

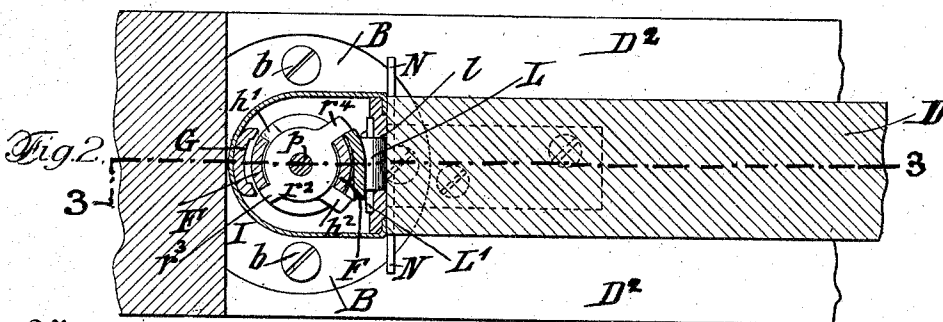
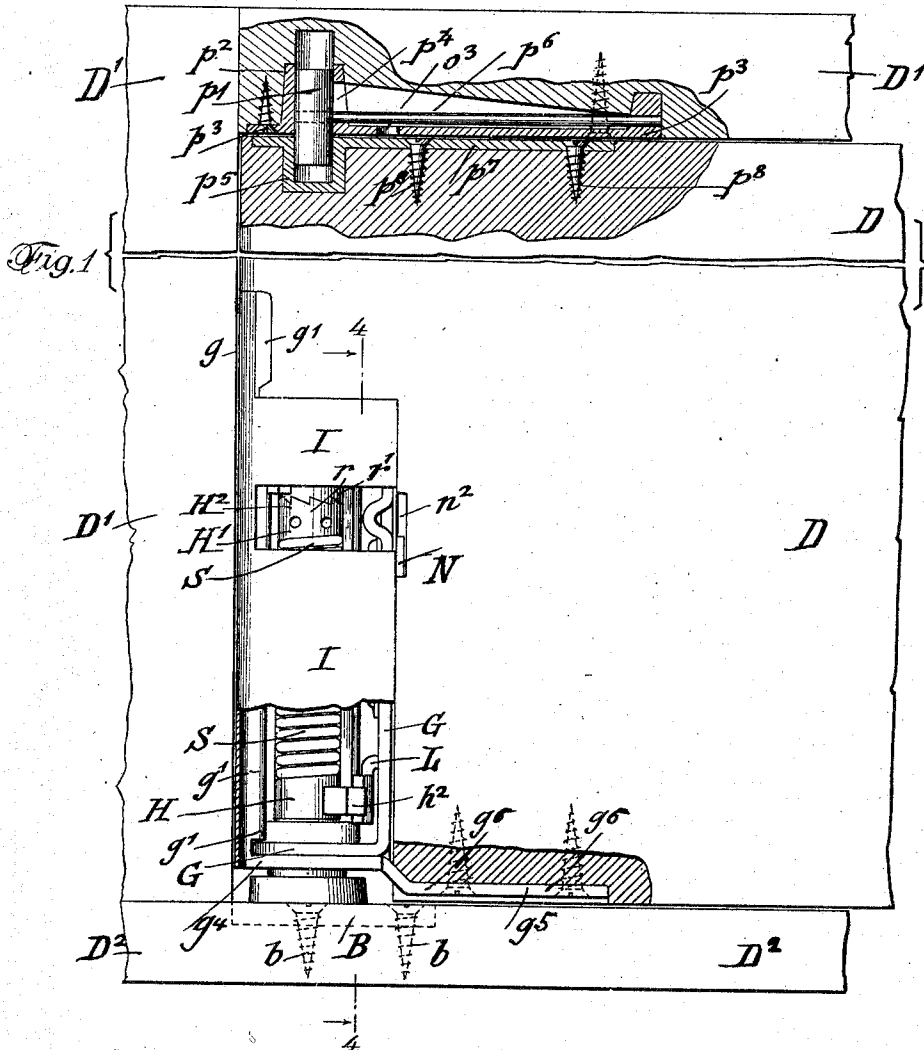
E. BOMMER.
SPRING HINGE.

APPLICATION FILED APR. 26, 1910.

981,053.

Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.



