No. 833,852. PATENTED OCT. 23, 1906.

H. W. STEELE.

SPRING HINGE.

APPLICATION FILED DEC. 30, 1905.

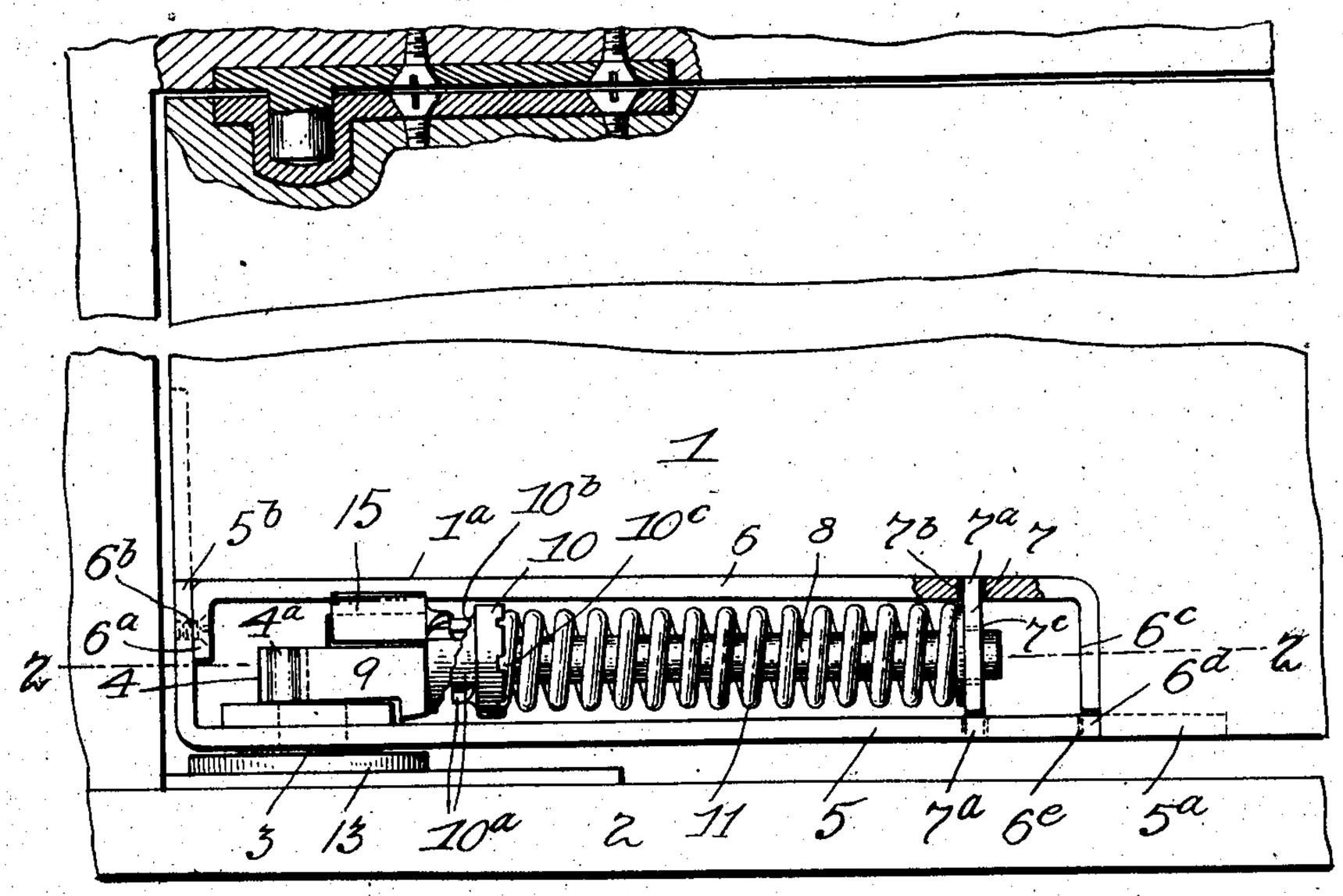


Fig. 1.

