

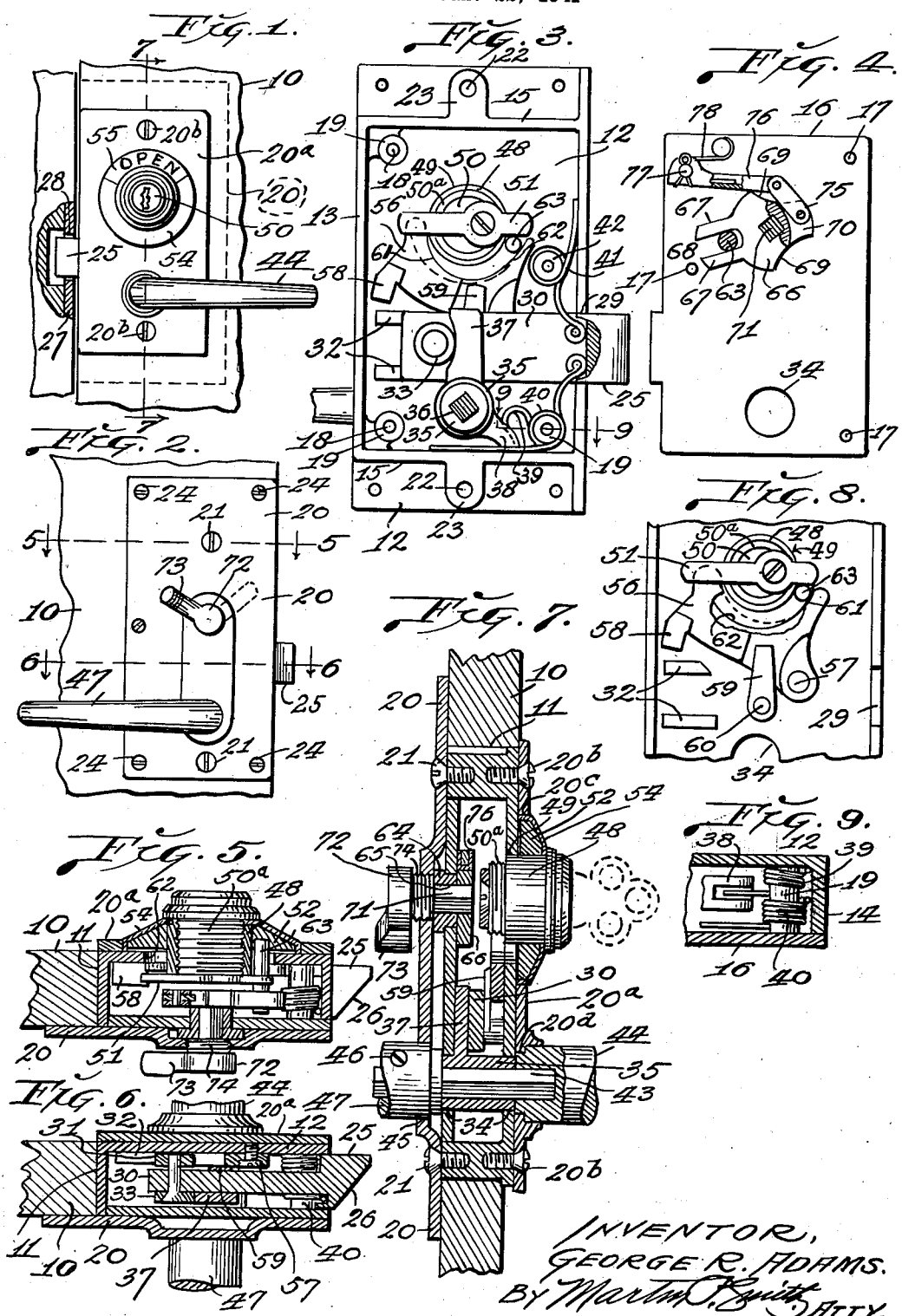
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LAVATORY LOCK

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LAVATORY LOCK

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My invention relates generally to locks and more particularly to a lock intended for use on lavatories, wash rooms and the like.

