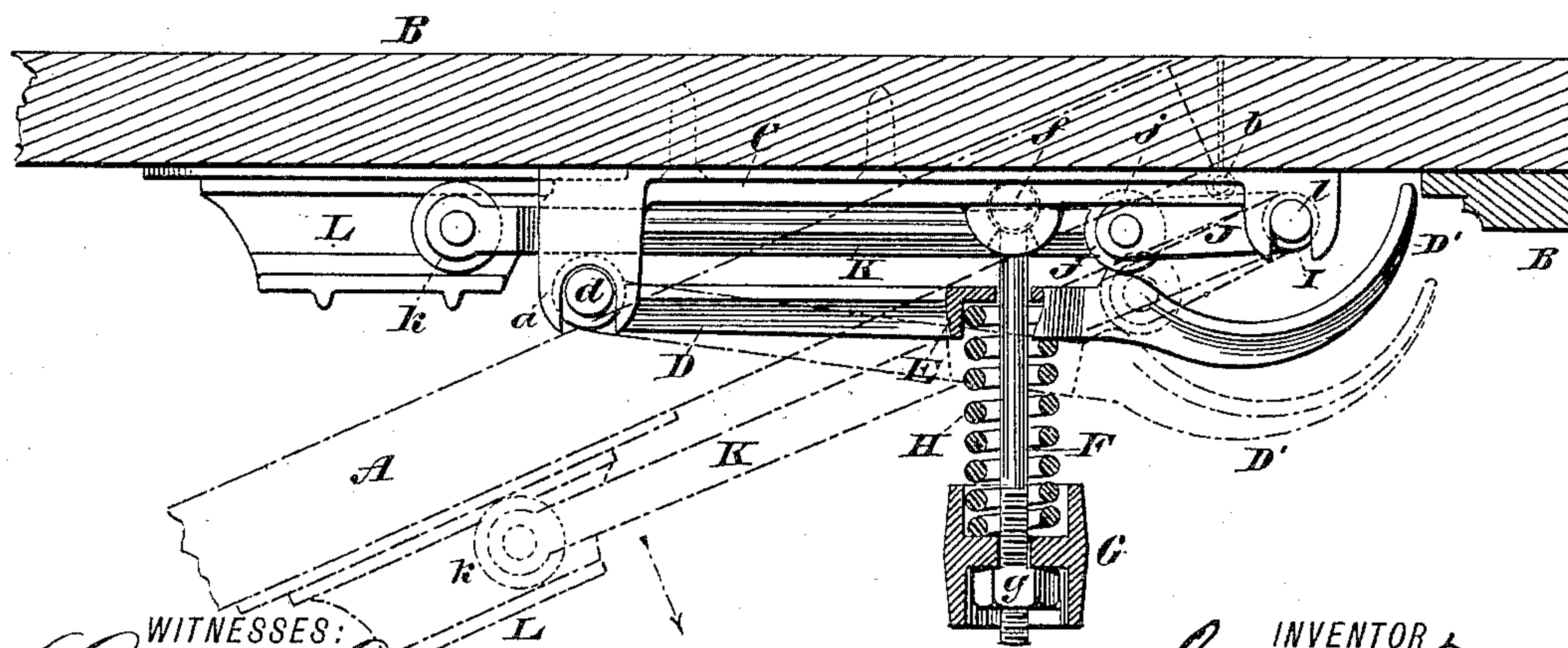


G. FOCHT.
DOOR SPRING.

Patented July 15, 1890.

Fig. 1.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE FOCHT, OF HOBOKEN, NEW JERSEY.

DOOR-SPRING.

SPECIFICATION forming part of Letters Patent No. 432,027, dated July 15, 1890.

Application filed March 12, 1890. Serial No. 343,608. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FOCHT, a citizen of the United States, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Devices for Closing Doors, of which the following is a specification.

The invention relates to improvements in devices for closing doors; and it consists in the devices hereinafter described and claimed, which upon the opening of the door will compress a spring, whose action thereafter will be upon the release of the door to force the parts into their initial position and relation with respect to each other, and thereby cause the door to close.

