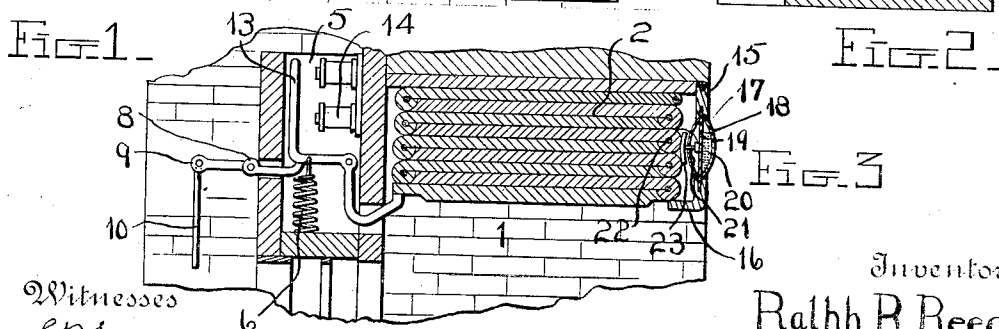
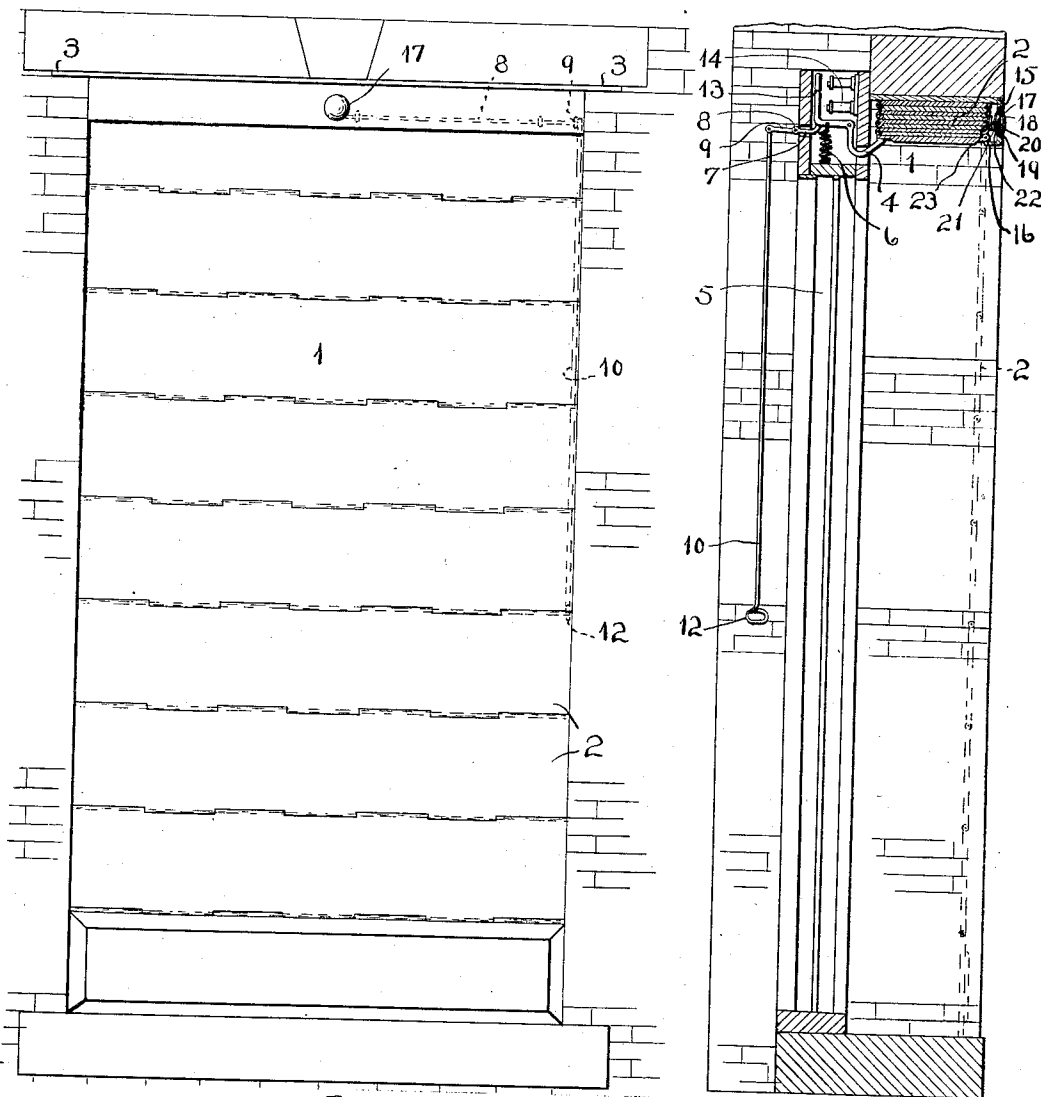


No. 848,853.

