(No Model.)

S. S. NILES.

SPRING HINGE.

No. 325,761. Patented Sept. 8, 1885.

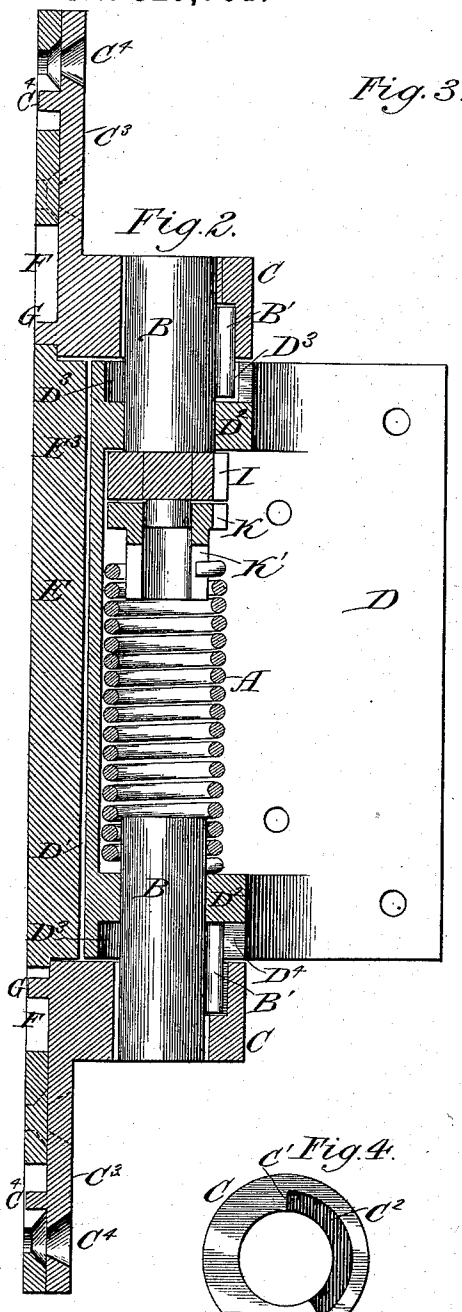


Fig. 2.

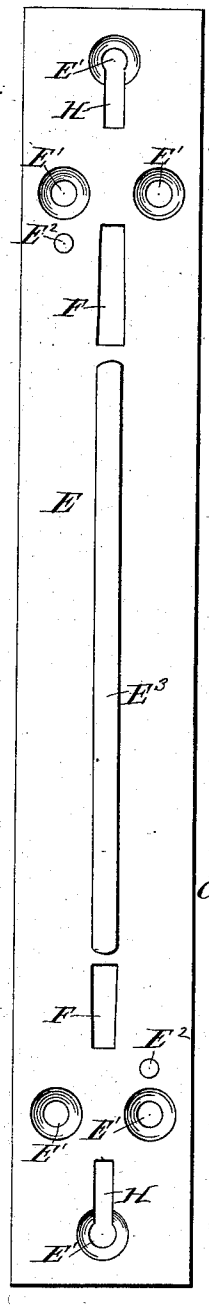


Fig. 3.

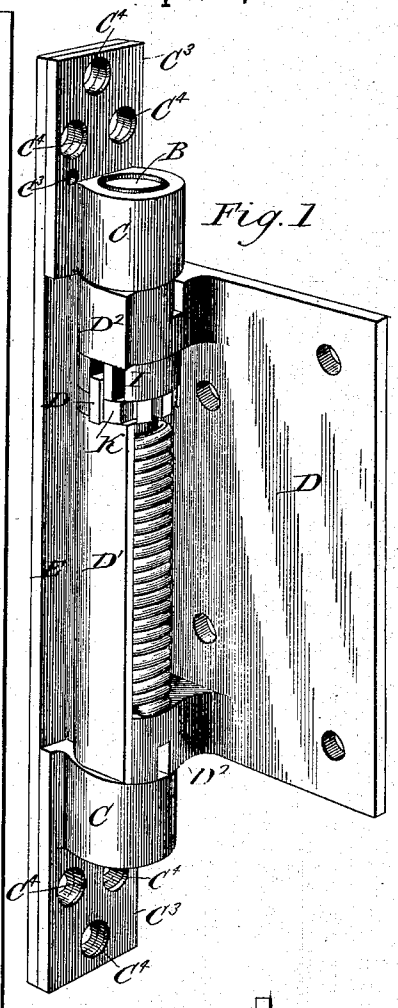


Fig. 1.

