

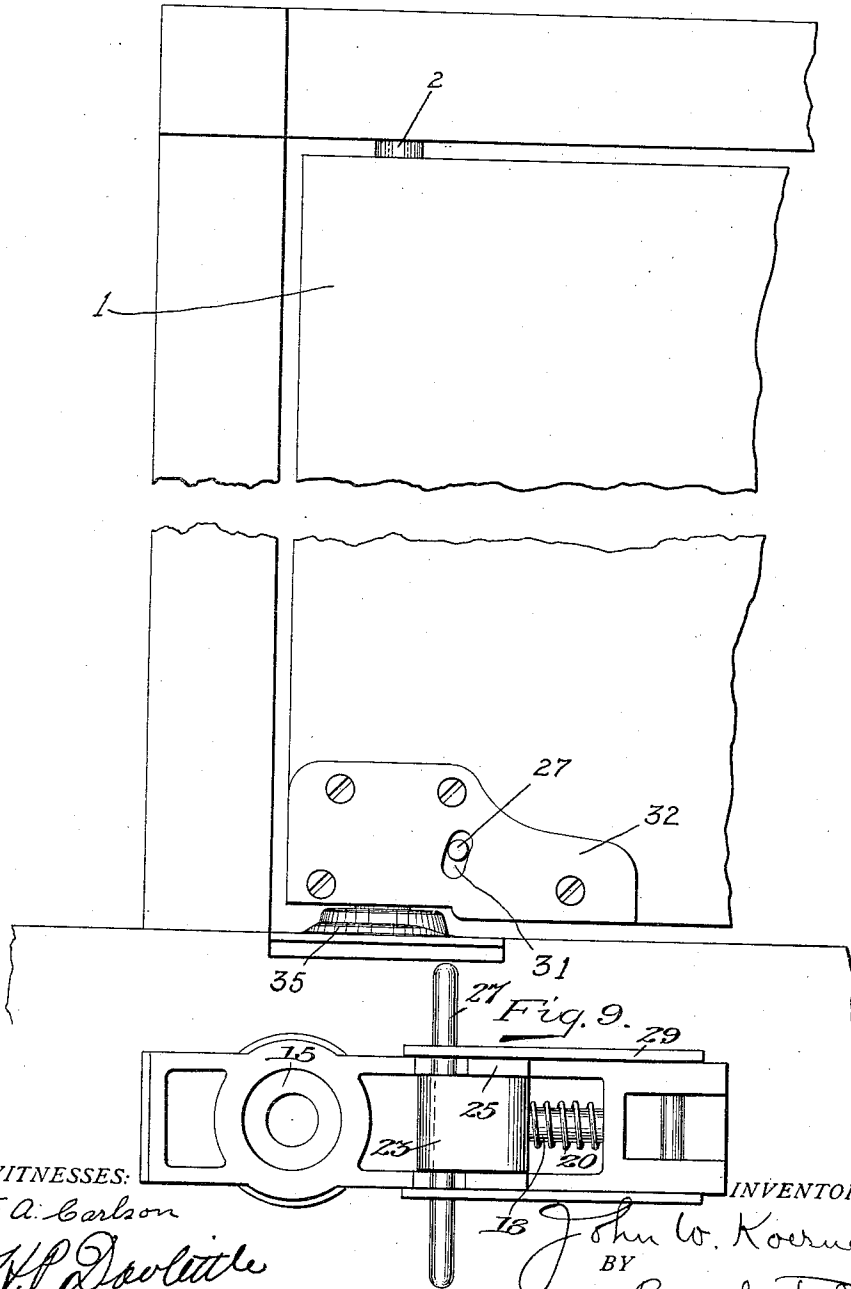
J. W. KOERNER.
SPRING HINGE.
APPLICATION FILED JULY 14, 1911.

1,065,145.

Patented June 17, 1913.

