

(No Model.)

A. A. PAGE.
SPRING HINGE.

No. 525,860.

Patented Sept. 11, 1894.

Fig. 1

Fig. 2

Fig. 3

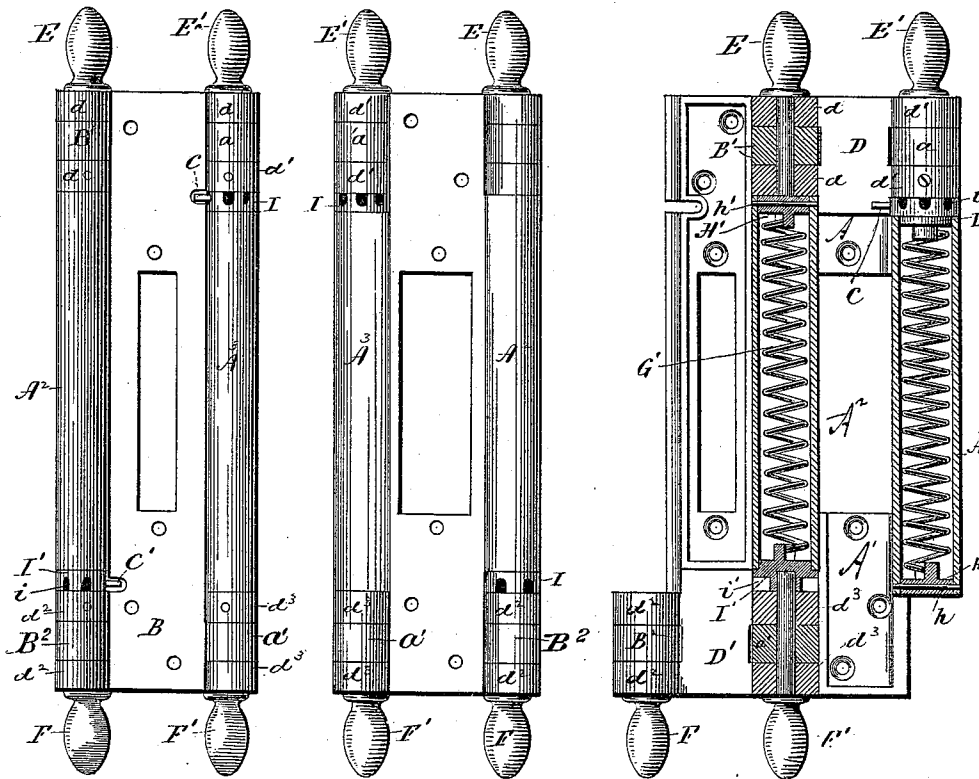
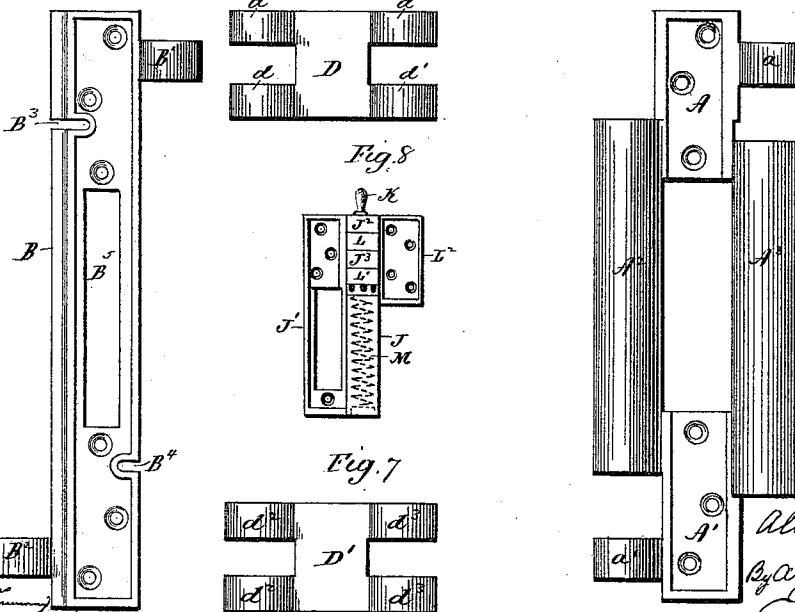


Fig. 5

Fig. 6

Fig. 4



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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 525,860, dated September 11, 1894.

Application filed November 13, 1893. Serial No. 490,745. (No model.)

To all whom it may concern:

Be it known that I, ALBERT A. PAGE, of East Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Spring-Hinges, (Case A;) and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in elevation of a double-acting spring-hinge constructed in accordance with my invention; Fig. 2, a reverse view thereof; Fig. 3, a reverse view of the hinge with its door-leaf swung into its open position; Fig. 4, a detached view in elevation of the casing-leaf of the hinge; Fig. 5, a similar view of the door-leaf thereof; Figs. 6 and 7, detached views of the upper and lower sections of the middle leaf respectively; Fig. 8, a view in inside elevation of a single hinge constructed in accordance with my invention.

