

No. 640,178.

Patented Jan. 2, 1900.

J. W. CURRIER.

COMBINED SPRING HINGE AND CHECK.

(Application filed Jan. 17, 1896.)

(No Model.)

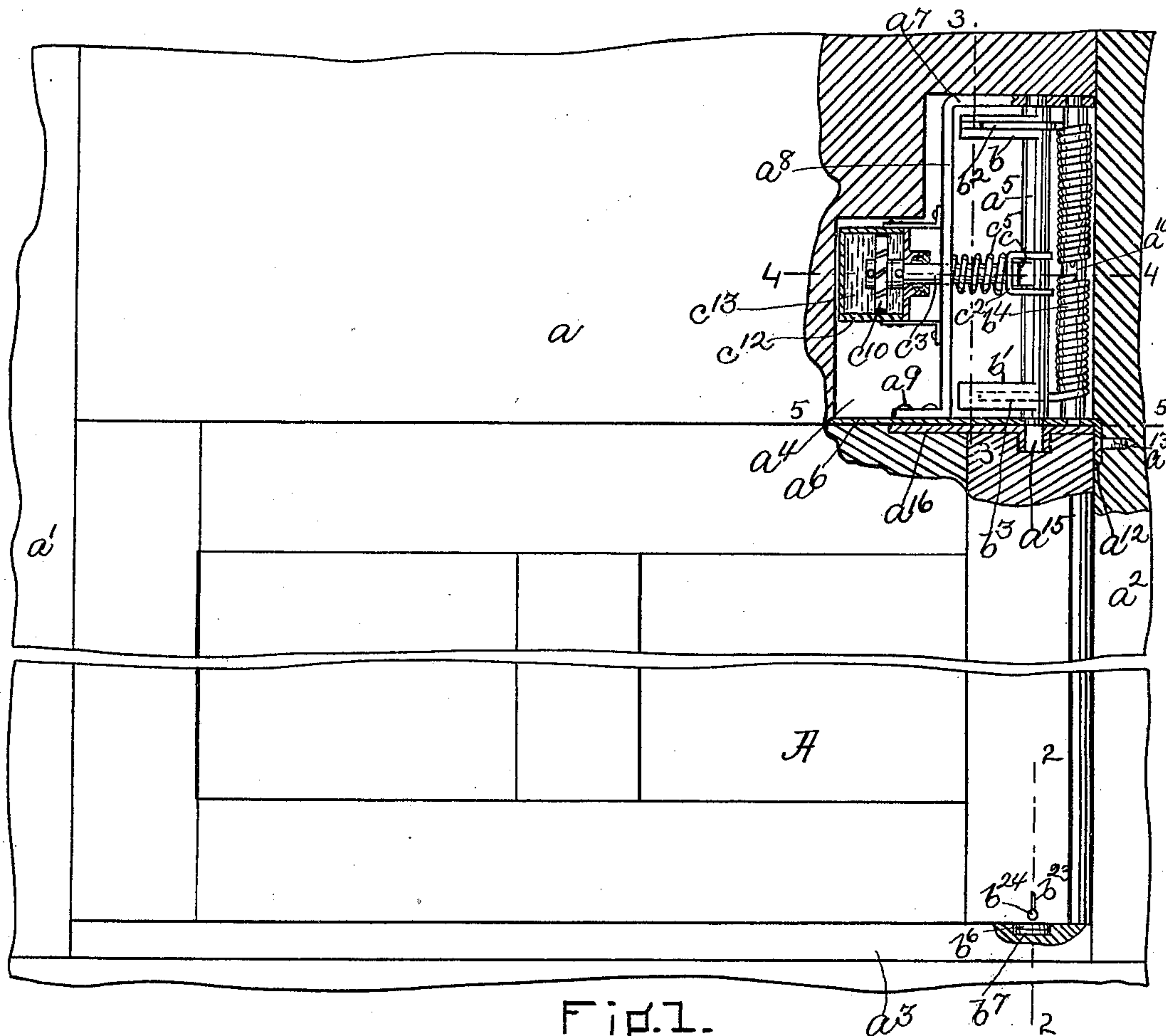


Fig. 1.

