F. J. RANDALL.
Door-Spring.

No. 209,713. Patented Nov. 5, 1878.

Fig. 1.

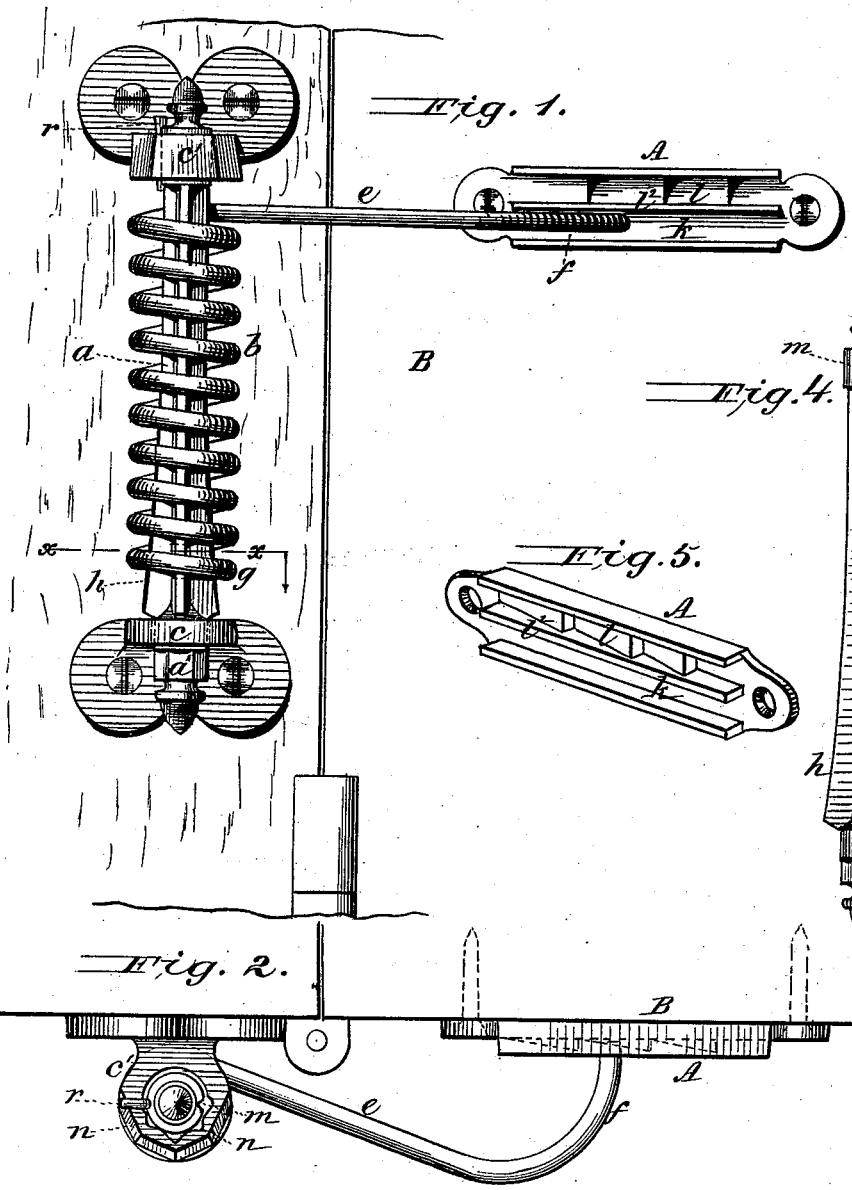


Fig. 4.

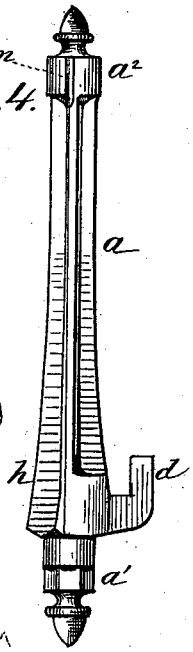


Fig. 5.

Fig. 2.

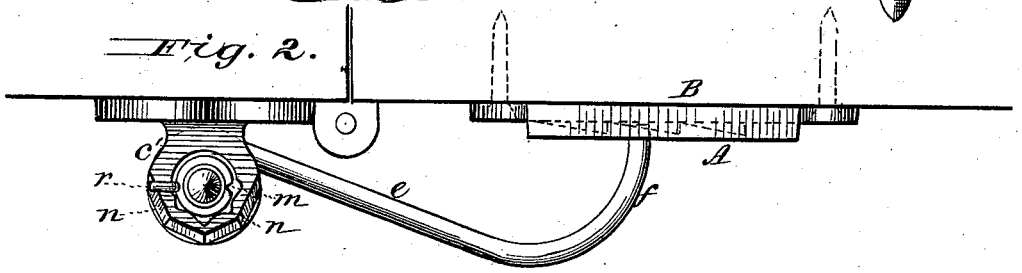
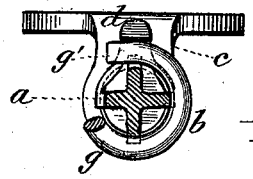


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK J. RANDALL, OF AURORA, ILLINOIS.

IMPROVEMENT IN DOOR-SPRINGS.

Specification forming part of Letters Patent No. **209,713**, dated November 5, 1878; application filed June 22, 1878.

To all whom it may concern:

Be it known that I, FRANK J. RANDALL, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Door-Springs; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

I have improved the door-spring in several particulars of construction and combination.