PATENTED APR. 2, 1907.

R. R. REED.
FIRE SHUTTER.
APPLICATION FILED JUNE 21, 1906.



Witnesses
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UNITED STATES PATENT OFFICE.

RALPH RAYMOND REED, OF SAN FRANCISCO, CALIFORNIA.

FIRE-SHUTTER.

No. 848,853.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed June 21, 1906. Serial No. 322,790.

To all whom it may concern:

Be it known that I, RALPH RAYMOND REED, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Fire-Shutters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in fire-shutters.

The object of the invention is to provide a shutter of this character having means whereby the same may be automatically released and closed in case of a fire, means being also provided whereby the same may be manually released and closed.

A further object is to provide a curtain or shutter of this character which will be simple, strong, durable, and inexpensive in construction and which when folded in an open position will be unobstructive and neat in appearance.

With the above and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a front view of a window, showing the shutter applied thereto and in a lowered position. Fig. 2 is a central vertical sectional view of the same, showing the shutter raised or folded up in full lines and in dotted lines the manner in which it is dropped down; and Fig. 3 is an enlarged central vertical sectional view through the upper end of the window, showing clearly the retaining and releasing mechanism for the curtain.

Referring more particularly to the drawings, 1 denotes the curtain, which is preferably made up of a series of horizontally-disposed sections or slats 2, formed of sufficiently heavy sheet metal and hingedly connected together to fold in opposite directions, as shown. The upper section or slat of the curtain is somewhat longer than the other slats, the projecting ends of said upper slat being set into the masonry immediately below the lintel at the opposite sides of the window, as shown at 3 in Fig. 1, thereby securely retaining the curtain in place. The lower slat or section of the curtain may be paneled or ornamented in any suitable manner to

present an attractive appearance when the slats are in folded position and to form a finish for the lower end of the curtain when open.

In order that the curtain may be held or supported in a folded or raised position, a suitable catch is provided, said catch being here shown in the form of a bell-crank lever 4, which is pivotally mounted in a casing 5, arranged at the upper end of the window, as shown. The end of said lever projects through the side of the casing and engages the lower section or slat of the curtain, as shown in Figs. 2 and 3 of the drawings. Connected to the upper arm of the bell-crank lever is a coil-spring 6, the tension of which is exerted to counterbalance the weight of the curtain sections or slats and to hold the end of the lever into engagement therewith. Pivotaly mounted on the inner side of the casing and projecting into the same and into engagement with the upper arm of the lever 4 is a releasing-arm 7, said arm being fixedly mounted on a rock-shaft 8, journaled in suitable bearings on the casing and engaging one side of the window, where it has connected therewith a crank-arm 9.

To the outer end of the arm 9 is connected the upper end of an operating-rod 10, the lower end of which extends downwardly along the side of the window-frame to within convenient reach of a person and is provided on its lower end with a handle 12. When it is desired to close the curtain, the operating-rod 10 is pulled downwardly, thereby rocking the shaft 8 and causing the releasing-arm 7 to rock the bell-crank lever 4, thus disengaging the end of the same from the lower slat of the curtain and permitting said curtain to drop.

If desired, the upper arm of the bell-crank lever may be extended upwardly to form an armature 13, which is adapted to be attracted by an electromagnet 14, mounted in the casing 5 and by means of which the bell-crank lever may be operated from a distance to release the curtain, and by means of which a series of curtains similarly operated and connected in the same electric circuit may be simultaneously closed.

If desired, an automatically-released supporting mechanism may be provided for the device, said device being here shown as a transversely-disposed plate or panel 15, hingedly connected along its upper edge to the outer edge of the upper cross-piece of the window-frame and provided on its lower

edge with an inwardly-projecting lug 16. The latter is adapted to be engaged with the under side of the lower section or slat of the curtain adjacent to the hinged edge of the same, as shown.

Arranged in the center of the panel 15 is a circular concavity or depression 17, adapted to be covered by a concave plate 18, thereby forming between said plate and the concave wall of the depression 17 a circular space in which is arranged a flexible diaphragm 19. Between the diaphragm 19 and the concave plate 18 is placed mercury or other highly-expansive fluid 20.

Slidably mounted in the concave inner wall of the depression 17 is a centrally-disposed plunger-bar 21, on the inner end of which is formed a head 22, which is adapted to be engaged with the inner side of the diaphragm.

On the outer end of the plunger-rod 21 is secured a curved or segmental plate 23, which is adapted to bear against the adjacent hinged edges of the slats or sections of the curtain when in folded position. In case of a fire the heat therefrom will expand the mercury or other fluid 20, causing the same to press upon the diaphragm 19, thereby forcing the panel 15 outwardly and disengaging the lug 16 from the lower section or slat of the curtain, thus permitting the latter to drop.

