July 24, 1928. 1,678,524

E. J. NIELSEN

CONTROL BUTTON

Filed Nov. 29, 1922

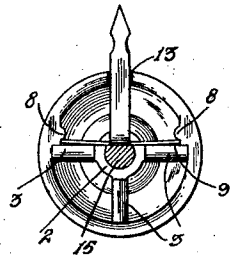


Fig. 3.

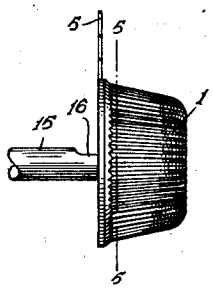


Fig. 1.

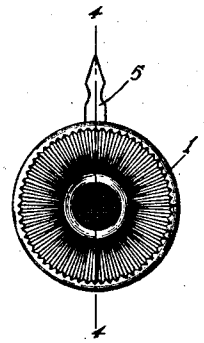


Fig. 2.

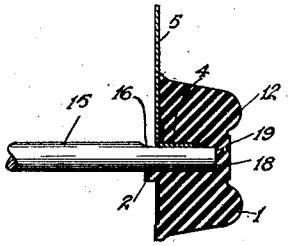


Fig. 4.

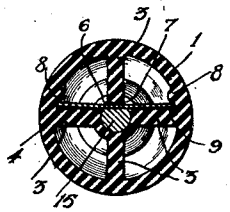


Fig. 5.

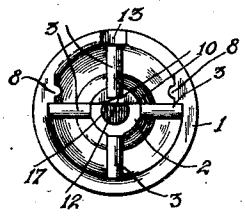


Fig. 6.

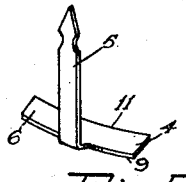


Fig. 7.

Inventor:
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Patented July 24, 1928. 1,678,524

UNITED STATES PATENT OFFICE.

EMIL J. NIELSEN, OF OAK PARK, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CONTROL BUTTON.

Application filed November 29, 1922. Serial No. 603,927.

My invention relates to control buttons, and more particularly to that class which is used for controlling the rotation of rotatable shafts.

Prior to my invention, control buttons of the above class were secured to shafts by means of a sleeve member secured in the button and adapted to receive the end portion of the shaft. A screw-threaded orifice is provided in the sleeve, and a suitable opening is provided in the side of the button and in alignment with the orifice in the said sleeve member, and through which opening a set screw extends and has screw-threaded engagement with the said orifice in the sleeve member. When the shaft is inserted into the sleeve the set screw is rotated to cause the end of the same to engage a portion of the side of the shaft so that when the button is rotated the shaft will also rotate with the button as a unit. This manner of securing the button to the shaft is objectionable in that there is a liability of the set screw becoming loose and thereby disengaging the shaft which will permit the button to be rotated without effecting rotation of said shaft, and further there is a liability of losing the button. Another objection is the cost of manufacturing this style of button, due to the number of operations and parts required in its production.

In order to overcome the above mentioned objections I have designed a control button which dispenses with the sleeve member and also with the set screw. The control button of my invention is provided with an opening for receiving the end portion of the shaft, and I provide a spring member which is secured in the button, and adapted to engage the shaft to cause said shaft to rotate with the button as a unit when the same is rotated. The spring member also prevents the button from disengaging the shaft under ordinary working conditions, but my button may be removed from the shaft by merely pulling on the button in the opposite direction from that of the shaft.

Another feature of my invention is the provision of means integrally formed in my button for securing the spring member in said button.

Still another feature of my invention is the provision of an indicator which is integrally formed with the spring member and adapted to indicate the degree or amount of rotation of the shaft.

For a clearer understanding of my invention reference may be had to the accompanying drawing in which like reference characters denote like parts in the several views, and in which:

Fig. 1 is a side view of the control button of my invention showing it secured to a shaft;

Fig. 2 is a right end view of Fig. 1;

Fig. 3 is a back view of my control button showing a shaft member in section and engaging and secured in the control button by the spring member;

Fig. 4 is a sectional view of my control button along the line 4—4 of Fig. 2, and showing the control button secured on the shaft member;

Fig. 5 is a sectional view along the line 5—5 of Fig. 1;

Fig. 6 is a back end view of my control button showing its construction; and

Fig. 7 is a plan view of the spring member for securing my control button on a shaft and also showing an arrow or indicating member integrally formed therewith.