Fig. 4.

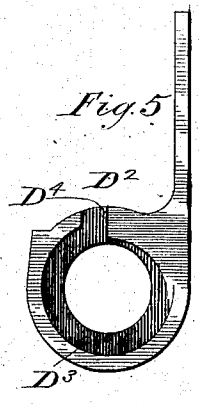


Fig. 5.

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UNITED STATES PATENT OFFICE.

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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 325,761, dated September 8, 1885.

Application filed April 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY S. NILES, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

This invention relates to that class of double-acting or right-and-left spring-hinges in which a coiled spring is connected at each end with one of a pair of pintles, which are mounted so as to be susceptible of respectively turning about their axes in reverse directions, and adapted to be alternately engaged by one or the other of a pair of knuckles on the leaf or swinging portion of the hinge, according to the direction in which the door or gate is swung, so as to wind up or increase the tension of the spring when the door or gate is swung either way from the position in which it is normally maintained by the spring.

In a spring-hinge of such character the independent pintles engaged by the spring and passing through the knuckles have been arranged in line with each other and journaled at their outer ends in eyes or sockets constituting bearings for the pintles at the ends of the hinge, and each formed with a small base-plate designed to be attached by screws directly to the jamb of the door or gate and made separate from each other, so as to allow the hinge to be more readily taken apart and put together than could be attained by casting these said eyes in one piece with a plate running the length of the hinge, as has heretofore been done in some instances, in which latter case the respective eyes of the bed and leaf must be arranged on the bed and leaf so as to allow the eyes or knuckles on the leaf to interlock with the eyes on the bed—that is to say, to allow one knuckle of the leaf to be between and the opposite knuckle to be outside of the pair of eyes or pintle-bearings, and hence to allow the hinge to be set up or put together.

In attaching a hinge embodying such general features of construction to the jamb of a door, for example, great care and nicety is required in forming a mortise for and setting and adjusting therein the independent eyes or bearings for the pintles so as to bring their respective base-plates in one and the same plane, and also so as to secure the said bearings in such position relatively to each other as shall bring the pintles into exact alignment, and thereby allow the pintles to turn freely and without undue side pressure in any one direction in the eyes, and also to admit of the knuckles being turned easily and without increased friction at any one point upon the pintles, it being obvious that if the pintles are not set true and in exact alignment the hinge will work hard and creak, the wear of its members be materially increased, and its general efficiency be thereby considerably lessened.

The object of my improvements is to obviate the difficulties heretofore incident to the setting or securing in position on a door-jamb or other like support of a hinge embodying the aforesaid general features, and to provide simple and efficient means whereby the pintle-bearings made separately from each other can be adjusted and held in a fixed relation to one another, so as to bring the pintles in alignment before as well as after the hinge is applied and secured to the door-jamb or other like support, in which way the several parts of the hinge can be fitted together by the manufacturer, and less skill and labor required in forming the mortise which is usually made in the door-jamb for receiving the base portion of the hinge. To such end I provide as a bearing for the base portions of the eyes or bearings for the hinge-pintles an oblong base-plate, upon which the said eyes are adjusted and detachably secured in position for bringing the pintles of the hinge in alignment, the said base-plate, which is common to both eyes, being adapted to be fitted and secured against any flat surface or to be fitted and secured in a mortise formed in the door-jamb or other like support for the hinge.

My improvements also relate to means for varying the tension of the spring in a spring-hinge of this nature, and to such end has for a further object to provide simple and efficient means for varying the spring-tension, all as hereinafter described and claimed, and illustrated in the annexed drawings, in which—

Figure 1 is a perspective view of a hinge provided with my improvements. Fig. 2 represents on a somewhat larger scale a central longitudinal section through the same. Fig. 3 is a top or plan view of the base or bed plate.

Fig. 4 shows a side elevation of one of the eyes or pintle-bearings. Fig. 5 is a like view of one of the knuckles at one end of the leaf of the hinge.