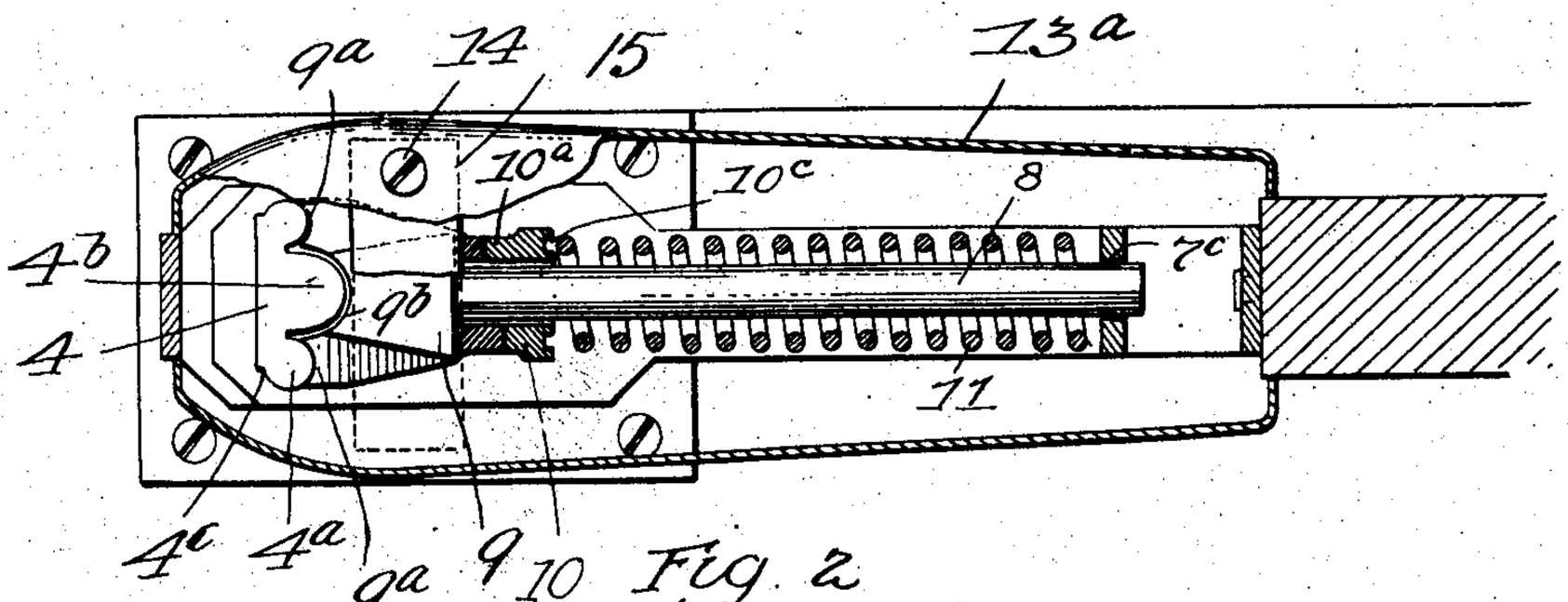


Fig. 2.

Fig. 3.

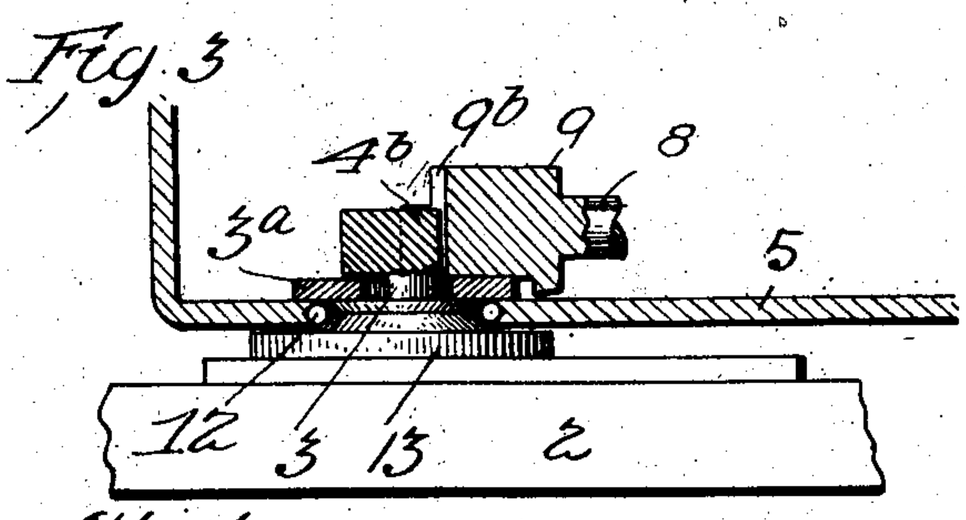
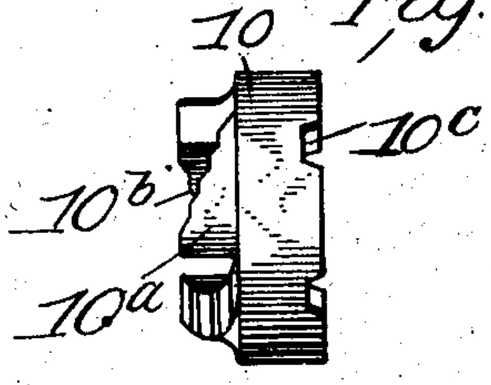


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY W. STEELE, OF SHELBY, OHIO, ASSIGNOR TO THE SHELBY SPRING HINGE CO., A CORPORATION OF OHIO.

