(Model.)

G. W. WARNER.

SPRING HINGE.

No. 384,102. Patented June 5, 1888.

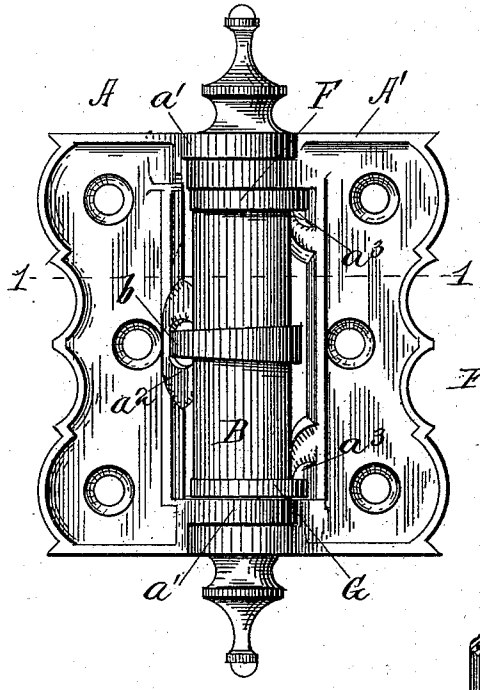


Fig 1

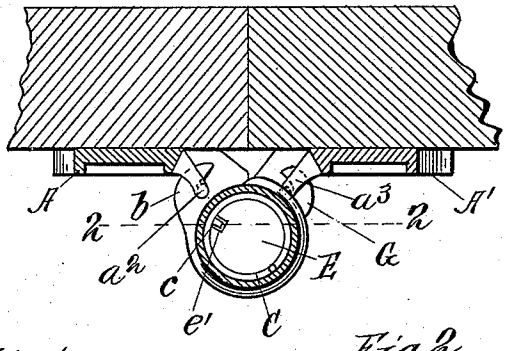


Fig 2

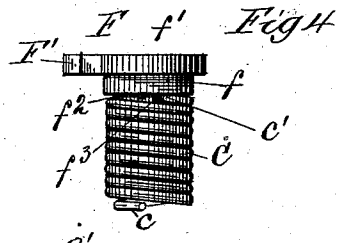


Fig 4

Fig 6

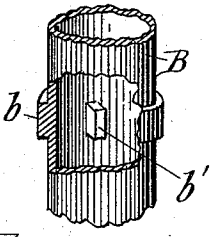


Fig 7

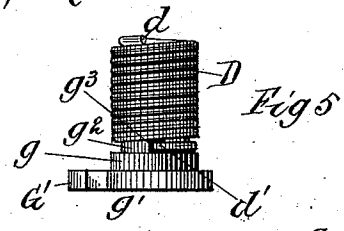
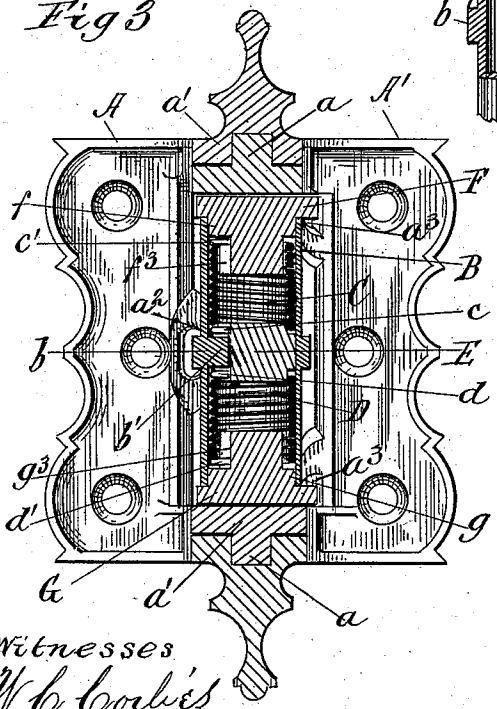


Fig 5

Fig 3



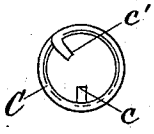


Fig 10

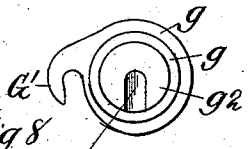


Fig 8

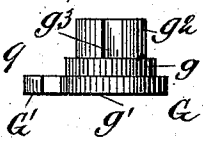


Fig 9

Witnesses
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Louis Miller

Inventor.
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N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. WARNER, OF FREEPORT, ILLINOIS.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 384,102, dated June 5, 1888.

Application filed August 12, 1887. Serial No. 246,806. (Model.)

To all whom it may concern:

Be it known that I, GEORGE W. WARNER, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented a certain new and useful Improvement in Spring-Hinges, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a construction embodying my invention; Fig. 2, a sectional view of the same, taken on the line 1 1 of Fig. 1; Fig. 3, a sectional view taken on the line 2 2 of Fig. 2; Fig. 4, a detail elevation of the upper spring and its trunnion detached; Fig. 5, a similar view of the lower spring and its trunnion; Fig. 6, a similar view of the intermediate connecting-piece; Fig. 7, a perspective view of the tube or cylinder detached and partly in section; Fig. 8, a detail plan view of the bottom trunnion detached; Fig. 9, a side elevation of the same, and Fig. 10 a plan view of one of the springs detached.

Like letters refer to like parts in all the figures of the drawings.

My invention relates to spring-hinges, and has for its object to produce a hinge which shall be cheap and simple in construction and effective in operation, and which shall serve to hold the door to which it is connected in either an open or a closed position, as desired.

To these ends my invention consists in certain novel features which I will now proceed to describe, and will then particularly point out in the claims.

