

(No Model.)

3 Sheets—Sheet 1.

R. LABUDDE & F. HANSEN.
SPRING HINGE.

No. 503,243.

Patented Aug. 15, 1893.

Fig. 1.

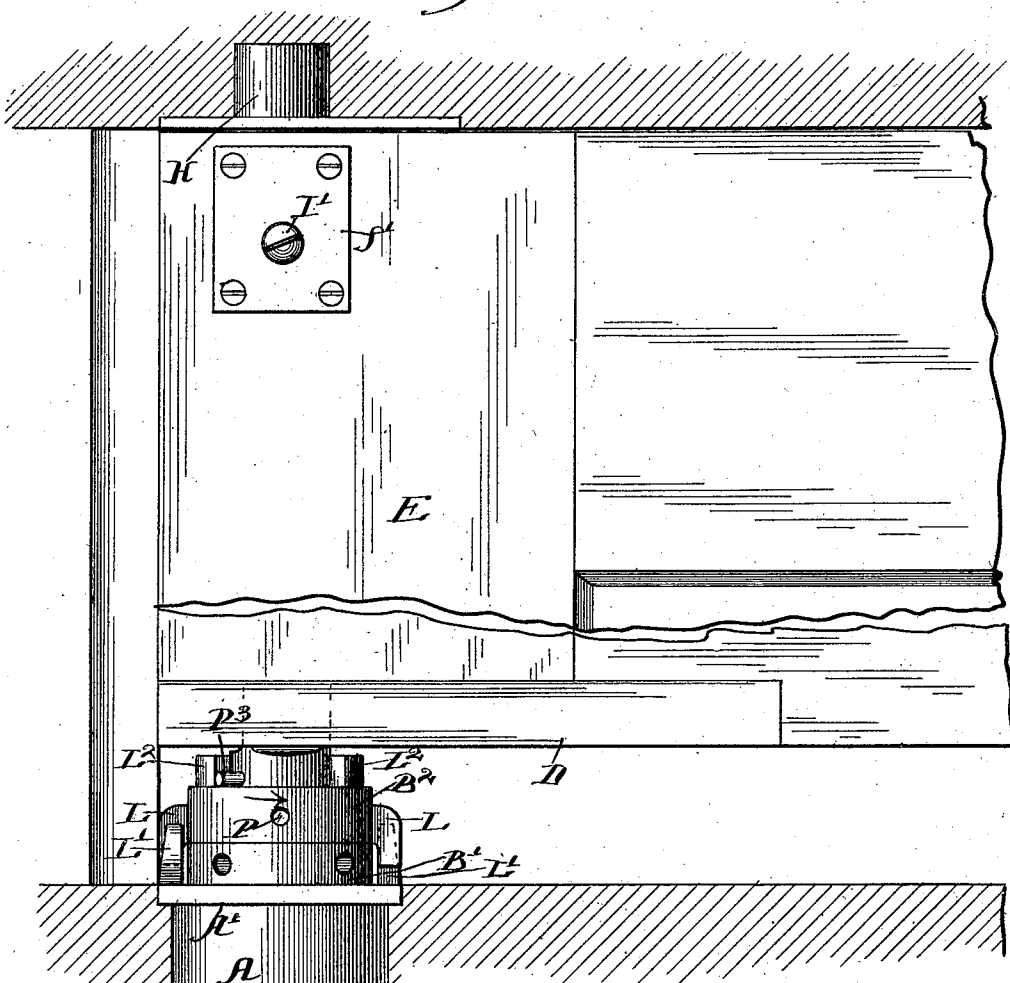
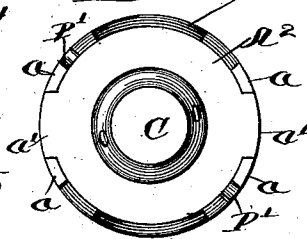


Fig. 2.



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Fig. 3.

