L. BOMMER.
Spring-Hinge.

No. 217,051. Patented July 1, 1879.

Fig: 1.

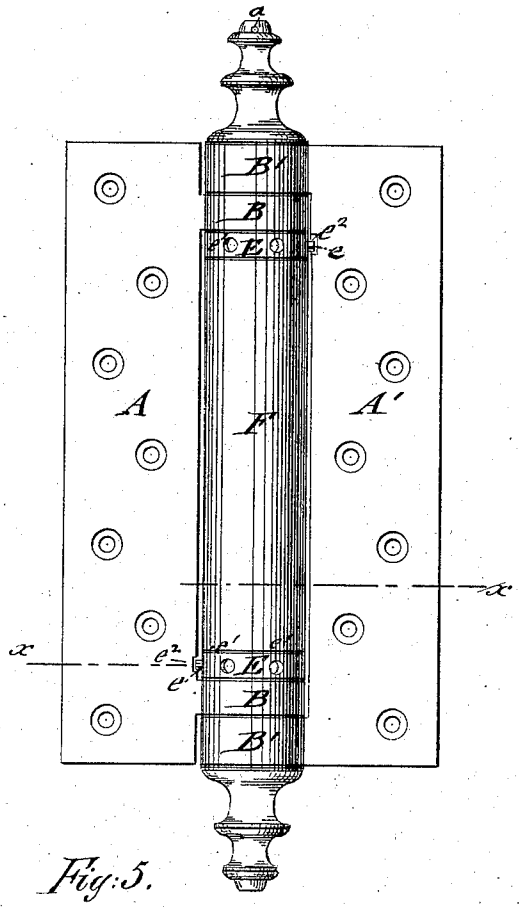


Fig: 2.

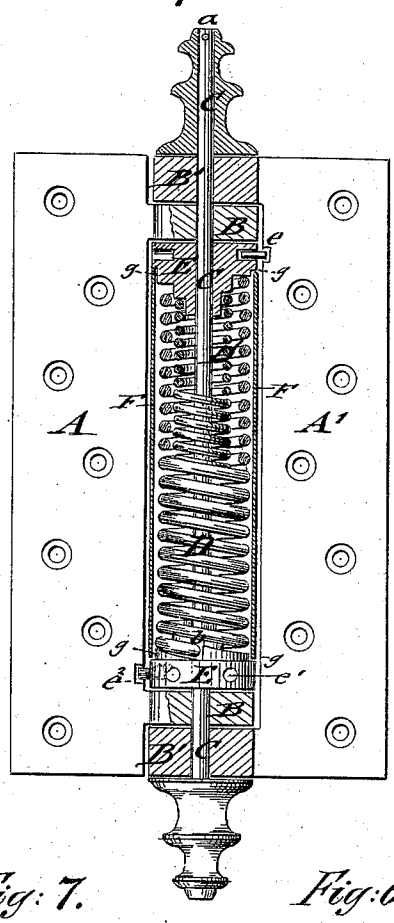


Fig: 5.

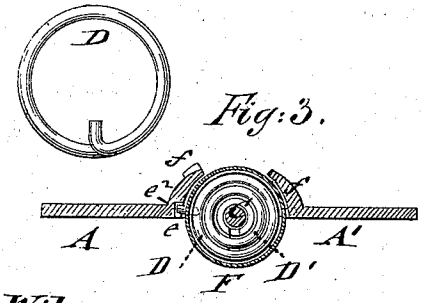


Fig: 7.

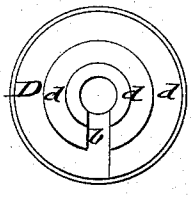


Fig: 6.



Fig: 4.

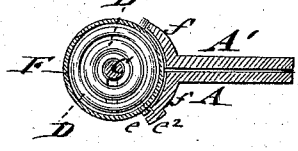
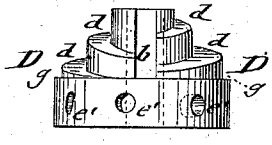


Fig: 8.



Witnesses:

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UNITED STATES PATENT OFFICE.

LORENZ BOMMER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SPRING-HINGES.

Specification forming part of Letters Patent No. **217,051**, dated July 1, 1879; application filed November 7, 1878.

To all whom it may concern:

Be it known that I, LORENZ BOMMER, of the city of Brooklyn, in the 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.

In the accompanying drawings, Figure 1 represents a side elevation of my improved spring-hinge; Fig. 2, a vertical section of the same. Figs. 3 and 4 are horizontal sections of the hinge on line *x x*, Fig. 1, showing the same, respectively, in open and closed position. Figs. 5 and 6 are detail top views, respectively, of the main and auxiliary springs; and Figs. 7 and 8 are, respectively, top and side views of the pintle-sockets.

Similar letters of reference indicate corresponding parts.

This invention has for its object to furnish a spring-hinge for doors of all kinds, in which greater spring-power is obtained than by the common spring-hinges, and which has the advantage of the common loose-joint hinges, of allowing the door to be taken off without unscrewing the leaves, either from the door or door-casing. The spring-hinge may be further set for reversible action, so as to admit of more extended application and be of greater practical utility.

The invention consists of a spring-hinge the leaves of which are connected by means of a detachable pintle and a fixed and a removable fastening or button, so as to form a loose-joint hinge.