Referring by letter to the several figures of the drawings, in which like letters denote like parts, A indicates the spiral spring, which is wound up from either end, according to the direction in which a door or gate provided with the hinge is swung. This spring is located between the opposing ends of and is connected at each one of its ends in some suitable way to one of a pair of short pintles, B, arranged in line with each other and journaled at their outer ends in eyes or sockets C, affording appropriate bearings for the said pintles.

The leaf D of the hinge is bent or curved along its rear edge, so as to form a part-cylindrical case, D′, by which the spring is partially inclosed, and at each end the leaf is formed with a knuckle, D^2, which said knuckles unite with the partial casing D′ at its ends. Each pintle passes through one of these knuckles, between which latter the spring is located, and as a means for causing the spring to be wound from either end, according to the direction in which the door is swung, the knuckles are so constructed with relation to the lugs upon the pintles that when the gate or door to which the hinge is attached is swung one way one of the knuckles shall engage a lug, B′, on one pintle, and thereby turn the same so as to wind up the spring from this end, while the remaining knuckle shall be free to turn upon the remaining pintle without engaging the lug thereon; and, conversely, when the door or gate is swung in an opposite direction from its closed normal position, the spring shall be wound from its opposite end by the action of a knuckle on a pintle-lug, B′, at this said end of the spring, while the opposite knuckle now turns freely upon the remaining pintle.

In order to cause one pintle to be operated by one knuckle when the door is swung open in one direction, and to cause the remaining pintle to be operated by the remaining knuckle when the door is swung open in a reverse direction, each knuckle is provided in its outer end with a segmental recess, D^3, the wall at one end of which constitutes a stop or abutment, D^4, for engaging a pintle-lug. Of these stops, one is formed at the right and the other at the left of the recess, while the pintle-lugs are normally held against said stops by the spring. It will be obvious, by reason of this disposition of the spaces or recesses with relation to the stops, that when the hinge is turned one way one stop or abutment only shall be brought into action for turning one of the pintles.

In order to hold one end of the spring while the opposite end thereof is being wound, the bearings or eyes for the pintles are each provided with a stop or abutment, C′, and a segmental recess, C^2, which said stops and recesses are disposed with relation to each other in substantially the same way as that in which the stops and recesses are arranged in the knuckles. The lugs on the pintles enter these recesses C^2 in the eyes, and are normally held against the said stops C′ by the spring, and hence when the door is swung open either way so as to turn one of the pintles, and thereby wind the spring from one end, the lug of the operating-pintle will leave its allotted stop and work round in a space or recess beyond the same, while the lug of the remaining pintle will be held by the remaining one of the said stops C′.

Each one of the eyes C is formed or provided with a base-flange or flat rectangular base-plate, C^3, extending beyond the outer end of the eye, and provided with a suitable number of perforations, C^4, for screws. These base-flange portions C^3 of the eyes are made separate from each other, not only for the purpose of allowing the several parts of the hinge to be readily taken apart and put together, but also to admit of said eyes being used for hinges having different lengths of springs, and hence requiring the eyes to be set at different distances apart.

It will be obvious that to set and secure the base-plates or flanged bases of these eyes in and at the ends of a mortise so as to bring the pintles in alignment with each other the mortise must of necessity be made with great accuracy, and that, as is frequently the case, the workman fails to make the mortise in such manner as will bring the pintles into a perfectly true position to avoid the objectionable features set forth in the first portion of this specification. To overcome such difficulties, I provide an oblong rectangular base or bed plate, E, adapted to constitute a connection between and a base common to both eyes. This base-plate E is designed to be fitted and secured in a mortise formed in the jamb, and is provided with screw-holes E′, corresponding to the screw-holes in the base-flanges of the eyes. The eyes are adjusted in place upon the end portions of this base-plate, and as a means for holding the eyes thereon each flange of an eye is provided with one or more perforations, C^5, in which a pin or small screw can be inserted and screwed into a corresponding perforation, E^2, in the common base-plate. The base or bed plate is also preferably provided with two or more longitudinal central slots, F, in which studs G on the under side of the base portions of the eyes are received, whereby the eyes can be readily fitted upon the base-plate in line with each other and then shifted along upon the same until the screw-holes in the flanged portions of the eyes are brought into register with the screw-holes in the base-plate. As an additional means for thus guiding the eyes into proper position on the base-plate, the flanged portion of each eye can also be provided on its under side with a second stud, c^4, designed to enter a slot, H, formed in the base-plate in line with the slots F in the said plate. In this way the hinge can be put together and its eyes secured upon the base-plate by screws or other

analogous devices so as to bring the pintles into exact alignment with each other, after which the hinge will be ready to be secured to the jamb by simply seating the base-plate in a mortise formed for such purpose in the jamb, and then passing screws through the flanges of the eyes and the base-plate.