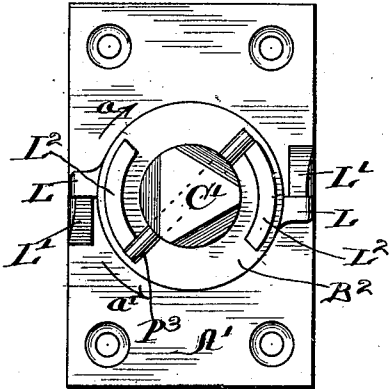


Fig. 6.

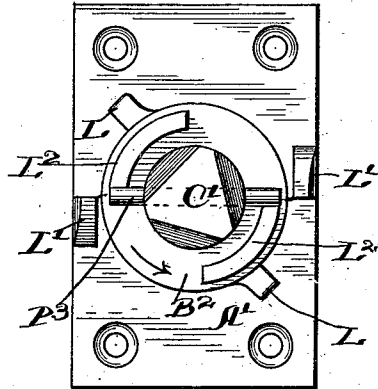


Fig. 4.

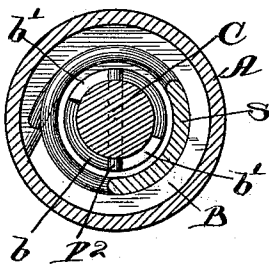


Fig. 7.

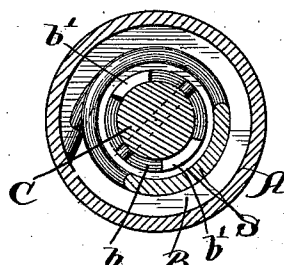


Fig. 5.

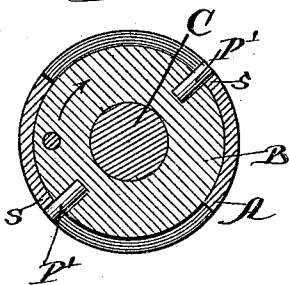
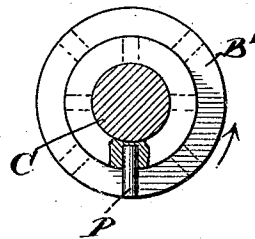


Fig. 8.



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Fig. 9.

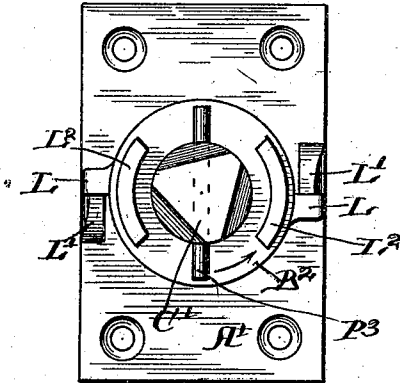


Fig. 10.

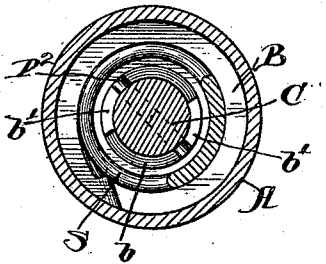


Fig. 11.

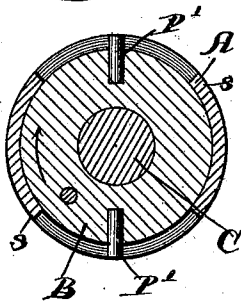


Fig. 12.

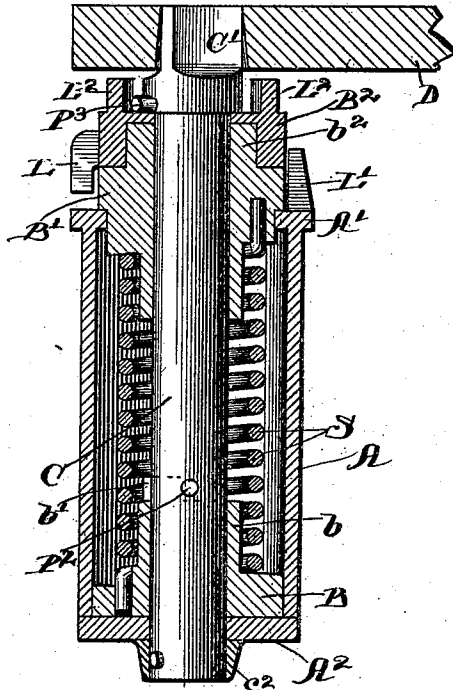


Fig. 13.