The principal objects of my invention are, to generally improve upon and simplify the existing forms of lavatory locks and further, to provide a lock of the character referred to that is simple in construction, capable of being readily installed, and which is provided on its outer face or the face that is arranged on the outer face of the door to which the lock is applied, with an indicator operable from the inside of the door to show whether or not the lavatory or compartment that is provided with the equipped door, is occupied.

Further objects of my invention are, to provide a lock having a manually operable bolt for normally securing the door to which the lock is applied in closed position, to provide key-actuated means operable from the outside of the door for securing the bolt against withdrawal from its strike or keeper in the jamb of the door and further, to provide a lock with means operable from the inside of the door for actuating the bolt securing means so as to shift the same into and out of bolt securing position, thus enabling the door with which the lock is associated to be locked and unlocked from the inside.

A further object of my invention is, to provide simple means whereby the indicator located on the outer face of the lock is actuated by the bolt securing means that is operated from the inside of the door.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is an elevational view of a portion of the outer face of a door equipped with my improved lock.

Fig. 2 is an elevational view of a portion of the inner face of the door and showing the inner face plate of the lock.

Fig. 3 is an elevational view of the lock housing with the cover plate removed.

Fig. 4 is an elevational view of the inner face of the cover plate.

Fig. 5 is an enlarged horizontal section taken on the line 5-5 of Fig. 2.

Fig. 6 is an enlarged horizontal section taken on the line 6-6 of Fig. 2.

Fig. 7 is an enlarged vertical section taken on the line 7-7 of Fig. 1.

Fig. 8 is an elevational view looking against the inner face of a portion of the lock housing and showing the bolt securing means and associated parts.

Fig. 9 is a detail horizontal section taken on the line 9-9 of Fig. 3.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of my invention, 10 designates the door to which the lock is applied and for the accommodation of said lock the door is provided adjacent its free edge with a rectangular notch or opening 11. The lock housing comprises a rectangular plate 12 slightly longer than the opening 11 in the door and formed integral with said plate are vertically disposed side walls 13 and 14, also horizontally disposed top and bottom walls 15. Side wall 13 which is disposed against the inner edge of the notch in the door is slightly shorter than plate 12 and wall 14 that is disposed on the edge of the door has the same length as plate 12.

The chamber within the walls 13, 14, and 15 contains the main operating parts of the lock and said chamber is closed by a cover plate 16 that is detachably secured to plate 12 by screws or like fastening devices that pass through apertures 17 in the cover plate and which enter threaded apertures 18 formed in lugs 19 and the latter being formed integral with plate 12.

When the lock housing and its cover plate are properly installed in the notch or opening 11 in the door, the external face of the plate 12 is covered by an inside face plate 20 which is slightly longer and wider than the plate 12 and said face plate 20 is detachably secured to the lock housing by means of screws 21 that pass through apertures formed in said inner face plate and which screws engage in threaded apertures 22 that are formed in lugs 23 on plate 12 above and below the end walls 15.

This inside face plate 20 is secured to the inner face of the door 10 by means of screws 24 that pass through apertures adjacent the corners of said inner face plate and which screws are embedded in the door 10 above and below the notch or opening 11.

An outer face plate 20a having substantially the same dimensions as plate 12 is secured to the external face of said plate 12 on the inner face of the door by means of screws 20b and formed in the upper portion of this outer face plate is a circular opening 20c. Formed in the lower portion of the outer face plate is a circular opening 20d.

The bolt of the lock comprises a head 25 having

a beveled face 26 which when the door is closed engages a strike 27 seated in the door jamb and when the door is fully closed, the projecting portion of the bolt passes through an opening 28 in said strike. This head of the bolt is arranged for sliding movement through a notch or opening 29 that is formed in the lower portion of wall 14 and formed integral with the bolt head 25 and extending into the lock housing is a shank 30.