4 SHEETS—SHEET 1.

Fig 1



WITNESSES:

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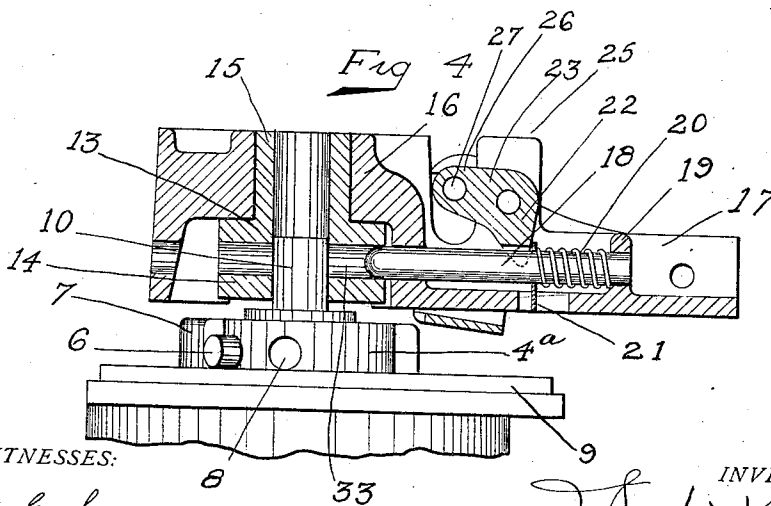
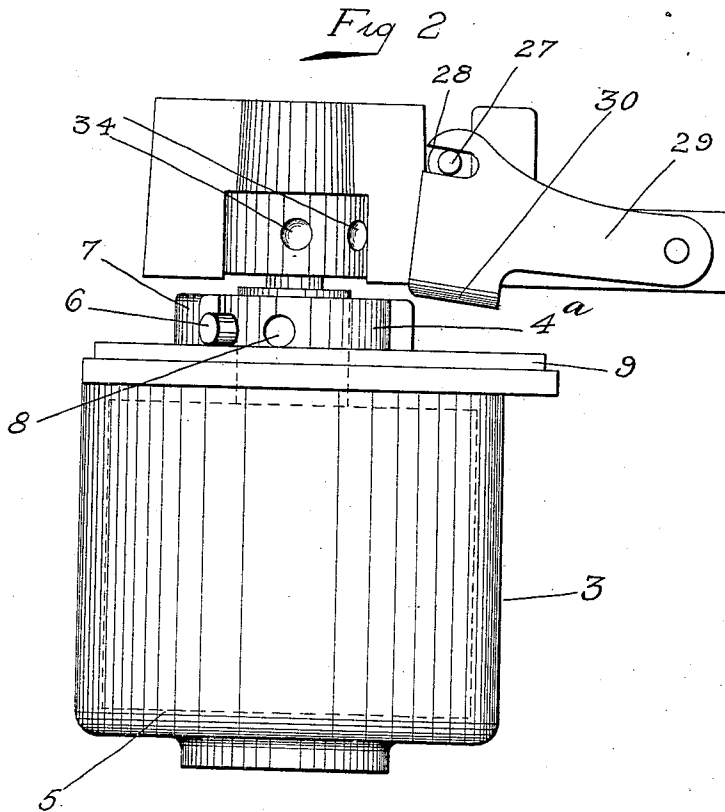
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4 SHEETS—SHEET 2.



WITNESSES:

F. A. Carlson
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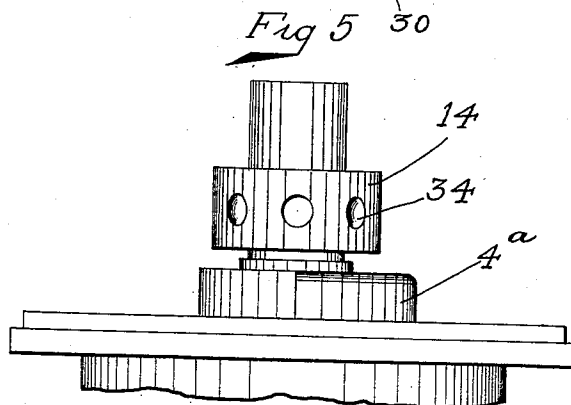
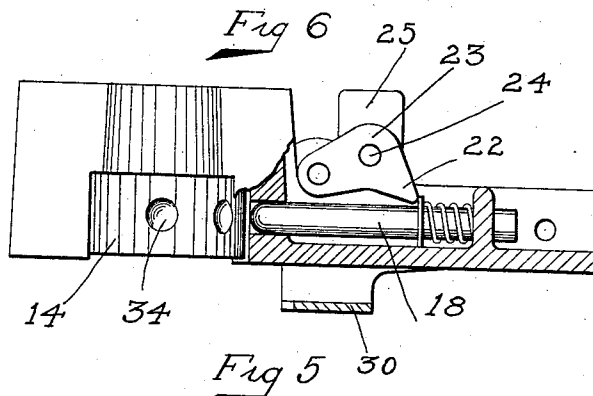
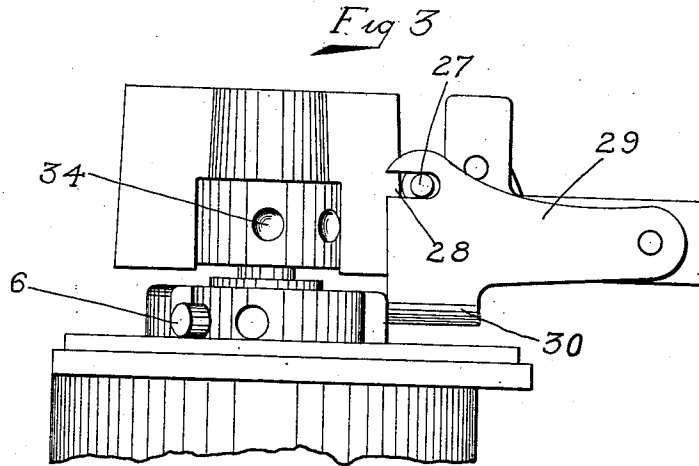
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 APPLICATION FILED JULY 14, 1911.

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4 SHEETS—SHEET 3.



WITNESSES:

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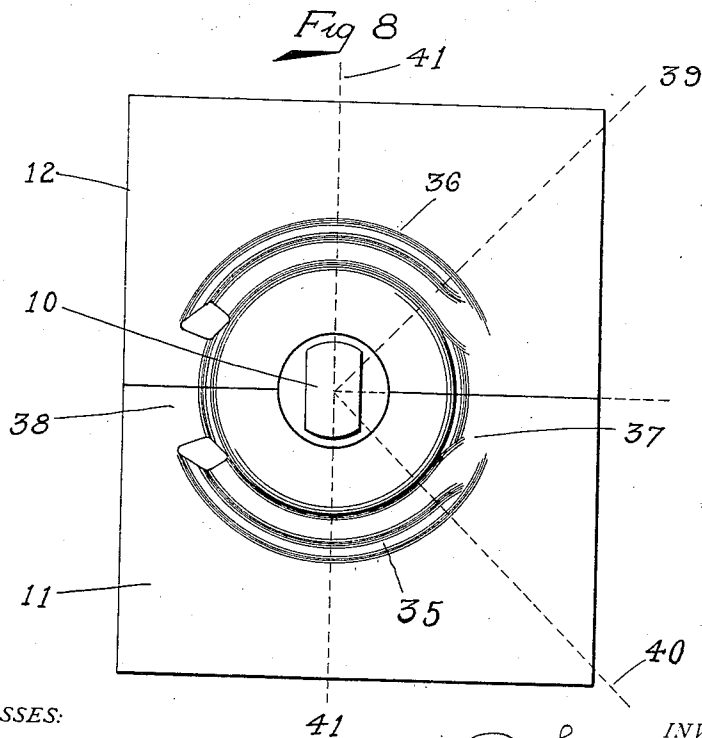
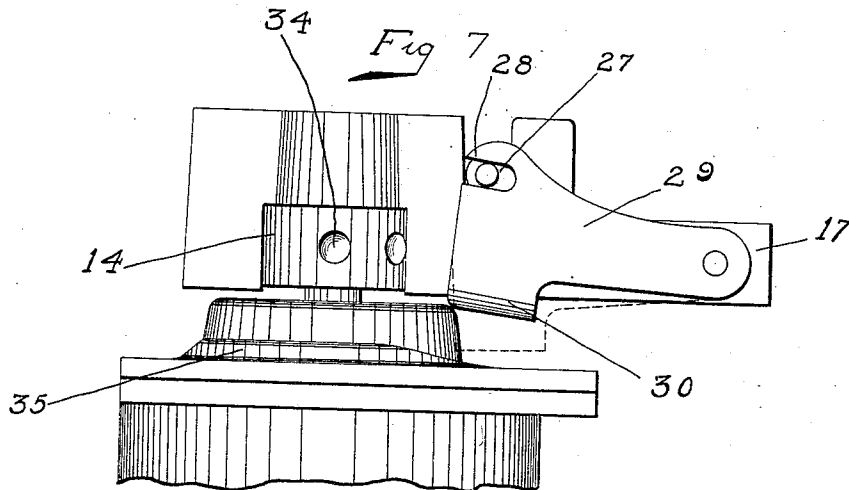
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1,065,145.