My invention relates to an improvement in spring-hinges for doors, the object being to produce at a comparatively low cost for manufacture, a simple, durable and effective hinge, of superior appearance, and constructed with particular reference to the housing and application of its spring or springs, whereby the same are protected against being unduly wound in the wrong direction, and thus prevented from buckling.

With these ends in view, my invention consists in a spring-hinge leaf having a spring-chamber or barrel cast integral with its body and in line with its knuckle or knuckles, both ends of the said chamber being made open, and the knuckle or knuckles being located at one end thereof and separated therefrom by a space, whereby one end of the chamber is left entirely unobstructed for the introduction of the spring, and a space formed at its other end for the reception of a rotatable adjusting head, to which the spring is connected.

My invention further consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In Figs. 1 to 7 inclusive of the drawings, I

have shown a double-acting hinge, constructed in accordance with my invention, which, however, also includes single hinges, as shown by Fig. 8.

The casing leaf or member, (Fig. 4) of the double-acting hinge, comprises two webs A and A', containing counter-sunk screw-holes for the application of the leaf to the door-casing, and two parallel corresponding barrels or spring-chambers A² and A³, located in the same plane, and cast integral with the webs A and A', which unite the ends of the said barrels or chambers and form the body of the leaf. The upper end of the barrel A² projects beyond the upper end of the barrel A³, while the lower end of the barrel A³ projects beyond the lower end of the barrel A². The web A, is constructed with a knuckle *a*, extending over the barrel A³, but separated therefrom, while the web A' is constructed with a corresponding knuckle *a'* extending in the opposite direction in line with the barrel A², from which it is separated by a space. All of the said parts or features of the casing-leaf are cast integral with each other.

I wish to call particular attention to the fact that each of the chambers is cast directly upon the webs forming the body of the leaf, rather than upon the knuckles of the leaf. I wish also to call attention to the fact that one end of the chamber is entirely unobstructed for the introduction of the spring, which could not be introduced at all if there were one or more knuckles at both ends of the chamber. I wish to still further call attention to the fact that there is a space between each chamber and the knuckle adjacent to it for the reception of the rotatable adjusting heads I and I', which will be described later on.

The door-leaf or member B, of the hinge, contains countersunk screw-holes for its application to a door, and is constructed near its upper end with a knuckle B', and near its lower end with an oppositely projecting knuckle B². The upper end of the door-leaf is also constructed with an open clearance slot B³, while the opposite edge of its lower end is constructed with a corresponding slot B⁴. These slots are designed to expose the tension pins C C' respectively, when the hinge

is closed, so that the pins may be removed preparatory to applying the hinge to the door and casing. The door leaf also has a central opening B⁵ to lighten it. The upper section D, and the lower section D', together form the middle leaf of the hinge. The upper section D, is constructed with two knuckles *d* *d*, which receive between them the knuckle B' of the door-leaf, and upon its opposite edge with two knuckles *d'* *d'*, which receive between them the knuckle *a* of the web A of the casing leaf. The knuckles *d* B' and *d* receive the pintle E, while the knuckles *d* *a* and *d'* receive the pintle E'. The lower section D' of the middle leaf is constructed upon one edge with two knuckles *d*² *d*², which receive between them the knuckle B² of the door-leaf B, and upon its opposite edge with two knuckles *d*³ *d*³, which receive between them the knuckle *a'* of the web A' of the casing-leaf. The said lower section D' is connected at one end with the door-leaf by means of the pintle F, which passes through the knuckles *d*², B² and *d*³, and at its opposite end with the casing-leaf by means of a pintle F', which passes through the knuckles *d*³, *a'* *d*³. It will be understood from the foregoing that the upper and lower sections of the middle leaf are each connected at one end with the casing leaf, and that the door leaf is connected at each end with the outer ends of the respective upper and lower sections. These sections alternately take the strain of the door and prevent the same from sagging. Thus when the door-leaf is swung as shown in Fig. 3 of the drawings to bring the lower section D' into play, the upper section D remains in its closed position, and braces the upper end of the door-leaf, which it connects with the casing-leaf of the hinge. On the other hand, when the door leaf is swung in the opposite direction so as to bring the upper section D into play, the lower section D' remains in its closed position and braces the lower end of the door-leaf, which it connects directly with the casing-leaf. The said upper and lower sections D and D' therefore reinforce each other, and prevent the door-leaf from sagging under the weight of the door.

The spring-barrels or chambers A² A³ of the casing leaf respectively contain heavy springs G G'. The spring located in the spring-barrel A³ is attached at its lower end to a plug H, located within the lower end thereof, and secured therein by means of a pin *h*, whereby the said lower end of the spring is virtually connected rigidly with the casing-leaf of the spring. The upper end of the spring is attached to a rotatable adjusting head I, having bearing upon the upper end of the barrel A³, and interposed between the same and the lower knuckle *d'* of the upper section D. This head is constructed with radial sockets *i*, any one of which is adapted to receive the tension pin C, which engages with the said upper section D, and hence transmits the tension of the spring to the door-leaf B. The other barrel

A² is furnished with a similar, but oppositely wound spring G', having its upper end secured to a plug H', rigidly fastened to the upper end of the barrel, by means of a pin *h'*, whereby the upper end of the spring G' is rigidly connected with the casing-leaf of the hinge. The lower end of the said spring G' is attached to a rotatable adjusting head I', the exposed edge of which has a circular series of radial sockets *i'*, which receive the tension pin C', the same being normally engaged with the lower section D' of the middle leaf of the hinge. The pintles E' and F' before mentioned, enter sockets formed in the outer faces of the adjusting heads I and I', and assist in holding the same in place.