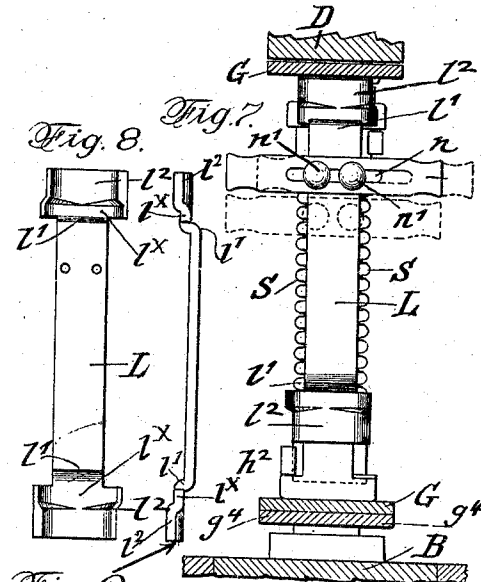
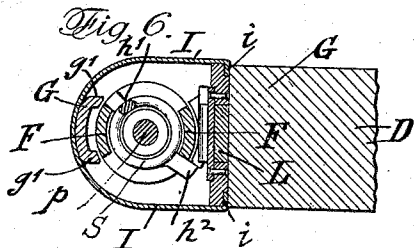
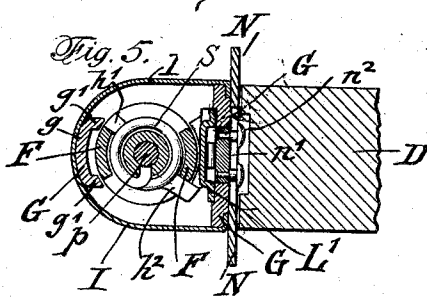
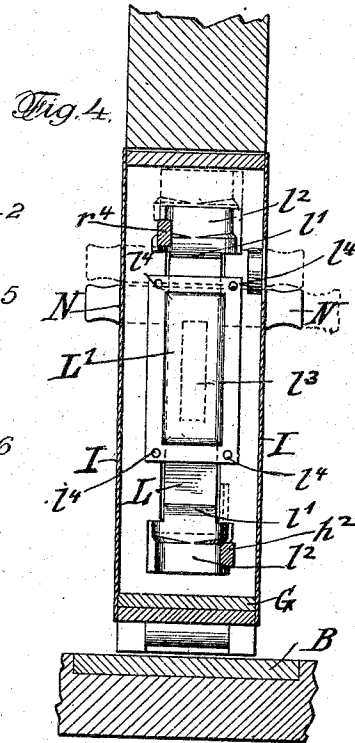
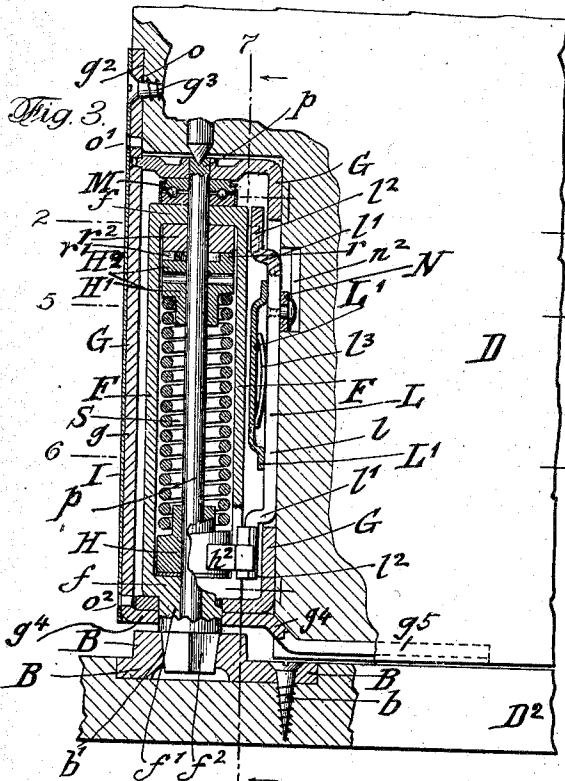
Witnesses:
Lilian J. Murphy
John Murtagh

Inventor
E. Bommer
By his Attorneys
Muller & Co.

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2 SHEETS—SHEET 2.



Witnesses:
L. J. Murphy
John Murphy

Fig. 9. Inventor
E. Bommer
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UNITED STATES PATENT OFFICE.

EMIL BOMMER, OF NEW YORK, N. Y.

