

J. K. GILFILLAN.

DOOR-SPRING.

No. 174,516.

Patented March 7, 1876.

Fig. 1.

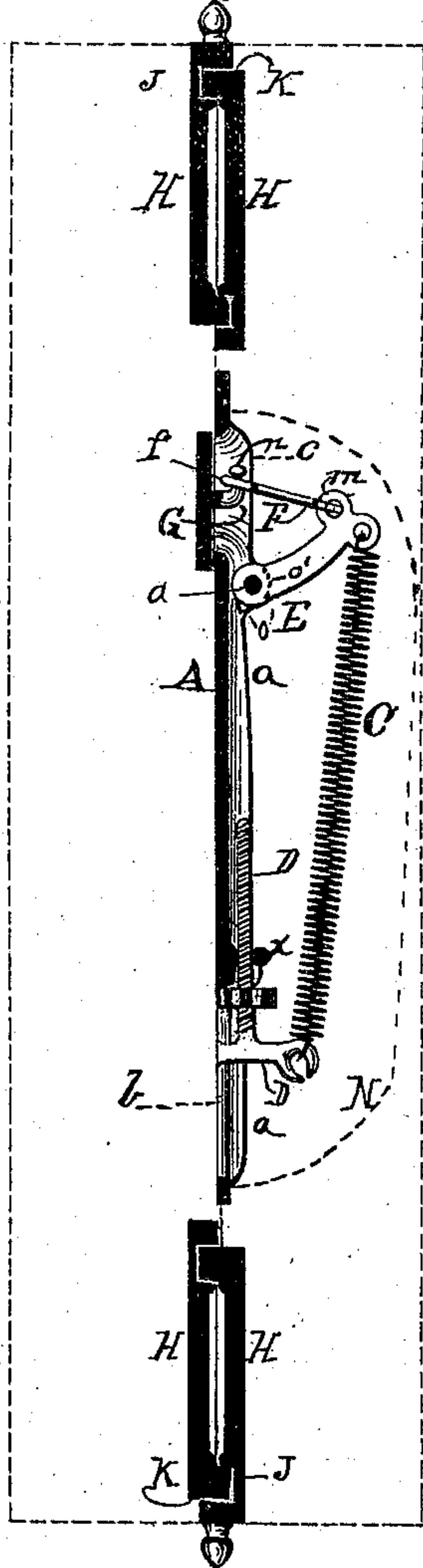


Fig. 2.

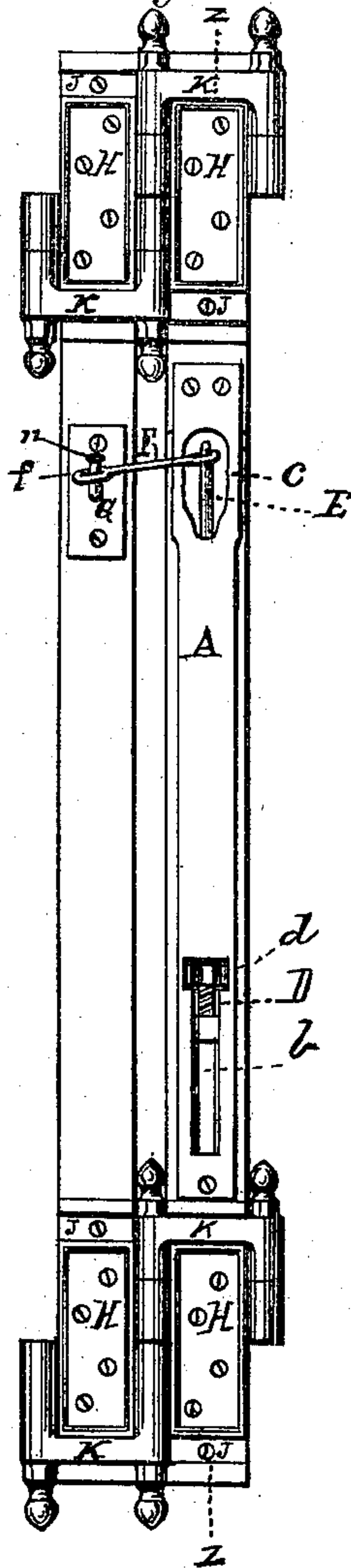


Fig. 3.