Mounted for rotation on the side of the shank 30 adjacent the plate 12 and near the end of said shank is a roller 31 which, as the bolt moves from one position to another, travels between a pair of horizontally disposed parallel guide ribs 32 that are formed on the inner face of housing plate 12. Mounted for rotation on the side of the shank 30 of the bolt opposite the side that carries the roller 31 is a roller 33.

Journalled in horizontally aligned openings 34 that are formed in plate 12 and cover plate 16 just below the intermediate portion of the shank 30 of the bolt, are the end portions of a cylindrical head 35, through which is formed an axially disposed non-circular aperture 36. Formed integral with this head 35 and projecting upwardly therefrom is a finger 37 which bears against roller 33 and formed integral with the lower portion of one side of head 35 is an outwardly and downwardly projecting foot 38 that normally rests on the upper face of the bottom wall 15, so as to provide a stop to limit the rotary movement of the head 35 and finger 37.

Mounted on the adjacent one of the lugs 19, is the coiled portion of a spring 39, one end of which bears on top of foot 38 so as to normally maintain the lower end thereof in contact with the lower one of the walls 15. The lug 19 just mentioned carries the coiled portion 40 of a spring, one end of which rests on the bottom wall 15 and the other end bearing against the rear side of the head 25 of the bolt. One end of a similar spring 41 that is mounted on a lug 42 similar to lug 19 and disposed above the bolt, bears against the rear side of bolt head 25, thus yieldingly resisting the inward or retractile movement of the bolt.

Passing through the non-circular opening 36 in head 35 is a non-circular shank 43 that extends outwardly through the opening 20*d* in the outer face plate 20*a* and rigidly fixed to the projecting portion of this shank, is one end of a horizontally disposed handle 44.

The opposite end portion of the shank 43 projects through an opening 45 that is formed in the lower portion of the inner face plate 20 and detachably mounted on the projecting end of said shank and retained thereon by means of a screw 46 is one end of a horizontally disposed handle 47.

The construction just described provides means for imparting rocking motion to the finger carrying head 35 from both sides of the door and when the finger 37 is swung against roller 33, the head 25 of the bolt will be withdrawn from the strike 27 so as to permit the door to be opened.

The inner end of the cylinder 48 of a conventional key operated lock is rigidly secured to the upper portion of plate 12 which cylinder projects outwardly through an opening 49 that is formed in plate 12 and screw seated in said cylinder 48, is a sleeve 50*a* in which is mounted for rotation the key operated lock core 50 containing the tumblers. Secured to the inner end of this core 50 is a cross bar 51. Secured on that

portion of the lock cylinder 48 that projects outwardly from face plate 20*a* is a ring 52 provided with a beveled outer face that bears the letters forming the words open and occupied.

The inner portion of this ring 52 occupies the circular opening 20*c* in face plate 20*a* and overlying the beveled face of said ring is a ring 54 of thin material, the outer edge thereof being positioned between the edge of ring 52 and the opening 20*c* and the inner edge of said ring 54 bearing on the cylinder 48 (see Fig. 7).

An arcuate portion 55 at the top of the ring 54 is transparent in order that the words appearing on the beveled face of ring 52 may be readily noted as said ring is shifted from one position to another during operation of the lock.

The means for preventing the bolt 25 from being retracted or withdrawn from its strike, comprises an irregular shaped plate 56 that is pivotally connected at one of its lower corners to a stud 57 that projects into the lock housing from plate 12. This plate occupies a position between the shank 30 of the bolt and the plate 12 and between the openings 34 and 49 in said plate 12.

Formed integral with the end of plate 56, opposite its pivoted end is a lug 58 which, when the plate is swung downward to its limit of movement, occupies a position between the end of the shank of the bolt 25 and the adjacent side wall 13 of the housing. A thin finger 59 is secured at its lower end to a stud 60 that projects from plate 12 just above the opening 34 and the upper portion of this finger overlies the lower portion of the plate 56 to retain the same in proper operative position against the inner face of plate 12.