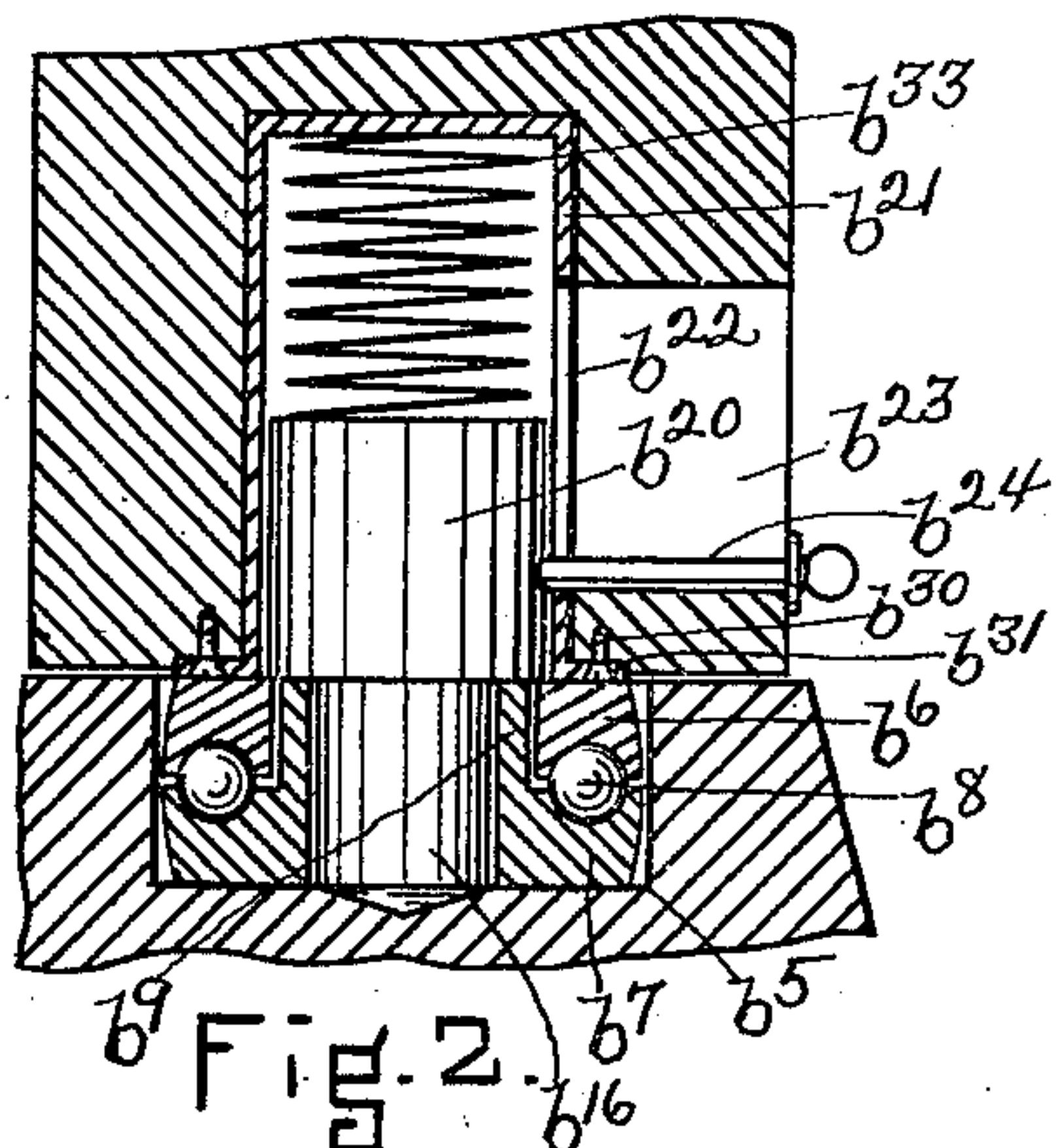


Fig. 2

