No. 639,254. Patented Dec. 19, 1899.

# J. LEHNBEUTER.

## SPRING HINGE.

(Application filed Dec. 27, 1898.)

(No Model.)

Fig. 1.

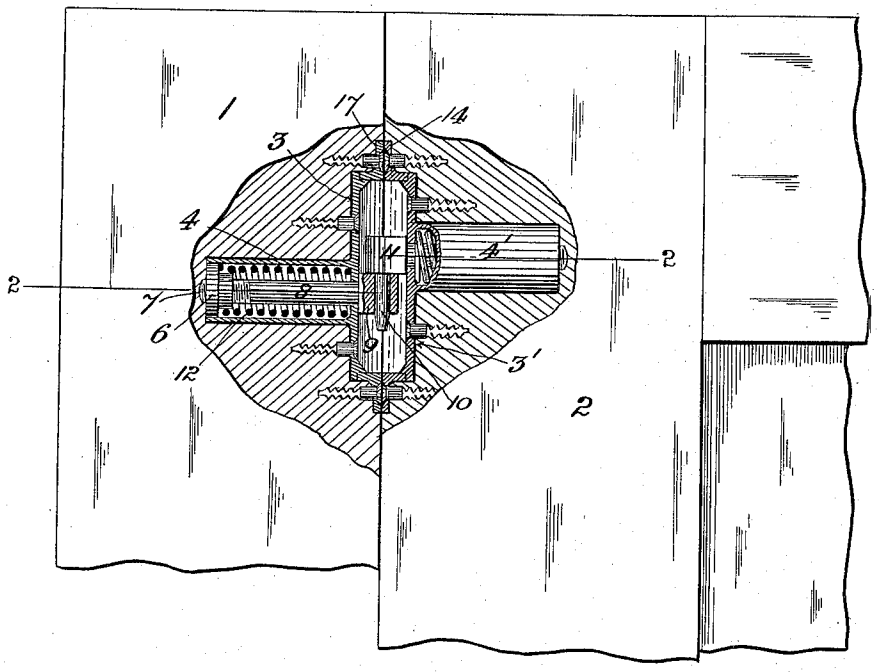



Fig. 2.

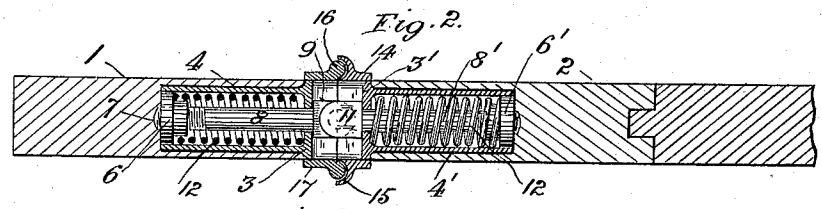



Fig. 3.

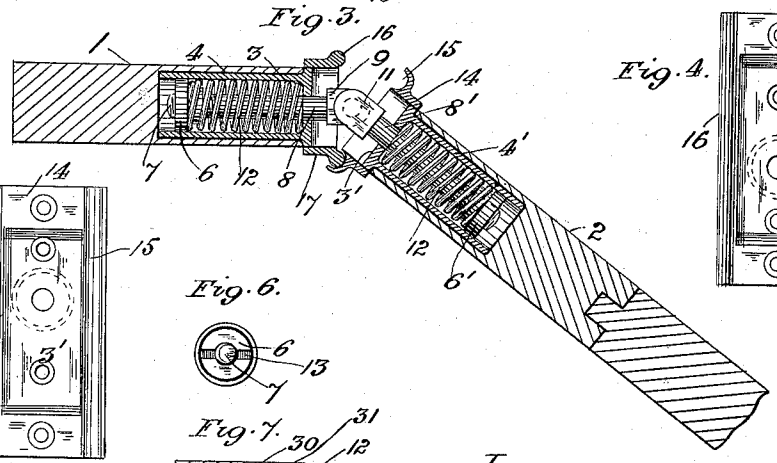



Fig. 4.



