(No Model.)

G. KOENNEMANN.

SPRING HINGE.

No. 576,131. Patented Feb. 2, 1897.

Fig. 1.

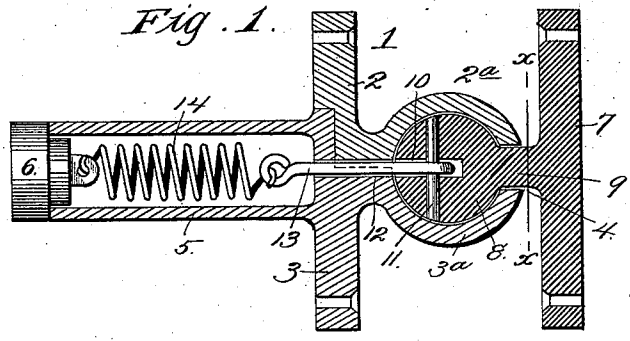


Fig. 2.

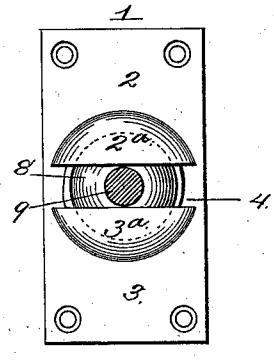


Fig. 3.

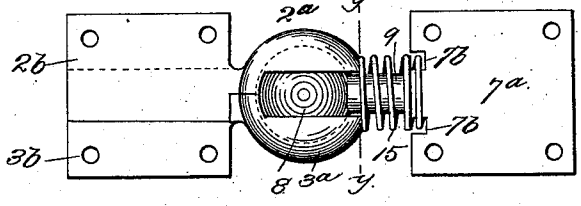


Fig. 4.

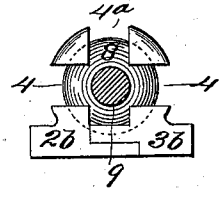


Fig. 6.

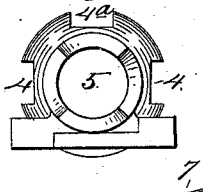
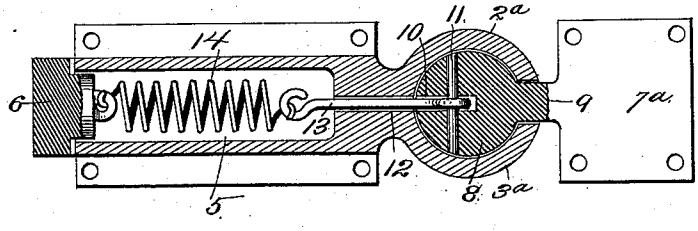


Fig. 5.



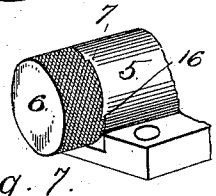


Fig. 7.

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UNITED STATES PATENT OFFICE.

GUSTAV KOENNEMANN, OF ARGENTINE, KANSAS, ASSIGNOR OF ONE-HALF TO HARRY M. HERR, OF SAME PLACE.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 576,131, dated February 2, 1897.

Application filed May 15, 1896. Serial No. 591,675. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV KOENNEMANN, of Argentine, Wyandotte county, Kansas, have invented certain new and useful Improvements in Hinges, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to hinges; and my object is to produce a hinge which combines simplicity, strength, durability, and cheapness of construction with efficiency of operation and adaptability for use in other connections.

Other objects of the invention will hereinafter appear, and be pointed out in appended claims.

In order that the invention may be fully understood, reference is to be had to the accompanying drawings, wherein—

Figure 1 represents a longitudinal section of a hinge embodying my invention. Fig. 2 represents a section taken on the line x x of Fig. 1. Fig. 3 represents a side view of a modified form of hinge construction. Fig. 4 represents a section taken on the line y y of Fig. 3. Fig. 5 is a longitudinal section of another modified form of my improved hinge. Fig. 6 is an end view of the same with the adjustable plug omitted. Fig. 7 is a perspective view of the end of the hinge with the adjustable plug in position.

Like reference-numerals designate corresponding parts in all of the figures, in which 1 designates one member of the hinge, consisting of two plates 2 and 3, which are stepped together and are provided with opposing hemispherical sockets 2^a and 3^a, respectively, which together form a spherical socket. The hemispherical sockets 2^a and 3^a are recessed or cut away so as to form slot 4, which may extend horizontally or vertically with reference to the disposition of the plates 2 and 3, accordingly as the door or window to which said hinge is applied is to swing in one direction or at right angles to that direction. The plate 3 is also provided with a tubular extension 5, closed at its rear end by a removable plug 6.

7 designates the second member of the hinge, which is provided with a spherical head or ball 8, which fits snugly within the socket hereinbefore described and is connected integrally with the plate or body portion of the member 7 by a neck 9, which extends loosely through the slot 4.

