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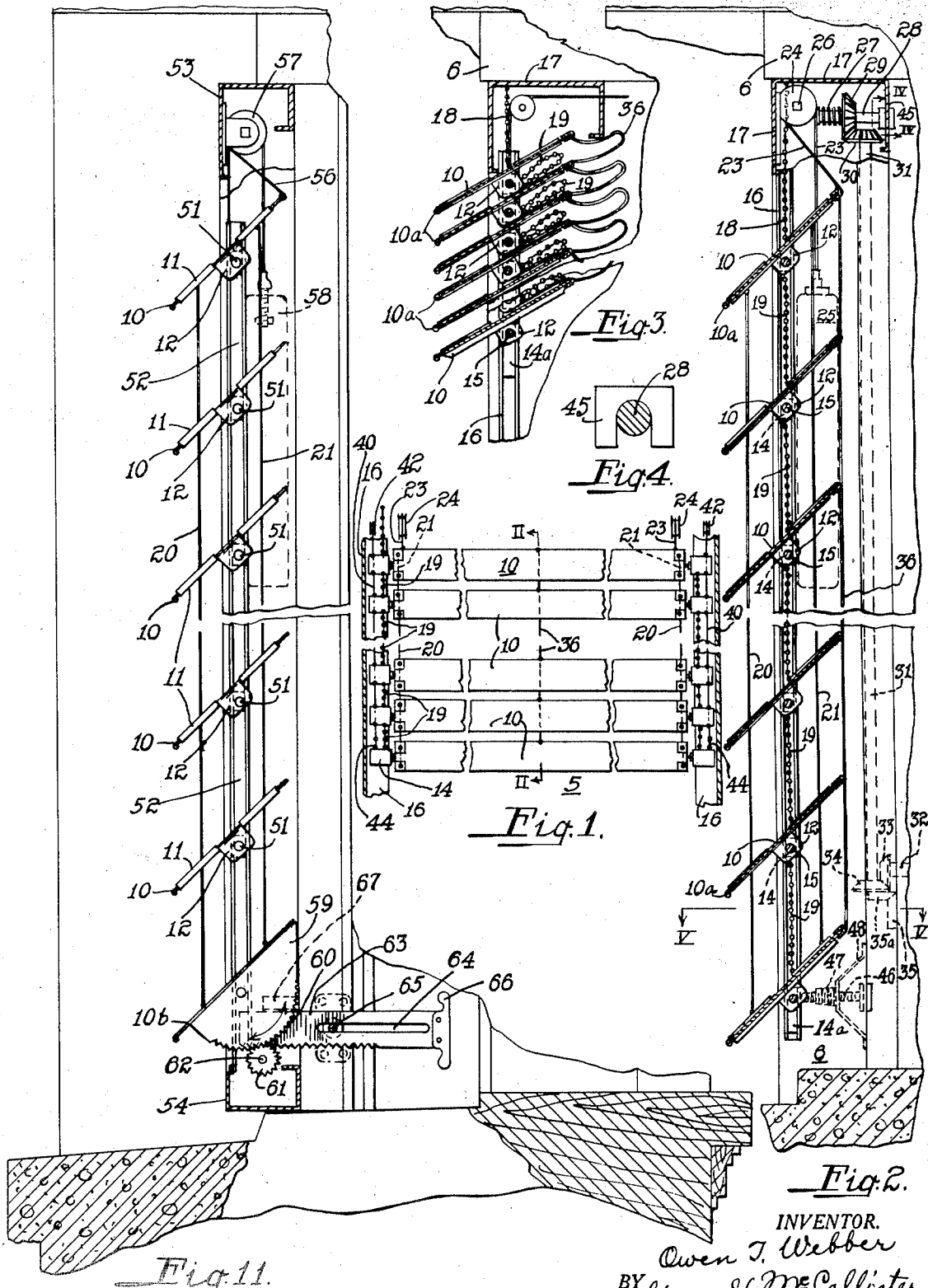
O. T. WEBBER