Formed in the upper portion of plate 56 immediately below the key operated lock is a substantially semi-circular notch 61, the radius of which is somewhat less than that of an arcuate slot 62 that is formed in plate 12 immediately below and communicating with the lower half of the opening 49 in plate 12. Notch 61 and slot 62 are somewhat less than 180° in length and define the degree of rotation of the lock core 50 and parts carried thereby.

Seated in the lower portion of ring 52 is one end of a horizontally disposed pin 63 which projects through slot 62 and through the notch 61 in plate 56. This pin is adapted to be engaged and moved through an arc defined by the length of notch 61 and slot 62 by the cross bar 51 on the core 50 of the lock and as said pin alternately engages the edges of plate 56 adjacent the ends of the notch 61 therein, said plate will be swung on its axis, the stud 57. Owing to the fact that lock core 50 is provided with an axial chamber for the tumblers, cross bar 51 is secured to the inner end of the annular wall of said core, or eccentric to the axis of said core and thus, to be effective in actuating pin 63, said cross bar has a long arm and a short arm.

Journalled for rotation in an opening in the upper portion of cover plate 16, which opening is directly opposite the opening 49 in plate 12, is a short cylindrical member 64 having an axially disposed non-circular opening 65 and secured to the inner end of this cylindrical member is a disc 66 from the edge of which projects a pair of spaced fingers 67, thus forming a slot 68 which receives the pin 63 (see Fig. 4).

Formed in the edge of disc 66 on the opposite side from the fingers 67 are notches 69 and

formed in the disc between the adjacent ends of these notches is a slot 70.

A non-circular shank 71 passes through the non-circular opening 65 in member 64 and the inner end of said shank is seated in a non-circular opening in the center of disc 66. The outer end of shank 71 that projects through the cylindrical member 64 and through an opening in the inner face plate 20 receives the head 72 on one end of a short radially disposed arm 73 and which latter is utilized for rocking the shank 71 to impart partial rotary movement to disc 66.

The inner end portion of head 72 is externally threaded as designated by 74 and this threaded portion engages in a threaded opening in the inside face plate 20, thus maintaining the arm 73 in operative position upon said face plate.

Positioned in the slot 70 and pivotally connected to disc 66 midway between the notches 69 is one end of a link 75 and the opposite end thereof is pivotally connected to a short arm 76, the latter being pivoted to a stud 77 that projects from the inner face of cover plate 16. Associated with this arm and its pivot is a spring 78 which yieldingly resists upward swinging movement of the end of said arm that is pivoted to link 75 (see Fig. 4).

When the door bearing my improved lock is closed and unlocked, the various parts of the lock occupy the positions as illustrated in Figs. 1 to 3 inclusive, with the head 25 of the bolt projecting through the opening 28 in the strike that is mounted on the door jamb. When so positioned, the ring 52 bearing the words Open and Occupied is positioned so that the word Open appears through the transparent portion of the covering member 54 with the short end of cross bar 51 positioned above the end of pin 63 that projects through notch 61 and slot 62.

To open the door, handle 44 is manually engaged and swung downward a short distance, thereby partially rotating shank 43 and member 35 carried thereby against the yielding resistance of spring 39 and the finger 37 projecting upwardly from member 35 bears against roller 33 carried by the shank of the bolt and moves said bolt within the lock housing, thereby withdrawing the head 25 from the strike in the jamb.

This retractile movement imparted to the bolt is yieldingly resisted by the springs 40 and 41 and during such movement the roller 34 travels between the ribs 32 so as to guide said bolt in its movement. When the end of the bolt head 25 leaves the strike, the door may be opened.

After entering the lavatory or compartment having the door equipped with my improved lock, the person so entering may lock the door by swinging arm 73 toward the right hand through an arc somewhat greater than 90 degrees as illustrated by dotted lines in Fig. 2.