Patented June 17, 1913.

4 SHEETS—SHEET 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN W. KOERNER, OF SYRACUSE, NEW YORK, ASSIGNOR TO SARGENT & COMPANY,
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SPRING-HINGE.

1,065,145.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed July 14, 1911. Serial No. 638,463.

To all whom it may concern:

Be it known that I, JOHN W. KOERNER, a citizen of the United States, residing in the city of Syracuse, county of Onondaga, in the State of New York, have invented new and useful Improvements in Spring-Hinges, of which the following is a full, clear, and exact description when taken in connection with the accompanying drawings.

My invention relates to spring door hinges, and its objects are particularly to improve the construction of the mechanism employed for holding the door open at certain predetermined positions to which it may be adjusted, to avoid danger of injury to the return spring, and to improve the general construction of a device of this type.

To these ends, my invention is embodied in preferable form in the device hereinafter described and illustrated in the accompanying drawings.

In these drawings, Figure 1 is a side view in elevation of a door showing the device applied thereto; Fig. 2, an enlarged view in side elevation of the device showing the movable stop operating member in inoperative position and with the cap removed; Fig. 3, a view similar to Fig. 2, partly broken away, showing the operating member in depressed operative position; Fig. 4, a detail vertical section with the door locked to the return member and with the locking bolt operating member in inoperative position; Fig. 5, a detail side elevation of the upper part of the pivot pin and of the socket sleeve mounted on the door; Fig. 6, a detail side view partly in vertical section of the socket sleeve and the locking bolt adapted to engage the same, showing the operating member for said locking bolt depressed into operative position with the locking bolt withdrawn from locking position; Fig. 7, a view similar to Fig. 3, but showing the cap in place, and the bolt operating member in full lines in inoperative position, and in dotted lines in operative position; Fig. 8, a top plan view of the casing in which the pivot pin is mounted with the cap plate in place; and Fig. 9, a detail plan view looking down on top of the locking bolt and the casing.

In all figures, similar letters of reference represent like parts.

Referring to the drawings, the door 1 is shown as provided at the upper end with a

suitable pin and socket connection of any appropriate type, denoted generally by reference character 2.

The hinge embodying my invention comprises a casing 3 fixed in the floor or door sill beneath the door 1 and having rotatably mounted therein a pivot pin or spindle 10 acted on by a strong coiled spring of well known form (not shown). The spring is double acting so as to return the pintle or pivot pin to a predetermined position when said pin is turned in either direction, for which purpose the device includes among other parts a disk 4^a, a stop pin 6 and an upwardly projecting flange 7 on the top of the casing, substantially as shown in the patent to Sargent and Page, #839,435, December 25, 1906.

