

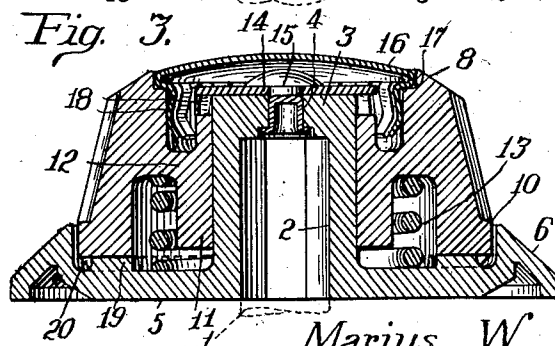
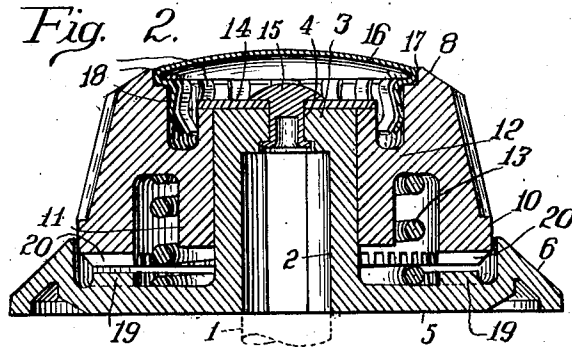
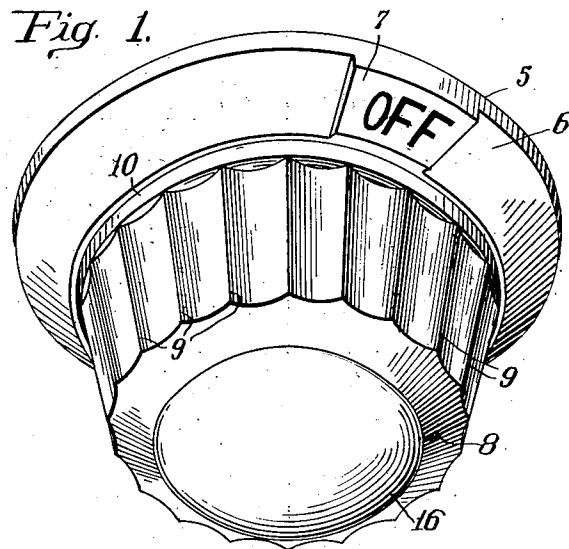
July 2, 1957

M. W. MARRAPESE
APPLIANCE KNOBS

2,797,592

Filed Sept. 3, 1952

2 Sheets-Sheet 1



INVENTOR

Marius W. Marrapese

BY *Gymer Kohn & Smeck*

ATTORNEY

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2 Sheets-Sheet 2

Fig. 4.

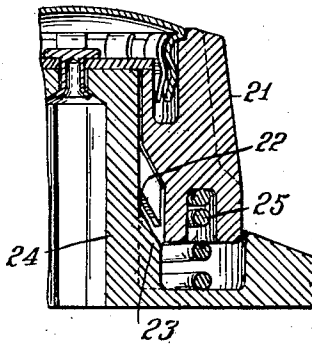


Fig. 5.

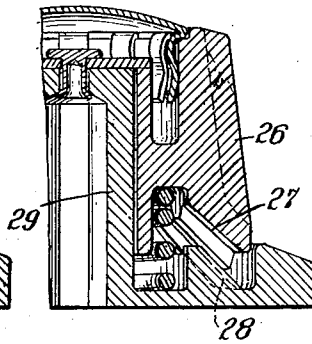


Fig. 6.

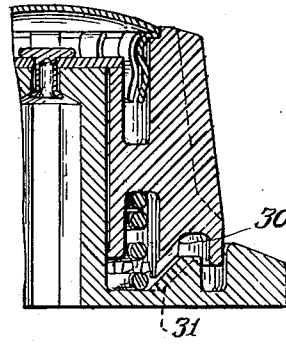


Fig. 7.

