T. CRANE.
Door Spring.

No. 233,837. Patented Nov. 2, 1880.

Fig. 1.

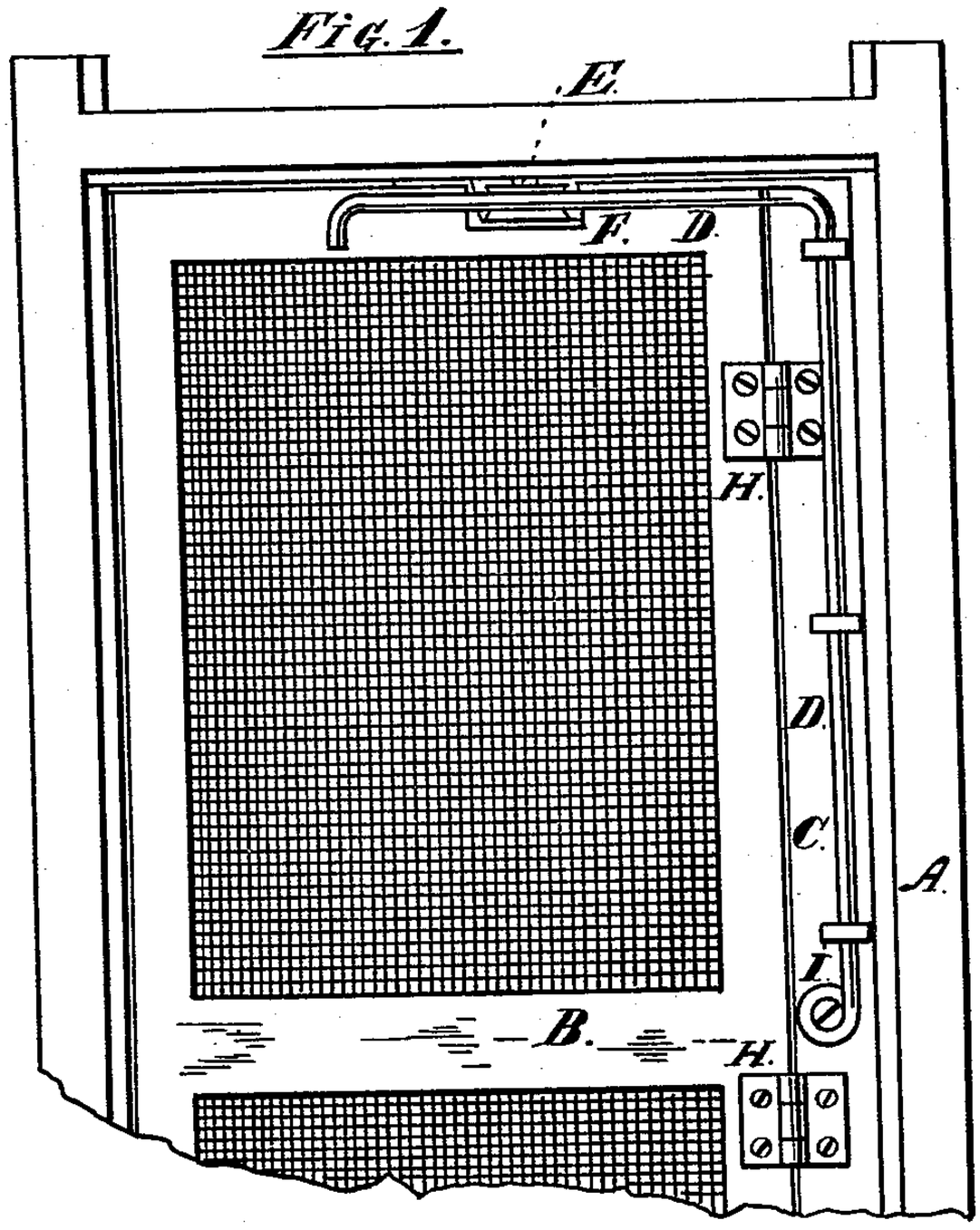

Fig. 5.