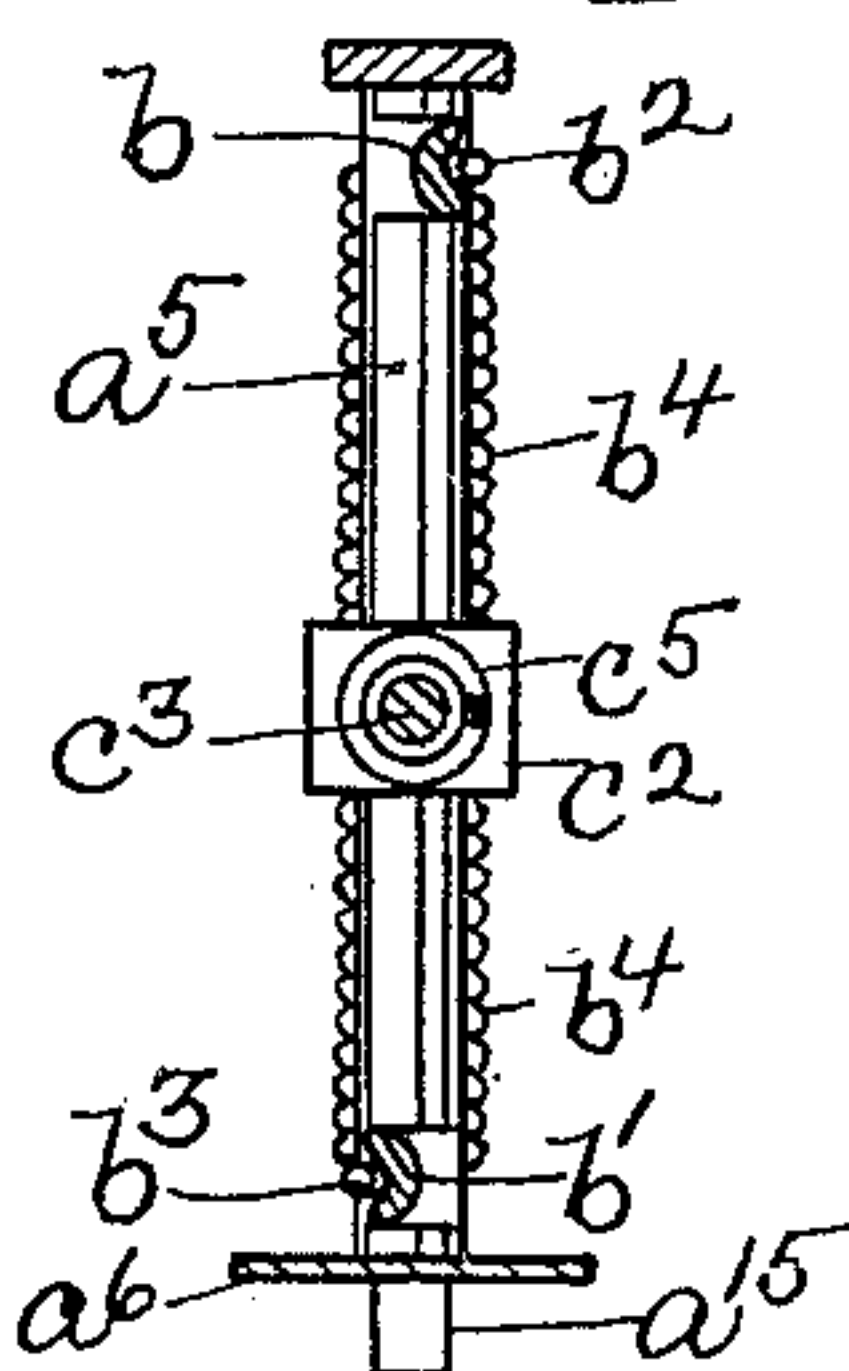


Fig. 3.

