C. M. LEMKE.

SPRING HINGE.

APPLICATION FILED SEPT. 18, 1916.

1,302,569. Patented May 6, 1919.

Fig. 1.

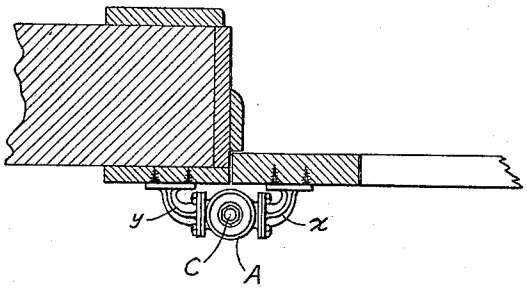



Fig. 4.

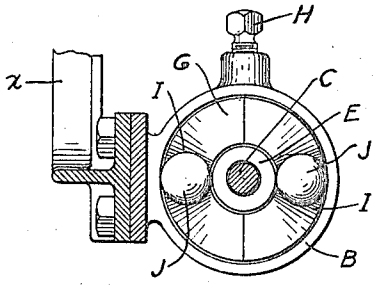



Fig. 3.

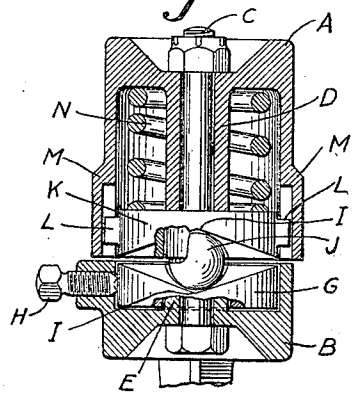
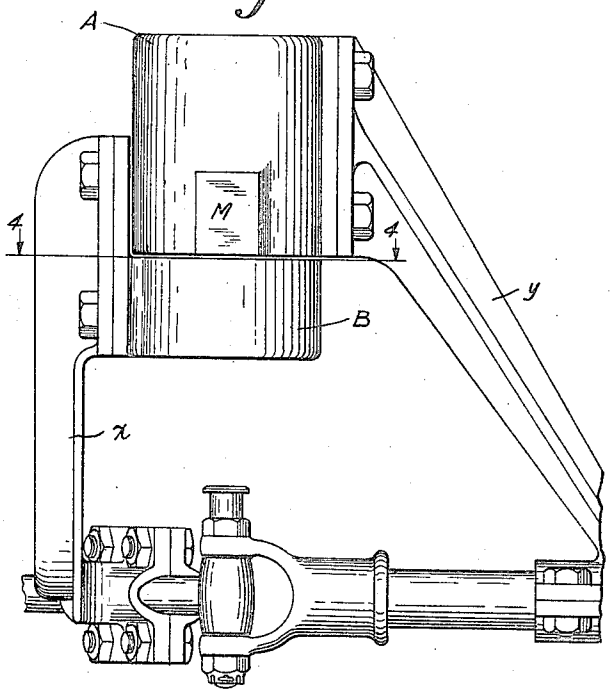



Fig. 2.




Inventor

Witnesses
Isaacs
Frederick W. Wolle

Charles M. Lemke
By Erwin & Wheeler
Attorneys

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# UNITED STATES PATENT OFFICE.

CHARLES M. LEMKE, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO EDWARD A. KICKHAEFER, OF MILWAUKEE, WISCONSIN.

## SPRING-HINGE.

1,302,569. Specification of Letters Patent. Patented May 6, 1919.

Application filed September 18, 1916. Serial No. 120,631.

*To all whom it may concern:*

Be it known that I, CHARLES M. LEMKE, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Spring-Hinges, of which the following is a specification.

My invention relates to improvements in spring hinges.

The object of my invention is to provide an inexpensive, durable spring hinge and positioning device which may be applied to any swinging door or to any pivotally joined arms to resiliently maintain said door or said arms in any chosen position.

In the drawings—

Figure 1 is a horizontal section through a portion of a swinging door and the adjacent door frame showing my improved hinge in operative position.

Fig. 2 is a front elevation of my device as applied to a pivot joint in the steering members of an automobile.

Fig. 3 is a vertical section in a plane turned 90 degrees from that of Fig. 2 and exposing the axis.

Fig. 4 is a sectional view drawn to line 4—4 of Fig. 2.

Like parts are identified by the same reference characters throughout the several views.

