins to take the predetermined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free convergent movement of said members, said lock being characterised in that the pins are turnable on said first member in a plurality of directions forming angles to one another.

4. A lock as defined in claim 3 characterized in that said pins are two armed and secured at their middle parts to said first member, the key being adapted to be placed at that side of the first member which is opposite to the side facing the recessed second member, so that said magnetic poles act on those ends of the pins which are opposite the ends co-acting with the recessed second member.

5. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a predetermined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a predetermined pattern for the attraction of the pins so as to cause the pins to take the predetermined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free convergent movement of said members, said lock being characterised in that the said pins are inserted and secured in holes in a plate which forms said first of said relatively movable members, in such way that the pins are tiltable in planes at right angles to said plate.

6. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a predetermined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a predetermined pattern for the attraction of the pins so as to cause the pins to take the predetermined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free convergent movement of said members, said lock being characterised in that said pins are two-armed and secured at their middle parts to said first member, the key being adapted to be placed at that side of the first member which is opposite to the side facing the recessed second member, so that said magnet poles act on those ends of the pins which are opposite the ends coacting with the recess second member.

7. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a predetermined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a predetermined pattern for the attraction of the pins so as to cause the pins to take the predetermined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free convergent movement of said members, said lock being characterized in that those ends of the pins which coact with the recessed second member are pointed.

8. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a predetermined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a predetermined pattern for the attraction of the pins so as to cause the pins to take the predetermined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free

convergent movement of said members, said lock being characterised in that said recessed second member is movable in relation to the frame of the lock in a direction substantially parallel to the longitudinal direction of said pins and cooperates with a member for actuating the recessed second member in a direction towards the pins, and that said recessed second member also cooperates with a member to be released upon unlocking, said recessed member engaging the member to be released in such a way that release can only occur when the recessed second member is moved past the plane in which the ends of the pins are located.

9. A lock as claimed in claim 8, characterised in that an operating member is provided for actuating the recessed member to movement towards the pins and for actuating the said member to be released to movement towards unlocking position, and that a resilient intermediate member is provided between said operating member and said recessed member.

10. A lock as claimed in claim 8, characterised in that an operating member is provided for actuating the member to be released to movement towards unlocking position, said recessed second member being subjected to a spring force striving to carry the recessed second member towards the pins, and said member to be released having means effective in the locking position of said member to overcome said spring force and urge the recessed second member away from said pins.

11. A lock as claimed in claim 10, characterised in that said member to be released is subjected to a spring force counteracting said spring force acting upon the recessed second member and effective to keep the member to be released in such position that the recessed member is kept at some distance from those ends of the pins which are facing the recessed second member.

12. In a magnetic lock, a first member and a second member, means mounting said members for relative convergent unlocking movement, a plurality of pins of magnetizable material mounted on and projecting from said first member toward said second member, means for tiltably supporting said pins on said first member so as to enable said pins to take any one of a plurality of positions with their ends pointing toward said second member, a like plurality of recesses in said second member, one of said recesses being disposed in alignment with the path of movement of each of said pins and adapted to receive the end of the associated pin only when such associated pin is in a predetermined position relative to said first member, a magnetic key, means for defining a predetermined position of said key relative to said first member, said magnetic key having a plurality of discrete magnetic poles disposed in a predetermined pattern for the attraction of the pins so as to cause the pins to take the predetermined positions requisite for said recesses to receive the ends of all of said pins thereby permitting free convergent movement of said members, said lock being characterised in that the recessed second member is movable in relation to the frame of the lock in a direction substantially parallel to the longitudinal direction of said pins and is subjected to a spring force striving to carry the recessed second member towards the pins, and that the recessed second member engages a locking hook which is pivotally mounted in the frame of the lock, the recessed second member engaging said locking hook in such a way that when the recessed second member is moved past the plane in which the ends of the pins are located, the hook is rotated out of a position in which it engages a corresponding stop.

13. A lock as claimed in claim 12 for mounting in a door so that the locking hook when the door is shut engages a stop attached to the frame of the door, characterised in that said stop is provided with a guiding surface coacting with the hook so that the hook is carried into engaged position when the door is shut, the hook being so connected with the recessed member that the latter is carried out of engagement with the ends of said pins by the coaction of the hook with said guiding surface.

14. A lock as claimed in claim 13, characterised in that the locking hook is subjected to a spring force striving to carry the hook into its engaged position, said spring force imparting to the hook a rotary moment which is less than a rotary moment in opposite direction exerted on the hook by the recessed member.

15. A lock as claimed in claim 14, characterised in that the recessed second member is provided with a lug which engages a surface on the locking hook, said lug being movable away from said surface to an extent sufficient to prevent forces from being exerted on the recessed second member by movement of the locking hook within its range of movement.

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