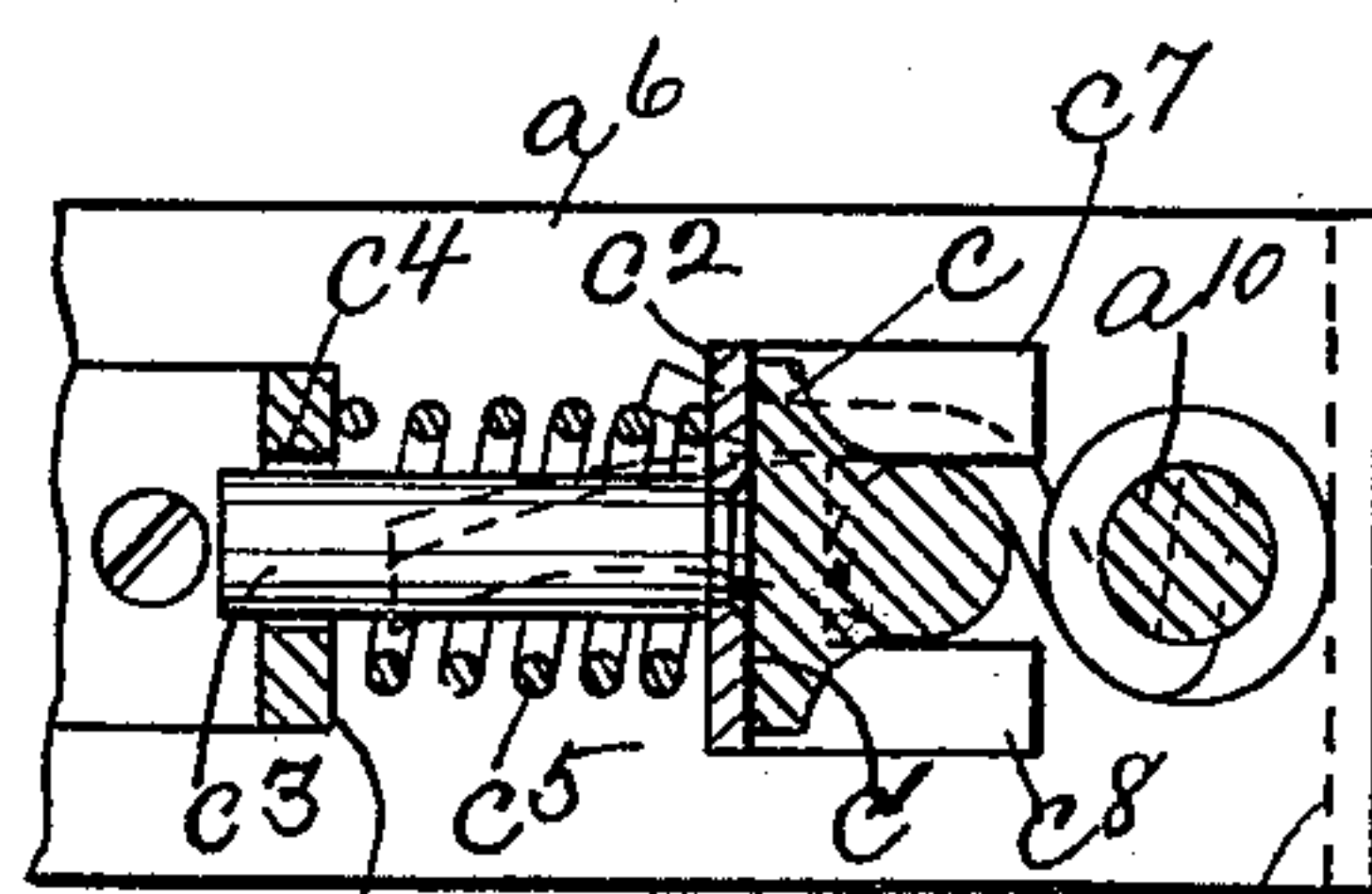
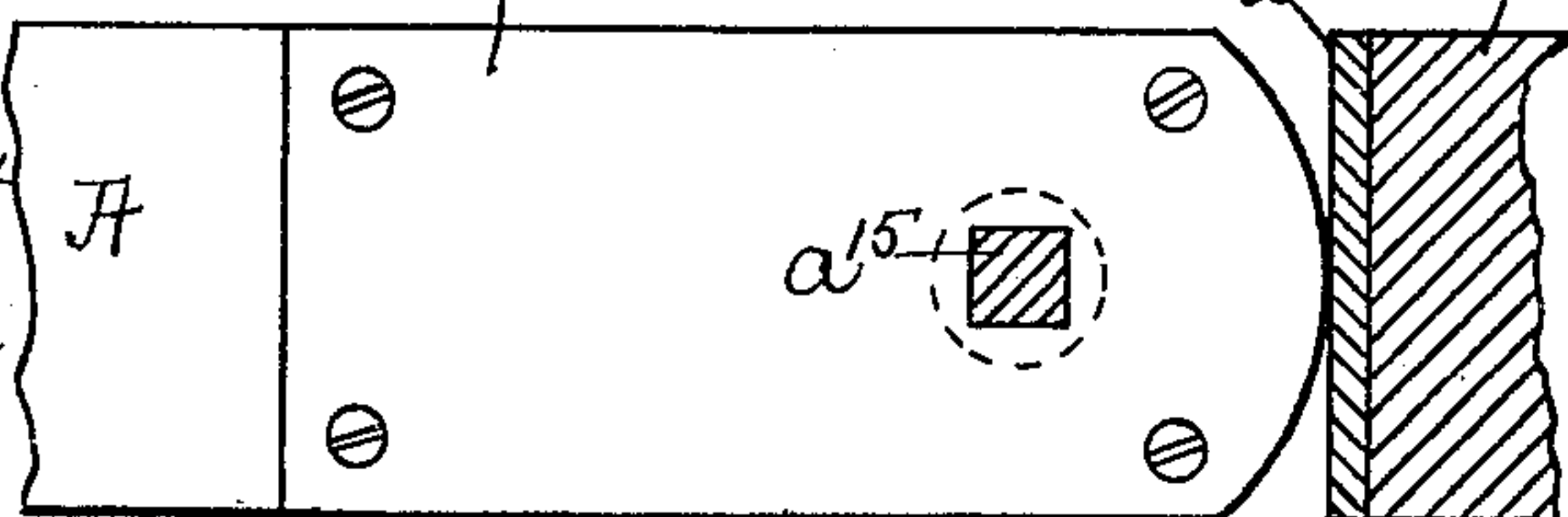