The invention will be more fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view, partly in section, of a portion of a door with its surrounding casing or frame and illustrating the application of the invention thereto, and Fig. 2 is a horizontal section of same on the dotted line 2 2 of Fig. 1.

In the drawings, A designates the door, and B the inclosing-frame, the door being mounted in the usual manner upon hinges *b*. Upon the frame B, adjacent to the upper inner corner of the door, is secured the casting C, which is angular in outline, as illustrated in Fig. 1, and is provided at its vertical portion with the lugs *l l*, which are recessed upon their outer ends, as illustrated more clearly in Fig. 2, to receive and form bearings for the vertical spindle I, the relation of which with respect to the lugs *l l* may be understood by reference to Fig. 1 of the drawings. The lower end of the spindle I is seated in the support C', which is secured upon the lower end of the vertical arm of the casting C by a screw C''. The spindle I, adjacent to its upper end, carries the arm J, having pivotally secured in its outer end the roller *j*, hereinafter more particularly referred to. At the end of the horizontal arm of the casting C, opposite to the spindle I, are formed the projecting lugs *a a*, the outer ends of which are

grooved to receive and form bearings for the trunnions *d* on the end of the lever D, which is sustained at its central portion on the rod F, whose inner end passes through an aperture in the casting C, as illustrated by dotted lines in Fig. 2, and is retained in position by the enlarged arm *f*, located and having a bearing against the inner surface of the casting C, said inner surface being conformed to receive said arm *f* and to permit its partial rotation when the rod F is moved by the operation of opening or closing the door. The rod F passes through an aperture in the lever D, as illustrated in Fig. 2, and around this aperture is formed, by means of the circular flange E, a seat or recess for the inner end of the guide-spring H, which encompasses said rod F between the lever D and the sleeve G, which is held upon the rod F by means of the internally-threaded nut *g*, engaging an external thread upon the outer end of said rod. The sleeve G is recessed upon its opposite ends, the recess at its inner end being formed to receive the outer end of the coiled spring H, and that at its outer end to receive the nut *g*, by which the sleeve and spring are retained upon the rod F. The purpose of the sleeve G and nut *g* is, in addition to other objects, to render the tension of the spring H adjustable, whereby the device may be adapted for doors varying in weight and requiring different degrees of force for closing them. The outer surface of the sleeve G enables a person with one hand to compress the spring on the rod F, while with the other hand the nut *g* may be conveniently screwed immediately against the said sleeve, and thereby secure it and the compressed spring in place. By adjusting the sleeve G and nut *g* the tension of the spring H may be regulated at will. The end of the lever D opposite to the trunnions *d* is in the form of a curved tramway D', more particularly illustrated in Fig. 2, which is in position to be acted on by the roller *j*, mounted in the arm J, during the opening and closing of the door. When the door is in its closed position, the roller *j* will be against the inner end of the curved tramway D', as illustrated by solid lines in Fig. 2; but as soon as the door is

opened its motion, communicated through the rod K, hereinafter described, to the spindle I, causes the roller *j* to travel along said tramway D', as represented by dotted lines in Fig. 2.

5 To the lower end of the spindle I is firmly connected one end of the rod K, the other end of which carries a roller *k* and rests against the guide-plate L, secured by screws to the upper portion of the door. The guide-plate L is in
10 the form of a casting, having two sides between which the roller *k* is adapted to travel, the relation of said sides with respect to said roller being more clearly indicated in Fig. 2.

When the parts comprising the device
15 which is made the subject of this application are in position upon the door and its casing, the pressure of the spring H, acting upon the roller *j* and through it the arm J and spindle I, imparts a tension to the outer end of the
20 rod K toward the door, and when the door is being opened its motion, operating through the rod K, serves to rotate the spindle I in its bearings *l l*, thereby causing the arm J to carry the roller *j* against and along the curved tramway D', the effect being to force the end of
25 the lever D outward and compress the spring H between said lever and sleeve G, the compression of the spring H continuing until the door has been fully opened.

