

G. W. WRIGHT.
DOOR SPRING AND CHECK.

No. 491,154.

Patented Feb. 7, 1893.

Fig. 1

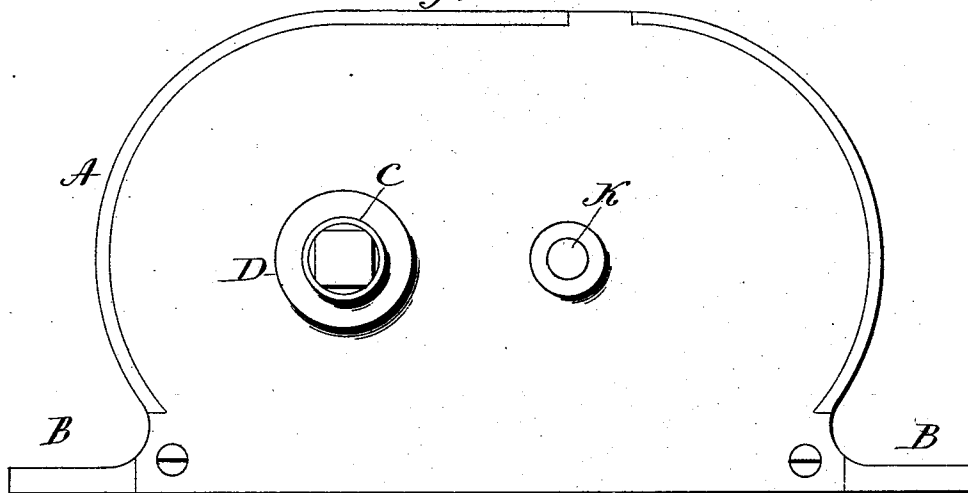
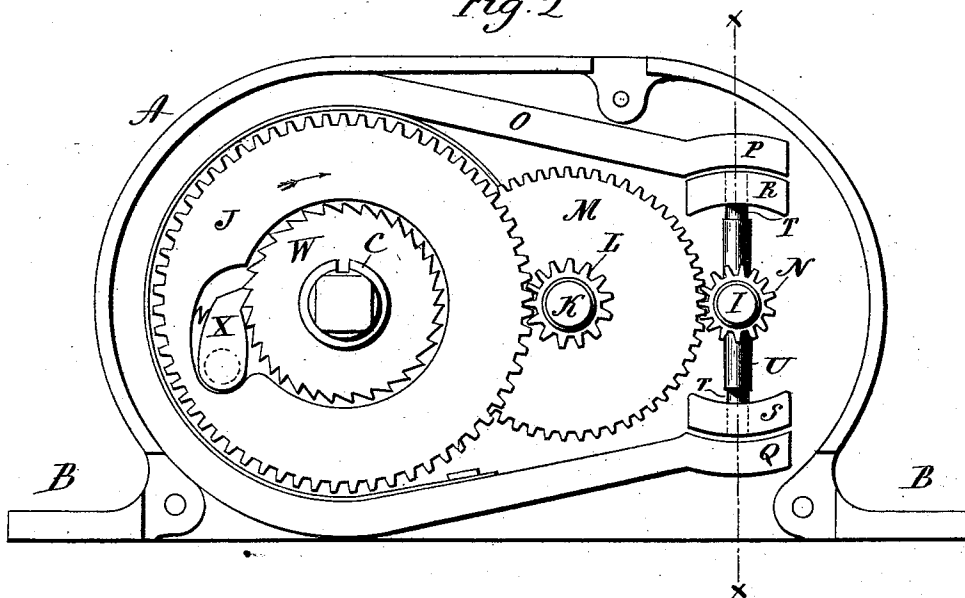