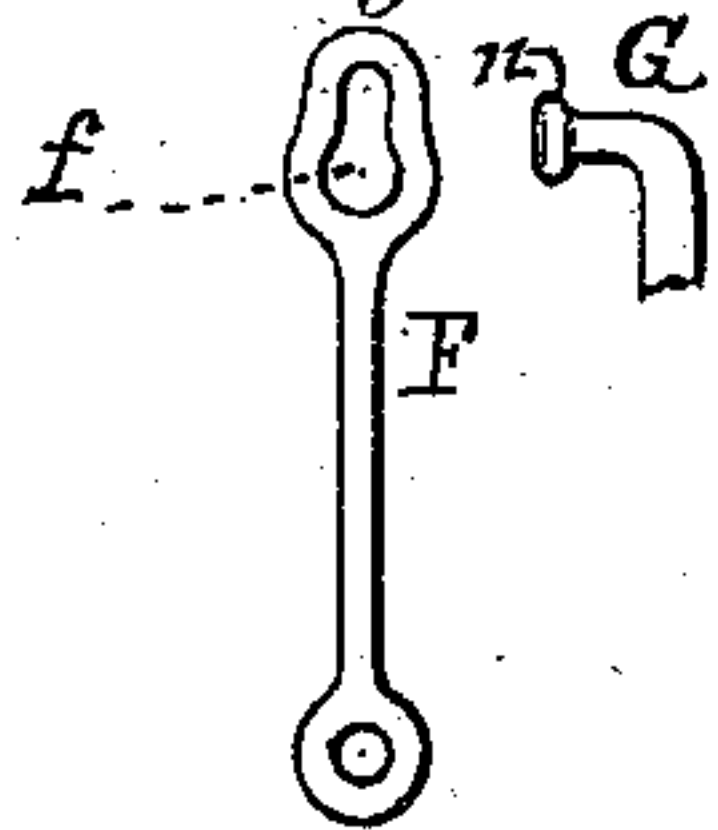
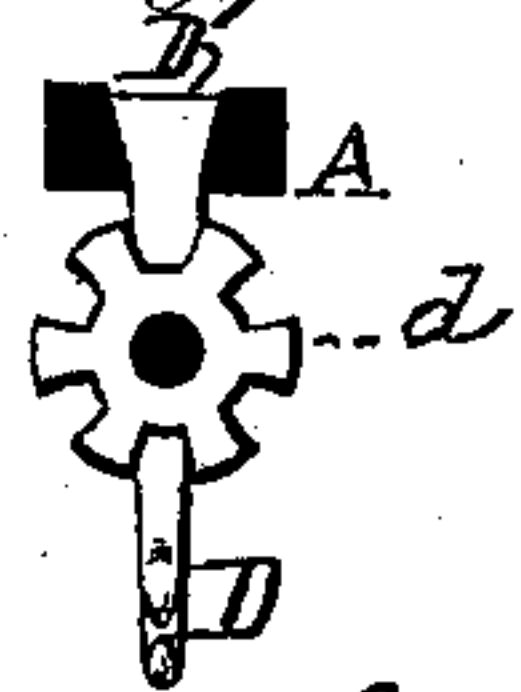


Fig. 4.



Attest:
C. D. Clark.
Charles H. Conner.

James H. Gilfillan
Inventor:
for & B. Stocking
att'y.

UNITED STATES PATENT OFFICE.

JAMES K. GILFILLAN, OF SYRACUSE, NEW YORK, ASSIGNOR TO WILLIAM GILFILLAN, OF SAME PLACE.

IMPROVEMENT IN DOOR-SPRINGS.

Specification forming part of Letters Patent No. **174,516**, dated March 7, 1876; application filed November 27, 1875.

To all whom it may concern:

Be it known that I, JAMES K. GILFILLAN, of the city of Syracuse and State of New York, have invented new and useful Improvements in Door-Springs, as set forth in the following specification, and in the drawings thereof, in which—

Figure 1 is a vertical section on the line Z Z in Fig. 2, and shows the invention in a closed door, both the door and door-casing being shown in dotted lines. Fig. 2 represents the invention in an open door. Figs. 3 and 4 are details.

My invention relates to those door-springs which are embedded in the door or door-casing, and in which the door receives the greatest force of the spring when the door is closed, and the least force when it is open, which severally consist, essentially, on the one hand, of a supporting-plate bearing a system of levers and a spring, and a suitable mechanism for adjusting the tension of the spring, and, on the other hand, of a hook, together with suitable connections for the two opposing portions of the apparatus.

My invention consists in pivoting the arm which supports the swinging end of the spring at the rear surface of the main supporting-plate; in attaching the spring directly to the pivoted arm; and in adjustably supporting the other end of the spring on a movable screw in a socket and T-slot formed on the main supporting-plate. It further consists in directly attaching to the arm, pivoted directly at the rear surface of the main supporting-plate, a rigid connecting-bar, itself being directly joined to a hook rigidly secured to the door-casing. And it further consists in detachably uniting the rigid connecting-bar with a hook rigidly attached to the casing and independent of the hinge.

A is the supporting-plate, of well-known construction, save in the following particulars, to wit, first, longitudinal bars *a a* on its back side. I may construct the plate without the bars *a a*, but I prefer to add them whenever desirable, for the purpose of strengthening the plate, to enable it to stand the strain of large springs necessary in heavy doors and gates; second, a T-shaped slot, with beveled edges, to con-

stitute one of the bearings for a peculiar screw, to be hereafter described.