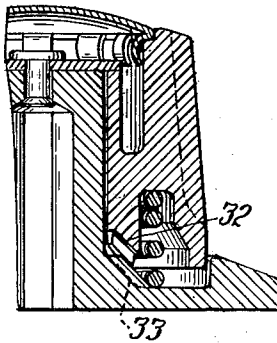


Fig. 8.

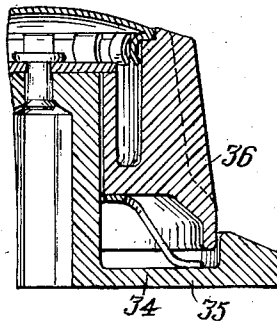


Fig. 9.

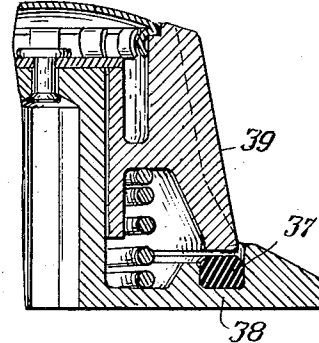


Fig. 11.

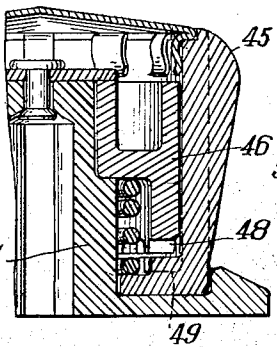


Fig. 10.

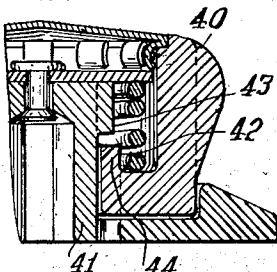
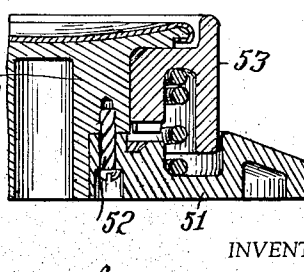


Fig. 12.



INVENTOR

Marius W. Marrapese

BY *Cyrus Kille & Smucker*

ATTORNEYS

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2,797,592

APPLIANCE KNOBS

Marius W. Marrapese, Bedford, Ohio, assignor to The Patent Button Company of Tennessee, Inc., Knoxville, Tenn., a corporation of Tennessee

Application September 3, 1952, Serial No. 307,617

16 Claims. (Cl. 74—548)

This invention relates to improvements in appliance knobs, and more particularly to the control knobs for gas and electric stoves and other appliances.

It is well known that young children tend to turn on electric and gas appliances, which often create real hazards and sometimes serious injury. Various attempts have been proposed heretofore to provide knobs which will prevent accidental operation of such appliances, or manipulation thereof by small children, but these have depended on threaded connections between the parts, or other objectionable characteristics thereof, which have not been satisfactory for efficient manufacture and use.

One object of this invention is to overcome these objections and to improve the construction of knobs for controlling gas, electric, and other appliances.

Another object of the invention is to provide a self-contained knob for gas and electric stoves, and other appliances, that will prevent operation of the valve or switch thereof by young children, and also prevent accidental operation by unintended body contact with the valve or switch, and which will be practical for manufacture and use.

Still another object of the invention is to provide a control knob for gas and electric stoves and other appliances, which is entirely self-contained, without depending upon any special construction of the valve stem or electric switch shaft to operate these devices.

These objects may be accomplished by providing a ribbed body, with a hub that is rotatably mounted on a central post, which latter has a back plate fixed thereto. These parts may be molded, of plastic or other suitable material, or otherwise formed, in the desired shape. A spring is interposed between the respective parts, normally tending to separate them, and they are mounted for relative axial movement against the tension of the spring for engagement of the teeth, friction surfaces, or other clutch means provided therebetween upon said relative movement. The knob itself, which is rotatable on the post, being formed of a body (having ribs or other surface suitable for gripping) with its hub, normally turns free of the post and independent of the latter until it is shifted axially to cause engagement of the clutch means, when rotation of the knob will also cause turning movement of the post and also of the appliance control means connected therewith, either a valve stem or a switch shaft, or other control device. These parts of the appliance knob are entirely self-contained without requiring a special threaded connection of the appliance device and are so made as to be manufactured and used in a practical form.