Fig. 2



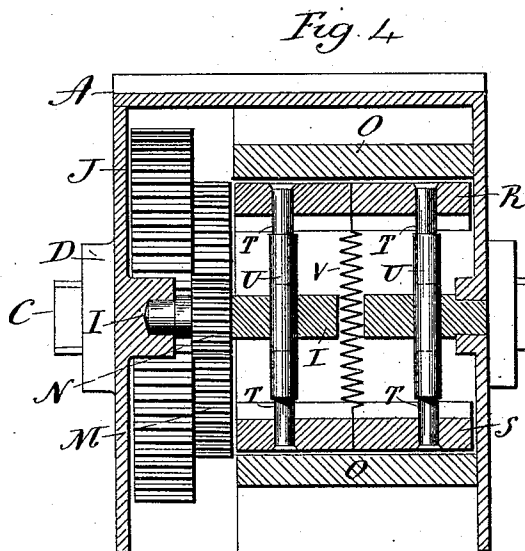
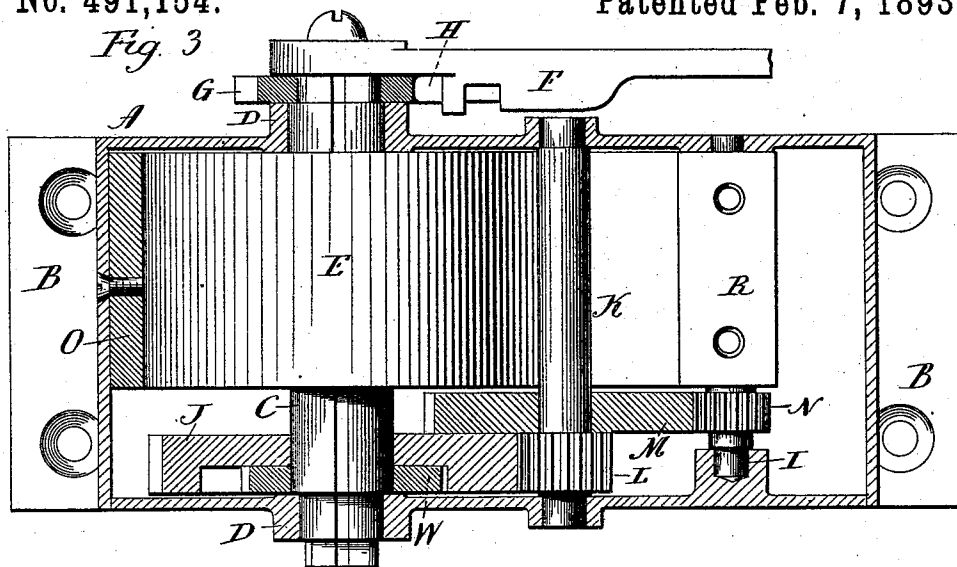
Witnesses
J. H. Shumway
William D. Kellogg

Granville W. Wright
Inventor.
By atty *Earle Seymour*

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UNITED STATES PATENT OFFICE.

GRANVILLE W. WRIGHT, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO
THE SARGENT & COMPANY, OF SAME PLACE.

DOOR SPRING AND CHECK.

SPECIFICATION forming part of Letters Patent No. 491,154, dated February 7, 1893.

Application filed February 23, 1892. Serial No. 422,473. (No model.)

To all whom it may concern:

Be it known that I, GRANVILLE W. WRIGHT, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Door-Checks, (Case B;) and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, an under side view. Fig. 2, an under side view of the bottom of the case removed to show the mechanism. Fig. 3, a longitudinal vertical central section through the case showing the magnet in section, the remainder of the mechanism in side view. Fig. 4, a transverse section on line $x-x$ of Fig. 2.

This invention relates to an improvement in that class of door-checks to be used in combination with a door-spring, and so that the closing movement of the door under the action of the spring, may be checked to prevent its slamming, and particularly applicable to that class in which a volute spring is employed as the door-spring, the object of the invention being principally to combine a mechanical check with such a volute spring within the same case as the spring, in contradistinction to a fluid check which has heretofore been combined with such a spring, the check however being adapted for use upon a door in which the force applied for closing the door may be a structure independent of the check, and the invention consists in the construction as hereinafter described and particularly recited in the claims.

A, represents the case, which is provided with suitable lugs or flanges B, by which it may be secured to the lintel, or wherever it may be desired. Within the case a vertical principal shaft C, is arranged, and supported in the top and bottom of the case in bearings D D, provided for the purpose, and so as to permit the shaft to be rotated. Within the case the steel volute spring E, is arranged, in the usual manner, the outer end of the spring being connected with the case, and the inner end of the spring connected with the shaft, and so that as the shaft is rotated in one di-

rection it will wind the spring, then when free, the reaction of the spring will impart rotation to the shaft in the opposite direction. At one end of the shaft outside the case, a lever, F, is applied, which is in connection with the door, in the usual manner, so that the opening of the door will turn the shaft in one direction to wind the spring, and so that the reaction of the spring will be communicated through the lever to close the door. As represented, this shaft is provided with a ratchet-wheel G, and the lever provided with a suitable pawl or bolt H, by which the lever may be coupled to the shaft, so that the spring may be wound to the required tension, and then engagement be made between the lever and the shaft, in the usual and well known manner. The connections between the shaft and the door are illustrated, but they are too well known to require particular description, and if preferred other connecting devices may be employed.

Within the case and at one side of the principal shaft, a second vertical shaft I, is arranged, its axis parallel with the axis of the principal shaft C, and the said second shaft is in gear connection with the principal shaft, and so that a partial rotation of the principal shaft, as in the closing movement of the door, will impart a rapid rotation to the said second shaft. As here represented this gear connection is produced by a gear-wheel J, preferably loose on the shaft C, but so as to be engaged with the shaft in the closing movement of the door. Between the principal shaft C, and the shaft I, an intermediate vertical shaft K, is arranged, which carries a pinion L, into which the gear J, works, and the shaft K, also carries a gear-wheel M, which works into a pinion N, on the shaft I, the difference in the diameters of the gears and pinions is so great that the slow movement of the principal shaft produced as in the closing movement of the door, will impart rapid revolution to the shaft I. Within the case a stationary horse-shoe magnet O, is arranged, its arms terminating in two poles P Q on opposite sides of the shaft I, as seen in Fig. 2, and equidistant therefrom; these poles preferably presenting a surface substantially concentric with the axis of the shaft I.