30 In Fig. 2 of the drawings the door is illustrated in its closed position by solid lines and partly open by dotted lines, and the movement of the lever D from its initial position is also illustrated by dotted lines. The lever
35 D during its movement under the action of the roller *j* and arm J turns upon its trunnions *d*, which serve as pivotal points, while at the same time the spring H retains the lever D in position, and the rod F operates as a
40 guide and also serves to sustain the lever. After the door has been opened and released from the force by which it was pushed open the tension of the compressed spring H, forcing the curved tramway D' against the roller
45 *j*, operates to cause the arm J and spindle I to have a reverse movement, which actuates the rod K to close the door, the outer end of the rod K being adapted during the opening and closing of the door to have a sliding
50 movement in the casing L. The radius of the curved tramway D' is different from that of the line of travel of the arm J and roller *j*, and hence said tramway acts as a cam, under the pressure of the spring H, to reverse the
55 movement of the said arm J and to close the door. Upon the door being opened the spindle I is rotated by the pressure exerted against the outer end of the rod K, and this rotation of the spindle I is imparted to the arm J; but
60 upon the release of the door the spindle I is rotated in a reverse direction by the force of the spring H, acting through the tramway D' and arm J, and this reverse rotation of the spindle I causes the outer end of the rod K
65 to press against and effect the closing of the door.

The apparatus sought to be protected by this application is thoroughly effective and its method of operation may be easily understood, and hence a more detailed description
70 of the movements of the elements composing the device is probably unnecessary. It may be noted, however, that the parts may be readily applied or detached at will, and that if
75 any one part is broken an unskilled person may attach a new part for it without loss of time. If, for instance, the arm K should by accident become broken, the spindle I, which carries said arm, may be quickly removed by
80 detaching the support C', and a new spindle substituted. The curved bearings in the lugs *l l* and *a a* are open, and the ends of the spindle and trunnions *d d* are held in place in
85 said bearings by the pressure of the spring H, and hence upon the removal of the spring by withdrawing the nut *g* the lever D may at once be withdrawn. The casting C is secured to the casing B by screws, as illustrated by dotted lines in Figs. 1 and 2.

What I claim as my invention, and desire to
90 secure by Letters Patent, is—

1. The casting C, secured to the door-frame, and the lever D at one end, set in bearings formed in said casting and at the other end forming the curved tramway D', combined
95 with the vertical spindle I, mounted in bearings at the end of the said casting opposite to the bearings for the said lever D, the arm J at the upper end of said spindle, the rod K at the lower end of said spindle, and a spring
100 pressing the lever D toward the door-frame, the other end of the arm J engaging said tramway and the outer end of the rod K engaging the door, substantially as set forth.

2. The lever D, having a pivotal bearing
105 at its outer end and the curved tramway D' at its inner end, combined with the rod F, the spring H thereon, the sleeve G at the outer end of said rod, the nut *g*, by which the tension of the spring may be regulated, and the
110 spindle I, carrying the rod K, whose outer end is in contact with the door, and the arm J, having the roller *j*, arranged to travel along the said tramway, substantially as set forth.

3. The casting C, having the lugs *a a* and
115 *l l*, and the spindle I in said lugs *l l* and carrying the rod K, having a bearing at its outer end against the door, and the arm J, carrying the roller *j*, combined with the lever D, having a pivotal bearing at its outer end and
120 provided with the tramway D' at its inner end in position to be engaged by said roller *j*, the flange E on said lever D, rod F, extending through the casting C and lever D, and the spring H, sleeve G, and nut *g* upon said
125 rod F, substantially as set forth.

4. The casting C, having the lugs *a a* and
130 *l l*, and the spindle I, mounted in said lugs *l l* and carrying the arm K, whose outer end is in contact with the door, and the arm J, carrying the roller *j*, combined with the support
C' for the lower end of said spindle, the lever

D, having a pivotal bearing at its outer end in the lugs *a a*, and the curved tramway D' at its inner end in position to engage the roller *j*, the spring H, acting against said lever
5 D, and means, substantially as described, for supporting said spring, substantially as set forth.

Signed at New York city, in the county of New York and State of New York, this 28th day of February, A. D. 1890.

GEORGE FOCHT.

Witnesses:

JNO. B. MCCARTHY,
FREDK. GIBLIN.