By connecting one end of each spring with a rotatable head as described, and locating those heads so that the tension pins carried by them may engage either with the upper and lower sections of the middle leaf, or with the casing leaf, I secure an important advantage. Normally, of course, and properly, the tension pins will be arranged to engage with the outer faces of the respective upper and lower sections, whereby the power of the springs will be constantly exerted toward maintaining those sections in their closed positions, and hence keeping the door closed. In case, however, either spring should be wound in the wrong direction, its pin instead of engaging with the adjacent section of the middle leaf, will be carried by the partial recovery of the spring in the opposite direction therefrom, and engaged with the casing-leaf, so that the action of the spring, both of its ends being virtually connected with the said leaf, will be neutralized and the door-leaf left free.

The damage resulting from winding the springs of spring-hinges of the class to which my invention relates, in the wrong direction, does not generally occur until the door is swung after such winding, whereby the springs are further wound in the wrong direction and buckled. Under my improvement that cannot happen, for if a beginning is made of winding the springs in the wrong direction, the power of the same is immediately neutralized by the engagement of their tension pins, upon their recovery, with the casing-leaf, and removed from the upper and lower sections of the middle leaf, and hence from the door leaf and the door, so that the swinging of the door in either direction does not continue the winding of the springs in the wrong direction, and has no effect upon them whatever.

By locating the springs in heavy chambers cast integral with the casing-leaf and in line with the knuckles of the hinge, they are located to the best advantage for the exercise of their power, and the chambers in which they are located are so heavy walled that they cannot be disfigured by the coils of the springs, under any stress to which the same may be subjected. Moreover, by inclosing

the springs in the chambers as described, I greatly improve the appearance of the hinge, as well as its strength.

I have shown the spring-barrels as formed integral with the casing leaf of the hinge, and that is my preferred construction, but they might be formed integral with the door-leaf thereof.

My invention is also applicable to single hinges, as shown by Fig. 8 of the drawings, in which a barrel or spring-chamber J, is shown as cast integral with the casing-leaf J' of the hinge, and in line with the knuckles J² and J³ thereof, which receive a pintle K, also passing through the knuckles L L' of a short door-leaf L². The spring M is secured within the barrel in this hinge, in the same manner as in the double-acting hinge described.

I wish to call attention to the fact that, in the single hinge just above described, the spring barrel is cast integral with the body of one of the hinge-leaves, and that both of the knuckles of the said leaf are located at one end of the said barrel, but separated therefrom by a space for the reception of a rotatable adjusting head, and that the other end of the barrel is entirely unobstructed to permit the introduction of the spring.

I have shown this single-acting hinge in this application only for the purpose of illustrating the scope of my invention, and not for specifically claiming the said hinge, upon which I have made a separate application. It will thus appear that my improvement, when broadly considered, is applicable to single-acting as well as to double-acting hinges.

I may mention here the fact that in neither form of my improved hinge does the pintle enter into or support the spring.

I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

I am aware, of course, that a double acting hinge, broadly considered, is old. I am also aware that it is old to locate a hinge-spring within a tubular pintle, forming, in a sense, a chamber for it, and extending through the knuckles of the hinge-leaves. I am also aware that a double-acting hinge provided

with rotatable adjusting heads, each having one end of one of the two springs of the hinge connected with it, is old. I do not, therefore, claim any of the constructions referred to broadly.

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

1. A spring hinge-leaf, having a spring-chamber or barrel and one or more knuckles cast integral with its body, the said barrel or chamber being made open at both ends, and the said knuckle or knuckles being located at one end of the said barrel or chamber, and separated therefrom by a space for the reception of a rotatable adjusting head, to which one end of the spring located in the barrel or chamber is attached, and the other end of the said barrel or chamber being entirely unobstructed for the introduction into it of the spring, substantially as set forth.

2. In a double-acting spring hinge, the combination with a casing leaf, having two corresponding parallel barrels or spring chambers cast integral with its body, the said chambers being made open at both ends, and each having one end entirely unobstructed and the other end separated by a space from knuckles also cast integral with the body of the leaf, and located in line with the said chambers, of upper and lower middle-leaf sections pivoted to the opposite ends of the said chambered leaf, in line with the said barrels or spring-chambers, a door-leaf pivoted to the opposite ends of the said sections, oppositely wound springs located in the respective barrels or spring chambers, into which they are introduced through the unobstructed ends thereof, and rotatable adjusting heads located in the spaces formed between the opposite ends of the chambers and the knuckle adjacent thereto, and having the springs connected with them and adapted to engage with the said sections of the middle leaf for swinging the same in opposite directions, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALBERT A. PAGE.

Witnesses:

CHAS. L. BALDWIN,
WILLIAM S. COOKE.