SPRING-HINGE.

No. 833,852. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed December 30, 1905. Serial No. 293,986.

To all whom it may concern:

Be it known that I, HARRY W. STEELE, a citizen of the United States, residing at Shelby, Ohio, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

My invention relates to improvements in double-acting spring-hinges.

One of the objects of my invention is to provide a simple and compact form of spring which can be easily applied to a rabbet or recess in the lower corner of the door without detracting from the appearance or finish thereof.

Another object is to provide a spring-hinge which shall possess all the advantages of a floor-hinge, (or hinge located in a recess in the floor,) while by its location all danger of moisture getting into the mechanism of the hinge is avoided.

Other objects are to simplify the construction, render it more durable and certain in operation, reduce friction and wear, and make the parts more readily adjustable to vary the tension on the hinge.

With these and other objects in view the invention includes the features of construction and arrangement and combination of parts hereinafter described, and particularly set forth in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a portion of a door and its frame, disclosing the hinged construction embodying my invention as applied thereto. Fig. 2 is a horizontal section on line 2 2 of Fig. 1. Fig. 3 is a sectional detail of certain features of the hinge construction, and Fig. 4 is a detail view in elevation of the adjusting-ring.

As disclosed in the drawings, the hinge comprises in its construction two members, one of which is fixed and the other movable thereon. The movable member is secured to the door and includes the spring-actuating mechanism, while the other or fixed member, which includes the pivot-post, is secured to the floor or door-sill, and it is the movement of the movable member upon the fixed member which causes the eccentric portions of the head of the post to move the bolt and increase the tension on the spring.

Referring by reference characters to the drawings, the numeral 1 designates the door, and 2 the floor, to which is secured a floor-plate by which the pivot-post 3 is rigidly carried. The post 3 carries at its upper end a cross-head 4, having rounded ears or projections 4^a and an intermediate rounded portion 4^b.

The operative parts of the spring-hinge are located in a rabbet or recess 1^a in the lower corner of the door and are carried by a plate 5, which has one end 5^a secured to the bottom edge of the door by screws or the like and its other angularly-turned end 5^b similarly secured to the vertical edge of the door. A strip or bar 6 has one of its angularly-turned ends 6^a detachably secured to the end 5^b of the plate 5 in a suitable manner, as by screw 6^b, while its other angular end 6^c is detachably connected to the horizontal portion of the plate 5, preferably by having a projection 6^d seated in a recess 6^e in the plate. The spring and coöperating parts are located between these two members 5 and 6, which thus constitute a frame therefor, or what I have hereinbefore termed a "movable member."

Near the outer or swinging end of the frame is located a pivoted plate 7, which may conveniently be supported by having integral projections or trunnions 7^a seated in recesses 7^b in the members 5 and 6, and in an opening 7^c in this plate is guided one end of a rod or bolt 8, so as to be freely movable therein in a longitudinal direction, the bolt having a certain amount of lateral swinging movement as the door swings and the plate 7 being pivoted to allow this. At the opposite end the bolt is provided with a head 9, which is slidingly supported upon the plate 3^a and which has in its face a central curved recess 9^b, corresponding to the rounded portion 4^b of the head of the post, and side recesses 9^a, corresponding to the rounded projections 4^a of the post-head. An adjusting-ring 10 is rotatably mounted on the rod or bolt 8 and has a plurality of inclines 10^a, each of which is flattened at intervals, as indicated at 10^b. The rod or bolt 8 is provided with lateral projections corresponding to these inclines. Square recesses 10^c are cut in the opposite face of the adjusting-ring, and it will be readily seen that by inserting a suitable instrument having a square end in these notches the ring may be turned so as to cause the inclines to act upon the projections of the

bolt or rod, thus forcing the collar outwardly thereof. This results in adjusting the tension of the spring 11, which encircles the rod or bolt 8 and is confined between the adjusting-ring 10 and the plate 7.