The pin 6, which serves to clutch the disk 4^a to the pivot pin or stem, is insertible in any of a number of sockets 8 provided on the periphery of said disk to permit the adjustment of the closing spring in an obvious manner. The flange 7 is carried by, and preferably integral with, a removable plate 9 secured to the casing. Two removable surface plates 11, 12, (Fig. 8) are fitted over the plate 9 and are provided with recesses at their meeting edges to engage a collar on the pivot pin 10, as shown.

A sleeve 13 provided at its lower part with an angular opening is fitted over an angular portion at the upper end of the pivot pin or spindle in such a manner that the sleeve and pin are locked together against relative angular movement. The sleeve 13 has a lower hub portion 14 and an upper stem portion to fit rotatably within a socket formed in a sleeve 16 fixed to the door. By this connection, the sleeve 16 and door are permitted a rotary or oscillatory movement around the stem 15 on the hub 14. The sleeve 16 consists preferably of a single piece of metal and from the socket part extend parallel arms 17. These arms constitute a housing in which is slidably mounted a locking bolt or detent 18 having one end projecting through and guided by a cross bar 19, and having its other end normally pressed toward the hub 14 by a spiral spring 20 bearing against said cross bar and against a head 21 secured to the locking bolt.

Adapted to bear against the head 21 are the depending portions of a forked arm 22

of a trip preferably having the form of a bell crank lever 23 pivoted on a pin 24 mounted in arms 25 extending upwardly from the arms 17. The inner arm 26 of this bell crank lever has secured thereto an operating pin 27 extending transversely of the bell crank and casing and adapted to project on either side of the door, so as to constitute projecting means which may be depressed by the foot in order to operate the trip and retract the spring pressed bolt or detent. The projecting ends of the pin 27 engage loosely, elongated open slots 28 formed in arms 29 of a loosely swinging frame which has a connecting bar 30 extending under the casing. The ends of the pin 27 project through elongated curved slots 31 of protective and ornamental face plates 32 secured to the sleeve 16 and to the door. These plates 32 preferably have a frictional bearing against the rotatable hub 14 for the purpose of retarding the movement of the door from one point of adjustment to another.

In the normal or closed position of the door, the locking bolt is adapted to be protracted into the deep locking socket or seat 33 preferably extending through the shell of the hub 14 of the sleeve 13. The hub 14 is provided on each side of the hole 33 with a series of shallow conical sockets or seats 34 which are also adapted to receive the end of the locking bolt for the purpose of yieldingly and releasably engaging said bolt so as to constitute separated locking points at which the door may be set open on either side of the door sill and from which points the door may be moved merely by pressure on the door without the necessity of actuating the bolt operating member.

Projecting upward from the respective cover plates 11 and 12, are curved and substantially semi-circular vertical flanges 35, 36, separated at their ends to leave spaces 37, 38. These flanges constitute stop means cooperating with the bar 30 of the stop frame connected to the operating pin 27.

The operation of the device is as follows: When the spindle or pivot pin 10 is held in its normal position with the stop pin 6 against the end of the stop flange 7 the socket 33 of the sleeve hub 14 will be held in alinement with the door sill and in such position that the door if left free will by the engagement of the locking bolt 18 with the socket 33 be held in closed position. Should the door be pushed open in either direction, the engagement of the locking bolt with the hub will rotate the pivot pin against the tension of the spring and upon the release of the door such spring will automatically return the door to closed position. Should it be desired to set the door ajar at the angle indicated for example by the line 39 or 40 in Fig. 8, the operating member 27 is de-

pressed by the foot so as to rock the bell crank connecting member 23 on its pivot and thus retract the locking bolt 18 and the door is then moved with the operating member held down until the stop frame bar 30 is carried above the flange 35, whereupon the pin is released and the movement of the door continued until the bolt is carried to the first socket 34. The bolt or detent will then be automatically protracted into said socket by its spring 20 thereby holding the door ajar at the angle indicated by either the line 39, or the line 40. In the closed position of the door the stop bar 30 is alined with the space 37 and hence the operating member may be depressed, but as soon as the stop bar rides over the flange 35, the operating pin 27 will be prevented from moving downward sufficiently to retract the bolt. Hence it is impossible to disconnect the door from the returning means when the door is fully or partially open, whereby a violent return of the pivot pin and spring is effectively prevented. The improved hinge possesses marked advantages over those hinges in which the door may be disconnected from the returning means when the former is in its open position, for under such conditions the shock produced by the sudden release of the spring is likely to break the spring or otherwise seriously injure the mechanism. The door may be moved from this position to fully open position indicated by the line 41 or moved back to closed position by pressing against the door, whereupon the locking bolt will be automatically released from its yielding engagement with the shallow socket and the door may be moved until the bolt engages the shallow socket corresponding to the fully open position or to the central locking socket.