The invention is illustrated in certain embodiments in the accompanying drawings in which:

Fig. 1 is a perspective view of one form of the appliance knob embodying this invention;

Fig. 2 is a cross-section therethrough, with the knob disengaged;

Fig. 3 is a similar view showing the knob engaged; and

Figs. 4 to 12, are cross-sections through modified forms of the appliance knob.

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This appliance knob may be used for controlling the valve of a gas stove or the electric switch of an electric stove, or other electric appliance that will prevent operation of the valve or switch by young children, or accidental or unintended operation thereof by bodily contact with the valve or switch. I have shown a portion of the appliance control, either a valve stem or an electric switch shaft, generally by the numeral 1, and it will be understood that this is intended merely as an example of the control means for the appliance to which the invention may be applied.

The appliance knob includes a central post generally designated at 2, which is tubular and has a suitable provision for connection with the shaft 1, such as a split D-shaft that will provide a press-fit or other connection between the post 2 and the shaft 1 or other control means. The post 2 is partially closed at its upper end by an inturned flange 3, provided with a central hub 4 therein, as shown in Figs. 2 and 3.

At its lower end, the post 2 is provided with a radially extending back plate 5, which projects outwardly therefrom and has a surrounding rim 6 thereon that may be shaped in any suitable or desired ornamental form. This rim preferably is made with an indicator element 7, to show the position of the appliance control means, as for instance the "off" position thereof.

A knob is provided on the post 2 and comprises a body 8 having radial ribs 9 on the periphery thereof to facilitate grasping and turning of the knob. The body 8 has an outturned flange 10 on the lower edge thereof in the embodiment shown in Figs. 1 to 3, which is spaced inwardly from, and surrounded by the rim 6, on the back plate 5.

The body 8 carries a hub 11, spaced inwardly therefrom by an interposed radially extending web 12, which hub 11 is journaled on the post 2 and free for sliding movement axially relative thereto.

The sliding movement of the knob relative to the post 2 is yieldable by a coiled compression spring 13 interposed between the web 12 and the back plate 5, being sleeved over the lower end portion of the hub 11. The sliding movement of the knob in the opposite direction is limited by a cap plate 14, which extends over the upper end of the post 2, and overlaps the adjacent end of the hub 11. The cap plate 14 is confined by a rivet 15, which is inserted through the cap plate 14 and through the hole 4 in the flange 3, having its lower end turned over to confine these parts in the relation shown.

A cover plate 16 extends over the upper end of the knob, engaging at its periphery in a seat 17, formed in the upper end of the body 8, closing the latter and forming an ornamental top to the knob. The cover plate 16 has a plurality of spring fingers 18 that extend downward in frictional engagement with the inner wall of the body 8 yieldably holding the cover plate in place.

Provision is made for a clutch connection between the spinning knob and the post 2 to permit free turning movement of the knob relative thereto in one position, and yet upon axial shifting movement of the knob, the post is turned thereby to shift the position of the appliance control 1 to an "off" or other position. One example of this clutch connection is illustrated in Figs. 2 and 3, and other examples are shown in Figs. 4 to 12.

In Figs. 2 and 3, the clutch connection is provided by interengaged teeth 19 and 20 formed respectively on the back plate 5 and on the lower edge of the body 8, the teeth being spaced apart circumferentially in each row and so disposed as to interengage with each other to form a positive jaw clutch. In this form the teeth 19 and 20 extend radially of the appliance knob and are spaced apart circumferentially.

