No. 865,943. PATENTED SEPT. 10, 1907.

R. R. REED.

FIRE SHUTTER.

APPLICATION FILED NOV. 1, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

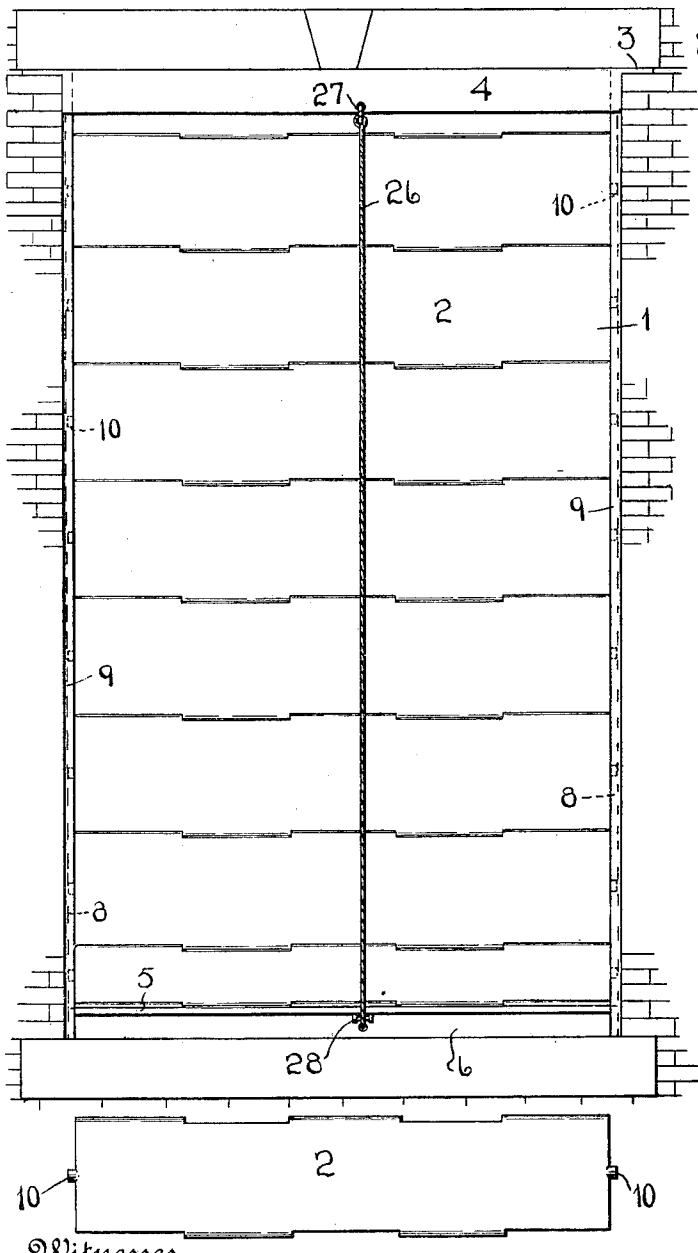


Fig. 2.

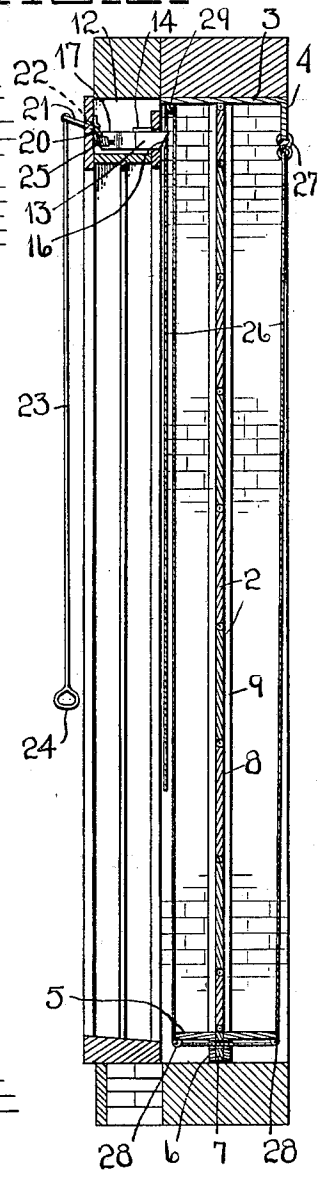


Fig. 5.

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2 SHEETS—SHEET 2.

Fig. 3.