Fig. 4. a'^2



Figs.

WITNESSES.

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JOHN W. CURRIER, OF LOS ANGELES, CALIFORNIA.

COMBINED SPRING HINGE AND CHECK.

SPECIFICATION forming part of Letters Patent No. 640,178, dated January 2, 1900.

Application filed January 17, 1896. Serial No. 575,832. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. CURRIER, residing in Los Angeles, county of Los Angeles, and State of California, have invented an Improvement in a Door Hinge and Check, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to doors of that class known as "swinging" doors, and has for its object to provide the same with a simple and efficient hinge of a construction, as will be described, whereby the hinge may be concealed from view.

15 In accordance with this invention the hinge proper is inserted into a suitable socket in the casing above the door and is provided with a pintle or pivot rod having its lower end fitted into a socket in the top of the door, the bottom of the door being preferably supported on ball-bearings, as will be described.

20 The hinge for the door is provided with a centering device and preferably with a retarding device, as will be described.

25 These and other features of this invention will be pointed out in the claims at the end of this specification.

30 Figure 1 represents in elevation, with parts broken out, a door provided with a hinge embodying this invention; Fig. 2, an enlarged sectional detail on the line 2 2, Fig. 1; Fig. 3, a section of the hinge on the line 3 3, Fig. 1; Fig. 4, a horizontal sectional detail on the line 4 4, Fig. 1; and Fig. 5, a sectional detail looking down on the line 5 5, Fig. 1, the section being on an enlarged scale.

35 Referring to Fig. 1, A represents a door which may be of any suitable or desired construction and which is hung vertically in its casing to swing in the arc of a circle on both sides of the casing.

40 The door-casing may be of any suitable or desired construction, and comprises the top a , sides a' a^2 , and bottom or threshold a^3 . In accordance with this invention the top a of the door-casing is provided on its under side with a socket or pocket a^4 of a suitable depth to receive my improved hinge, which 45 comprises, essentially, a pivot pin or rod a^5 , vertically arranged and having bearings in a bottom plate a^6 and in the horizontal arm

a^7 of a bracket a^8 , secured to the bottom plate a^6 , as by screws a^9 or in any other suitable or desired manner, the free end of the horizontal arm a^7 being united to the bottom plate a^6 by a post or upright a^{10} , which is secured to the arm a^7 and the said plate against rotation in any suitable or desired manner. The bottom plate a^6 is designed to be secured to the door-casing, so that its under surface will be substantially flush with the under side of the top a of the said casing, and preferably the said bottom plate will be provided with a depending flange a^{12} , which in practice is fitted into a suitable mortise in the side a^2 of the said casing. The plate a^6 and its flange a^{12} may be secured to the door-casing by suitable screws, only one, a^{13} , of which is shown in Fig. 1.