In the modification shown in Fig. 4, the spinning knob 21 is provided with axially elongated teeth 22, in posi-

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tion to engage substantially parallel teeth 23, extending along the length of the post 24. These teeth 22 and 23 thus form a splined connection between the body 21 and the post 24, which may be disengaged from each other upon axial shifting movement of the body relative to the post under the influence of the coiled spring 25.

A further modification is shown in Fig. 5, in which the spinning knob 26 has teeth 27 in position for coaxing clutch engagement with teeth 28, formed on the post 29. In this example, the teeth 27 and 28 are sloped upward and inward from the outer edge of the knob 26, toward the center, which relation, however, may be reversed as indicated at 30 and 31 in Fig. 6. In the latter form, the teeth slope outward and upward from the center.

In the examples shown in Figs. 1 to 6, the teeth are shown as formed on the body of the spinning knob. However, as desired, the teeth may be formed on the hub thereof, as illustrated at 32 and 33 in Fig. 7, in which event they slope inward and upward toward the center.

It is also possible to use friction clutch connections between the spinning knob and the post, as illustrated in Figs. 8 and 9. In Fig. 8, the coiled spring is replaced by a spring clutch generally indicated at 34, having radially extending fingers thereon that bear against the back plate 35, while the base of the spring clutch bears against the lower face of the knob 36. This forms a friction drive therebetween and upon downward pressure on the knob, the frictional contact will be increased to the point where the post that is connected with the back plate 35 will be turned to shift the appliance connection.

Another form of friction clutch connection is shown in Fig. 9, in which an O-ring 37 is supported by the back plate 38 in position for frictional engagement by the knob 39. Otherwise this form will function substantially as described with respect to the form shown in Fig. 8.

In Fig. 10, I have shown a pull type of connection between the knob 40 and the post 41, provided by a normal separation thereof by a spring 42. A jaw clutch is shown at 43—44 which will be engaged upon outward pulling movement imparted to the knob 40 axially thereof.

Another form of pull connection is shown in Fig. 11, in which the knob is shown at 45, separate from the hub portion 46, that is fixed to the post 47. A jaw clutch is shown at 48—49 upon axial shifting of the knob 45 relative thereto.

An example of an application of this invention to a gas valve or an electric switch is shown in Fig. 12 in which the post that is adapted to be connected with the valve or switch is illustrated at 50 and is secured to the back plate 51 by one or more drive screws 52 inserted therethrough. The knob 53 normally is disconnected from the back plate 51 but capable of engagement and actuation thereof by any of the forms set forth and described above. The construction illustrated in Fig. 12 provides for a cover plate that will remain in a fixed position with relation to the valve or switch stem, thus enabling any legend inscribed on the cover plate to remain in a correct reading position when the back plate shows "off."

It will be apparent that the invention may be applied to the valve stem or shaft of an electric switch for a stove or other appliance so that manual adjustment thereof may be accomplished, when desired, but normally the parts are disconnected so that shifting of the knob by children or accidentally will not cause a shifting of the valve or switch. At the same time, the parts are entirely self-contained, simple and inexpensive to manufacture, and may be applied readily to the device to be controlled thereby.

Normally the parts of the knob are in the relation shown in Fig. 2 in which the rotatable knob 8 is shifted outwardly on the post 2 by the spring 13, with the clutch means disengaged. The knob 8 is thus free to rotate relative to the appliance control without turning the latter. The cap plate 14 limits the outward movement of the knob

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8 relative to the post but is free to allow rotation and also to limit relative movement in the opposite direction.

All of these parts are confined in the rotatable knob, without requiring threaded connections between the parts. Thus a practical unitary structure is provided, with the parts fully enclosed, and without danger of disconnection. At the same time, this structure provides effective control of the appliance.

While the invention has been illustrated and described in certain embodiments, it is recognized that variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post, means forming an engageable clutch between the central post and the rotatable knob, spring means surrounding the post normally tending to hold the clutch means disengaged, said hub portion being slidable axially relative to the post for engagement of the clutch means, and means for limiting said axial sliding movement of the hub portion, said limiting means including a cap plate extending over the end of the hub portion, a fastening member connected with the cap plate and extending into the central post, and means for confining an end of the fastening member in the central post.

2. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post, a back plate fixed to one end of the central post and extending radially over an end of the rotatable knob, means forming an engageable clutch between the back plate and the rotatable knob, and spring means surrounding the post normally tending to move the rotatable knob axially relative to the post to disengage the clutch means, said rotatable knob surrounding the opposite end of the central post, a cap plate mounted within the rotatable knob overlying the hub portion and extending over the last-mentioned end of the central post, and a fastening connecting the cap plate with said end of the central post.

3. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post, a back plate fixed to one end of the central post and extending radially over an end of the rotatable knob, means forming an engageable clutch between the back plate and the rotatable knob, and spring means surrounding the post normally tending to move the rotatable knob axially relative to the post to disengage the clutch means, said rotatable knob surrounding the opposite end of the central post, a cap plate mounted within the rotatable knob overlying the hub portion and extending over the last-mentioned end of the central post, and a fastening connecting the cap plate with said end of the central post, said cap plate being unconnected with the rotatable knob for bodily shifting movement of said knob in one direction relative to the post and for limiting the sliding movement in the opposite direction relative thereto by abutment with an end of the hub portion.

4. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post, a back plate fixed to one end of the central post and extending radially over an end of the rotatable knob, means forming an engageable clutch between the back plate and the rotatable knob, and spring means surrounding the post normally tending to move the rotatable knob axially relative to the post to disengage the clutch means, said rotatable knob surrounding the end portion of the central post opposite the back plate, a cap plate mounted within the rotatable knob overlying the hub portion and extending over the last-mentioned end of the central post, and a fastening connecting the cap plate with said end of

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the central post, said cap plate being unconnected with the rotatable knob for bodily shifting movement of said knob in one direction relative to the post and for limiting the sliding movement in the opposite direction relative thereto by abutment with an end of the hub portion, and a cover plate detachably mounted in the rotatable knob over the cap plate and closing the end of the rotatable knob.

5. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post and axially movable relative thereto, a back plate fixed to one end of the central post and extending radially over an end of the hub portion of the knob, means forming an axially engageable clutch between the outer face of the back plate and the rotatable knob upon axial inward movement of the knob on the post, a separate member overlying outer end portions of the central post and the hub portion of the knob, and a fastening device connected with said member and extending into the post and securing the separate member thereto.

6. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post and axially movable relative thereto, a back plate fixed to one end of the central post and extending radially over an end of the hub portion of the knob, means forming an axially engageable clutch between the outer face of the back plate and the rotatable knob upon axial inward movement of the knob on the post, a plate separate from the knob and post and overlapping adjacent outer end portions thereof, a fastening member connected with the plate and extending into the post holding the plate and the knob thereon, said knob having an axially projecting wall portion surrounding the plate and fastening member, a cover plate seated within said wall portion overlying the first-mentioned plate and enclosing the latter, and means for securing the cover plate to the knob.

7. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post and axially movable relative thereto, a back plate fixed to one end of the central post and extending radially over an end of the hub portion of the knob, means forming an axially engageable clutch between the outer face of the back plate and the rotatable knob upon axial inward movement of the knob on the post, said knob having a surrounding wall portion spaced from the hub portion and having a radially extending web therebetween, and yieldable means interposed between said web and the back plate normally urging the knob outwardly relative to the post.

8. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post and axially movable relative thereto, a back plate fixed to one end of the central post and extending radially over an end of the hub portion of the knob, means forming an axially engageable clutch between the outer face of the back plate and the rotatable knob upon axial inward movement of the knob on the post, said knob having a surrounding wall portion spaced from the hub portion and having a radially extending web therebetween, and a coiled spring sleeved over the hub portion on the post and interposed between the web and the back plate normally urging the knob outwardly relative to the post.

9. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having a hub portion journaled on the central post and axially movable relative thereto, a back plate fixed to one end of the central post and extending radially over an end of the hub portion of the knob, means forming an axially engageable clutch between the outer face of the back plate and the rotatable knob upon axial inward movement of the knob on the post, said knob having

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a surrounding wall portion spaced from the hub portion and having a radially extending web therebetween, a coiled spring sleeved over a portion of the hub surrounding the post and interposed between the web and the back plate normally urging the knob outwardly relative to the post, a plate separate from the knob and post and overlapping adjacent outer end portions thereof for confining the knob on the post, and a fastening member extending through adjacent portions of the plate and post with heads on opposite ends thereof confining the plate to the post.

10. An appliance knob comprising a center post adapted to be connected with an appliance control member, a control knob mounted on the center post for rotary and axial movement relative thereto means forming an engageable clutch between the center post and control knob, said control knob having a hub portion journaled on the center post and having an annular recess therein surrounding the hub portion, and a coiled spring surrounding the center post and having one end seated in said recess and permanent means fixed to the post to limit the outward travel of the knob.

11. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having an outer end and an appliance end and having a hub portion journaled on the central post, a back plate fixed to the central post at a zone remote from the outer end of the knob and extending radially and substantially covering the appliance end of the rotatable knob, means forming an engageable clutch between the central post and the rotatable knob, and spring means surrounding the post normally tending to hold the clutch means disengaged.

12. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having an outer end and an appliance end and having a hub portion journaled on the central post, a back plate fixed to one end of the central post at a zone remote from the outer end of the knob and extending radially and substantially covering the appliance end of the rotatable knob, means forming an engageable clutch between the back plate and the rotatable knob, and spring means surrounding the post normally tending to move the rotatable knob axially relative to the post to disengage the clutch means.

13. An appliance knob comprising a central post having a recess therein adapted to receive therein an appliance control member, a rotatable knob having an outer end and an appliance end and having a hub portion journaled on the central post, a back plate fixed to one end of the central post at a zone remote from the outer end of the knob and extending radially and substantially covering the appliance end of the rotatable knob, means forming an engageable clutch between the central post and the rotatable knob, spring means surrounding the hub portion normally tending to hold the clutch means disengaged, said clutch means comprising a row of clutch teeth extending continuously around the central post and fixed thereto, and a second row of clutch teeth in position for engagement therewith and extending continuously around the axis of the rotatable knob and fixed thereto.

14. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having an outer end and an appliance end and having a hub portion journaled on the central post, a back plate fixed to the central post at a zone remote from the outer end of the knob and extending radially and substantially covering the appliance end of the rotatable knob, means forming an engageable clutch between the central post and the rotatable knob, spring means surrounding the post normally tending to hold the clutch means disengaged, said clutch means comprising a row of clutch teeth formed on the back plate and extending continuously around the central post, and a second row of clutch teeth in position for engagement

therewith and extending continuously around the axis of the rotatable knob and fixed thereto.

15. An appliance knob comprising a central post having a recess therein adapted to receive therein an appliance control member, a rotatable knob having an outer end and an appliance end and having a hub portion journaled on the central post, a back plate fixed to the central post at a zone remote from the outer end of the knob and extending radially and substantially covering the appliance end of the rotatable knob, means forming an engageable clutch between the central post and rotatable knob, spring means surrounding the hub portion normally tending to hold the clutch means disengaged, said clutch means comprising frictional engaging means between the rotatable knob and the central post.

16. An appliance knob comprising a central post adapted to be connected with an appliance control member, a rotatable knob having an outer end and an appliance end and having a hub portion journaled on the central post, a back plate fixed to one end of the central post at a zone remote from the outer end of the knob and extending radially and substantially covering the appliance end of the rotatable knob, means forming an engageable clutch between the back plate and the rotatable knob, and spring means surrounding the post normally tending to move the rotatable knob axially relative

to the post to disengage the clutch members, and a cover plate extending over the outer end of the post and adjacent portion of the rotatable knob.

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