For a more detailed statement of my invention, 1 is the button of my invention, which is molded out of some suitable substance, such as bakelite or the like, and has a central rearwardly extending cylindrical portion 2 integrally formed therewith. A number of radially disposed webs 3 are integrally formed with the button for reinforcing the cylindrical portion 2. The cylindrical portion 2 has a part of its wall cut away for purposes to be hereinafter described. A spring member 4 is provided which has its end portions turned slightly upward to produce a spring effect, and a member 5 is also provided which is integrally formed with the member 4 and whose purpose will be pointed out later. To secure the members 4 and 5 in the button 1, the member 4 is inserted into the button 1 so that a part of its upper face 6 opposite the member 5 will be opposite and adapted to engage the end 7 of the web 3, the ends of the member 4 will engage the extending

portions 8 integrally formed with the button 1, and the face 9 of the member 4 intermediate its ends will engage the face of two of the webs 3, and also the faces 10 of the wall of the cylindrical portion 2. A portion of the edge 11 of the member 4 will engage face 12 of the cylindrical portion 2 and the member 5 will engage a suitable slot 13 cut in the button 1. The members 4 and 5 are held in this position due to the spring effect of the member 4 which causes its ends to press against the portions 8 of the button 1, and its lower intermediate face portion 9 to press against the webs 3 and the cut away wall of the cylindrical portion 2. The tension of the member 4 is of sufficient strength to hold the member 4 in this position in the button 1, and in case the tension of the member 4 is desired to be increased, the same may be done by removing the member 4 and then raising its end portions farther above the alignment of its portion intermediate said ends.

The shaft or member 15 to which the button 1 is secured is cylindrical in shape and has a portion of its side at one end cut away to provide a flat face 16 and is of a suitable size in diameter to permit the insertion of said one end into the opening 17 of the cylindrical portion 2, so that the flat face 16 will engage the face 9 of the member 4 and the end 18 of the member 15 will abut against the closed end portion 19 of the opening 17 in the cylindrical portion 2. The spring tension of the member 4 is such that the portion of the member 4 intermediate its ends assumes a position in the line of travel of the face 16 of the shaft or member 15 so that when the said shaft or member 15 is inserted into the opening 17, the face 16 will engage a portion of the face 9 of the member 4 and will force the member 4 at the place engaged by said face 16 upward, whereby a frictional engagement is effected between the member 4 and shaft or member 15, which frictional engagement is sufficiently strong enough to retain the button 1 on the shaft or member 15. Now, when the button 1 is rotated, the shaft or member 15 will rotate with it as a unit, due to the member 4 engaging the flat face 16 on one side and the other side of said member 4 engaging the end 7 of the web 3, which will prevent the shaft or member 15 from rotating within said button 1 when the button 1 is rotated. The button 1 may be removed from the shaft or member 15 by pulling on it in the opposite direction from that of the said shaft or member 15, and may again be remounted as pointed out above.

The arrow or member 5 rotates with the button 1, and shaft or member 15, and will indicate on a scale or graduated member (which may be associated with the member 5, but which is not shown on the drawing as it is not deemed necessary for an understanding of the same), the degree or extent to which the shaft or member is rotated. This information is useful when the member 15 has a rheostat or the like mounted thereon, which will indicate the position of the rheostat. The control cylindrical portion 2 of the button 1 extends slightly beyond the back face of the button 1, as shown in Fig. 4, and is adapted to engage the face of a mounting member upon which the shaft or member 15 and button 1 are mounted in order to reduce the amount of frictional engagement between the button 1 and mounting member, to enable the button 1 and member 15 to be freely rotated.

Having described and illustrated a particular form of my invention, it is to be understood that I do not wish to be limited to the exact structure as shown and described, but aim to cover all modifications and changes which come within the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described including a control member provided with an opening, a control shaft fitting into said opening, and means comprising a member for indicating the degree of rotation of the control shaft secured in said control member by spring tension and projections on said control member and co-operating with said shaft yieldingly securing said control member on said shaft and preventing rotation of the control member relative to said shaft.