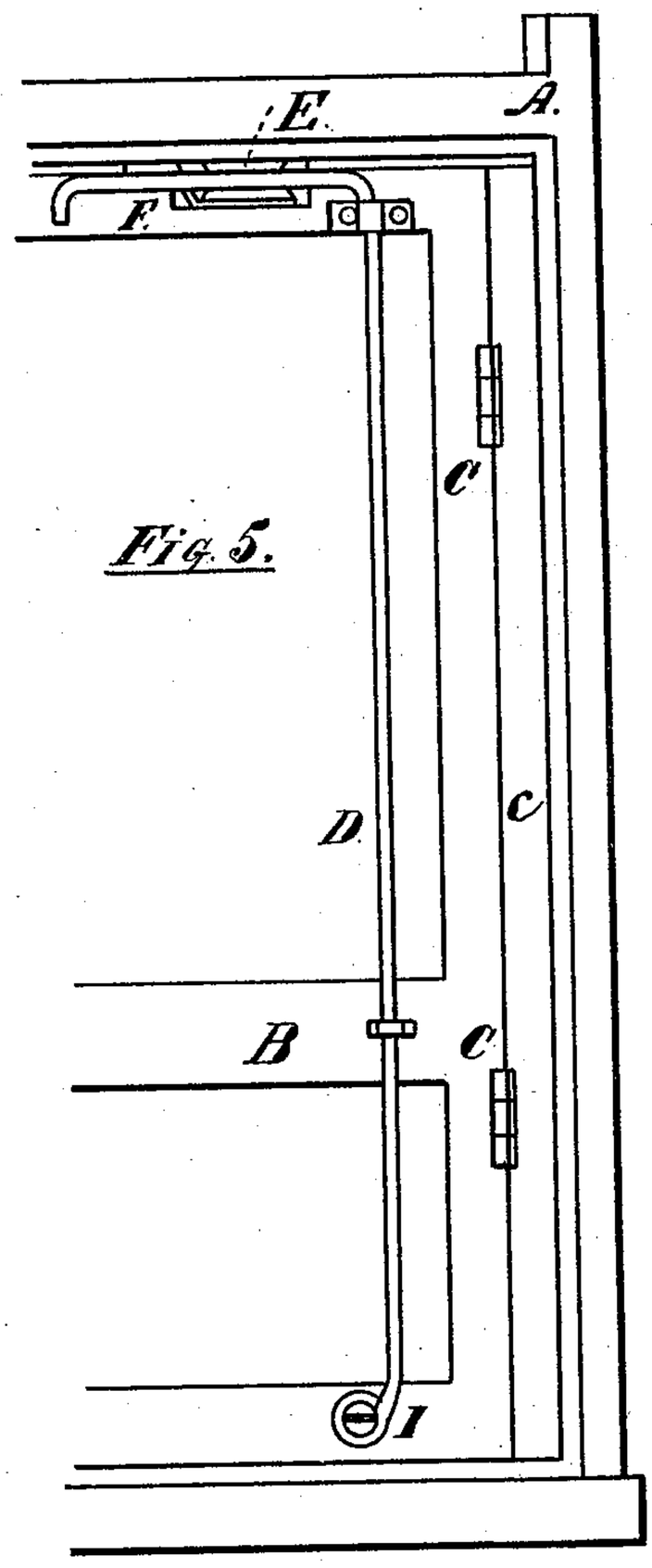

Fig. 2.

Fig. 3.

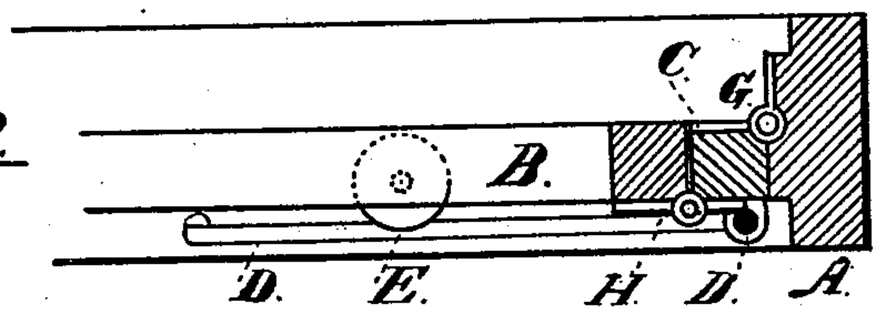

Fig. 6.

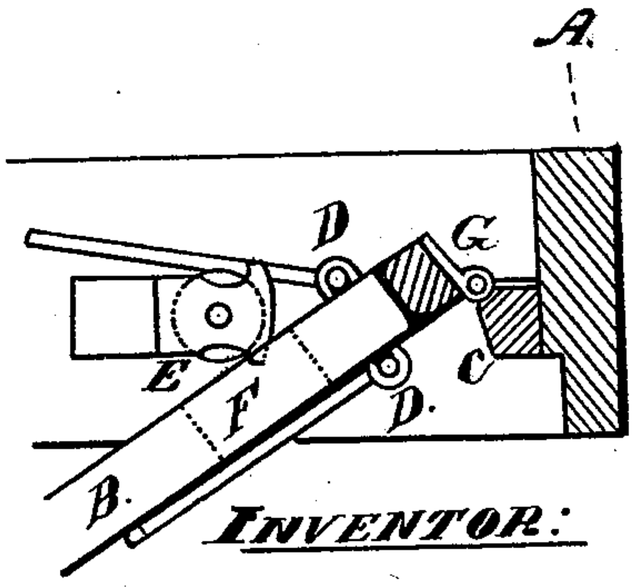

Fig. 4.