SPRING-HINGE.

981,053.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed April 26, 1910. Serial No. 557,669.

To all whom it may concern:

Be it known that I, EMIL BOMMER, a citizen of the United States of America, residing in New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

This invention relates to an improved spring-hinge of that class which are attached to the lower corner of the door and operated in connection with a stationary socket-plate attached to the floor below the hinge, and a socket at the upper corner of the door for a connecting pivot in the door-casing.

The invention relates more specifically to certain improvements in the spring-hinge for which Letters Patent No. 825104 were granted to me on July 3, 1906, said improvements being designed with a view of permitting the release of the spring power from the movable casing of the spring-hinge and the holding back or locking of the door in open position in either direction to the door-casing when the door is not desired to swing under the action of the spring of the spring-hinge; and for this purpose the invention consists of a spring-hinge of the type referred to combined with means for releasing the closing action of the spring-hinge and for moving the door independently therefrom, and of means for holding back the door in open position whenever desired, and the invention consists further of certain novel features and combination of parts which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side-elevation of a door and door-casing, partly in section, and showing the improved spring-hinge applied to the lower corner of the door and the pivot connection with the door at the upper corner of the same respectively adjacent to the floor and door-casing, Fig. 2 is a horizontal section on line 2, 2, Fig. 3, Fig. 3 is a vertical central section through the spring-hinge taken on line 3, 3, Fig. 2, Fig. 4 is a vertical transverse section on line 4, 4, Fig. 1, Figs. 5 and 6 are horizontal sections respectively on lines 5, 5 and 6, 6, Fig. 3, Fig. 7 is a rear-view of the slide-plate in its relation to the spring and spring-holder, showing the push-plate, Fig. 8 is a detail elevation of the slide-

plate for releasing the swing-door from the closing action of the spring of the spring-hinge and for holding the swing-door in open position at one or the opposite side of the casing, and Fig. 9 is a side-elevation of Fig. 8.

Similar letters of reference indicate corresponding parts throughout the different figures of the drawings.

Referring to the drawings, D represents a swing-door and D¹ the casing of the same. The lower rear-corner of the door is provided with a mortise of sufficient size for inserting into the same a spring-hinge which corresponds in size and strength to the size and weight of the door. Below the spring-hinge and axially in line therewith is arranged a socket-plate B, which is countersunk into the sill-board of the door-casing and attached by fastening screws *b* permanently to the sill D² or the socket-plate is screwed directly to the floor. The socket-plate B is provided with a tapering socket-hole *b*¹ of square cross-section for receiving the lower correspondingly-tapered and squared end *f*² of a tubular stationary frame F, which is open at the sides and connected at its upper and lower ends, the connecting portions *f* being provided with central openings for permitting the passage of a pintle *p*, by which the connection of the frame F with the inclosing shell or casing G for the spring-hinge is made. The ends of the pintle *p* are preferably upset after the parts are assembled so as to hold them firmly together. The walls of the stationary frame F are made arcuate in horizontal section, as shown clearly in Figs. 2, 5 and 6, while the casing G has a rounded-off outer wall *g* adjacent to the outer wall of the frame F, a straight inner wall and connecting upper and lower ends, as shown in Figs. 3, 5 and 6. The casing G is also open at the sides and its rounded-off outer wall provided with inwardly-bent reinforcing flanges *g*¹ extending throughout the entire length of said wall. The outer wall *g* is extended above the upper connecting end of the casing G and has inwardly-bent flanges *g*¹, the extension *g*² being provided with a larger hole *o* for a fastening screw *g*³ and with a smaller opening *o*¹ which is used as an oil-hole for supplying the necessary lubricating oil to the rotating parts of the spring-hinge. The

upper and lower ends of the casing G are bent at right angles with the straight rear-wall and connected by a riveted dovetail joint with an outer wall g , which is concentric with the arcuate walls of the frame F. The casing is preferably bent up of sheet-steel, also the wall g , so as to take up less space and be of greater strength than the cast-metal casing heretofore used in the spring-hinge before referred to. The bent-over ends of the casing G are also provided respectively with openings for permitting the passage of the pintle p and the rounded stud f^1 of the frame F through the same. The rounded-off outer wall g of the casing G is further provided at its lower end with a bent-over extension g^4 which underlaps and is riveted or otherwise fastened to the lower connecting end of the inner wall of the casing, and which is provided with an extension g^5 having countersunk screws g^6 by which the casing is attached to the underside of the lower rear-corner of the door, as shown clearly in Figs. 1 and 3.

