G. S. KNAPP.

Door-Springs.

No. 196,095. Patented Oct. 16, 1877.

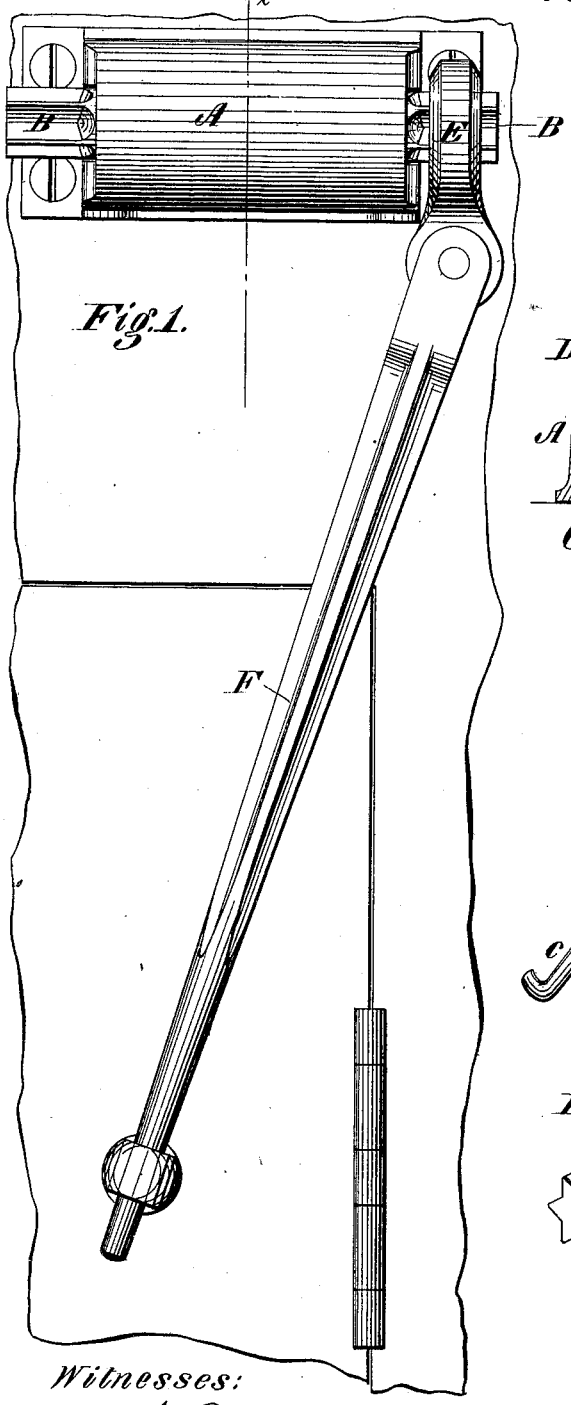


Fig. 1.

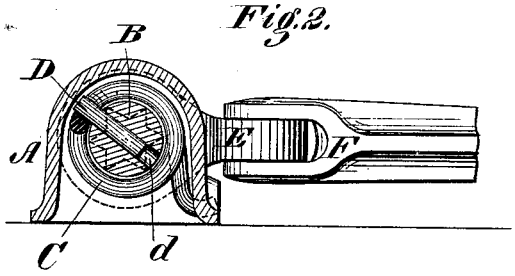


Fig. 2.

Fig. 3.

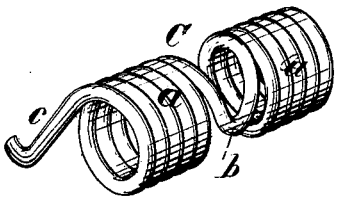
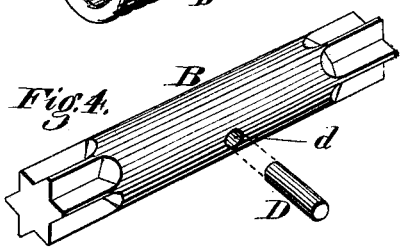


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE S. KNAPP, OF CHICAGO, ILLINOIS, ASSIGNOR OF A PART OF HIS RIGHT TO I. H. KELLOGG AND GEORGE A. ARNOLD, OF SAME PLACE.