2,237,800

METALLIC BLIND

Filed Sept. 25, 1937

2 Sheets-Sheet 1



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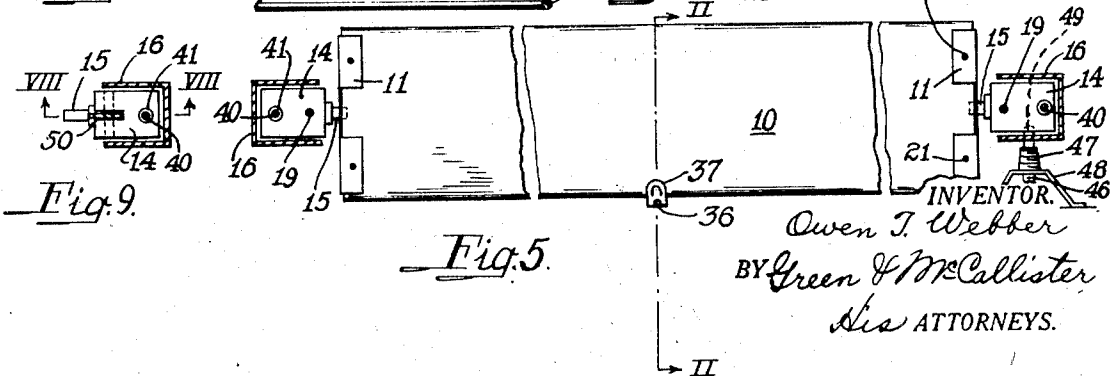
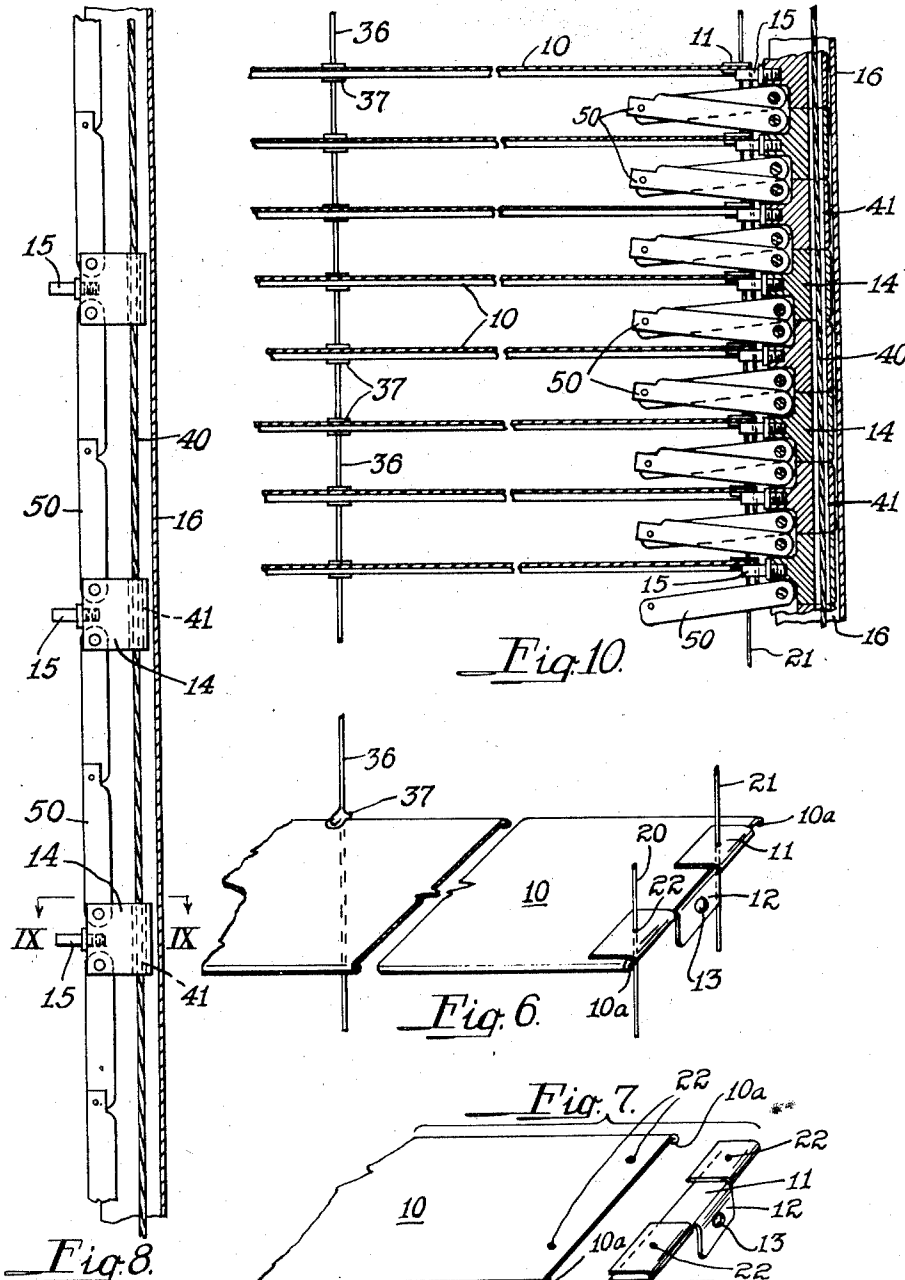
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UNITED STATES PATENT OFFICE

2,237,800

METALLIC BLIND

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9 Claims. (Cl. 189—62)

This invention relates to blinds or curtains for controlling the admission of light and air through windows, doors and the like, and more particularly to a blind or curtain fabricated from a metal capable of withstanding the heat of the sun and inclement weather over a long period of years without appreciable depreciation, which is adapted to be installed on the outside of a window and provides a combined sun blind and fire curtain for such window.