It will be seen that the door can be disengaged from connection with the return member only in its closed position and only by depressing the foot actuated operating member while it may be moved from the fully open, or partly open, positions only by positive pressure against the door itself.

It will therefore be understood from the foregoing description that by my invention I provide a spring pressed pivotal support for the door, normally held in a position to hold the door closed, there being a positive locking connection to lock the door and the support together when they are in this position. This locking connection is releasable only when the door is closed, as previously explained, but after the door and its pivotal support have been released from each other, they can be locked together again automatically by merely moving the door into a predetermined position. After the door has been released from its spring actuating means, it will be reengaged automatically therewith when the door is opened to a cer-

tain extent, but in case the engagement between the parts is a yielding one which can be released by merely pushing on the door, but which under ordinary conditions holds the door with sufficient firmness in the desired adjustment, either fully or partially open. Of course, this yielding frictional engagement between the door and its pivotal support can be effected as soon as the positive locking connection is released, and it is not necessary to manipulate the locking bolt by means of the foot or by any special manipulation, in view of the fact that the locking bolt or its equivalent normally occupies a position in which it will move into yielding engagement with the support as the door is swung on its pivot in either direction.

I wish to have it understood that my invention is not limited in all of its aspects to a hinge in which the spindle casing is located in the floor, as certain features of my improvements are applicable to hinges in which the spindle casing is carried by the door. The foregoing description is necessarily a detailed one in so far as it concerns the particular embodiment of the invention selected for illustration and description, and I have not attempted to illustrate and describe the numerous modifications of the construction which may be adopted within the scope of the invention as defined in the claims.

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

1. The combination with a door, of a spring hinge to normally hold the same closed, having a member connected positively with the door but releasable therefrom, and fixed means beneath the lower edge of the door to prevent the reconnection of said parts when the door is open; substantially as described.

2. The combination with a door, of a spring hinge having a spring pressed rotatable member mounted in the floor, means to connect said member positively but releasably with the door to hold the same closed, and means to prevent the reconnection of said parts when the door is open; substantially as described.

3. The combination with a door, of a spring hinge having a spring pressed rotatably mounted member, means to connect said member releasably to the door to hold the same closed, an operating device for said means, and a fixed controlling device for said operating device, over which the latter travels; substantially as described.

4. The combination with a door, of a spring hinge at the lower edge of the door to normally hold the same closed, having a releasable locking connection with the door, an operating member for said connection,

and a stop device for said operating member located beneath the edge of the door; substantially as described.

5. In a spring hinge, an actuating member, and a releasable positive locking device for the connection of said member with the door, which engages the door yieldingly as the latter is released and opened to a certain extent; substantially as described.

6. In a spring hinge, the combination of a spring pressed supporting member, a member for application to the door, and a locking device carried by one of said members for locking said members positively together in one position, or engaging them yieldingly in another position; substantially as described.

7. A spring hinge comprising a spring pressed member for pivotally supporting the door, releasable means for connecting the door with said member, and means extending under the edge of the door to prevent the disconnection of said door and member when the door is open; substantially as described.

8. The combination with a door, and a spring pressed pivotal support for the door mounted in the floor, of a locking device carried by one of said parts, and means extended upward from the floor to prevent the disconnection of said parts except when the door is in closed position; substantially as described.

9. The combination with a door, and a spring pressed pivotal support for the same mounted in the floor, of a casing for said support, a locking connection between the door and the support, and means carried by said casing to prevent the release of said locking connection when the door is open; substantially as described.

