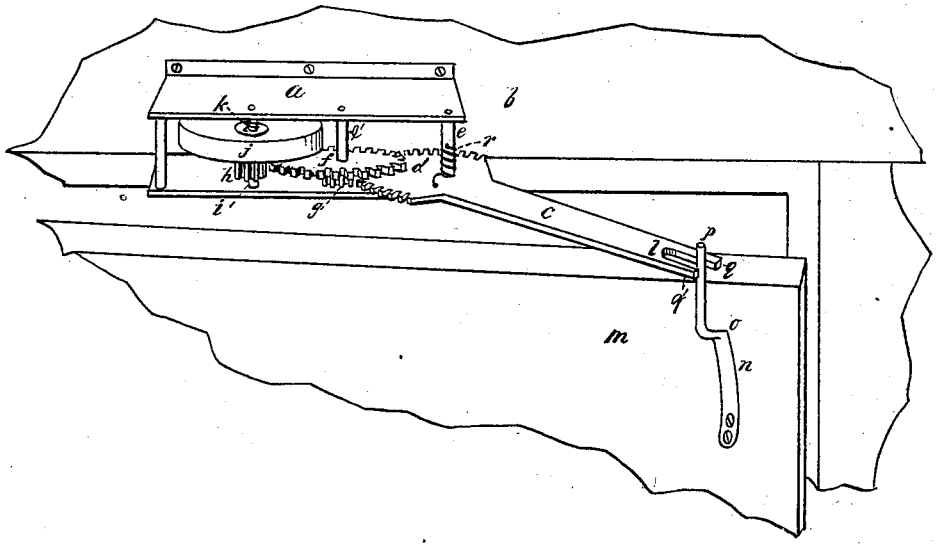
A. E. HOTCHKISS.

Door-Check.

No. 211,660. Patented Jan. 28, 1879.

Fig. 1



Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR E. HOTCHKISS, OF CHESHIRE, CONNECTICUT.

IMPROVEMENT IN DOOR-CHECKS.

Specification forming part of Letters Patent No. **211,660**, dated January 28, 1879; application filed October 16, 1876.

To all whom it may concern:

Be it known that I, ARTHUR E. HOTCHKISS, of Cheshire, in the county of New Haven and State of Connecticut, have invented a certain new and Improved Door-Check, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms a part of this specification.

This invention relates to that class of door-checks which, after checking the door, exert power to close it.

The nature of said invention consists in the combination of a balance or fly wheel with a spring-bar attached to a door and a lever, said lever being arranged to engage with said spring-bar, and to be operated also by said balance or fly wheel for the final closing of the door.

The accompanying drawing represents a perspective view of my door checking and closing devices, the door having been checked, and being now approximated to a closed position.

In said drawing, *m* designates a door; *b*, the door-casing of the same, and *a* the frame of my door-check, secured to said casing above said door.

To the side of said door, near its upper free corner, I attach an upright flat spring, *n*, the upper part of which is bent at *o* and formed into a vertical cylindrical rod, *p*, extending above said door.

In frame *a* is secured a vertical pillar or pivot-pin, *e*, on which a horizontal lever, C, is pivoted. Around said pillar *e* is wound a spring, *r*, the lower end of which is attached to said lever C, and which operates to hold outward the longer end of lever C at an angle of about forty-five degrees with the door-casing. The long outer arm of this lever is constructed with a terminal longitudinal slot, *l*, which gives it a bifurcated shape. The inner tine or finger, *q*, of the fork thus formed is made longer than the outer one, and the arrangement of the above devices is such that the rod *p* may readily engage with the said finger *q* when the door is turned on its hinges for shutting.

The other end of lever C is broadened and formed into a segmental gear, *d*, which meshes with a pinion, *g*, on a pillar or pivot-pin, *e'*, in frame *a*. Pillar *e'* also carries gear-wheel *f*, which turns with pinion *g* and meshes with pinion *h* on small shaft *i*. This shaft *i* also carries balance or fly wheel *j*.

The operation of the above devices is as follows: When the rod *p* comes in contact with finger *q*, the door is checked by the resistance offered by the inertia of the balance-wheel *j* and the friction of the gears *d g f h*, thus preventing slamming. As this resistance yields rod *p* passes inward toward the inner end of slot *l*, as shown in the drawing, this motion being caused by the difference in the radius of the curves described by said rod *p* and by said finger *q* when turned pivotally, the one on the door-hinges, the other on pillar *e*.

The pressure thus applied to finger *q* causes segment-gear *d* to turn from right to left. Said gear *d* then causes pinion *g* and gear-wheel *f* to turn from left to right. Gear-wheel *f* in like manner causes pinion *h* and balance-wheel *j* to turn from right to left. The chief resistance encountered is from the inertia of balance-wheel *j;* but this is overcome by the pressure of the rod *p* against finger *q*, and it has two effects: First, it checks said door; and, secondly, as the motion of said door is thereby slackened, the momentum of the wheel, by that time in rotation, operates to give the door a fresh impulse, closing it—that is, the wheel *j*, still turning from right to left with pinion *h*, will cause gear-wheel *f* and pinion *g* to continue to turn from left to right, and pinion *g*, transmitting this power, will cause segment *d* to continue turning from right to left, so that the outer finger, *q'*, of lever C will be pressed against the outside of rod *o*, closing the door. Thus the balance-wheel *j* simply performs the ordinary duty of a fly-wheel, that of utilizing the power employed in overcoming its inertia on first starting by applying the same to operate the machine after the impulse has wholly or partly subsided.

Balance-wheel *j* is not permanently attached to shaft *i*, but is pressed firmly against pinion *h* by spring *k*, causing it to turn with said pinion. In case of accidental extraordinary resistance, said spring will yield so as to allow

said balance-wheel to turn freely on said shaft, thus avoiding all injury to the devices.

Spring *n* prevents any injury from resulting from the sudden shock of rod *p* against lever C, as it will yield considerably in an outward direction; but as soon as the resistance of the balance-wheel *j* is overcome, said spring *n* resumes its normal position against the face of the door, so that finger *q'*, by pressing against the rod, as stated, instantly operates the door to close it.

When the door is thrown open spring *r* throws lever C outward into its normal position, at an angle of about forty-five degrees with the door-casing.

The gearing and arrangements of parts may be considerably varied without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In combination with a spring-rod attached to a door, a lever, balance-wheel, or its equivalent, and connecting-gears, whereby the balance-wheel, after checking, operates to close the door.

ARTHUR E. HOTCHKISS.

Witnesses:

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