At the interior of the stationary frame F is arranged a coil-spring S of sufficient power for moving the door from its open into the closed position. The lower end of the coil-spring S is bent inwardly and inserted into a recess of the lower spring-holder H, as customary in spring-hinges. The upper end of the coil-spring S is also provided with an inwardly-bent end, which is inserted into a recess in the upper spring-holder H¹, said upper spring-holder being made in one piece with a tension-collar H², which is provided with radial holes for inserting a lever-pin by which the coil-spring is set to tension in the usual manner. The upper end of the tension-collar H² is provided with ratchet-teeth r which engage the teeth r^1 at the under-side of a ratchet-plate r^2 which is provided with diametrically opposite lugs r^3, r^4 , of which one is shorter than the other, the shorter lug r^3 engaging the outer wall of the stationary frame F and the longer lug r^4 engaging the inner wall of the frame F, as shown clearly in Fig. 2. The lower spring-holder H is also provided with diametrically opposite lugs h^1, h^2 which engage respectively the opposite edges of the stationary frame F, the lug h^1 being shorter and the lug h^2 longer, in the same manner as the lugs of the upper spring-holder, as shown in Figs. 5 and 6. The spring-hinge, after being placed in position, is inclosed by a sheet-metal shell I, which is attached to the outer wall g of the casing G by the fastening screw g^3 and by means of inwardly-bent flanges i to the opposite sides of the inner straight plate of the casing G. The inclosing shell I is also provided near its upper and lower ends with small holes which register with the oil-holes o^1, o^2 of the frame G for permitting the insertion of the spout of

an oiler for injecting lubricating oil to the upper end of the casing G, which end is slightly dished for this purpose, and to the lower ends of the frame F and casing G. An antifriction ball-bearing V is inserted at the upper end of the casing, as shown in Fig. 3, and the oil conducted along the pintle p to the bearings of the hinge so as to properly lubricate the same, and permit thereby the easy and noiseless motion of the spring-hinge in opening and closing the door.

The upper rear-corner of the door is held in position by a pivot-pin p^1 , which is slidably connected with a cast-metal socket p^2 that is cast integrally with a plate p^3 , said socket and plate being set into a recess in the door-casing above the upper rear-corner of the door. The pivot-pin p^1 is axially in line with a socket p^5 set in the upper rear-corner of the door and with the pintle of the spring-hinge at the lower rear-corner of the door. The socket p^2 is provided with a slot p^4 through which passes a spring-rod p^6 that is rigidly attached at one end to a lug on the plate p^3 , while its opposite end engages loosely a hole in the pivot-pin p^1 . An aperture o^3 in the plate p^3 vertically below the spring-rod p^6 permits the insertion of the end of a screw-driver, nail, or pin, so that the pivot-pin p^1 can be sufficiently raised when the door is to be taken out for being withdrawn from the socket p^5 which is attached to the door by means of an extension-plate p^7 and fastening screws p^8 . When the door is to be replaced in position, the pivot-pin p^1 is pushed back flush with the socket-plate p^3 until the socket p^5 is below the pivot-pin when the spring p^6 causes the pivot-pin p^1 as soon as it comes in line with the socket p^5 to enter the same and be engaged thereby.

The inner straight wall of the casing G is provided with a longitudinal opening l in which is guided a slide-plate L, that is provided with shoulders l^1 and curved portions l^2 at the upper and lower ends that extend over the upper and lower ends of the straight inner wall of the casing G when shifted in upward or downward direction, and flat guiding sections l^3 that extend between the shoulders l^1 and curved portions l^2 and are guided upon the inner face of the inner straight wall of the casing G, thereby retaining the part of the slide-plate guided in the opening of the straight wall of the casing G in plane therewith. The slide-plate L is held in raised or lowered position in the guide-opening l by means of a flat friction-spring l^4 , which is located in a narrow space between the slide-plate L and a raised covering plate L¹, which latter is attached at its upper and lower corners by means of rivets l^4 to the straight inner plate of the casing G, as shown in Fig. 4, and also serves to guide and retain the slide-plate L more firmly in

position. To the outside of the slide-plate is applied a transverse push-plate N which is provided with a longitudinal slot n that moves on headed pins n^1 of the slide-plate, as shown clearly in Figs. 5 and 7, said push-plate being of greater length than the thickness of the door so as to extend to one side or the other of the same, according as the plate is pushed inwardly or outwardly on the headed guide-pins. A recess n^2 is arranged in the door adjacent to the transverse push-plate so as to permit the raising or lowering of the same, together with the slide-plate L, by lifting or lowering the projecting end of the push-plate either by foot or by hand. The slide-plate is adjusted by the push-plate in raised or lowered position in the guide-opening l of the inner straight wall of the casing G and retained by the pressure of the flat spring l^2 in raised or lowered position.