10. The combination with a door, and a pivotal support therefor normally holding the door closed, of a locking device carried by one of said parts to lock them together positively, said device being releasable from its positive locking position, and having a further position in which it frictionally and yieldingly engages one of the parts to hold the door in a predetermined open position; substantially as described.

11. The combination in a spring hinge, of a spring pressed pivotal support for the door, a member rotatable with respect to said support, a locking device carried by one of said parts to lock them together positively, said device being operable when released from its positive locking position to hold the door yieldingly in a predetermined open position, and means to prevent the release of said locking device from its positive locking position except when the door is closed; substantially as described.

12. In a spring hinge, the combination of a spring pressed pivotal support for the

door, a door attaching member rotatable with respect to said support, a casing in which the support is journaled, a locking device carried by said member and having one position in which it locks the door positively to said support, and another position in which it locks the door and support yieldingly together, and means carried by said casing for preventing the release of said locking device from its positive locking position when the door is open; substantially as described.

13. In a spring hinge, the combination of a casing, a spring pressed pivotal door support journaled therein, a member rotatable on said support, a locking device carried by said member, and a flange on the top of said casing to control the operation of said locking device; substantially as described.

14. In a spring hinge, the combination of a casing, a spring pressed pivotal support for the door journaled therein, a member rotatable on said support, a locking device carried by said member, a depressible operating device for said locking device, and a flange on said casing to block said operating device but having an interruption to permit the depression of said device when the same occupies a predetermined position with respect to the casing; substantially as described.

15. In a spring hinge, the combination of a pivotal support for the door, a door attaching member rotatable relatively to said support, one of said parts having a deep socket and a shallow socket, and a locking bolt carried by the other part and engageable with the deep socket to lock the door positively to said support, and engageable with the shallow socket to lock the door yieldingly to said support; substantially as described.

16. In a spring hinge, the combination of a pivotal spring pressed support for the door, a door attaching member rotatable relatively to said support, one of said parts having a hub with a deep socket and a series of shallow sockets, and a spring pressed locking bolt on the other part cooperating successively with said sockets as the door is turned on its axis in either direction; substantially as described.

17. In a spring hinge, the combination of a supporting pin, a member for attachment to the door, a separate intermediate member detachably but positively connected with said pin to rotate therewith, and means for detachably securing said door member to said intermediate member in a plurality of

angular adjustments about said pin; substantially as described.

18. In a spring hinge, a supporting and actuating member, a member for attachment to the door, a locking device for positively but releasably connecting said members, means to operate said device to release said members, and means carried by one of said members for engaging said locking device yieldingly when said members are released and moved angularly with respect to each other to a predetermined extent; substantially as described.

19. In a spring hinge, the combination with the hinged members and spindle therefor, of a double acting spring connecting said spindle to one of said hinge members, a detent for connecting said spindle and the other of said hinged members, one of said parts having relatively deep and shallow seats arranged to be engaged by said detent to hold the door in closed and open positions, respectively, and a trip for disengaging said detent from said relatively deep seat, substantially as described.

20. In a spring hinge, the combination with the hinged members and spindle therefor, of a double acting spring connecting said spindle to one of said hinge members, a detent for connecting said spindle and the other of said hinged members, one of said parts having relatively deep and shallow seats arranged to be engaged by said detent to hold the door in closed and open positions respectively, a trip for disengaging said detent from said relatively deep seat, and a spring for automatically shifting said detent into engagement with said seats, substantially as described.

21. In a spring hinge, the combination with the hinged members and spindle therefor, of a double acting spring for connecting the spindle to one of the hinged members, a detent mounted on the other hinged member, said spindle having relatively deep and shallow seats arranged to be engaged by said detent to hold the door in closed and open positions respectively, a trip for disengaging said detent from said relatively deep seat and a spring for automatically shifting said detent into said seats, substantially as described.

In witness whereof, I have hereunto set my hand on the 8th day of July, 1911.

JOHN W. KOERNER.

Witnesses:

C. HERMAN SCHRADER,
GILES B. EVERSON.