The hinge is arranged with two adjustable pintle-sockets, which are made with step-shaped seats and radial recesses, and of a compound actuating-spring, formed of two or more coiled springs, of which the exterior mainspring is of greater power, while the inner auxiliary spring or springs are lighter, they being bent inwardly at both ends, so as to extend into the recesses of the movable pintle-sockets. These sockets are provided with radial holes for the stop-pins, which are inserted at diagonally-opposite sides of the sockets and forced by the compound spring into notches or recesses of the raised parts of flanges of the leaves. For reversing the action of the hinges, the pins are removed and inserted into holes of the sockets at diagonally opposite sides of the sockets, the leaves being provided with corresponding stop-recesses for the pins. The compound spring is inclosed by a cylindrical protecting-barrel, which rests on annular recesses of the sockets, and may be removed with the same and the springs on withdrawing the pintle.

Referring to the drawings, A and A′ represent the leaves of my improved spring-hinge, which are cast with the usual knuckles B B′, and connected by a detachable pintle, C. The pintle C is secured to the leaves by means of buttons *a* or other fastening devices, of which one button is permanently riveted or otherwise attached to one end of the pintle, while the other button is keyed thereto by a pin that passes through holes of the pintle and button. The removability of the pintle imparts to the spring-hinge the character of a loose-joint hinge, which admits, in analogy to the common loose-joint hinges, the convenient removal of the door without the necessity of unscrewing the leaves either from the door or casing.

This feature forms an essential advantage of my improved hinge, as it renders the spring-hinge just as convenient in use as the common loose-joint hinges employed for hanging doors.

The spring action is imparted to the hinge by means of a compound spring composed of two or more spiral springs, D D′, of which the exterior spring, D, is of greater power, while the interior auxiliary spring or springs, D′, are of less size and strength, the latter serving for the purpose of re-enforcing the outer spring, and furnishing thereby greater power within the same or less space than heretofore.

The auxiliary springs render the hinge more reliable in action, and admit the reduction of the hinge in length, which produces a saving in material and a less bulky appearance of the hinge.

The main and auxiliary springs are bent inwardly at the ends at right angles to the main portion, the ends being inserted into radial recesses of pintle-sockets E, which turn loosely on the center pintle, and are removable with the springs D D′ when the pintle is withdrawn. The pintle-sockets E are made with

as many steps of diminishing diameter as there are springs, the steps having a pitch corresponding to that of the springs, so as to form reliable seats for the ends of the springs, each spring having a corresponding top and bottom step and seat.

The employment of two separate pintle-sockets, one at the upper and the other at the lower end of the springs, serves not only for the more convenient adjustment of the tension of the springs, but mainly for the purpose of adjusting them for reverse action by changing the position of the stop-pins of the sockets from one side of the pintle-sockets to the other, and setting thereby the springs for action, either in one direction or the opposite one. The pintle-sockets E are provided with the usual exterior holes, e^1, into which a small lever-rod is inserted for turning the sockets, and adjusting thereby the springs to the desired tension.

The stop-pins *e* are inserted into the holes nearest the leaves A A′, and are forced by the action of the springs into recesses or notches e^2 of the raised or flanged portions *f* of each leaf.

By inserting the stop-pins in diagonal position to each other and at opposite sides into the pintle-sockets, the springs throw the door in one direction, while by changing the position of the pins to the other sides of the sockets, so that they are also in diagonal position to each other, the action of the springs is reversed and the door thrown in opposite direction. This is of special advantage when applied to the doors of ferry-houses, public buildings, &c., as in these cases the doors are desired to be kept in closed position during the winter season, while they may be set for reverse action for being retained in open position during the summer season.

The changing of the pins from one side to the other is accomplished by means of the lever-rod or key in convenient manner, and thus the janitor or employé is enabled to reverse the action of the springs as required by the special use of the door. The leaves are, for the same purpose, provided with corresponding notches or recesses for the stop-pins, respectively, at the upper and lower parts and at opposite sides, and thereby the utility of the spring-hinge is greatly increased and the same adapted for more general application.

The springs are finally inclosed by a cylindrical barrel, F, which is fitted to annular recesses of the pintle-sockets, and removed with the same when the pintle is withdrawn. The barrel prevents the entrance of dust to the springs, protects them against the influence of the weather, and secures, in addition thereto, the movable pintle-sockets in proper position.

The improved spring-hinge combines thus the advantage of a loose-joint hinge with a greater degree of spring-power and with reversible action of the springs, so as to furnish a butt-hinge of superior construction and increased adaptability for building purposes.

I claim—

1. The combination, in a spring-hinge, with the leaves, of a compound actuating-spring composed of an exterior or main spring and an interior auxiliary spring or springs, for the purpose set forth.

2. In a spring-hinge, the combination, with the leaves and connecting-pintle, of a compound actuating-spring and of movable pintle-sockets having step-shaped seats and recesses for the ends of the springs, substantially as specified.

3. The combination of the pintle-connected leaves with a compound actuating-spring composed of an exterior mainspring and inner auxiliary spring or springs, said springs having inwardly-bent upper and lower ends, and with upper and lower pintle-sockets having recesses and step-shaped spiral seats for the spring ends, substantially as described.

4. The combination, in a spring-hinge, of the leaves with spring-acted pintle-sockets having radial holes, and with adjusting stop-pins that may be set diagonally to each other at opposite sides of the sockets, so as to admit the setting of the springs for reverse action, substantially as set forth.

5. The combination of the leaves, detachable pintle running the entire length of the hinge, and spring-acted upper and lower pintle-sockets having annular recesses with an inclosing-barrel removable upon withdrawing the pintle, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 26th day of October, 1878.

LORENZ BOMMER.

Witnesses:
PAUL GOEPEL,
ADOLF DENGLER.