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2,645,446

LOCKING HINGE

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Fig. 1

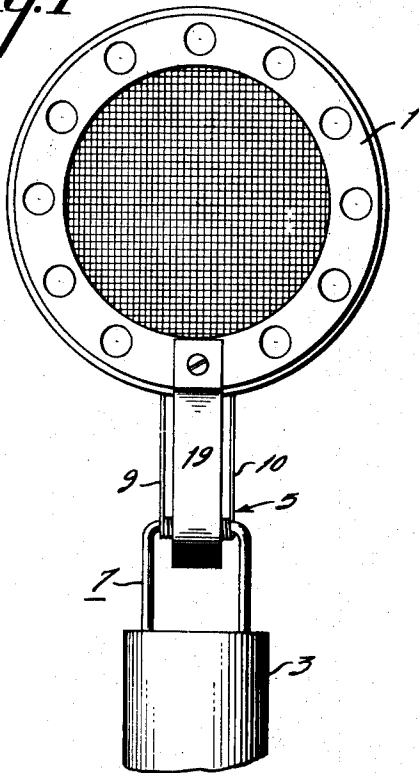


Fig. 2

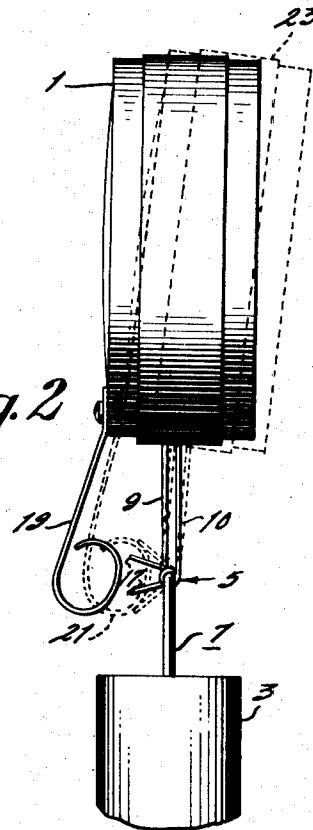


Fig. 4

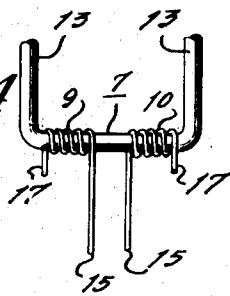


Fig. 3

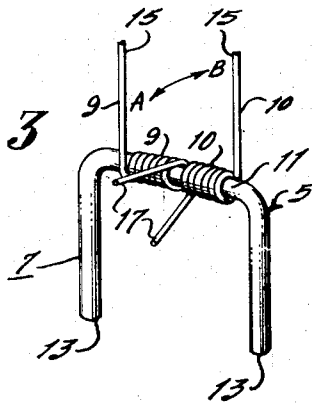
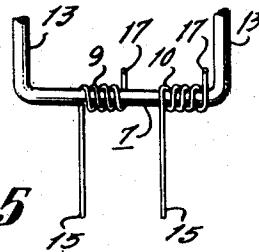


Fig. 5



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LOCKING HINGE

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My present invention relates to hinges, and more particularly to a hinge which is self locking in any position to which the two members which it connects are disposed.

While my present invention will be found useful for many applications where one member is pivotally attached to another, it has been developed particularly for use in microphone supporting apparatus wherein frequent adjustment of the angular position of the microphone with respect to its support is necessary and wherein a simple, quick and positive means of locking and unlocking the hinge is desirable. Most hinges in use at the present time are usually provided with a complicated or cumbersome means of locking the hinge to maintain the microphone in its adjusted position. Irrespective of the advantages claimed for these hinges, considerable difficulty is encountered in manipulating the locking mechanism therefor, such mechanisms frequently being so tightened that it is difficult to release them.

The primary object of my present invention is to provide an improved hinge which is self locking and thereby overcomes the above as well as other disadvantages of prior art hinges.

It is also an object of my present invention to provide a hinge which will hold and lock the members it connects in any selected position with respect to each other, and which may be quickly and easily released when it is desired to change the position of the members with respect to each other.

It is a further object of my present invention to provide a novel, improved, self locking hinge which requires a minimum number of parts, and one which is simple and easy to construct at a minimum of cost.

In accordance with my present invention, I provide a hinge for pivotally connecting two members together which comprises a hinge post or rigid pivotal member adapted to be affixed to one of two members to be connected, and a pair of spiral springs each having one end thereof adapted to be affixed to the other member, the other end of each spring being freely disposed. The spiral springs are coaxially mounted in close fitting relation around the hinge post, with the respective convolutions thereof encircling the hinge post in opposite directions in a clockwise sense beginning with the fixed end of each spring. The frictional contact of the convolutions with the hinge post produces a clutching effect between the spiral springs and the hinge post when it is attempted to pivot or

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move the one member with respect to the other. The hinge thereby prevents the two members from being rotated in either direction with respect to each other until the clutching effect is released. For this purpose, a release button is provided which engages the freely disposed ends and is arranged to enlarge the convolutions of the springs. The springs will then be free to rotate around the hinge post and the one member may be pivoted with respect to the other to change its position.

The novel features of my present invention, as well as additional objects and advantages thereof, will be better understood from the following detailed description of three embodiments thereof when read in connection with the accompanying drawing, in which:

Figure 1 is a front elevation of a microphone attached to a support by a self locking hinge in accordance with my present invention,

Figure 2 is a side elevation of the apparatus shown in Figure 1,

Figure 3 is a perspective view, slightly enlarged, of the locking hinge shown in Figures 1 and 2 with the release button omitted, and

Figures 4 and 5 are front elevations of two further embodiments of a locking hinge, without the release button, in accordance with my present invention.