As a result of this movement, the shank 71 is partially rotated, thereby imparting corresponding movement to the disc 66 and as the latter shifts its position, the pin 63 positioned in the slot 68 will be swung through the slot 62 and notch 61, and during the latter portion of this movement of pin 63 it will strike against the edge of the notch 61 in plate 56 farthest from the pivot 57, thereby shifting the position of said plate so as to move the free end thereof downward and consequently positioning lug 58 behind the end of the shank 30 of the bolt so that retractile movement of the bolt by manipulation of the outside handle 44 is prevented.

As disc 66 is partially rotated as just described,

link 75 will be moved upward, thereby swinging arm 76 upward against the resistance of spring 78 and as the pivot point between link 75 and disc 66 passes center, the power restored in spring 78 will be exerted to quickly move or snap the disc 66 to its limit of movement.

Inasmuch as pin 63 is positioned in slot 68 in the disc 66, said pin will be moved through the arcuate slot 62 immediately below the lock, and as said pin is secured to ring 52, the latter will be partially rotated so as to bring the word Occupied into position immediately behind the transparent portion 55 of member 54. At the end of the operations just described the pin 63 will be positioned beneath the long arm of cross-bar 51.

Thus the shifting of the arm 73 from one position to another locks the bolt against retractile movement and at the same time shifts the indicator ring so as to bring the word Occupied into view.

To unlock the door from the inside thereof, it is only necessary to shift arm 73 back to its normal position and following this movement the disc 66 will be partially rotated, thereby moving pin 63 through the slot 62, which pin engages the edge of the notch 61 adjacent the pivot point of plate 56 so as to swing said plate upward and thereby withdraw the lug 58 from its position against the inner end of the shank of the bolt. Under such conditions pin 63 is positioned beneath the short arm of cross bar 51.

With the parts so positioned, the inner handle 47 may be engaged and swung downward a short distance so as to impart retractile movement to the bolt.

To lock the door from the exterior so as to prevent the same from being opened, the proper key is inserted in the lock and the core 59 is rotated approximately a half turn and the cross bar 51 on the inner end of said member will engage pin 63 to move the same through the arcuate slot 62 and which movement will position the lug 58 on plate 56 behind the end of the shank 30 of the bolt, thus preventing said bolt from being retracted.

In the event that a person within the lavatory or compartment should be locked in as a result of actuation of the locking mechanism by the key as just described, the door may be unlocked from the inside by manipulation of the arm 73 which is mounted on the outer end of shaft 71, the latter carrying disc 66 having the fingers 67 which engage pin 63.

The locking of the door from the exterior moves pin 63 through the arcuate slot so as to engage the edge of notch 61 and swing plate 56 on its pivot so as to position lug 58 behind the inner end of the bolt. Obviously, the disc 66 and parts connected thereto are shifted as a result of this movement by the engagement of the pin 63 between the fingers 67 and by movement of the handle 73 which is on the inside of the door, disc 66 is reversely rotated so as to swing pin 63 to the opposite end of the notch 61, thereby tilting plate 56 so as to raise lug 58 from behind the bolt and thereby permitting the bolt to be unlatched by manipulation of the handle 47 that is mounted on the inside of the door to which the lock is applied. The lock cylinder and core are mounted in ring 52 and wall 20^a so that when the cross bar 51 is horizontally disposed as illustrated in Fig. 3, the key hole is vertically disposed, thereby permitting the key to be freely inserted and removed and after door has been locked or unlocked from the exterior by means of the key,

the latter can only be withdrawn after it has been reversely rotated a sufficient distance to bring the key hole into vertical position, which operation necessarily rotates the core so as to bring the cross bar into horizontal position, with pin 63 positioned beneath the short arm of cross bar 51 when the door is unlocked, and beneath the long arm of said cross bar when said door is locked.