On the shaft I, an armature is arranged, which will revolve with the shaft, and between the two poles of the magnet. As here represented the armature is composed of two cheeks R S, each provided with two guiding spindles T, which slide into corresponding radial tubular arms U on the shaft I, (see broken lines Fig. 4) which permit them to move outward and inward as occasion may require, and the two cheeks are connected by a spring V, the tendency of which is to draw the cheeks toward the shaft, yet allow the cheeks to move outward under centrifugal force produced by the rapid revolution of the shaft I, which carries the cheeks. The armature thus constructed, may revolve between the two poles of the magnet without contact therewith, the spring normally holding the cheeks of the armature at a slight distance from the poles. The attractive force of the magnet operates to draw the armature toward them, and thereby resists the passage of the armature from the poles.

In the opening movement of the door, the lever connection rotates the principal shaft in one direction, and without engaging the gear wheel J, as will be hereinafter described, but engages the shaft as the door closes, and so that the closing movement of the door will impart a corresponding rotation to the gear J, and this rotation of the gear J, will produce a rapid revolution of the shaft I, and the armature which it carries, and so that the armature will revolve between the two poles of the magnet, such revolution being resisted by the attractive power of the magnet tending to arrest the revolution of the shaft each time the armature is brought into line with the poles, the resistance to the revolution of the shaft I thus produced by the magnet and armature, operates against the closing force applied to the door, and so as to resist the closing to such an extent that the closing movement must be comparatively slow, and so slow that the door will close easily, and thereby prevent slamming.

The cheeks or armature is preferably movable toward and from the shaft, as described, so that as the revolution of the armature shaft increases, the tendency of the centrifugal force is to throw the cheeks outward and into nearer engagement with the magnets, thereby correspondingly increasing the resistance which the magnet offers to the revolution of the armature, the tendency of the spring should therefore be arranged with relation to such centrifugal action.

As a means for engaging and disengaging the gear J from the principal shaft, a ratchet-wheel W, is rigidly attached to the shaft, and on the wheel J, a spring-pawl X is hung, adapted to engage the ratchet in the closing movement of the door, that movement being indicated by the arrow, and so as to escape therefrom in the opening movement of the door. This is desirable in order that the checking appliance will not operate during

the opening movement of the door. This is a common device for making such connection and disconnection, and for which other known devices may be substituted.

The cheeks of the armature may be made stationary with relation to the shaft which carries them if preferred.

The particular construction or kind of magnet employed, is immaterial to the invention, it only being essential that there shall be a magnet with its armature arranged to revolve rapidly under the closing movement of the door.

The checking device may be employed with a spring independently applied, the door having the connection with the principal shaft, as described, and the same as if the spring were in direct connection therewith, and so that the closing movement of the door will impart rapid revolution to the magnet.

While representing the apparatus as inclosed within a case, it will be understood that this is not essential to the invention, any suitable frame which will support the mechanism being sufficient.

I claim—

1. A door-check consisting of a magnet, a revolving shaft carrying the armature of the magnet, a principal shaft, with connection therefrom to the door, and so that a corresponding rotative movement is imparted to said principal shaft by the opening and closing movement of the door, gearing between said principal shaft and the armature, whereby the rotative movement of the said principal shaft will communicate a rapid revolution to the armature, substantially as described.

2. A door-check consisting of a principal shaft with connection therefrom to the door, and so that a corresponding rotative movement is imparted to the said principal shaft by the opening and closing movement of the door, a stationary magnet, a second shaft carrying an armature adapted to revolve therewith and arranged between the poles of the magnet, a train of gearing between said principal shaft and the armature-shaft, whereby the rotative movement imparted to said principal shaft will communicate rapid revolution to the armature shaft, and mechanism substantially such as described for disengaging said principal shaft from the gearing in the opening movement and engaging it in the closing movement of the door, substantially as described.

3. The combination of a case or frame adapted for attachment to the lintel of a door, a vertical principal shaft in said frame, a volute spring, around said shaft, the inner end of the spring secured to said shaft, and the outer end of the spring secured to the case, a lever extending from the said principal shaft, and adapted to receive a swinging movement in the opening and closing of the door, and impart a corresponding rotative movement to said shaft, a stationary magnet within the

case, a second shaft carrying an armature adapted to revolve between the poles of the said magnet, with a train of gearing between the said principal shaft and the armature-shaft, whereby the rotative movement of the principal shaft will communicate rotation to the said armature shaft, and mechanism substantially such as described to disengage the principal shaft from the gearing in the opening movement of the door, and engage the

said shaft with the gearing in the closing movement of the door, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses:

GRANVILLE W. WRIGHT.

Witnesses:

FRED. C. EARLE,
LILLIAN D. KELSEY.