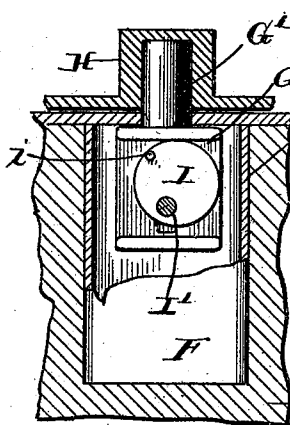
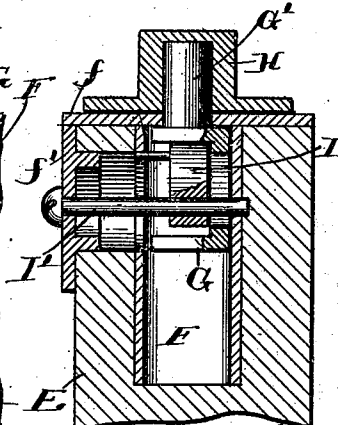


Fig. 14.



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UNITED STATES PATENT OFFICE.

RUDOLPH LABUDDE AND FRED HANSEN, OF FREEPORT, ILLINOIS.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 503,213, dated August 15, 1893.

Application filed January 31, 1893. Serial No. 460,226. (No model.)

To all whom it may concern:

Be it known that we, RUDOLPH LABUDDE and FRED HANSEN, citizens of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have jointly invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

Our invention relates to improvements in spring hinges of that class in which the spring and the parts immediately connected therewith are let into the floor beneath a swinging door, one element of the mechanism connected with the spring being adapted to serve as a pivot for the bottom of the door and being so constructed as to engage a plate fastened to the door.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a view in side elevation and vertical section showing a hinge embodying our improvements in operative connection with a door. Fig. 2 is a bottom plan of the case which incloses the spring. Fig. 3 is a top plan of the hinge disconnected from the door, the parts of the hinge being in their normal positions, that is, in the positions which they assume when the door is closed. Fig. 4 is a horizontal section through the line 4—4, Fig. 1, the view being downward. Fig. 5 is a similar view through the line 5—5, Fig. 1. Fig. 6 is a top plan of the hinge, its central spindle having been rotated forty-five degrees from its normal position in the direction indicated by the arrow, *a*, Fig. 3. Fig. 7 is a section through the line 4—4, Fig. 1, the parts being in the positions shown in Fig. 6. Fig. 8 is a top plan of the cap which engages the upper end of the spring. Fig. 9 is a top plan of the hinge, its central spindle having been rotated forty-five degrees from its normal position in the direction indicated by the arrow, *a'*, Fig. 3. Fig. 10 is a horizontal section through the line 4—4, Fig. 1, the parts being in the positions indicated in Fig. 9. Fig. 11 is a horizontal section through the line 5—5, Fig. 5, the parts being in the same positions as in Figs. 9 and 10. Fig. 12 is a central vertical section of the entire hinge and the plate engaging the upper end of the spindle and adapted to be fastened to a door.

Figs. 13 and 14 are sections illustrating details of construction of the pivot at the upper end of the door.

In the views, A is a tubular case adapted to be let into the floor of a building through a cylindrical opening bored therein, the upper end of the tube being provided with an integrally formed plate, A', formed with screw-holes for attaching it to the floor. The lower end of the case is provided with a stationary plate, A², Fig. 2, formed with tongues, *a'*, which lie between lugs, *a*, *a*, in the lower end of the wall of the case, whereby the plate is secured against rotation.

Immediately above the plate, A², is a second plate B, free to rotate in the case and formed with an upwardly extending neck, *b*, intended to lie within the coils of a spring, S, whose lower end is turned downward and enters the plate, B.