2. A device of the character described including a control button provided with bridge members forming a central opening, a control shaft fitting into said opening, and a spring-pressed member secured in said button contacting with said shaft to prevent longitudinal movement of said button relative to said shaft and to cause said shaft to rotate with said button.

3. A device of the character described including a control member provided with bridge members forming a central opening, a control shaft fitting said central opening and having a flat portion, a spring member secured in said control member and adapted to contact with the flat portion of said control shaft to yieldingly secure said control member to said control shaft.

4. In a device of the character described, including a member provided with a central opening, another member adapted to be rotated and having its one end engaging said opening, spring means secured in said first member and adapted to engage a portion of said one end of said second member so that said first member and second member rotate as a unit, and an indicator integrally

formed with said spring means for indicating the degree of rotation of said second member.

5. A device of the character described, including a button provided with a central rearwardly extending cylindrical portion, a plurality of radially disposed webs integrally formed with said button for reinforcing said cylindrical portion, said cylindrical portion having a portion of its wall cut away, a spring member secured in said button and in operative relation with that portion of the cylindrical portion where its wall is cut away, means for securing said spring member in said button, and a rotatable shaft member for engaging said cylindrical portion and said spring member whereby said shaft member and said button are adapted to be rotated as a single unit.

6. A device of the character described, including a button provided with a central rearwardly extending cylindrical portion, a plurality of radially disposed webs integrally formed with said button for reinforcing said cylindrical portion, said cylindrical portion having a portion of its wall cut away, a spring member secured in said button and in operative relation with that portion of the cylindrical portion where its wall is cut away, means for securing said spring member in said button, a rotatable shaft member for engaging said cylindrical portion and said spring member whereby said shaft member and said button are adapted to be rotated as a single unit, and an indicator integrally formed at right angles with said spring member and adapted to indicate the degree of rotation of said shaft member.

7. A device of the character described including a button having a central rearwardly extending cylindrical portion, a spring member adapted to be mounted in said button and in operative relation with said cylindrical portion, means integrally formed with said button for retaining said spring member in its mounted position, a member for engaging the opening in said cylindrical portion and to be engaged by said spring member so that when said button is moved in a rotary direction the said second member will rotate with said button.

8. A device of the character described including a button having a central rearwardly extending cylindrical portion, a spring member adapted to be mounted in said button and in operative relation with said cylindrical portion, means integrally formed with said button for retaining said spring member in its mounted position, a member for engaging the opening in said cylindrical portion and to be engaged by said spring member so that when said button is moved in a rotary direction the said second member will rotate with said button, said spring member adapted to permit the button to be removed from said second member by pulling the said button away from said second member, and a member integrally formed with said spring member for indicating the extent to which said second member has been rotated.

9. A device of the character described including a button having a central rearwardly extending cylindrical portion, a spring member adapted to be mounted in said button and in operative relation with said cylindrical portion, means integrally formed with said button for retaining said spring member in its mounted position, a member for engaging the opening in said cylindrical portion and to be engaged by said spring member so that when said button is moved in a rotary direction the said second member will rotate with said button, and a member integrally formed with said spring member for indicating how much the said second member has been rotated.

10. A device of the character described including a control member provided with a central opening, projections formed on the inner surface of said control member, a spring secured in said member by said projections, a control shaft fitting into said control member and having a surface in contact with said spring member for causing rotation of said shaft with said control member.

11. A device of the character described including a control member provided with inner ribs forming a central opening, projections in said control member, a flexible member fitting into said control member and held in position by said projections, and a control shaft fitting into the opening in said control member and yieldingly held in position by said flexible member.

12. A device of the character described including a shaft, a member of insulating material formed in one piece provided with an opening to receive said shaft, and a combined holding and indicating member formed of a single piece of material for cooperation with said shaft and insulating member to securely attach said insulating member to said shaft.