70 The rod or pin a^5 is designed to be connected to the door A, so as to move the same, and as herein shown the said rod projects through the plate a^6 and is provided with an extension a^{15} , made square or angular in cross-section to fit into a correspondingly-shaped socket in a plate a^{16} , screwed or otherwise suitably fastened on top of the door A. The rod or pin a^5 is provided above the bottom plate a^6 with preferably two arms b b' , preferably crescent-shaped in cross-section (see Fig. 3) and curved in opposite directions, the said arms being engaged by the ends b^2 b^3 of a coiled spring b^4 , encircling the stationary post a^{10} and practically divided at its center, the center ends of the two halves of the spring being fastened to the post a^{10} . The arm or end b^2 of the coiled spring acts on the arm b to turn the rod a^5 in one direction, and thereby move the door A in the same direction, and the arm or end b^3 of the said spring acts on the arm b' to turn the rod a^5 in the opposite direction, and thereby move the door in the opposite direction from its movement by the spring arm or end b^2 . The door A may be hung at its lower end in any suitable or desired manner to conform to the pivot-rod a^5 . Preferably the said door will be hung after the manner herein shown and as will now be described.

100 In the preferred manner of hanging or supporting the lower end or bottom of the door the threshold a^3 is provided with a pocket or socket b^5 , (see Fig. 2,) in which is located a

ball-bearing for the door, the said bearing consisting of two annular members $b^6 b^7$, provided with annular grooves on their adjacent faces, which grooves are substantially semi-circular in form and receive balls b^8 . The lower member b^7 is provided with a central bore or opening and with an annular hub b^9 , extended up substantially flush with the upper surface of the upper member b^6 , which is represented as a ring encircling the hub b^9 .

The upper member or ring b^6 forms the movable member of the ball-bearing and takes or supports the weight of the door A, which is provided, as herein shown, with a centering-pin b^{16} , fitted into the hub b^9 of the lower or stationary member of the ball-bearing, the said pin having an enlarged head b^{20} , which enters a socket in the under edge or bottom of the door, the said socket preferably having fitted into it a metal shell b^{21} , provided with a vertical slot b^{22} , through which and a slot b^{23} in the door extends a pin b^{24} , which forms a handle by which the head b^{20} may be carried up into the shell b^{21} , so as to remove the centering-pin b^{16} from the hub b^9 , and thereby permit the door to be quickly and easily placed into or removed from its operative position. The shell b^{21} may be secured to the door by screws b^{30} , preferably inserted through suitable holes in a flange b^{31} on the said shell, and the latter preferably contains a spring b^{33} , which acts to keep the centering-pin in its hub b^9 when the door is in operative condition.

It will be understood that the ends $b b'$ of the spring b^4 act to restore the door to its normal or closed condition or position, and in order that the door may be held closed until considerable force is applied to it to open the same I have provided the hinge proper with what I prefer to call a "holding" or "centering" device, which is herein shown (see Figs. 1 and 4) as composed of two members, one member being fastened to the pivot-rod a^5 to move therewith and consisting of a lug, projection, or arm c , having a substantially flat or straight face c' , which normally engages the substantially flat or straight face of a cross bar or plate c^2 , secured to or forming part of a rod c^3 , extended through an opening c^4 in the bracket a^8 , the said rod being encircled by a spring c^5 , one end of which bears against the said bracket and the other end against the cross-bar c^2 , the latter having secured to or forming part of it at its top and bottom guide-arms $c^7 c^8$, which embrace or straddle the pivot-rod a^5 , as clearly shown in Figs. 1 and 4.