From the foregoing description it will be readily seen that when the door is in normal and closed position both the rounded projections of the head of the post would rest in the recesses of the head of the bolt. When, however, the door is swung in either direction, the action of one or the other of the projections 4^a, owing to their eccentric relation to the pivot, will cause the bolt 8 to be moved outwardly, carrying with it the collar 10 and compressing the spring, thus resisting the tendency of the door to open. The compression on the spring will be increased the further the door is opened until the door has reached a position at right angles to its closed position. A slight further opening movement of the door carries it past the dead-center, so that the spring tends to open it wider, and in order that it may not be opened too wide, but may be held automatically in its open position, I provide shoulders 4^c on the head of the post against which the corners on the head of the bolt project, thus limiting the swinging movement of the door. By the use of these rounded projections and corresponding recesses on the post and bolt heads arranged in the manner shown the lateral swinging of the bolt 8 is practically eliminated, and I am therefore enabled to dispense with the use of any link or pitman connection, thereby greatly simplifying the construction, reducing the cost, and making the device more durable. Further, the coacting rounded faces of the bolt and post heads afford bearing-surfaces of sufficient extent to reduce the wear to a minimum, and being packed in grease the friction is almost entirely eliminated.

I find it desirable also to support the door upon a ball-bearing, the balls 12 being located in a raceway formed in an enlargement at the foot of the pivot-post 4 and in the part 5 of the movable hinge-frame between the plate 13, rigidly secured to the floor and the plate 3^a.

In order to provide a neat finish, the sides of the rabbet are covered by ornamental plates 13^a, preferably of the shape shown, which may be conveniently secured in place by set-screws 14, engaging a cross member 15, carried by the upper bar.

Having thus described my invention, what I claim is—

1. A spring-hinge comprising a movable part, a rigid post about which the movable part pivots, a bolt slidably carried by the movable part, said bolt and said post each having a head, one of said heads having a rounded projection on each side of the center and the other head having corresponding recesses and a spring encircling the bolt between relatively fixed and movable abutments, substantially as described.

2. A spring-hinge comprising a movable part, a rigid post about which the movable part pivots, having rounded projections on opposite sides thereof and shoulders in proximity to said rounded projections, a bolt carried by the movable part and longitudinally movable thereof, said bolt having a head having concave recesses on opposite sides of its center corresponding to the projections on the post-head, and a spring encircling the bolt between relatively fixed and movable projections, substantially as described.

3. A spring-hinge comprising a suitable spring-containing frame for attachment to a door, a rigid post about which said frame pivots, said post having a T-shaped head, a bolt mounted in said frame to have longitudinal reciprocating movement and also transverse swinging movement, said bolt having a head corresponding to the head on the post, and a spring encircling the bolt and which is compressed by longitudinal movement thereof, substantially as described.

4. A spring-hinge, comprising parallel bars with means for securing them to the door, a plate supported between the said bars near the outer end, a bolt having its outer end slidably mounted in an opening in said plate, a rigid post about which the door pivots having a T-shaped head, a corresponding head on the bolt coacting therewith, an adjusting-collar on the bolt, and a helical spring encircling the bolt between the collar and plate, substantially as described.

5. A spring-hinge comprising parallel bars, with means for securing them to a door, a plate constructed to be pivotally seated in the holes in said bars near their outer ends, a post about which the door pivots having a T-shaped head, a bolt having its outer end slidably mounted in said pivoted plate, a spring encircling said bolt, and means on the bolt for adjusting the tension of the spring, substantially as described.

6. A spring-hinge comprising a movable member constructed for attachment to a door, a rigid post about which said movable member swings having a substantially T-shaped head, a slidable bolt carried by the movable member having a corresponding head coacting with the head on the post, a spring encircling said bolt, between relatively fixed and movable abutments, and means interposed between the spring and one of said abutments for varying the tension of the spring, said means comprising a rotatable collar on the bolt having a plurality of inclines or cams constructed to coact with projections on the bolt, substantially as described.

7. In a spring-hinge, a frame for carrying the parts comprising an L-shaped bar with means for securing its ends to the edges of the

door, and a second L-shaped bar reversely arranged with relation to the first bar and having its ends detachably connected to the first-named bar, substantially as described.

8. In a spring-hinge, the frame adapted to be secured to the lower corner of the door, and comprising upper and lower members, a post extending through the lower member and having a substantially T-shaped head, a base-plate by which said post is carried, an antifriction-bearing between the base-plate and lower frame member, a bolt longitudinally movable in the frame and having a head constructed to engage the head of the post, a spring within the frame, and means whereby in connection with said bolt the spring is placed under tension on the swinging of the frame, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY W. STEELE.

Witnesses:
L. D. MALONE,
FANNY FLETCHER.