13. A device of the character described, including the combination with a rotary shaft having a non-cylindrical face, of an insulating actuating button on said shaft and spring means extending across said buttom and engaging said face to maintain said button on said shaft, and an integrally formed slot in said button to hold said means in place.

14. A device of the character described, including the combination with a rotary shaft having a non-cylindrical face, of an insulating actuating button for said shaft, a spring member within said button and serving to impress tension on said face to hold said button on said shaft, and an integrally

formed receptacle on said button to hold an end of said spring.

15. A device of the character described including the combination with a button, of a rotary shaft having a part shaped for the fastening of said button thereto to turn said shaft, and an element secured to said button to form a single unit for linking said button and shaft shaped to fit said part and spring-pressed to maintain an adjustment between said button and shaft.

16. A device of the character described, including the combination with a rotary shaft, of an actuating button therefor, a combined indicator and holding member secured in said actuating button, said button and shaft being spring-pressed together by said combined indicator and holding member to maintain adjustment between them.

17. A device of the character described, including the combination with a shaft having a non-cylindrical face, of an actuating button to be fitted thereon, and a spring member secured in said button by frictional engagement to form a single unit therewith to cooperate with means in said button to clamp said button and shaft when said button is on said shaft.

18. A device of the character described, including a shaft having a non-cylindrical face, a combined indicator and holding member, an actuating button for said shaft shaped to fit said face by said combined indicator and holding member and spring-pressed on said face to prevent displacement.

19. A device of the character described, including the combination with a rotary shaft having a non-cylindrical portion, of an insulating button to be mounted on said shaft and a transversely extending spring within said button adapted at a point intermediate the two ends of said spring to engage said portion.

20. A device of the character described, including the combination with a rotary shaft having a non-cylindrical portion, of an actuating button to be mounted on said shaft, a spring member within said button adapted to engage at an intermediate point of its length said portion and peripherally moulded slots in said button to receive the ends of said spring.

21. A device of the character described, including the combination with a rotary shaft having a non-cylindrical face, of an actuating button insulating material to be fastened on said shaft, fastening means including spring pressure means exerting tension upon said face, and an indicator integrally formed with said fastening means for indicating the degree of rotation of said rotary shaft.

22. A control device of the character described having a portion adapted to be grasped by the hand of an operator, a central portion for receiving the shaft of the device to be controlled, and web members extending from said central portion to the inner periphery of the portion adapted to be grasped by the operator.

23. A device of the character described having a circular wall portion, a centrally located rearwardly extending portion therein, and web members connecting said centrally located portion with said circular wall portion.

24. A control device of the character described having a circular wall portion and an inner integrally formed circular member for receiving the shaft of a device to be controlled, and connecting members extending from said outer wall portion to said inner member.

25. A control device of the character described including a hollow cup member provided with a rearwardly extending integrally formed member having an orifice for receiving the shaft of the device to be controlled, and integrally formed connecting members extending from the wall portion of said cup member to said inner rearwardly extending portion.

26. A device of the character described comprising a control device having a hollow handle, a rearwardly extending cylindircal portion in the middle of the hollow of the handle adapted to be attached to a shaft to be operated, and web members molded as a unit with said handle and said cylindrical portion and reaching from said rearwardly extending cylindrical portion to said handle, and means adapted to maintain said member on said shaft.

27. A control device of the character described including a molded handle having a recess and provided with a front wall and a rearwardly extending wall, a rearwardly extending cylindrical portion centrally located within said recess and substantially smaller than said rearwardly extending wall, a plurality of walls located within said recess and molded to said two walls and to said centrally located cylindrical portion, said cylindircal portion adapted to receive a device to be operated, spring means for securing said control device to said device to be operated and projections integrally formed with said handle for maintaining said spring means in position.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 22d day of November, 1922.

EMIL J. NIELSEN.

CERTIFICATE OF CORRECTION.

Patent No. 1,678,524. Granted July 24, 1928, to

EMIL J. NIELSEN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, lines 33 and 34, claim 18, strike out the words "by said combined indicator and holding member" and insert the same to follow after the word "face" in line 35, same claim; same page, line 56, claim 21, after the word "button" insert the word "of"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of November, A. D. 1928.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.