Cup shaped casing members A and B are mounted upon a pivot bolt C about which they are adapted to rotate relatively to each other. An elongated tubular member D integral with the upper casing member and a corresponding member E integral with the lower casing member provide a bearing for the bolt C throughout its length and insure the rigidity of the device.

Within casing B there is a disk-like bearing plate G held in fixed relation to said casing by means of set screw H. The upper surface of plate G is not flat but is hollowed at two diametrically opposite points I. Said plate is centrally bored to receive member E. It will be observed that the surface of the bearing plate constitutes a circular path for balls J which are positioned thereon by the wall of casing B and the inner member E.

A second and similar bearing plate K is mounted in an inverted position in upper casing member A. The hollowed portions I therein are in registry with corresponding hollows I in plate G. The hollowed portions or depressions I in the respective plates progressively deepen from their ends to the central portions thereof. These depressions are concentric with the central apertures in the axes of the plates to receive the tubular members D and E about the adjacent ends of which the balls travel Vertical grooves in the thickened wall M of the casing serve to guide the lugs L carried by plate K. In this way said plate is kept from rotative motion but is allowed free vertical motion relative to casing member A. A coiled spring N bears upon the top of the casing and resiliently opposes the upward movement of plate K. Balls J normally rest between the hollowed portions of the bearing plates above and below. It is apparent from the drawings, however, that any rotative movement of one casing member relative to the other communicates said movement to the bearing plates which are non-rotatively secured to their respective casing members. This wedging action resulting from this rotation separates the bearing plates in opposition to spring N which tends, by its resilient pressure, to return the plates and casing members to their original position.

Arms $x$ and $y$ which may be varied with the necessities of use, serve to operatively connect my device to any mechanism it is designed to control. The arm $x$ is fastened to member B and arm $y$ to member A. As shown in Figs. 1 and 2, my device may itself constitute the hinge or it may be used in connection with a pivoted joint, the axis C being centered with the aforesaid joint.

By loosening set screw H, the plate G may be freed from member B and the latter may then be rotated to set arms $x$ and $y$ to any desired angle with each other. The tightening of set screw H will again restore the device to operative condition.

In practice, any movement of the door, the automobile steering rods, or other like mechanism to which arms $x$ and $y$ are fastened will cause a change in the angle at which these arms are set and a corresponding rotation of casing members A and B will result. This relative rotation will be communicated to plates G and K which will be wedged apart against the pressure of spring N. As soon as the door or the steering wheel is released, the pressure of the spring will serve to return arms $x$ and $y$ to their original angle. As is evident from the drawings, rela-

tive rotation of the casing members in either direction will spread the bearing plates and compress the spring which will, when the rotative force is no longer exerted, return the arms *x* and *y* to their predetermined position.

I claim:—

1. A positioning hinge consisting in the combination of a set of cup shaped members having their open ends adjusted in opposition, a pivot bolt extending axially through said members and connecting them with each other, each of said members being provided with sleeves through which the bolt passes, adapted to prevent lateral shifting movements of said members, a bearing block in one of said members, means for rotatively adjusting said block and locking the same in various positions of adjustment, an opposing bearing block in the other cup shaped member, means for preventing said bearing block from rotating while permitting it to move longitudinally in its casing member, a compression spring between said last mentioned bearing block and the outer end of the casing member, and a set of balls located between the bearing blocks and adapted to hold said blocks to the casing members in spaced relation, each of said bearing blocks being provided with registering depressions progressively deepening from their ends toward the central portions.

2. A positioning hinge consisting in the combination of a set of cup shaped members having their open ends adjusted in opposition, a pivot bolt extending axially through said members and connecting them with each other, each of said members being provided with sleeves through which the bolt passes, adapted to prevent laterally shifting movements of said members, a bearing block in one of said members, means for rotatively adjusting said block and locking the same in various positions of adjustment, an opposing bearing block in the other cup shaped member, means for preventing said bearing block from rotating while permitting it to move longitudinally in its casing member, a compression spring between said last mentioned bearing block and the other end of the casing member, and a set of balls located between the bearing blocks and adapted to hold said blocks to the casing members in spaced relation, each of said bearing blocks being provided with registering depressions progressively deepening from their ends toward the central portions, and each of the cup shaped members being provided with an exterior arm having clamping members secured thereto, and adapted to be connected with the relatively movable parts to which the hinge is applied.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES M. LEMKE.

Witnesses:

LEVERETT C. WHEELER,

FREDERICK W. NOLTE.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**