The operation of the door-hinge herein shown is as follows: When the door is pressed against on one side, it turns on the movable upper member b^6 of the ball-bearing, and by means of the angular extension a^{15} of the pivot-rod a^5 the latter is turned in the same direction, moving one of the arms $b b'$ against the action of its coöperating end or arm of the spring. When the door is moved

in one direction, the arm b may be supposed to act against the end b^2 of the spring b^4 , and when the door is moved from its closed or normal position in the opposite direction the arm b' may be supposed to act against the end b^3 of the spring b^4 . In either case the spring b^4 is placed under tension, so that when pressure is removed from the door the spring turns the pivot-rod a^5 back to its normal position and movement of the said door beyond its normal position by the spring b^4 is checked or reduced by the centering or holding device, the cross-bar c^2 of which is kept pressed against the arm c by the spring c^5 . When the door is moved by pressure applied to it, the spring c^5 is compressed by the arm or lug c acting on the cross-bar c^2 . When the door is in its normal position, the flat face of the cross-bar engages the flat face c' of the lug or arm c , and the force of this engagement is proportional to the strength of the spring c^5 , which is sufficient to hold the door-spring locked against considerable pressure, such as would be occasioned by a moderate draft of wind, thereby avoiding the swinging of the door by wind-pressure.

I have herein shown the pivot-rod a^5 as provided with two arms located near the opposite ends of the same; but it is evident that a single arm might be used with the ends of the spring acting on opposite sides of the same. In order to cause the door to return somewhat slowly to its normal or closed position and to prevent it passing by the center, I may provide a check or retarding device operatively connected to the rod c^3 . The check referred to may be of various constructions, preferably a propeller-wheel c^{10} , loosely mounted on the end of the rod c^3 within a casing or cylinder c^{12} , (see Fig. 1,) which may and preferably will contain glycerin or other liquid c^{13} , the said cylinder or casing being secured to the bracket a^8 , as herein shown.

The wheel c^{10} is caused to revolve by the movement of the rod c^3 within the cylinder c^{12} and offers a resistance to movement of the rod c^3 , which resistance retards the closing movement of the door sufficiently to prevent the spring b^4 from carrying the door beyond its center or normal position.

I claim—

1. The combination with a door-hinge consisting of a pivot-rod provided with arms and rotatable in opposite directions, a frame in which said rod is mounted to turn in opposite directions, a spring carried by said frame and engaging said arms to turn the said pivot-rod in opposite directions, means to connect the pivot-rod with the door, a spring-actuated centering or holding device extended at an angle to and engaging the said pivot-rod, substantially as described.

2. The combination with a spring-actuated pivot-rod and a frame in which said rod is mounted to turn, of a centering or holding device for the said pivot-rod consisting of a fixed member secured to the pivot-rod to move

therewith, and a movable member coöperating with the fixed member and movable bodily at an angle to the said pivot-rod, and a spring encircling the said movable member to keep
5 it in engagement with the fixed member, substantially as described.

3. A door-hinge consisting of a pivot-rod rotatable in opposite directions, a frame in which said rod is mounted to turn in said op-
10 posite directions, an upright independent of the pivot-rod and secured to said frame, a spring encircling said upright and engaging said pivot-rod to turn it in opposite directions, and an extension of the pivot-rod
15 adapted to engage a socket carried by the door, substantially as described.

4. A door-hinge consisting of a pivot-rod provided with arms *b b'* and with a lug or arm *c*, a supporting-frame for said rod, a spring
20 to act on the arms *b b'*, an angular extension *a¹⁵* on the pivot-rod adapted to engage the door, and a centering or holding device coöperating with the lug or arm *c* and consisting of a cross-bar, a rod *c⁸* and a spring to keep

the said cross-bar in engagement with the lug 25 *c*, substantially as described.

5. In a door-hinge, the combination with a pivot-rod, a frame in which said pivot-rod is mounted, a spring carried by said frame and means for operatively connecting said spring 30 with the pivot-rod, of a centering or holding device consisting of a fixed member secured to the pivot-rod, and a movable member extended at an angle to the pivot-rod and engaging said fixed member to be moved away 35 from the pivot-rod when the latter is turned, and a spring encircling said movable member and acting to keep it in engagement with the fixed member, substantially as and for the purpose specified. 40

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

JOHN W. CURRIER.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.