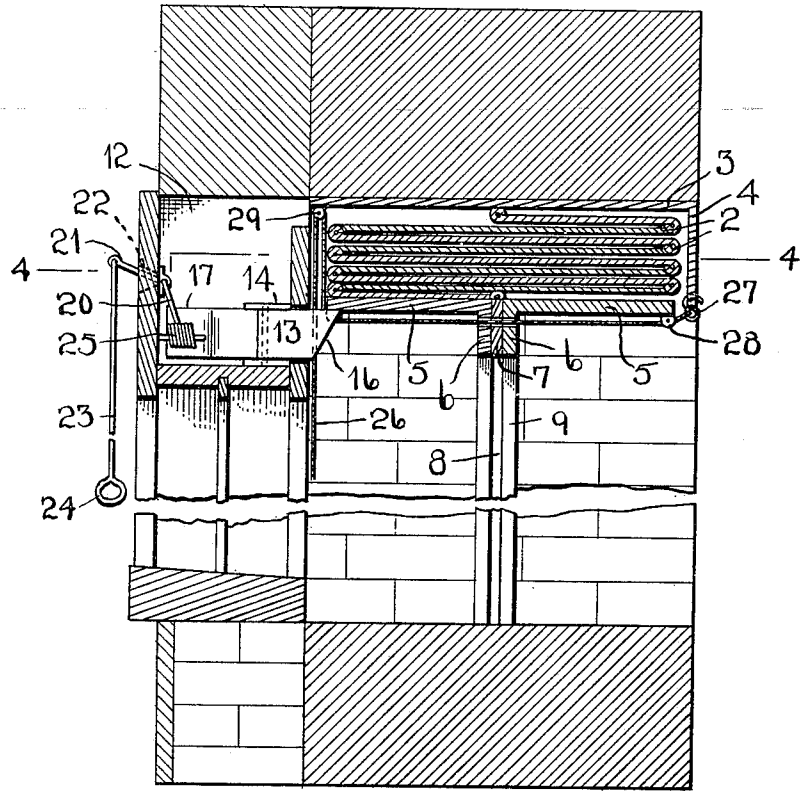
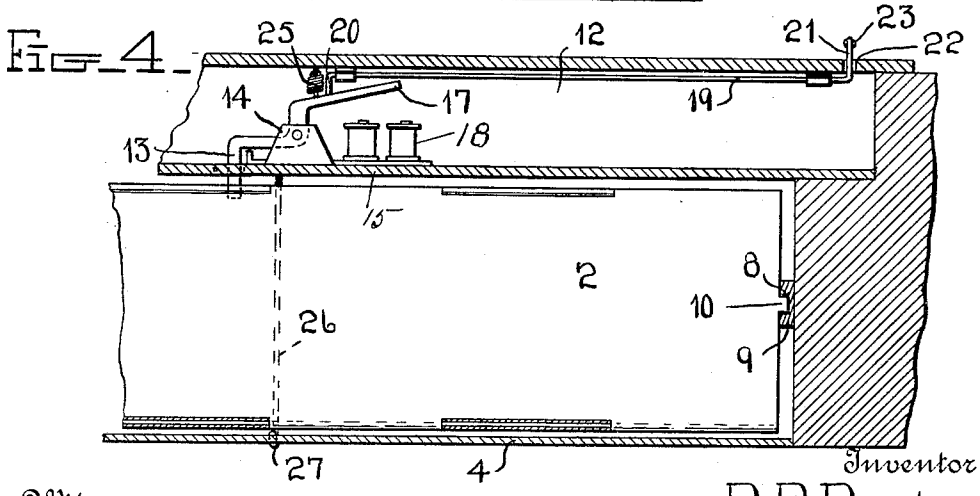


Fig. 4.



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UNITED STATES PATENT OFFICE.

RALPH R. REED, OF SAN FRANCISCO, CALIFORNIA.

FIRE-SHUTTER.

No. 865,943. Specification of Letters Patent. Patented Sept. 10, 1907.

Application filed November 1, 1906. Serial No. 341,598.

To all whom it may concern:

Be it known that I, RALPH R. 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, adapted to be held in a folded, out-of-the-way position when not in use, and means whereby the supporting mechanism may be quickly released in case of fire to permit the shutter to drop to a closed position.

A further object is to provide means whereby large or heavy shutters may be readily raised and folded to a closed position.