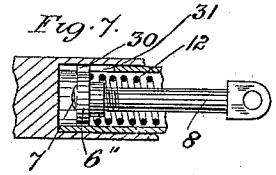

Fig. 5.




Fig. 6.




Fig. 7.

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# UNITED STATES PATENT OFFICE.

JOSEPH LEHNBEUTER, OF ST. LOUIS, MISSOURI.

## SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 639,254, dated December 19, 1899.

Application filed December 27, 1898. Serial No. 700,401. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH LEHNBEUTER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in hinges; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a face elevation of a portion of a door frame or post with the door pivoted thereto, parts thereof being broken away and showing a portion of my improved hinge in longitudinal middle section and part in side elevation. Fig. 2 is a horizontal section on line 2 2 of Fig. 1, showing the door closed and showing the coupling ends of the reciprocating stems of the hinge in top plan. Fig. 3 is a similar section showing the door, however, partly open. Fig. 4 is a front view of the plate or rocker supporting frame carried by the door-frame, about which the door rocks. Fig. 5 is a front view of the corresponding plate or rocker carried by the door and which rocks about the plate carried by the door-frame. Fig. 6 is an outer face view of the adjustable nut or piston carried by the reciprocating stem of the casing forming a part of the hinge-leaf, and Fig. 7 is a sectional detail showing the preferred form of nut or piston.

The present invention is an improvement in hinges for that class of doors known as "swinging" doors—for example, such as are usually interposed between dining-rooms and kitchens of restaurants, hotels, and the like, where it is intended that the waiters shall have free and ready egress from one room to the other, the door closing automatically after being once swung open.

The object of the present invention is to construct a hinge which shall automatically close such door with as few oscillations as possible, the medial or axial line of the spring with which the hinge is provided acting directly across the axis of suspension of the door and being entirely concealed from view.

In detail the device may be described as follows:

Referring to the drawings, 1 represents the door frame or post, and 2 the door hinged thereto. Within a suitable recess of the frame is secured a hinge-leaf 3, with which is integrally formed a tubular casing 4, adapted to be inserted into a socket of the frame, the casing serving as a cylinder for a spring-actuated nut or piston 6, secured to the screw-threaded extension 7 of a reciprocating stem or piston-rod 8, operating in said casing, the piston-rod or stem being preferably cylindrical and its outer end terminating in a loop 9 for the reception of the hinge-pin 10, carried by or formed integrally with the outer projecting head 11 of a similar stem 8′, provided with a similar piston 6′ and operating in a similar casing 4′, forming a part of the leaf 3′, secured to the door. Encircling the stem of each casing and interposed between the base of said casing and the piston thereof is a resilient spring 12, whose tension can be regulated by adjusting the position of the piston along the screw-threaded end of the stem on which it is mounted, the piston being adapted to be turned by a key (not shown) inserted into the groove 13, formed on the exposed face thereof.

As seen from the foregoing, the connection between the hinge-pin or axis of suspension of the door and the leaves of the hinge is a yielding one, the axial lines of the springs acting directly across such axis and the axes of the stems being normally disposed in the common plane passing through the axis of suspension of the door.

Surrounding the leaf on the door and overlapping the sides thereof for a certain distance is a frame or plate 14, denominated herein as the "rocker," said rocker being provided at its opposite corners with concave wings 15, the inner concave surfaces of said wings rocking over corresponding cylindrical beads 16, formed at the adjacent corners of a like frame or plate 17, surrounding the leaf on the door-frame, the frame 17 being denominated herein as the "rocker-supporting frame." As the door is swung open in one direction or the other the wings 15 rock over the beads 16, the springs 12 under the circumstances being compressed and the stems or pistons of the leaves correspondingly with-

drawn from the cylinders, (see Fig. 3,) the springs by their resilient action restoring the door to its closed position after the same is released. In opening the axis of suspension is of course shifted away from the door-frame, being restored to its original position in a minimum amount of time by the springs, which act directly in the path of such axis. The recesses within which the leaves and their surrounding frames 14 17 are secured are deep enough to allow the wooden surfaces of the door and door-frame to contact, whereby as the door rocks back and forth in opening or closing the oscillations thereof will be practically noiseless, further precaution being taken for eliminating any metallic click due to the rocking of the wings 15 over the beads 16 by allowing a slight clearance between these parts when the door occupies a closed position, (see Fig. 2,) the majority of the contacts taking place during the swinging of the door between the latter and the door-frame.