In the upper end of the case is a plate, B', journaled in a circular opening in the plate, A', and having a downwardly extending neck, which lies within the upper coils of the spring, S, the upper end of the spring being turned upward to enter the plate, B'. The plate, B', has on its upper face an upwardly extending neck, *b*², which is encircled and covered by a plate, B², the two plates, B', B², being connected in any desired relation by means of a pin, P, adapted to be inserted in a radial horizontal hole in the plate, B², and to enter any one of a series of holes in the neck, *b*².

The plate, B', is provided with a series of radial holes shown in dotted lines in Fig. 8 and in full lines in Fig. 1, each of these holes being intended to receive the end of a lever for turning the plate in order to bring it into any desired position with relation to the plate, B², for the purpose of changing the position of the pin, P, and adjusting the two plates with reference to each other.

In the plates, A², B, B', B², is journaled a vertical spindle, C, having at its upper end a non-circular head, C', and at its lower end a thimble, C², lying below the plate, A², and held in place by a transverse pin, the thimble being intended to prevent accidental upward movement of the spindle. A plate, D, formed with an opening corresponding substantially in shape to the head, C', is fastened to the lower margin of a door, E, the opening in the

plate being in engagement with the head, C', when all the parts are in operative connection and the swinging of the door and plate in either direction being adapted to correspondingly rotate the spindle which forms the lower pivot of the door.

The spring, S, is so formed and connected with the plates, B, B', that when under tension it tends to rotate the lower plate, B, in the direction indicated by the arrow thereon, in Figs. 1, 5, and 11, and also tends to rotate the upper plate, B', and the plate, B², connected with it in the direction indicated by the arrow on the plate, B², in Figs. 1, 6, 9. The rotation of the lower plate, B, is limited by means of pins, P', projecting radially from the plate and pressed against shoulders, s, s, in the wall of the case, when the parts of the hinge are in their normal positions, as illustrated in Figs. 3, 4, 5. The rotation of the upper plate, B', and the plate, B², connected therewith is limited by means of lugs, L, L, projecting from the margin of the plate, B², and pressed against lugs, L', L', on the plate, A', when the parts of the hinge are in their normal positions.

In the upper end of the neck, b, of the lower plate, B, are formed two lugs, b', b', Figs. 4, 7, 10, and on the upper surface of the upper plate, B², are formed two lugs, L², L², Figs. 3, 6, 9; and through the spindle C, are passed two horizontal pins, P², P³, adapted to engage the lugs, b', L², respectively, the pins being in such angular positions as to be in contact with said lugs, respectively, when the parts of the hinge are in their normal positions. The relation of the spindle, C, the pins, P², P³, and the lugs, b', L², is such that when the spindle is turned in the direction indicated by the arrow, a, Fig. 3, it rotates the plate, B², in the same direction without affecting the position of the plate, B, and, on the other hand, when the spindle is rotated in the direction indicated by the arrow, a', Fig. 3, it rotates the lower plate, B, in the same direction without affecting the position of the plate, B².

Figs. 3, 4, 5, show the relative positions of the parts when the hinge is in its normal position. Figs. 6, 7, show the positions of the parts when the spindle has been rotated forty-five degrees in the direction indicated by the arrow, a, the motion of the spindle having been communicated to the plate, B², and the lugs, L, L, of the plate B² having been swung away from the lugs, L', L' of the plate, A'. At the same time, the pin, P², of the spindle has been swung away from the lugs, b', b', of the lower plate, B, the lower plate having remained stationary. This movement of the spindle has evidently rotated the upper end of the spring, S, and thus increased its tension. Figs. 9, 10, 11, illustrate the rotation of the spindle in the opposite direction, that is, in the direction indicated by the arrow, a', Fig. 3. As shown in the views, the pin, P³, of the spindle has been swung forty-five de-

grees from the lugs, L², L², of the plate, B², the plate having remained stationary. At the same time, the rotation of the pin, P², has swung the lugs, b', b', and plate, B, forty-five degrees from their normal positions, thereby rotating the lower end of the spring and increasing its tension. From this explanation it is evident that the motion of the spindle in either direction from its normal position, must increase the tension of the spring and that the tension of the spring must therefore always tend to return the spindle to its normal position; and when the plate, D, is fastened to the door and is in engagement with the head, C', of the spindle, C, the swinging of the door in either direction from its normal position must evidently be resisted by the spring, and the tension of the spring must constantly tend to hold the door in its closed or normal position.