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

In the accompanying drawings,—Figure 1 is an outer side view of a window, showing the application of the invention thereto, the curtain being closed or in a lowered position; Fig. 2 is a vertical sectional view of the same; Fig. 3 is a similar view on an enlarged scale, showing the curtain folded up, parts of the window being broken away; Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 3; and Fig. 5 is a detail side view of one of the slats of the shutter.

Referring more particularly to the drawings, 1 denotes a curtain or shutter, which is preferably made up or formed of a series of horizontally-disposed sections or slats 2, said slats being preferably constructed of heavy sheet metal and hingedly connected together to fold in opposite directions, as shown. The upper and lower sections or slats of the shutter are but half the width of the intermediate slats, the inner edge of the upper half of slats being hingedly-connected to a supporting plate 3 suitably secured in the masonry of the wall. The outer edge of said plate is bent downwardly at right angles to form a closing plate or panel 4, behind which the shutter is disposed when in a folded position.

Hingedly connected to the free edge of the lower slat or section is a lower closing plate or panel 5. Said panel 5 is preferably formed in two horizontally-disposed sections or plates, the inner edges of which are bent at right angles to form flanges 6. Between the flanges 6 is bolted or clamped the guide strip 7, the ends of which project beyond the ends of the plate 5, and are adapted to slidably engage a guide groove or channel 8 formed in the guide strip 9 arranged at each side of the window frame, as shown. Each of the intermediate slats of the shutter have preferably formed on their opposite ends outwardly-projecting cylindrical guide lugs 10, which are also adapted to engage and slide in the guide groove 8 in the strips 9, thereby firmly holding the shutter and preventing the same from swaying or bulging inwardly when in a lowered position, and also facilitating in the raising and lowering of the same.

Arranged in the upper end of the window frame is a suitable casing 12, in which is pivotally mounted a supporting catch 13, by means of which the window shutter is held up in a folded position. The catch 13 is here shown, and is preferably in the form of a bell-crank lever, which is pivoted between parallel ears or lugs 14, and on a plate 15 secured in the casing 12, as clearly shown in Fig. 4 of the drawings. One end of the bell-crank lever is beveled, as shown at 16, and forms the catch to engage the under side of the plate 5 when the shutter is in a raised or folded position. The opposite end of the bell crank lever is in the form of an armature 17, and is adapted to be attracted by an electro-magnet 18, which is arranged in a suitable position in the casing 12, and which when energized will attract the armature end of the bell-crank lever, thereby rocking the same and disengaging the catch end from underneath the plate 5 of the shutter, thus permitting the shutter to drop.

In addition to the electro-magnet operating mechanism the bell-crank lever is adapted to be manually operated by means of a rock shaft 19 journaled in suitable bearings in the casing. The inner end of the shaft 19 is provided with a right angularly bent lever-engaging end or lug 20 adapted to be engaged with the free or armature end 17 of the bell-crank lever to force the same inwardly and thereby disengage the catch end of the lever from beneath the plate 5 of the shutter, thus permitting the latter to drop. The opposite end of the crank shaft is provided with an outwardly-projecting crank 21 that projects through a slot 22 at one end of the casing 12 adjacent to one side of the window frame, and to said crank is connected the upper end of an operating rod 23 that extends to within convenient reach and is provided with a handle 24. By means of the handle 24, the shaft 19 may be rocked to engage the lug 20 with the bell crank lever as hereinbefore described. Connected to the armature end 17 of the bell crank lever is a retracting spring 25, the tension of which is exerted to retract the lever to a normal position with the catch end of the same projecting into the path of movement of the shutter slats, so that when the same are drawn upwardly to a folded or closed position, they will engage the beveled end of the catch and force the same inwardly until all of the shutters have been

drawn up to a position above the catch when the latter will spring beneath the bottom plate 5 and retain the slats in folded position.

In order that the shutter may be readily raised or folded, I provide a suitable housing mechanism, which is here shown and is preferably in the form of a block and tackle, consisting of a cable 26. On one end of the cable 26 is secured a hook 27 adapted to be engaged with an aperture in the lower edge of the right angularly bent panel or cover plate 4 of the upper securing plate, as shown. The cable 26 is then passed downwardly around guide pulleys 28 mounted in the opposite edges at the center of the lower plate or panel 5 and beneath said plate, and from thence upwardly around a guide pulley 29 secured to the inner edge of the plate 3, and from thence the end of the cable passes downwardly into convenient reach, so that when the shutter is in a lowered or closed position, the end of the cable is grasped or drawn up, which will quickly hoist or elevate the shutter and hold the slats of the same at the upper end of the window, as clearly shown in Fig. 3 of the drawings.