In the drawings, A and A′ represent, respectively, the two leaves of the hinge, connected in the usual manner by pintles *a* and pintle-lugs *a′*. The leaf A is provided at about the middle of its inner edge with a loop, slot, or opening, a^2, and the leaf A′ is provided near each end of its inner edge with similar loops, slots, or openings, a^3.

B represents a tube or hollow cylinder provided externally with a hook, *b*, at about its middle to engage with the loop a^2 on the leaf A. Within the tube or cylinder B are arranged two reversely-coiled springs, C and D. The inner ends of these coiled springs are connected to each other and to the tube B in any suitable manner. The construction which I prefer for this purpose is that shown in the drawings, in which an intermediate connecting-piece, E, is employed, which has a body portion of a diameter equal to the internal diameter of the tube B, and is provided with a slot, *e*, to receive a lug or projection, *b′*, on the interior of the said tube. This lug is of a length equal to the length of the body portion of the piece E, and from each end of said body portion there projects an extension, *e′*, of less diameter, to adapt it to enter the coils of the springs C and D. The slot *e* is of sufficient depth and length to extend into these extensions *e′*, and the inner ends of the springs C and D are bent inward, as shown at *c* and *d*, to enter the slot *e*. By these means the two springs are connected to each other and to the tube B at their inner ends, while at the same time they are allowed free longitudinal play within certain limits. At the upper end of the tube B there is provided a trunnion, F, having a body portion, *f*, of a diameter which adapts it to fit within the tube B. Above this body portion *f* there is a head or cap, *f′*, of larger diameter, provided with a hook, F′, to engage with the loop a^3 at the upper inner edge of the leaf A′. Below the body portion *f* of the trunnion F there is an extension, f^2, of less diameter than the body portion and extending into the coil of the spring C, the upper end of which is connected thereto in any suitable manner, preferably by forming a slot, f^3, in the said extension, into which the inwardly-bent end *c′* of the spring C extends. At the lower end of the tube B there is a similar trunnion, G, provided with a body portion, *g*, enlarged cap or head *g′*, with hook G′ and extension g^2, slotted at g^3. The hook G′ is connected to the lower loop, a^3, of the leaf A′, and the slot g^3 receives the inwardly-bent lower end, *d′*, of the spring D.

The operation of my improved hinge will be readily understood from the preceding description. It will be seen that the torsional action of the coiled springs is exerted through the tube B upon one of the leaves of the hinge and through the trunnions F and G upon the other leaf of the hinge, and that this torsional action tends to draw the leaves toward each other upon one side or the other of the line of

the pintles connecting the leaves. In other words, the springs will act to draw the leaves either into parallelism with each other or into the position shown in the drawings, in which they both lie in the same plane. It will be at once seen that when one leaf of the hinge is connected to a door and the other to the door-casing the springs will act to hold the door either in a closed or an open position, according as the door is swung beyond a position at right angles to the casing in either direction. The tube and its trunnions serve not only to connect the springs to the leaves of the hinge, but they also serve to inclose the springs and to effectually protect and conceal the same.

It will be observed that the tube is connected to its leaf by a pivotal joint or connection, and that the trunnions are similarly connected to their leaf, so that the tube and trunnions, along with the springs arranged therein, will move with and independently of the leaves upon the line bisecting the angle formed by said leaves, and will therefore always be equidistant therefrom. By reason of this construction a steady and smooth action will be obtained and an equal force exerted on both leaves.

Various modifications may be made in the details of construction and arrangement of the parts without departing from the principle of my invention. For instance, the inner ends of the two springs may be connected directly to each other, or, in other words, the two springs may be made from one continuous piece of wire.

Various other changes will readily suggest themselves, and I therefore do not wish to be understood as limiting myself strictly to the precise details hereinbefore described, and shown in the drawings.

I make no claim in the present application to the construction set forth and claimed in an application filed by me of even date herewith, Serial No. 246,808.

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

1. In a spring-hinge, the combination, with the independent tube or cylinder pivotally connected to one leaf of the hinge and its end trunnions pivotally connected to the other leaf, of the reversely-coiled springs arranged within the tube, and having their inner ends connected thereto and their outer ends connected to the respective trunnions, substantially as and for the purposes specified.

2. In a spring-hinge, the combination, with the leaf A, having loop a^2, and the leaf A′, having loops a^3, of the tube B, provided with a hook, b, to connect it to the loop a^2, the trunnions F and G, mounted in the ends of the tube and provided, respectively, with hooks F′ and G′, by means of which they are connected to the loops a^3, and the coiled springs C and D, arranged within the tube B and having their inner ends connected to the said tube and their outer ends connected, respectively, to the trunnions F and G, substantially as and for the purposes specified.

3. In a spring-hinge, the combination, with the independent tube pivotally connected to one of the leaves and the reversely-coiled springs arranged within said tube and having their inner ends connected thereto, of the trunnions, each provided with a body portion to fit within the tube, an inward extension to receive the coiled spring which is connected thereto, and an outer cap or head provided with a hook, by means of which it is pivotally connected to the other leaf, substantially as and for the purposes specified.

4. In a spring-hinge, the combination, with the tube B, connected to one of the leaves and having internal projection, b', of the trunnions F and G, connected to the other leaf, the coiled springs C and D, arranged within the tube and having their outer ends connected to the trunnions, and the intermediate connecting-piece, E, arranged between the inner ends of the springs and slotted at e to receive the projection b' and the inner ends of the springs, substantially as and for the purposes specified.

GEORGE W. WARNER.

Witnesses:
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CARRIE FEIGEL.