The spherical head or ball 8 of the second member of the hinge is slotted in the same plane as the slot 4, as shown at 10, and intersecting such slot at its middle is the pivot-rod 11, and communicating with said slot and axially with the tubular extension 5 is a passage 12, formed in the plates 2 and 3. A link-rod 13 extends through said passage and is pivotally connected at its front end to the pivot-rod 11, and at its rear end is connected to one end of a retractile spring 14, which is connected at its opposite end to the plug 6, as shown. By this construction it is obvious that the retractile tendency of said spring maintains a constant friction in the ball-and-socket connection of the hinge members, and thereby will hold the window or door, as the case may be, opened at either side or closed reliably.

Referring now to the construction illustrated in Figs. 3 and 4, it will be noticed that I have produced what I term a "universal" hinge, that is, a hinge which may swing both horizontally and vertically, and also whereby one member may rotate with reference to the other in order to adapt it for use in connection with large windows which pivot at their middle. One member comprises plates 2^b and 3^b, stepped into each other, and which are formed with a hemispherical socket or enlargement 2^a and 3^a, respectively, and said heads are provided with intersecting slots 4 and 4^a, standing at right angles to each other. 7^a designates the other member. 8 designates the spherical or ball-shaped head of the same, which fits between or within the spherical socket formed by the opposing hemispherical sockets and is connected with the plate 7^a by means of the neck 9. In order to establish the requisite frictional relation between the ball-and-socket connection thus formed, the plate 7^a is provided at opposite sides of the neck with notches 7^b, and fitting in the same at one end is a spiral expansion-spring 15, which surrounds said neck and bears at its opposite end against the spher-

ical socket, so that whether the hinge is swung to the right or the left, above or below, or whether it be rotatably operated the frictional relation to the ball and socket is constantly maintained, so that the window or door may be held at any required point of adjustment.

By referring now to Figs. 5, 6, and 7 it will be noticed that the construction of Figs. 1 and 2 is duplicated, except that the spherical socket is provided with intersecting slots 4 and 4^a instead of a single slot 4, and it will also be noticed that instead of the plates 2 and 3, and one of them provided with a tubular extension 5, I employ plates stepped together as before but extending parallel with instead of at right angles to the tubular extension 5. In this instance also the tubular extension is provided with one or more ratchet-teeth 16 at its rear end, and the plug 6 is provided also with one or more opposing teeth 17. It is obvious that a door or window attached to one of the members can only swing in a single plane as long as the pivot-rod 11 remains in a single position; but if it be desired, however, to swing the door or window in a plane at right angles to that before referred to, it is only necessary (before the hinge is attached to the door, of course) to grasp the plug 6 and the other member of the hinge and rotate them the distance of a quarter of a circle until the tooth or teeth of said plug engages the next notch of the extension 5. Immediately this adjustment is accomplished the spring 14 causes the plug to interlock with the tubular extension and thereby hold the hinge adjusted to swing in a plane at right angles to its former movement, or, in other words, in such position that the neck 9 will swing in the slot which intersects the slot in which it before had movement.

From the above description it will be apparent that I have produced a hinge which may be employed in various connections not necessary to be enumerated in this connection, and also that I have produced a hinge which is simple, strong and durable, and inexpensive of construction, which can be arranged in operative position relative to any door or window easily and expeditiously.

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

1 A hinge, comprising two plates stepped together and each provided with a hemispherical socket which are arranged oppositely to each other to form a spherical socket, each socket being provided with one or more slots, and a second member of the hinge provided with a neck which extends through one or the other of said slots and is provided with a spherical head or ball which fits loosely within the socket formed by said hemispherical sockets, substantially as described.

2. A hinge comprising two plates stepped together and each provided with a hemispherical socket which are arranged oppositely to each other to form a spherical socket, each socket being provided with one or more slots, and a second member, provided with a neck which extends through one or the other of said slots and is provided with a spherical head or ball which fits loosely within the socket formed by said hemispherical sockets, one of said first-named plates having a tubular extension, a plug closing its rear end, a rod extending through said first-named plates and pivotally connected to the spherical head of the second member of the hinge and a retractile spring connecting said rod and said plug, substantially as described.

3. A hinge, comprising a pair of plates stepped together and each provided with a hemispherical socket which conjointly form a spherical slotted socket, one of said sections also being provided with a tubular extension provided with ratchet-teeth at its rear end, a second member of the hinge with a neck extending through the slotted spherical socket and provided with a spherical slotted head fitting loosely within said socket, a pivot-rod extending through said head at right angles to its slot, a rod pivotally connected thereto and extending through said first-named plates into said tubular extension, and a retractile spring connecting said rod and said plug, substantially as described.

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

GUSTAV KOENNEMANN.

Witnesses:

JAMES F. TROTTER,

JOSEPH W. PARKER.