The base or bed plate E is provided on its upper face with a central longitudinal spline or rib, E^3, which is arranged in line with and between the two slots F in the plate. The object of this spline or rib is to provide an abutment or stop for the bases of the pintle eyes or bearings C, which latter, when adjusted and secured in position upon the bed-plate, abut against the ends of said rib, as in Fig. 2. A further object of this spline or rib is to strengthen the bed-plate and to close the space which would otherwise occur between the bed-plate and that portion of the hinge which is embraced between the two pintle eyes or bearings C.

The means for varying the tension of the spring consists of a toothed disk, I, fixed upon one of the pintles at a point near one of the inner sides of an eye, and a similar toothed disk, K, loosely fitted upon the same pintle at a point between the rigid disk and the end of the spring, which latter is connected with said loose disk in some suitable way—as, for example, by having its terminal engaging in a slot formed in a hub portion, K′, of the loose disk. The disk I is conveniently held rigid on the pintle by fitting it upon a squared portion of the latter, and the spring and said pintle are maintained in connection with each other by a wedge or key, L, fitting in registering-spaces between the teeth of the two disks. It will be seen that under such arrangement the tension of the spring can be increased by temporarily removing the wedge and turning the disk engaged by the spring, after which the two disks can be again locked together by means of the wedge or key.

The longitudinal rib formed with or provided on the bed-plate as hereinbefore described constitutes at each end a stop or abutment for the base of one of the pintle eyes or bearings; and while, so far as this object is concerned, a pair of short ribs or lugs on the bed-plate would subserve the same purpose, yet by forming one long rib the space between the bed-plate and that portion of the hinges which is between the two pintle-eyes is closed, thus preventing the passage of wind and dust.

It will be seen that under this construction and arrangement of hinge the pintles extend beyond the hinge at each end of the latter, and that the leaf or movable portion of the hinges is embraced between the two eyes in which the pintles have their bearings, the knuckles at the ends of said leaf being fitted to turn against the inner sides of the castings forming the pintle-eyes.

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

1. A hinge provided with a pair of eyes or pintle-bearings formed independent of one another and attached to a common bed-plate formed separately from the eyes or pintle-bearings, and adapted to be secured to a door-jamb or other support, substantially as described.

2. The combination, in a hinge, of the independent pintle-bearings, each having a perforated flanged base portion, with an independent bed-plate provided with perforations adapted to register with the perforations in the base-flanges of the pintle-bearings when the latter are secured in place upon the said bed-plate, substantially as described.

3. In a hinge, the independent pintle-bearings, each provided with a flanged base portion having a stud or studs projecting from the under side thereof, in combination with an oblong bed-plate provided with slots, in which the studs of the base portions of the pintle-bearings are received, said bed-plate and pintle-bearings being adapted to be secured together, substantially as described.

4. The separate and opposing pintles, and a spring-connection between said pintles, in combination with a toothed disk rigid upon one of said pintles, a similar disk secured to the spring, and a key fitting between the teeth of and locking said disks together, substantially as described.

5. The two opposing pintles, a lug on one of said pintles, a bearing and a leaf, each provided with independent stops engaging with the pintle-lug, and a leaf bearing on the pintle, in combination with a spring-connection between said pintles, a toothed disk on the spring, a similar disk on the other pintle, and a key locking said disks together, all substantially as described.

6. The combination, in a hinge, of the pintle eyes or bearings with a bed-plate made separate from the pintle-eyes, and provided upon its face with a stop or abutment, against which the base portion of one or both of the pintle-eyes shall abut when the latter are applied to the bed-plate, substantially as described.

7. The combination, in a hinge, of the pintle eyes or bearings with a bed-plate made separate from the pintle-eyes, and provided upon its face with a longitudinal rib constituting a stop for the pintle-eyes, and serving to close the space between the bed-plate and that portion of the hinge which is embraced between the pintle-eyes, substantially as described.

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