The curved portions at the upper and lower ends of the slide-plate L project into the path of the longer lugs h^2 and h^4 of the lower and upper spring-holders H, H¹ when the slide-plate L is in its lower position, as shown in Fig. 8, so as to close the door by the tension of the coil-spring after it has been opened in one direction or the other. But when the slide-plate L is raised by lifting the push-plate N while the door is in closed position, the curved portions are moved above the longer lugs out of the path of the longer lugs so as not to be engaged by the same, and permit thereby the disconnection with the spring-hinge proper and the free swinging of the door to one side or the other. To restore the action of the coil-spring, the door is placed into closed position and the slide-plate pushed down again by the push-plate, so that the curved end-portions l^2 engage the lower lugs and call thereby the coil-spring into action. The shifting transverse motion of the push-plate serves for the purpose of preventing the marring of the door-casing by the forcible contact of the opposite end of the push-plate with the door-casing. This marring is avoided by the pushing over of the push-plate upon contact with the casing at either side, so that one end projects always at that side of the door which is away from the casing and is placed thereby into a position for more readily permitting the shifting of the push-plate and the movement of the slide-plate in upward or downward position. As the setting of the slide-plate L is best accomplished by the foot exerting a raising or lowering action on the push-plate, a metallic covering plate (not shown) may be arranged at both sides of the door so as to prevent scratching or marring of the door by the foot. The slide-plate L can further be used for holding back or locking the door in open position in one or the opposite direction to the door-casing, by pushing down

the push-plate and slide-plate when the door is in fully open position, so that the back-edge of the upper or lower curved end-portion is placed into the path of or in abutment with the back-edge of the upper or lower longer lugs h^4 or h^2 , thus confining the lugs h^2 and h^4 between the inner wall of the stationary frame F and the back-edge of the upper or lower curved portion of the slide-plate, thereby locking the door in open position to the right or left, as may be desired.

The operation of my improved spring-hinge is the same as the operation of the spring-hinge described in my prior patent referred to as regards the action of the spring-hinge and the return of the door from its open into its closed position by the coil-spring which is set to increased tension in opening the door and returns the door to its closed position, except that the longer lugs, instead of abutting on the rounded outer wall of the casing G, in this present improvement abut upon the curved upper and lower portions of the slide-plate of the straight inner wall of the casing G. In addition to this ordinary working of the door under the influence of the coil-spring, the door can be released from the action of the spring by shifting the slide-plate when the door is in closed position by means of the push-plate into raised position, so that its lower end clears the long lug of the lower spring-holder. In this position of the slide-plate, the lower end of the slide-plate is adapted to clear and pass over the lug, so that the door can be moved on its pivots around the stationary frame until the back-edge of one of the long lugs strikes or abuts upon the rounded outer wall of the casing G, or until the door D abuts upon the door-casing D¹, without setting the coil-spring to tension. This free swinging of the door is very useful in many cases when the door is to be placed in open position in either direction in the casing. When it is desired to reestablish the action of the coil-spring on the door, the door is first brought to closed position and the slide-plate is moved down by the push-plate so that its projecting and raised portions reengage with the lugs of the upper and lower spring-holders, as shown in Fig. 6, whereby the action of the coil-spring on the door is reestablished. In addition to the free swinging of the door, the slide-plate enables also the holding back of the door in open position, which is accomplished by moving the slide-plate into downward position after the door is placed in open position against either side of the casing, whereby the door is held locked in open position at the casing on either side by the abutting of the back-edge of the lower or upper curved end-portions of the slide-plate upon the back-edge of the lower or upper longer lugs and the abutting of the

door upon the casing. The spring-hinge offers therefore, in addition to its ordinary use as a spring-hinge, the advantages of releasing the door entirely from the action of the coil-spring for its free motion in either direction, and also of providing the hold-back feature when the door is to be held in open position in one or the opposite direction, whereby the usefulness of this class of door spring-hinge and its adaptability for different uses is enhanced. It is obvious that the transverse movement of the push-plate as well as the separate push-plate can be dispensed with by providing integral side-extensions on the slide-plate and raising or lowering the latter by means of said extensions.