To unlock the door after it has been locked from the exterior by means of key or from the inside by actuation of lever 73 as described, the key inserted in the keyhole is rotated clockwise so as to rotate core 50 and cause the long arm of cross bar 51 to engage and move pin 63 to the left hand ends of slot 62 and notch 61, thereby actuating plate 56 to elevate lug 58 from behind the end of bolt 30 and by now reversely rotating key so as to bring the keyhole into vertical position, the key may be removed and at this time pin 63 is positioned beneath the short arm of cross bar 51.

The actuation of lever 73 on the inside of the door does not in any way effect the lock cylinder, core and cross arm and when said lever is swung from one position to the other, pin 63 moves through the arcuate slot 62 and notch 61, so as to swing plate 56 on its axis and move lug 58 into or out of engagement with the inner end of bolt 30.

An especially desirable feature of my improved lock is the symmetrical appearance of the external plate 20a for the key operated lock is located centrally on the upper portion of said plate 20a and directly above the axis of the external handle 44. Such arrangement presents a much more pleasing and attractive appearance than where the lock and the axis of the handle are offset with respect to each other on the external plate.

Thus it will be seen that I have provided a lavatory lock that is relatively simple in construction, inexpensive of manufacture and very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of my improved lavatory lock, may be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a lock, a housing, a bolt arranged for sliding movement in said housing, a spindle passing through said housing, means mounted on said spindle externally of the housing for actuating said spindle, means carried by said spindle for imparting retractile movement to said bolt, a member pivotally mounted within the housing and adapted to engage said bolt to hold the same against retractile movement, locking means operable from the exterior of the door to which the lock is applied for shifting said pivoted member into bolt engaging position and separate means operable from the inside of the door to which the lock is applied for shifting said pivoted member out of bolt engaging position.

2. A lock as set forth in claim 1, with an indicator mounted for operation on the outside wall

of the lock housing and means within the lock housing and actuated by the bolt engaging actuating means for shifting said indicator to positions corresponding with the position of the pivoted bolt engaging member.

3. In a lock, a housing, a bolt arranged for sliding movement in said housing, a spindle passing through said housing, means mounted on said spindle externally of the housing for actuating said spindle, means carried by said spindle for imparting retractile movement to said bolt, a member pivotally mounted within the housing and adapted to engage said bolt to hold the same against retractile movement, which pivotally mounted member is provided with an arcuate notch, an indicator ring mounted for rotation on the outer wall of the housing, a pin projecting from said indicator ring through the front wall of said housing and through the arcuate notch in said pivotally mounted member, key controlled locking means mounted for operation on the outer wall of the housing, said locking means including a rotary core, a cross bar secured to the inner end of said rotary core and lying in the path of travel of the pin that passes through the notch in the pivotally mounted member and means including an arm pivotally mounted on the outer wall of the housing for moving said pin through the arcuate notch of said pivoted member to swing the same upon its axis.

4. In a lock, a housing having inside and outside walls, a bolt arranged for operation within said housing, means mounted for operation on said housing and operable from the external faces of said inside and outside walls for imparting retractile movement to said bolt, a member mounted for operation within the housing and adapted to engage said bolt to hold the same against retractile movement, an indicator mounted for operation on the outer face of the outside wall of the housing, a pin seated in said indicator and projecting into the housing for actuating said bolt engaging member and means mounted for operation on the inside of the wall of the housing for actuating said pin to shift said bolt engaging member into and out of bolt engaging position.

5. In a lock, a housing having inside and outside walls, a bolt arranged for operation within said housing, means mounted for operation on said housing and operable from the external faces of said inside and outside walls for imparting retractile movement to said bolt, a member mounted for operation within the housing and adapted to engage said bolt to hold the same against retractile movement, an indicator mounted for operation on the outer face of the outside wall of the housing, a pin seated in said indicator and projecting into the housing for actuating said bolt engaging member, a key controlled lock mounted for operation on the outside wall of the housing and means actuated by said key controlled lock and arranged within the housing for engaging and shifting said pin to move the bolt engaging member into and out of bolt engaging position.

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