

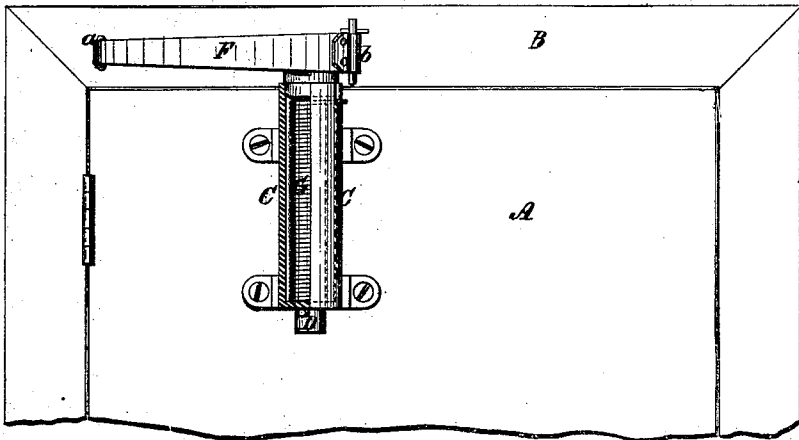
*A. T. Ballantine,*

*Door Spring.*

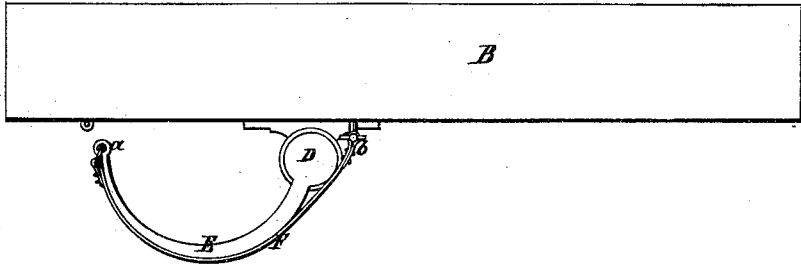
*No. 102,197.*

*Patented Apr. 19, 1870.*

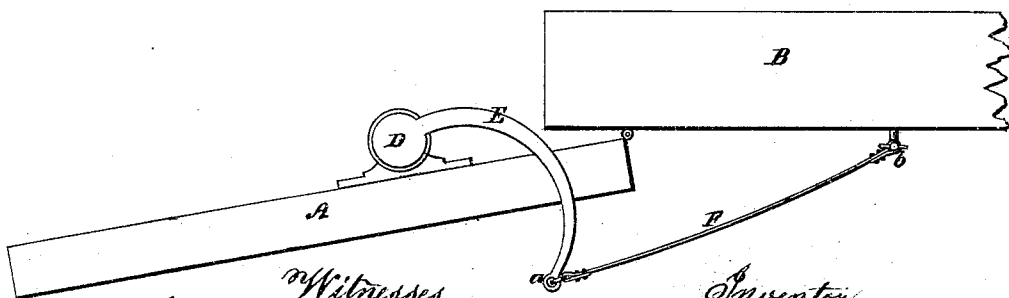
*Figure 1.*



*Figure 2*



*Figure 3.*



*Witnesses*  
*Chas. C. Upperman*  
*P. A. Devine*

*Inventor*  
*Alexander T. Ballantine*  
*By his Attorneys,*  
*Upperman & Johnson.*

# United States Patent Office.

ALEXANDER T. BALLANTINE, OF TITUSVILLE, PENNSYLVANIA, ASSIGNOR TO HIMSELF, W. W. KINGSLAND, N. R. BATES, AND L. D. PHELPS, OF SAME PLACE.

Letters Patent No. 102,197, dated April 19, 1870.

## IMPROVEMENT IN DOOR-SPRINGS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, ALEXANDER T. BALLANTINE, of Titusville, in the county of Crawford and State of Pennsylvania, 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, reference being had to the accompanying drawings which make part of this specification, and in which—

Figure 1 represents an elevation of a portion of a door and its frame, showing a spring embracing my improvement.

Figure 2 represents a plan or top view of the same.

Figure 3 represents a similar view, showing the door open.

My invention relates to springs applicable to doors, gates, &c., for closing them, and consists in the construction and arrangement of a curved arm mounted upon a swiveling-stem secured to the inner side of the door, in combination with a flexible strap attached to said curved arm and to the door in such manner that when it is closed the strap will hug the said curved arm closely; and, when being opened, it will spread out from said arm, drawing the latter backward over the top of the door in a direction opposite to that in which it is opened, so that the curved arm, whether in opening or closing the door, always has a direct pull on its connecting-strap, making the spring very simple and compact.

In the accompanying drawings—

A represents the door, and  
B, the frame.

To the inner side of the door, at the top thereof, is secured a vertical tubular arm support, C, within which is arranged the stem D of the curved operating arm E, which latter is permanently fixed to the said stem, and projects therefrom horizontally, so as to describe a semi-ellipse or semicircle.

To the outer end *a* of this arm E a flexible strap, F, is attached, the other end, *b*, of the latter being se-

cured to the door-frame B, near the hub of the arm, so that, when the door A is closed, the said connecting-strap will lie snugly against the convex side of the spring arm E. This strap F is made of hoop-steel, and is, therefore, perfectly flexible, and, in its attachment to the arm E and door F, assumes a bow form, so that, in opening and closing the door, it exerts a certain degree of force.

The stem D of the curved arm is surrounded by a spiral spring, G, one end of which is attached to the lower end of said stem, and the other to the upper end of the inclosing tube C, so as to resist the turning of the arm toward the frame as the door is being opened.

The connecting-strap F, attached at the point *a* of the arm E, and to the door-frame B near the hub of said arm, draws the latter backward and inward over the top of the door from opposite the inner side of the latter to opposite its outer side when opened, which has the effect of straightening its connecting-strap F against the action of the closing-spring G, and, as the door closes, the said arm E is brought again to the inner side of the door, bringing with it its connecting-strap F around and against its convex side.

The spring arm E is connected so that it may be readily attached to and removed from its supporting-case, and the connecting-strap may be inelastic, if desired.

Having described my invention,

I claim—

The strap F, connected to the door-frame and to the curved spring arm E, in such manner that the former will hug the convex side of the latter when the door is closed, and operate, by such connection, to pull said curved arm around over the top of the door as the latter is opened, as and for the purpose herein described.

ALEXANDER T. BALLANTINE.

Witnesses:

J. J. HOLDEN,  
C. A. SELDEN.