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

1. The combination, with a spring-hinge of the class described, comprising a casing, a stationary frame in said casing, spring-holders having shorter and longer lugs, and a coil-spring for said spring-holders, of a slide-plate guided in the inner wall of the casing and provided with curved end-portions at its upper and lower ends, and means for raising or lowering the slide-plate so that its end-portions engage with or clear the longer lugs of the spring-holders for the purpose of placing the force of the coil-spring on the casing of the hinge or for holding the door in open position at one or the other side of the door-casing.

2. The combination, with a swing-door pivoted to the sill or floor and upper portion of the casing, of a spring-hinge at the lower rear-corner of the door, said spring-hinge having a stationary frame, a casing swinging around the same, a coil-spring, and holders for said spring provided with shorter and longer lugs, the shorter lugs engaging the stationary frame, a slide-plate guided in the inner wall of said casing, and means for raising or lowering the slide-plate so as to permit it to engage one side or the other of the longer lugs of the spring-holders for actuating the door by the spring-hinge, locking the door into open position on either side of the casing, or disconnecting it from the spring-hinge.

3. In a spring-hinge of the type described, the combination, with a casing mortised in the door and comprising spaced inner and outer walls, of a stationary frame in said casing having spaced outer and inner walls, a pintle passing centrally through said casing and stationary frame, a coil-spring in said frame, spring-holders connected with the ends of said coil-spring and rotatable about said pintle, said spring-holders having diametrically disposed shorter and longer lugs, the shorter lugs engaging the outer wall of the frame, a slide-plate guided

on the inner wall of the casing, and a transverse push-plate engaging said slide-plate and producing the raising or lowering of the same so that its end-portions engage with or clear the longer lugs of the spring-holders.

4. In a spring-hinge of the type described, the combination, with a casing mortised in the door and comprising spaced inner and outer walls, of a stationary frame in said casing having spaced outer and inner walls, a pintle passing centrally through said casing and stationary frame, a coil-spring in said frame, spring-holders connected with the ends of said coil-spring and rotatable about said pintle, said spring-holders having diametrically disposed shorter and longer lugs, the shorter lugs engaging the outer wall of the frame, a slide-plate guided in the inner wall of the casing and provided with curved and offset end-portions, and a transverse, laterally movable push-plate guided on said slide-plate for producing the shifting of the push-plate into a position flush with the door and the raising or lowering of the slide-plate by the push-plate for engaging or clearing the longer lugs of the spring-holders.

5. In a spring-hinge of the type described, the combination, with a casing mortised in the door and comprising spaced inner and outer walls, of a stationary frame in said casing having spaced outer and inner walls, a pintle passing centrally through said casing and stationary frame, a coil-spring in said frame, spring-holders connected with the ends of said coil-spring and rotatable about said pintle, said spring-holders having diametrically disposed shorter and longer lugs, the shorter lugs engaging the outer wall of the frame, a slide-plate guided on the inner wall of the casing and comprising a flat middle portion, curved and offset end-portions and shoulders between the flat portion and the end-portions, and a transverse laterally shifting push-plate guided on said slide-plate for producing the raising or lowering of the same for engaging or clearing the longer lugs of the spring-holders.

6. In a spring-hinge of the type described, the combination, with a casing mortised in the door and comprising spaced inner and outer walls, of a stationary frame in said casing having spaced outer and inner walls, a pintle passing centrally through said casing and stationary frame, a coil-spring in said frame, spring-holders connected with the ends of said coil-spring and rotatable about said pintle, said spring-holders having diametrically disposed shorter and longer lugs, the shorter lugs engaging the outer wall of the frame, a slide-plate guided in a longitudinal recess of the inner wall of the casing and provided with curved and offset end-portions extending over the upper and lower end-portions of the inner wall of the

casing, a laterally sliding push-plate guided
on said slide-plate for raising or lowering
the slide-plate, and a friction-spring retained
on said slide-plate for holding the same in
5 raised or lowered position so that its end-
portions engage with or clear the longer lugs
of the spring-holders.

In testimony, that I claim the foregoing
as my invention, I have signed my name in
presence of two subscribing witnesses.

EMIL BOMMER.

Witnesses:

PAUL GOEPEL,
FANNIE FISK.