The spring C is of the usual construction. The screw D consists of a shank, D, and a T-head. One end, D¹, Fig. 4, of the head is of size to pass from behind the plate A through the cross portion of the T-slot in the plate A. This end has a neck of size to slide in the longer portion of the T-slot. The head has sides beveled to correspond with the bevel of the sides of the slot. The other end of the T-head of the screw D has a hook over which one end of the spring is placed.

On the shank of the screw, and having a toothed perimeter which projects into the cross part of the T-slot in plate A, rides a screw-threaded nut, *d*. It is obvious that by turning this nut with any suitable tool the screw D is worked backward or forward parallel to the plate A, and that thereby the tension of the spring C is regulated. This construction adds strength and cheapness to the adjusting device.

In such apparatus heretofore, where adjustment of the spring was possible from the outside, the screw had its bearing in a slotted cylinder cast on the back of plate A.

The whole strain, in the old construction, was at one end of the screw, while in my device the strain pulls between the two extremities and supports of the screw D.

Near one end, and on the back of the plate A, are formed two eyes, *o o'*, one on each edge of the plate, which serve as journals for a pintle on which turns an arm, E. On the pivotal end of this arm, and on one edge thereof, is a square shoulder, which, when the arm is nearly perpendicular to the plate A, strikes against the back side thereof, between the ribs *a a*, and prevents the arm from turning farther in that direction. The upper edge of the foot of the arm E is rounded, and the body of the arm may be straight or slightly curved. If straight, the eye *m* should project from the arm E farther than is shown in the drawings. Two eyes are formed on the opposite sides of the head of the arm E.

The connecting-bar F has, at the end farthest from the arm E, a key-hole-shaped eye, *f*, which, at the inner end, is wide enough to

receive the knob *n* of the casing-hook *G*. The eye gradually becomes narrower than the diameter of the knob, and yet is large enough to hold loosely the neck of the hook *G*, which is secured to the outside of the casing of the door, and projects toward the aperture *c*.

The advantages of this construction are that the hook, being secured to the outside of the casing, and projecting from it instead of projecting inwardly, there need be no excavation of the casing to receive the hook; and the hook being also opposite the slot *c* of the plate *A*, the bar may connect directly with the arm *E*.

The operation of the spring is as follows: The door having been excavated, as shown by dotted lines in Fig. 1, the supporting-plate *A*, bearing all its attachments, is securely fastened at or near its ends to the door. The casing-hook is also secured to the casing directly opposite to the slot *c* in plate *A*. The door being placed slightly open, the connecting-bar *F* is placed onto the hook *G*, and the force of the spring *C* is permitted to draw the bar toward the door and secure it in the narrowest part of the key-hole slot of the connecting-bar. The door being shut, the casing-hook projects entirely within the slot *c*, and no part of the door-spring is in view. As the door is gradually opened it recedes from the casing-hook, which holds the connecting-bar, and the swinging end of the arm *E* gradually turns vertically toward the slot *c*, while the connecting-bar *F* is gradually turning horizontally, both on the hook *G* and on the eye of the bar *E*, until, finally, when the door is completely open, the bar *E* lies nearly parallel to the plate *A*, the spring *C* is bent against lever *E*, the eye *m* projects through and beyond the

slot *c*, and the arm *F* extends nearly horizontally, and close to and parallel with the face of the casing and the edge of the door. In closing the door the operation is reversed. The tension of the spring is regulated by turning the nut *D* with any suitable tool.

If the supporting-plate and its attachments be embedded in the casing, and the hook attached to the door, or if the whole device be inverted, so that the part now shown uppermost shall be beneath, in either case the operation will be the same as when in the position illustrated and described.

What I claim, and wish to secure by Letters Patent, is—

1. The combination, with the plate *A*, having a T-slot, a socket, *x*, eyes *o' o'*, and aperture *c*, and with spring *C* and pivoted bar *E*, of the T-headed screw *D*, one branch of its head riding in the T-slot, and the serrated nut *d*, as and for the purpose set forth.

2. The combination of the bar *E*, pintled directly at the rear surface of the supporting-plate *A* of plate *A*, having lever-supports *o' o'*, and aperture *c*, and the connecting-bar *F*, attached to the eye *m*, with the rigidly attached casing-hook *G*, all arranged as described.

3. The combination of the plate *A*, having slot *c*, the hook *G*, having knob *n*, the rigid connecting-bar *F*, having key hole slot *f*, and the spring *C* and the bar *E*, pivoted on plate *A*, the connecting-bar *F* being attached directly to the pintled bar *E*, as and for the purpose set forth.

JAMES K. GILFILLAN.

Witnesses:

D. I. STEVENS,
HARRY CLEVELAND.