WITNESSES:

Aug. H. Schattenberg.

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UNITED STATES PATENT OFFICE.

THOMAS CRANE, OF FORT ATKINSON, WISCONSIN, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO L. S. KELLOGG, OF SAME PLACE.

DOOR-SPRING.

SPECIFICATION forming part of Letters Patent No. 233,837, dated November 2, 1880.

Application filed October 25, 1879.

To all whom it may concern:

Be it known that I, THOMAS CRANE, of the city of Fort Atkinson, State of Wisconsin, have invented a new and useful Improvement in Door-Springs, of which the following is a specification.

The object of my invention is more successfully to close doors automatically, the manner and purpose of which I now proceed to describe in detail.

Figure 1 is an elevation, and Figs. 2, 3, and 4 are cross-sectional views, of a screen-door hinged substantially like the screen-door shown in Patent No. 215,439, issued to Thomas Crane May 20, 1879.

A is the door-frame. B is the screen-door, hinged to independent stile C by means of hinges H. Stile C is also hinged to frame A by means of hinges G, Figs. 2, 3, and 4.

A torsion-spring, D, is secured to stile C by means of screw I; also three clasps, in which the spring-rod can freely turn. The upper end of spring-rod D is turned to form a horizontal arm-extension, with a hook upon its end, which rests upon door B, and is pressed upon it by the adjustment of screw I, whereby the hinges H are closed.

A grooved pulley, E, with a cap-support, having a projection upon each side extending beyond the periphery, is secured to the under side of the upper portion of frame A, directly above the door B. In this groove rests the arm of spring D, Figs. 1, 2, and 3. In the top of the door-rail is a recess, F, for the reception and free passage of pulley E, as the door, when swinging, passes this point.

When door B turns upon hinges G, as in Fig. 2, the arm of spring D is retained in the groove of pulley E, and the axis of the spring is carried about with the door. When door B turns, as in Fig. 4, hinges G are closed, and the axis of spring D is at rest, the door turns upon hinges H, and the hooked end of the spring-arm is carried about with it, and in both cases the reflex action of the spring closes the door as soon as it is released.

Figs. 5 and 6 show a modified arrangement for using spring D. The door B is hinged to rib *c*, with a set of common hinges, in such a manner that the door will swing about it and open either way, as in Fig. 6.

In place of spring D, placed upon the independent stile *c*, combined with door B and pulley E, for closing the door, Figs. 1, 2, 3, and 4, I use, in Figs. 5 and 6, two springs, D D, one upon each side, secured wholly to the door, and when the door is closed the spring-arms rest in the groove of pulley E, one upon each side, which holds the door in a closed position. When the door is open the spring, the arm of which rests in the groove of pulley E, closes the door by its reflex action, while the opposite spring-arm serves as a yielding stop, as in its movement it strikes the opposite side of pulley E, and thereby prevents the usual annoyance of a slamming door.

While opening door B, as in Fig. 6, the axis of spring D is carried about with it, and the spring-arm is also carried about the pulley E, which gradually changes the direction of the spring-pressure both upon the pulley and door, and thereby gradually lengthens the distance between pulley E and the axis of the spring-arm until the rectangular hook upon the end of the arm engages with the projection upon the pulley-support and stops the door from swinging farther, and thus by the indirect action of spring D upon the door, also by the before-described movement of the axis of spring D from the arm-rest E, the power of the spring upon the door is gradually diminished while opening it.

When more power is desired for closing large doors, secure the spring to the door nearer to the pulley-rest E. In this manner any desired pressure may be obtained with the first movement of the door, but gradually decreases until it is fully open, in which position there is no increase of pressure by the adjustment of the spring.

Spring D may be used to close common doors which swing only one way, in which case pulley E is placed one side of the door-rail, which removes the necessity of recess F in the top of the door-rail. The rest E is placed its thickness below the line of the upper edge of

the door-rail, to allow the spring-arm to swing about it and not interfere with the door-frame in its operation.

The door may be released, for convenience, from the spring D by removing the arm from the pulley E and resting it upon the door below recess F.

Having plainly and fully described my improvement and invention, what I claim, and desire to secure by Letters Patent, is—

1. In door-springs, the pulley E, located in a cap-support, and provided with projections upon each side, in combination with spring D, having an arm hooked at the end and adapted to engage with the cap-support, substantially as and for the purpose set forth.

2. The door B, having recess F at the top, and hinges adapted for swinging either way, in combination with two springs, D D, and pulley E, substantially as and for the purpose set forth.

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Witnesses:
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