In practice there will of course be two (or more) sets of hinges for each door, as is usual. It is apparent, too, that minor changes could be made in the present device without departing from the spirit of my invention. For example, the stems 8 8′ could be polygonal instead of cylindrical; but a cylindrical form presents the advantage in that if the opening of the loop of one stem is not in perfect alinement with the hinge-pin carried by the other it may be turned to bring the same into such alinement, and the door when once hung will cause the stems to turn sufficiently to bring the axes of the hinge-pins into alinement with the axis of suspension of the door, and thus avoid lateral strain on the pins. Again, instead of forming the hinge-pin integrally with the stem carried by the door the hinge may be coupled together in any manner well known to the art and a removable hinge-pin used to secure the leaves together, care being taken that the coupling ends of the stems corresponding, respectively, to the loop 9 and head 11 be of sufficient dimension to limit the inward movement of the stems, and thus prevent the same from being drawn into the casing under the action of the spring when the parts are uncoupled. So may the details of the rocker and rocker-supporting frame be altered without departing from the spirit of my invention. While the present construction shows the two casings or cylinders out of alinement, it is apparent that they could be pivoted, so that one would come directly opposite the other.

As best seen in Fig. 7, which, by the way, practice has shown to be the more desirable construction, I provide the nut or piston 6″ with a lug 30, which enters a slit 31, made in the peripheral wall of the casing 4, thus "feathering," as it were, the piston to the casing. By this construction adjustment of the tension of the spring 12 can be effected from the outside of the hinge by simply turning the stem 8 in one direction or the other, the nut traveling along the casing, but being prevented from turning by the lug 30, confined within the slit. The depth of the slit is sufficient to allow for all necessary adjustments of the spring.

Having described my invention, what I claim is—

1. A spring-hinge comprising two leaves secured respectively to the door-frame and to the door, a casing forming a part of each leaf, a reciprocating stem having a cylindrical rotatable portion confined within each casing and projecting through the leaf, a piston or disk secured at the inner end of each stem, a coupling end forming a permanent part of each stem, normally bearing against the leaf by which the stem is carried, a spring encircling each stem and confined between the piston thereof and the leaf, the springs being adapted to retain the door in a closed position, a rocker located about the leaf secured to the door and having hollow or concave wings at its opposite longitudinal edges and extending the full length thereof, a rocker-supporting frame located about the leaf on the door-frame, and having longitudinal beads adapted to be engaged by the wings, a suitable clearance being left between the parts when the door is closed to prevent the metallic click incident to the swinging of the door, substantially as set forth.

2. A spring-hinge comprising two leaves secured respectively to the door-frame and to the door, a casing forming a part of each leaf, a reciprocating stem confined within each casing and projecting through the leaf, a piston or disk secured at the inner end of each stem, a coupling end forming a permanent part of each stem and normally in contact with the leaf by which the stem is carried, a spring encircling each stem and confined between the piston thereof and the leaf, the springs being adapted to retain the door in a closed position, a rocker located about the leaf secured to the door and having hollow wings at its opposite longitudinal edges, and a rocker-supporting frame located about the leaf of the door-frame, and having longitudinal beads adapted to be engaged by the hollow wings, the axial lines of the springs acting directly across the axis of suspension of the door, substantially as set forth.

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

JOSEPH LEHNBEUTER.

Witnesses:
EMIL STAREK,
GEORGE L. BELFRY.