The head, C', and the opening in the plate, C, may be of any desired non-circular shape in horizontal section, but we prefer to taper the opening, making it larger at the lower than at the upper face of the plate. This construction enables us to bring the opening in the plate into engagement with the head, C', when the door is in a slightly oblique position, thus rendering it possible to insert the case A, in the floor, fasten the plate, D, to the door, and bring the door into its working position without interfering with the head jamb of the door frame.

The upper end of the door may be pivoted to the head jamb in any desired manner, but preferably by the means shown in Figs. 13, and 14, in which F is a tubular case set in the door and preferably oval in horizontal section, the tube being provided at its upper end with a plate, f, fastened to the edge of the door. Within the case slides freely up and down a recessed plate, G, having at its upper end a bolt, G', adapted to enter a socket, H, set in the head jamb. Within the recess in the plate, G, lies an eccentric I, having a horizontal stem, I', by means of which it may be rotated for the purpose of raising and lowering the bolt. The stem, I', projects outward through a plate, f', fastened to the face of the door and is provided at its outer end with a slotted head adapted to receive the end of a screw-driver with which it may be turned. A pin, i, set in the face of the eccentric is adapted to strike the wall of the tubular case when the eccentric is rotated to the position shown in Fig. 13, and thus to prevent further rotation of the eccentric. The rotation of the eccentric evidently raises and lowers the plate, G, and bolt, G', and the plate and bolt are at all times held in line by means of a vertical slot in the plate through which the stem, I', or the eccentric passes.

Having now described and explained our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination with the tubular case, A, of the plates, B, B', B², the spring, S, hav-

ing its ends in engagement with the plates, B, B', means substantially as shown and described, for connecting the plates, B, B', stops limiting the movements of the plates, B, B', the spindle, C, journaled in the plates, B, B', B², and having the non-circular head, C', and means substantially as shown and described, connecting the spindle with the plates, B', B², whereby rotation of the spindle in one direction may rotate one of said plates and its rotation in the opposite direction may rotate the other plate, the rotation of either of the plates by the spindle being adapted to increase the tension of the spring; substantially as shown and described.

2. The combination with the tubular shell, A, of the plate, B, journaled in the lower end of the shell and having the upwardly extending neck, b, formed with lugs, b', b', the plate, B', journaled in the upper end of the shell, the spring, S, having its ends in engagement with the plates, B, B', respectively, the plate, B², connected with the plate, B', and formed with lugs, L², L², the spindle C, journaled in the plates, B, B', B², and provided with pins, P², P³, adapted to engage the lugs, b', L², and stops adapted to limit the rotation of the plates, B, B', B², the rotation of the spindle, C, in opposite directions being adapted to rotate the plates, B, B', alternately, and the rotation of either of said plates being adapted to increase the tension of the spring; substantially as shown and described.

3. The combination with the tubular shell, A, provided with the plate, A', at its upper

end, of the plate, B, journaled in the lower end of the shell and provided with pins, P', engaging shoulders on the shell and limiting the rotation of the plate, the plate, B', journaled in the upper end of the shell, the spring, S, having its ends in engagement with the plates, B, B', the plate, B², adjustably connected with the plate, B', and having lugs, L, L, engaging lugs, L', L', on the plate, A', and limiting the rotation of the plates, B', B², the spindle, C, journaled in the plates, B', B², and having the head, C', and the plate, D, adapted to be attached to a door and formed with an opening adapted to engage the head, C'; substantially as shown and described.

4. The combination with a door and a spring-actuated pivot for the lower end thereof, of a pivot for the upper end thereof, embracing the shell, F, set in the upper end of a door, a socket, H, set in the jamb above the door, a vertically sliding recessed plate, G, lying within the case and provided with a bolt, G', adapted to enter the socket, H, an eccentric I, lying in the recess in the plate, G, and an eccentric stem, I', projecting from the face of the door and serving as a means for rotating the eccentric and thereby raising and lowering the plate, G, and bolt, G', substantially as shown and described.

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