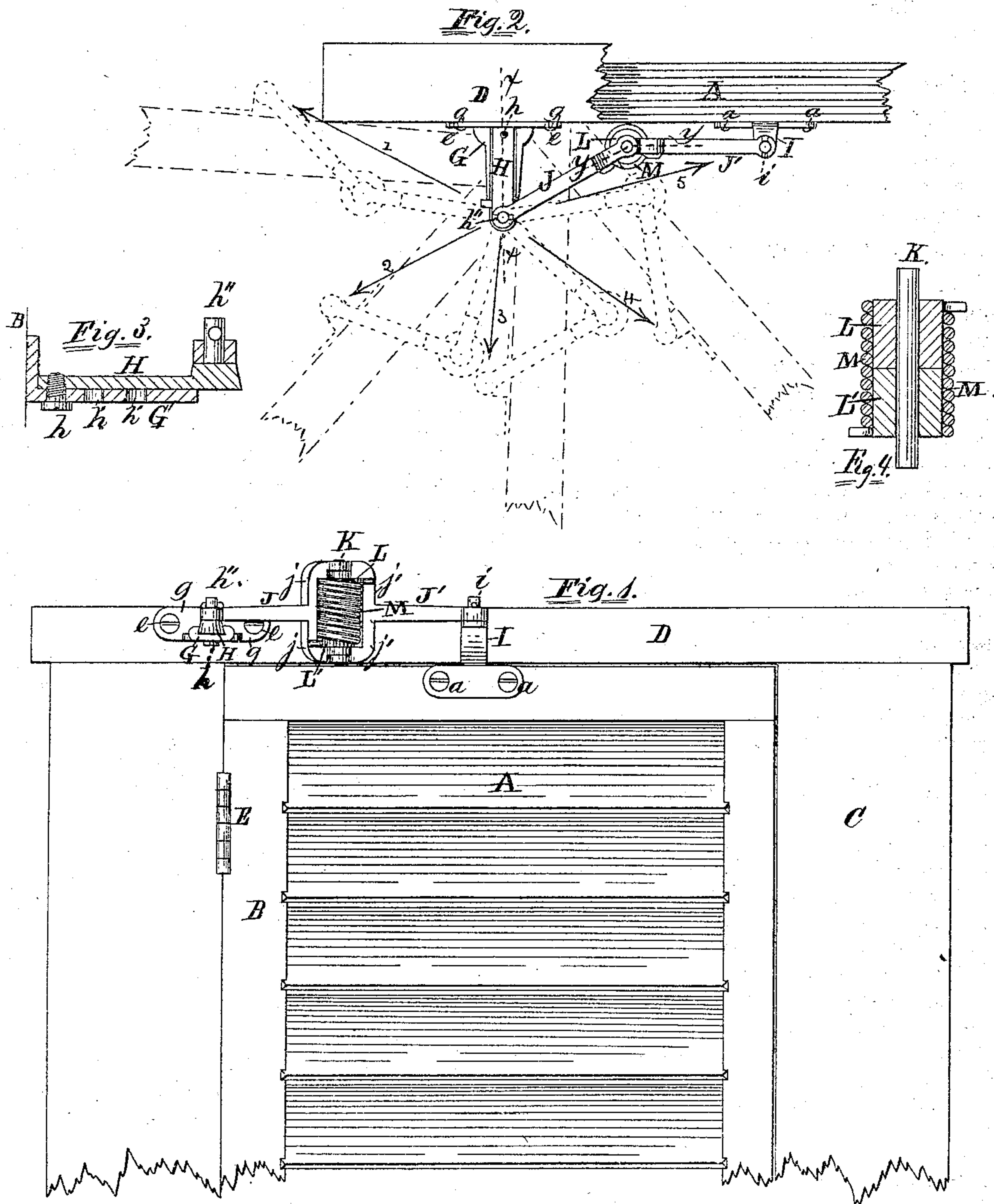


G. GEER.

Door-Springs.

No. 136,371.

Patented March 4, 1873.



Witnesses:
M. H. Barringer,
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Inventor.
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UNITED STATES PATENT OFFICE.

GEORGE GEER, OF PLAINVILLE, CONNECTICUT.

IMPROVEMENT IN DOOR-SPRINGS.

Specification forming part of Letters Patent No. 136,371, dated March 4, 1873.

To all whom it may concern:

Be it known that I, GEORGE GEER, of Plainville, in the county of Hartford and State of Connecticut, have invented certain Improvements in Door-Spring and Retainer, of which the following is a specification:

Nature and Objects of the Invention.

The nature of my invention relates to improvements in springs for attaching to doors, window-shutters, &c., for the purpose of closing them when standing at any position between closed and open at right angles, and which will tend to hold the door open when opened past a right angle with the door-frame; and the invention consists in the arrangement of a toggle-joint, the outer ends of the toggle-arms being pivoted to standards projecting from the door and from the door-frame, and their adjacent or inner ends forked and pivoted to each other, the pivot being encircled by a spiral spring, the ends of which rest, one against each of the forked ends of the toggle-arms in such manner as to produce the effect aforesaid. The invention further consists in the arrangement of two spools or sleeves between the spiral spring and the pivot-bolt, the upper spool being made to turn with the upper portion of the spiral spring in one direction while the lower spool turns with the lower portion of the spring in the opposite direction, thereby facilitating and rendering the action of the spring free; and further consists in making the standard projecting from the door-frame adjustable in length, for the purpose of regulating the force exerted by the device on the action of the door, all as hereinafter fully described.