The engagement of the bell-crank lever 4 with the opposite edges of the sections or slats of the curtain will not interfere with the dropping of the same when released by the thermostatic support on the opposite edges thereof, neither will the lug 16 on the panel 15 of the thermostatic support interfere with the dropping of the curtain when released by the bell-crank lever, it being understood that the engagement of both said supports is necessary to hold the curtain in a closed or folded position.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined by the appended claims.

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

1. A fire-curtain comprising a series of hingedly-connected slats or sections, means to connect the upper section or slat at the top of a window-frame, a pivotally-mounted bell-crank lever adapted to engage the inner edge of the lower slat when the latter is in folded position, a hingedly-mounted panel arranged at the opposite edges of said folded

slats, a retaining-lug on the lower edge of said panel to engage the outer edge of the lower slat, a counterbalancing-spring connected to said bell-crank lever, and means whereby the latter is manually operated and disengaged from the slats of said curtain to permit the same to drop, substantially as described.

2. A fire-curtain comprising a series of hingedly-connected slats or sections, means to connect the upper section or slat at the top of a window-frame, a pivotally-mounted bell-crank lever adapted to engage the inner edge of the lower slat when the latter is in folded position, a hingedly-mounted panel arranged at the opposite edges of the folded slats, a retaining-lug on the lower edge of said panel to engage the outer edge of the lower slat, a counterbalancing-spring connected to said bell-crank lever, a rock-shaft having arranged on one end thereof a releasing-arm to engage said bell-crank lever, a crank-arm on the opposite end of said rock-shaft, and an operating-rod connected to said crank-arm, substantially as described.

3. A fire-curtain comprising a series of hingedly-connected slats or sections, means to connect the upper section or slat at the top of a window-frame, a pivotally-mounted bell-crank lever adapted to engage the inner edge of the lower slat when the latter is in folded position, a hingedly-mounted panel arranged at the opposite edges of the folded slats, a retaining-lug on the lower edge of said panel to engage the outer edge of the lower slat, a counterbalancing-spring connected to said bell-crank lever, a rock-shaft having on one end a releasing-arm adapted to engage said bell-crank lever, a crank-arm on the opposite end of said shaft, an operating-rod connected to said crank-arm, an armature formed on the upper arm of said bell-crank lever, and an electromagnet adapted to attract said armature when energized, thereby rocking said bell-crank lever and disengaging the same from the folded sections of the curtain, substantially as described.

4. A fire-curtain comprising a series of hingedly-connected slats or sections, means to connect the upper section or slat at the top of a window-frame, a pivotally-mounted bell-crank lever adapted to engage the inner edge of the lower slat when the latter is in folded position, a hingedly-mounted panel arranged at the opposite edges of the folded slats, a retaining-lug on the lower edge of said panel to engage the outer edge of the lower slat, a counterbalancing-spring connected to said bell-crank lever, means to electrically and manually operate said bell-crank lever to disengage the same from said slats, and an automatically-released supporting mechanism arranged at the opposite edge of said slats, substantially as described.

5. A fire-curtain comprising a series of hingedly-connected slats or sections, means to connect the upper section or slat at the top of a window-frame, a pivotally-mounted bell-crank lever adapted to engage the inner edge of the lower slat when the latter is in folded position, a hingedly-mounted panel arranged at the opposite edges of the folded slats, a retaining-lug on the lower edge of said panel to engage the outer edge of the lower slat, a counterbalancing-spring connected to said bell-crank lever, means to electrically and manually operate said bell-crank lever to disengage the same from said slats, and a thermostatic releasing mechanism arranged in said panel to disengage the lug thereon from said slats, substantially as described.

6. A fire-curtain comprising a series of hingedly-connected slats or sections, means to connect the upper section or slat at the top of a window-frame, a pivotally-mounted bell-crank lever adapted to engage the inner edge of the lower slat when the latter is in folded position, a hingedly-mounted panel arranged at the opposite edges of the folded slats, a retaining-lug on the lower edge of

said panel to engage the outer edge of the lower slat, a counterbalancing-spring connected to said bell-crank lever, means to electrically and manually operate said bell-crank lever to disengage the same from said slats, and a thermostatic, releasing mechanism arranged in said panel to disengage the lug thereon from said slats, said thermostatic, releasing mechanism comprising a covered concavity formed in said panel, a diaphragm arranged in said covered concavity, an expansive fluid adapted to bear on one side of said diaphragm and a plunger-rod in engagement with the opposite side of the latter and with the adjacent edges of the curtain-slats, whereby upon expansion of said fluid the retaining-lug on said panel will be disengaged from said slats, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RALPH RAYMOND REED.

Witnesses:

J. B. WINGER,
G. R. CRABE.