An important element of improvement consists in forming the arm, which bears against the door with a yielding-hook termination, in combination with a bearing-plate having separate smooth and ratchet grooves, so that said bearing-arm can be adjusted laterally in either groove, and when so adjusted in the ratchet-groove to hold the door open, more or less, it will spring over said holding-ratchets in the event of suddenly pulling the door closed when so held, and thereby prevent accidental breaking of the parts, which would be liable with a rigid-holding catch-lever. The separate smooth-bearing groove avoids the liability of catching and holding the door when thrown back, and the yielding-catch end can be easily adjusted for use in either groove, as may be desired.

The spring-support is made with webs, or angular in cross-section, and tapers from the fixed to the bearing end of the actuating-spring, whereby the friction of its coils upon the fixed support is greatly reduced, and by which the coil or coils embracing the greatest diameter are bound tightly upon the support, thereby relieving the holding end of the spring from any direct pull, so that its end need only be retained in a slot formed by a hook-shaped arm fixed to and projecting from said spring-support. Whatever the form of the bearing-arm or its connection with the closing-spring, its yielding-catch termination is controlled by said spring, so that said catch will disengage itself from the ratchet-shoulder under undue or sudden force applied to close the door held open by said yielding catch.

Referring to the drawings, Figure 1 represents an elevation of my improved spring, as applied to a door and its frame; Fig. 2, a top view, showing the spring-hook termination of the bearing-arm; Fig. 3, a section taken on the line *x x* of Fig. 1, showing the straight end of the spring in the holding-arm; Fig. 4, the spring-support, showing its tapering form; and Fig. 5, the grooved bearing-bracket, showing its plain and ratchet ways.

The support *a* for the actuating coil-spring *b* has its bearings in brackets *c c'* secured to the frame of the door, while the spring has one of its ends confined within a slot formed parallel with its support by a hook or bent arm, *d*, and has its free end terminating in a bearing-arm, *e*, the end of which terminates with a bowed or spring catch, *f*, for a purpose to be presently stated. The support *a* tapers from one end to the other, and is of web or angular cross-section, in order that one or more coils at its holding end *g* will be bound upon the widest end *h* of the webs, while the other coils will be free from contact therewith, and thus, while reducing the friction of the spring upon said webs, allow the fixed end *g'*, Fig. 3, of the spring to be held in the slot by pressing against the inner side of the slot forming arm or projection *d* from the support, and the binding of the end coil *g* thereon.

The bearing-plate A of the door B is provided with two parallel horizontal grooves, *k l*, one of which, *k*, has a plain bearing-surface, while the other, *l*, has a series of ratchet-teeth, so that for opening and closing the door the yielding-catch end *f* of the spring bearing-arm *e* is adjusted to bear within the plain groove *k;* and when it is desired to hold the door open more or less, said bearing-arm is adjusted sidewise within the ratchet-groove *l*, and when so adjusted the bowed end *f* of the bearing-arm serves as a spring-catch, for the purpose of allowing it to spring over the ratchet-shoulders in case the door should be accidentally pulled to close it when so held open, and thereby prevent the breaking of the parts.

I have shown in the drawings the closing-spring formed in one piece with the bearing-arm and the yielding-catch; but it is obvious that a separate bearing-arm with yielding catch may be applied directly upon the spring-sup-

port, and effect the same result of controlling the yielding catch by means of the closing-spring. The bearing-arm, as stated, is adapted for adjustment into either of the ways or trenches of the door-plate; and to maintain the free action of said arm when adjusted in the plain way, and prevent its bearing end from catching into the ratchets, the two parallel ways or trenches are divided longitudinally by a ridge or guard, l^2, over which said bearing-arm is moved, for use in opening and closing the door and for holding it open, as may be desired.

One end, a^1, Figs. 1 and 4, of the spring-support is formed angular to receive a wrench by which to turn it, while a hub, a^2, on the other end has grooves m, formed parallel with its axis, and the bracket-casting c' has a corresponding number of grooves, n, Fig. 2, on its inner surface, so that when the spring is set for use the support a is locked with its bracket c' by a pin, r, and the force of the spring is increased, as may be desired, by applying the wrench to the angular end a^1, when the pin r can be removed and inserted into the next coincident grooves, and in this way the spring can be adjusted without regard to its bearing-arm.

The spring can be used for right or left hand doors by reversing its position.

The spring is shown full size for screens and light doors. I may use two springs upon the same support, if deemed necessary.

The separate ratchet-groove gives the advantage of holding the door open at any desired point, and the smooth groove or trench allows the door to be opened and closed without regard to the ratchet-groove.

The bearing-arm of the spring has its bowed or curved hook end made of spring-steel, of sufficient strength to hold the door open and allow it to yield and free itself from the catches in the contingency stated. When two coil-springs are used, as stated, one of them only is adjusted in the ratchet groove or trench to effect the purpose stated.

I claim—

1. The combination, with a closing-spring and a ratchet-plate, of a yielding catch controlled by the spring and arranged, substantially as described, to disengage itself from the ratchet-plate under undue force applied to close the door on which said plate is carried.

2. The combination, with a spring having its bearing-arm constructed with a yielding catch, of a bearing-plate having parallel plain and ratchet grooves or trenches, into either of which the bearing-arm yielding catch may be adjusted laterally, substantially in the manner and for the purpose herein set forth.

3. The spring-support a, made tapering and of angular cross-section, as described, in combination with the coil-spring having its fixed end coils g bound upon said support, and held between it and the slot forming projection or arm d, and its remaining coils free from said support, and terminating in a hook-shaped spring bearing-arm, e f, as and for the purpose set forth.

In testimony that I claim the foregoing I have affixed my signature in the presence of two witnesses.

FRANK JOHN RANDALL.

Witnesses:

R. R. FERRISS,

A. C. LANGWORTHY.