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 shutter comprising a series of horizontally-disposed slats hingedly connected together, means to secure the upper end of the shutter to the masonry at the top of the window frame, means to raise said shutter, a catch for holding the shutter raised, means for releasing the catch electrically, and means for releasing the catch manually substantially as described.

2. A fire shutter comprising a series of horizontally-disposed slats hingedly connected together, a supporting plate to which the upper end of said curtain is hingedly connected, means to raise said shutter, a pivoted catch to hold the same in a raised position, one end of which forms an armature, and an electro-magnet and manual mechanism, each adapted for actuating said catch by means of said end substantially as described.

3. A fire shutter comprising a series of horizontally-disposed slats hingedly connected together, means to secure the upper end of the shutter to the masonry at the top of the window frame, guide lugs formed on the ends of said slats, channeled guide-pieces arranged on the wall at the ends of the shutter to receive said lugs, a plate or panel secured to the lower slat of the curtain, a pivotally mounted catch arranged at the upper end of the window casing and engaged beneath the lower plate of the shutter, and an electro-magnet adapted to attract said catch and to disengage the same from the lower plate of the shutter to permit the latter to drop, substantially as described.

4. A fire shutter comprising a series of slats loosely connected together, means to secure the upper end of the shutter to the masonry at the top of a window frame, a plate secured to the lower slat of the shutter, a pivotally mounted bell crank lever arranged at the upper end of the inner casing, a catch on one end of said lever to engage beneath the lower plate of the shutter to hold the same in a raised or folded position, an armature formed on the opposite end of said bell crank lever, a magnet to retract said armature end of the lever, thereby disengaging the catch end of the same from the shutter, and means to manually actuate said lever, substantially as described.

5. A fire shutter comprising a series of slats loosely connected together, means to secure the upper end of the shutter to the masonry at the top of a window frame, a plate secured to the lower slat of the shutter, a spring retracted bell crank lever having on one end a catch to engage the lower plate of the shutter, an armature on the opposite end of said lever, an electro-magnet adapted to attract said armature to release the catch end thereof from beneath the folded shutter, a rock shaft having on one end a lug adapted to be engaged with and to actuate said bell crank lever, a crank on the opposite end of said rock shaft, and an operating rod connected to said crank arm, substantially as described.

6. A fire shutter comprising a series of slats hingedly connected together, means to secure the upper end of said shutter to the masonry at the top of the window frame, a plate or panel on the lower end of said shutter, a guide strip arranged in said plate and projecting beyond the opposite ends of the same, channeled guide strips secured to the sides of the window opening to receive the projecting ends of said guide strip, guide lugs formed on the opposite ends of the slats to slide in said guide channels, means to raise said shutter to a folded position at the top of the window, a supporting mechanism to hold said shutter in an elevated position, and means to release said supporting mechanism, substantially as described.

7. A fire shutter comprising a series of slats hingedly connected together, means to secure the upper end of said shutter to the masonry at the top of the window frame, a plate or panel on the lower end of said shutter, a guide strip arranged in said plate and projecting beyond the opposite ends of the same, channeled guide strips secured to the sides of the window opening to receive the projecting ends of said guide strip, guide lugs formed on the opposite ends of the slots to slide in said guide channels, a hoisting cable connected at one end to the upper outer portion of the window, guide pulleys arranged in the lower end of the shutter, and a guide pulley arranged at the upper inner portion of the window to receive said cable, substantially as described.

8. A fire shutter comprising a series of horizontally-disposed slats hingedly connected together, a supporting plate arranged in the masonry at the upper outer portion of the window opening to receive the shutter when in a folded position, a bottom plate or panel secured to the lower slat of the shutter, guide lugs formed on said slats and said lower plate, channeled guide strips to receive said lugs, a hoisting cable connected at one end to the outer end of said supporting plate, guide pulleys arranged in the opposite edges of said lower plate or panel of the shutter around which said cable is adapted to pass, a guide pulley secured to the inner edge of said supporting plate to receive the inner end of the hoisting cable, a casing arranged at the upper end or top of the window, a supporting catch pivotally mounted in said casing to engage the lower plate of the shutter and support the latter in a raised or folded position, an electric releasing mechanism connected to said catch, and a manually-operating rock shaft adapted to be engaged with the catch to release the same from engagement with the shutter, substantially as described.

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

RALPH R. REED.

Witnesses:
ALFRED FUHRMAN,
A. FRASER.