Referring more particularly to the drawing, wherein similar reference characters designate corresponding parts throughout, there is shown, in Figures 1 and 2, a microphone 1 pivotally mounted on a support 3 of any suitable kind and connected thereto by a self locking hinge 5 according to my present invention.

The self locking hinge 5 comprises essentially male and female elements consisting, respectively, of a rigid hinge post, bar or pivot member 7, and a pair of spiral or coil springs 9 and 10. The hinge post 7 is of U-shape configuration, having a central portion 11 about which the spiral springs 9 and 10 are disposed and two end portions 13 which are provided with suitable means (not shown) for securing the hinge post 7 to either one of the members (shown herein attached to the support member 3) to be connected.

The spiral springs 9 and 10 are of substantially uniform inside diameter throughout the length of their convolutions and are mounted with their convolutions encircling the hinge post central portion 11 in close fitting relation thereto and in opposite directions in a clockwise sense commencing at corresponding ends (15 or 17) of the

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two springs 7, that is, beginning either at the two ends 15 which are adapted to be secured to one of the members, or beginning at the two freely disposed ends 17 in either case. The spiral springs 9 and 10 are so closely fitted about the hinge post 7 that when the springs are rotated in one direction or the other about the hinge post, one or the other will grip or bind on the hinge post. One end 15 of each spring is suitably fastened to the other member (shown herein as the microphone 1) of the two members to be connected, and the opposite end 17 thereof is freely disposed. According to the preferred form of my present invention, as shown by Figures 1 through 3 of the drawing, the two spiral springs 9 and 10 are of similar construction so that when they are mounted with their corresponding free ends 17 adjacent to each other, the convolutions of the springs will encircle the central portion 11 of the hinge post 7 in opposite directions as above described. With this arrangement, the corresponding mounting ends 15 are remotely disposed with respect to each other, thereby providing a more stable or rigid support between the members 1 and 3. However, these similar spiral springs 9 and 10 may also be mounted with their corresponding securing ends 15 adjacent to one another and with their free ends 17 remote, as shown in Figure 4 of the drawing, but this arrangement does not provide as stable a connection as would be desired for most purposes. A third arrangement of the spiral springs 9 and 10 might also be employed, the same being shown in Figure 5 of the drawing. In this latter embodiment, in order to function properly, the free end 17 of spiral spring 9 is mounted adjacent the connecting end 15 of spiral spring 10. Each spiral spring is wound in a direction opposite to that of the other spiral spring.

In operation, because of the close fitting relation of the spiral springs 9 and 10 about the hinge post central portion 11, when it is attempted to move the microphone 1 in the direction indicated by the arrow head A in Figure 3 of the drawing, the convolutions of spiral spring 10 will bind or tighten about the hinge post central portion 11 and effect a clutching action between the two which will restrain movement in that direction. Similarly, if the microphone 1 is attempted to be moved in the opposite direction, as indicated by arrow head B, the spiral spring 9 will grip or clutch the hinge post central portion 11 and restrain movement in that direction.

In order to release the self locking action of the spiral springs 9 and 10 from the hinge post 7, a suitable release button 19 comprising a flexible or yieldable lever is provided which can be attached to either member connected by the hinge 5. The release button 19 is arranged in a manner to engage the free ends 17 of the spiral springs 9 and 10, which are disposed laterally of the hinge post 7 and substantially in the same direction, so that, when it is pressed toward the hinge post 7, as shown by the broken line outline 21 in Figure 2, it will apply a force to the free ends 17 in opposite directions circumferentially with respect to the hinge post and cause the internal diameter

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of the spring convolutions to be enlarged sufficiently to free the springs 9 and 10 for rotation on the hinge post 7 in either direction at will, as shown by the broken line microphone outline 23 in Figure 2.

From the foregoing description, it will be recognized by persons skilled in the art that my present invention provides a novel, improved, self locking hinge for pivotally connecting two members together. While I have illustrated but three modifications of my present invention, it will also be recognized by those persons skilled in the art that other modifications and changes within the spirit of my invention will readily suggest themselves. Therefore, I desire that the particular form of my invention described herein shall be considered as illustrative and not as limiting.

What is claimed is:

1. An adjustable microphone structure comprising a support for said microphone, a locking hinge for pivotally mounting and locking said microphone on said support, said hinge comprising a hinge post fastened to said support, a pair of spiral springs each having one end secured to said microphone, said springs extending from said microphone and encircling said hinge post in opposite circumferential directions to normally tightly grip said hinge post and thereby prevent relative rotation between said springs and said hinge post, the opposite ends of each of said springs being freely disposed on the same side of said hinge post and extending therefrom in outwardly diverging relation in such directions that separation thereof in said directions will tend to unwind said springs and loosen them on said hinge post, and a movable spring operating member mounted adjacent to said hinge post and having a portion disposed in operative relation to said diverging springs ends, said portion being adapted, when pressed against said diverging spring ends, to separate them in said diverging directions to thereby loosen said springs on said hinge post and free them for rotation on said hinge post.

2. The invention set forth in claim 1 wherein said spring operating member comprises a flexible member having an arcuate, depending end constituting said portion.

3. The invention set forth in claim 2 characterized in that said flexible member comprises a resilient, metallic strip.

4. The invention set forth in claim 2 characterized in that said flexible member is mounted on said microphone.

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