IMPROVEMENT IN DOOR-SPRINGS.

Specification forming part of Letters Patent No. **196,095**, dated October 16, 1877; application filed July 25, 1877.

To all whom it may concern:

Be it known that I, GEORGE S. KNAPP, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Door-Springs, of which the following is a specification:

My invention relates to that class of door-springs in which a spiral spring seated in a metal case surrounds and acts upon a rock-shaft, which latter is provided with an arm to act upon the door.

The invention consists in the combination of an outside case, an inside spring having a central stirrup, a rock-shaft having two protruding angular ends, and a central pin which retains it in place, and also receives the force of the spring, and a removable boss or hub adapted for application to either end of the shaft, and provided with a swinging arm to act upon the door, all as hereinafter more fully described and claimed.

Figure 1 represents a face view of my device in position for use; Fig. 2, a transverse section of the same on line *x x*; Fig. 3, a perspective view of the spring proper, and Fig. 4 a perspective view of the rock-shaft.

A represents a hollow case or body, cast in one piece, with a flat open back and end flanges to receive fastening-screws, and with a central hole in each end to receive and sustain a central rock-shaft, B.

C represents a coiled or spiral spring, made in one piece, having two end coils, *a*, an intermediate loop or stirrup, *b*, and two outwardly-bent extremities, *c*, as shown in Fig. 3.

The rock-shaft B is cast in one piece, of such length as to extend through the case or body and protrude at both ends, and is provided at its middle with a pin-hole, *d*, and at its ends with longitudinal flutes; or, in place of the flutes, the ends of the shaft may be made of a square or other angular form.

The spring being first dropped into the case, and its ends seated in notches therein, the shaft is inserted from one end through the case and spring, and a pin, D, inserted in the central hole, and seated in the loop or stirrup of the spring. The pin thus applied serves to secure the shaft in place, and upon the latter being turned backward receives the entire strain of the spring, which tends to turn the shaft forward to its original position.

It will be observed that the two ends of the spring are coiled in different directions, and that as they both urge the shaft in the same direction they act in the same manner and serve the same end as two separate springs, giving the device far greater power than it would have were the spring made continuous and the connection made therewith at one end.

Another advantage of the construction shown is, that in the event of the spring breaking at either end, the other end will continue to act, and the device will remain operative.

E represents a hub or boss, adapted for application, either side first, to either end of the shaft; and F represents a long arm, pivoted to the boss in such manner that it can swing thereon in a direction parallel with the axis of the shaft.

In applying my device the case or body is secured to the inside of the door-frame, above the inner edge of the door, and the end of the arm seated in an eye or bearing on the door, as shown. As the door is opened the arm is swung laterally on its pivot, and also forced outward at its lower end, in such manner as to turn the shaft and strain the spring, which latter, urging the arm inward, tends, of course, to close the door. This continues until the door stands wide open and the arm stands at a right angle to the axis of the shaft, after which, if the door is opened farther, the spring and arm tend to hold it open.

By changing the boss from one end of the shaft to the other, and changing the position of the arm and body, the device may be applied to right or left hand doors, as required, and to doors in all ordinary locations; and by changing the distance between the end of the arm and the rear edge of the door, the device may be caused to close the door with any force required. The force exerted may also be varied by applying a wrench and giving the shaft and spring a greater or less rotation before the boss is applied.

Having described my invention, what I claim is—

The combination of the case A, the double spring C, having the stirrup *b*, the rock-shaft B, having the protruding fluted ends, the pin D, serving both to secure the shaft in place and to receive the force of the spring, and the removable and reversible boss or hub E, having the arm F pivoted thereto, in the manner shown, for the purpose set forth.

GEORGE S. KNAPP.

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