In the accompanying drawing, Figure 1 is an elevation of the upper part of a door and frame, and of my invention; Fig. 2 is a top view of my invention and part of a door and the hinge side of the door-frame. Fig. 3 is a vertical sectional view of that part of Fig. 2 crossed by the line *x x*, and Fig. 4 is a vertical sectional view of that part of Fig. 2 crossed by the line *y y* and on the plane of said line. In Figs. 3 and 4 the scale is enlarged to twice the size of Figs. 1 and 2.

Referring to the parts by letters, letter A represents the upper part of a common lattice-door. B is the hinge side of the door frame,

C the latch side, and D the top. E is the upper hinge by which the door is hung in the frame. G is a standard projecting from the top part of the door-frame D a short distance back from a vertical line with the door-hinges, and is secured to the frame D by screw-nails *e e*, through foot-plates *g g*. H is an adjustable arm on the standard G, and adjustably secured thereto by a bolt, *h*, and series of holes *h' h' h'*, as plainly shown at Fig. 3. *h''* is a short axis or pivot-bolt on the outer end of the arm H. I is a standard, with a pivot-bolt, *i*, on its outer end, and secured to the upper part of the door A, by screw-nails *a a*, through a foot-plate thereon. J J' are toggle arms, their outer ends pivoted on the pivots *h''* and *i*, and their inner or adjacent ends forked, and the arms *j j j' j'* of their forked ends pivoted to each other by a bolt, K. L L' are wooden sleeves or spools, one on the upper half and one on the lower half of the bolt K, between the forked ends of the arms J J'. M is a spiral spring, encircling the sleeves L L', with its upper end bent outward and resting against the forked end of the arm J', and its lower end bent outward and resting against the forked end of the arm J.

The operation of my invention is as follows: The standards G and I are arranged at such a distance apart that when the door is opened and swung back to the wall, or is entirely closed, the toggle-arms J J' will still form an obtuse angle with each other; and the spiral spring is put in place on a strain in a direction with its spiral twist, so that it will continually exert a force endwise on the toggle-arms, the effect of which is plainly shown by the dotted lines at Fig. 2, and the accompanying arrows 1, 2, 3, 4, and 5. When the door is opened to the position shown by dotted lines of the device accompanying arrow No. 1 the endwise force exerted by the spring on the toggle-arms will exert a force upon the door A in the direction of said arrow, and of course have no effect, either toward opening or closing the door; and it will be observed that, by changing the position of the standard G to the left hand, the door will be required to be swung further open before the said unaffected point is reached. When the door is swung on its hinges from the aforesaid position toward being closed it will be brought into more favorable condition for

the effect of the spring, and when brought into position of the dotted lines accompanying the arrow No. 2 the force will be exerted on it in the direction of said arrow, and when brought into position shown by the full lines accompanying arrow No. 3 the force will be exerted upon it in the direction of said arrow No. 3.

It will be evident to any one skilled in the art that, as the door is swung from the position at arrow No. 1 toward the position at arrow No. 3, or closed, it will be brought continually into more favorable position for the action of the spiral spring and toggle-arms, and that they will consequently exert a continually-increasing force as the door is closed, and thus exert the greatest closing force on the door when in the position where it is most needed. When the door is opened past the position accompanying arrow No. 1, it will be plainly seen, from an inspection of the positions shown by dotted lines accompanying arrows Nos. 4 and 5, that the force of the spiral spring and toggle-arms will tend to press it (the door) open with a continually-increasing force as it is further opened, and will act as a retainer to hold it open wherever stopped, by any device, in the arc last described.

By adjusting the arm H so as to throw the fulcrum for the toggle-arm J further from the door and frame, the toggle-arms and spiral spring will be brought into more favorable position for the effect of their force on the door;

and this may be taken advantage of to compensate for weakening of the spring by use or for increased pressure in cases where desired.

The wooden sleeves or spools L L' allow the upper and lower halves of the spiral spring M to draw in opposite directions with freedom, and prevent the spirals cramping in any manner on each other or on the bolt K. The spring may be adapted to a door opening in an opposite direction from that described by changing the toggle-arms, end for end, on their respective pivots *h'* and *i*.

Claims.

1. The spiral spring M, arranged to operate with the toggle-arms J J' and the standards G and I, substantially as and for the purpose specified.
2. The sleeves or spools L L', interposed between the pivot K and spring M, and arranged to turn in opposite directions, one with the upper and the other with the lower portions of the spring, substantially as and for the purpose specified.
3. The adjustable arm H, when arranged to operate with the standard G, toggle-arms J J', spring M, standard I, and door A, substantially as described, and for the purpose specified.

GEORGE GEER.

Witnesses:

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