The primary object of this invention is to provide a blind adapted to be used on the outside of a window, having metallic slats preferably made from stainless steel or any other suitable metal having great strength which is highly resistant to heat, and which are not only capable of being adjusted to vary the angle of inclination of the slats and thus provide normal ventilation in a room even during a storm, but also are capable of being raised to nest the slats at the top of the window opening to admit more light and to permit the windows protected thereby to be washed.

Another object is to provide a metallic blind for a window which, in the event of fire, will act as a fire curtain and prevent flames from entering the building if the fire is exterior thereof, or confine flames within the building if interior thereof and which is provided with means for automatically lowering and closing the blind, if the slats are nested at the top of the window opening at the outbreak of the fire, or for automatically closing the slats if the blind is in its lower or operating position.

Another object of this invention is to provide metallic blinds for the windows of any building which will not only enhance the architectural appearance thereof, but which can be arranged to act as a shield to prevent people, especially children, from accidentally falling from an open window and also prevent the entry of thieves and the like into the building through such windows. To accomplish this object, I prefer to make the blinds from a metal, such as stainless steel, which has great strength and resistance to both impact and cutting, special tools being required to cut stainless steel due to the inherent toughness and work hardening characteristics of such metal and to fabricate the blind in such a way that in order to gain unlawful entry into the building a large portion of the slats of the blind would have to be cut away, even though the slats were in their operating position.

A further object is to provide means for covering openings in the inside walls and over the

skylights in factories and other buildings where through ventilation is desired but where reasonable protection against fire and theft is essential.

These and other objects which will hereinafter be made apparent to those skilled in this particular art are accomplished by means of this invention, one embodiment of which is described in the following specification and illustrated in the accompanying drawings, wherein:

Figure 1 is a view in elevation having portions thereof broken away for convenience of illustration, showing one exemplification of my invention and the relation of the blind to a window reveal;

Fig. 2 is an enlarged vertical section taken on line II—II of Fig. 1, showing the blind in operating position;

Fig. 3 is an enlarged sectional view of the blind shown in Fig. 1, with the blind in its raised or nested position;

Fig. 4 is a section taken on line IV—IV of Fig. 2 and illustrates the mounting for the blind closing means;

Fig. 5 is a horizontal section taken on line V—V of Fig. 2 showing the slat and mounting therefor;

Fig. 6 is a perspective view of one of the slats or louvers showing means for correlating the angle of inclination thereof with other slats or louvers and for preventing fluttering thereof;

Fig. 7 is an exploded perspective view of one slat and its connecting clip;

Fig. 8 is a sectional view on line VIII—VIII of Fig. 9 illustrating another means for connecting the slat carrying blocks to each other;

Fig. 9 is a section taken on line IX—IX of Fig. 8;

Fig. 10 is a sectional view showing the position of the slat connecting links when the blind of Fig. 8 is raised or in its nested position; and

Fig. 11 is a view in vertical section of a blind embodying another exemplification of my invention.

Throughout the specification, like reference characters refer to corresponding parts.

Referring to Figs. 1 to 7 of the drawings, I have illustrated a metallic blind 5 embodying my invention mounted in a window reveal 6 exteriorly of the window therein so as to catch the rays of the sun and deflect them together with the attendant heat before such rays can reach the window protected by the blind. Blind 5 comprises a series of slats or louvers 10 made of strip metal (preferably of a metal having great

strength and high heat resistance, such as stainless steel), having their longitudinal edges rolled or beaded as at 10a to further increase the stiffness and rigidity of the slats. A U-shaped clip 11 (Figs. 5 to 7) is drive fitted over or otherwise secured to each end of each of the slats 10. This is made of the same material as the slat and is formed from a piece of such metal by bending it upon itself to such an extent that the size of the opening between the legs of the clip is somewhat less than the thickness of the slat 10 whereby an exceedingly tight fit is secured when the clips are driven or forced over the ends of the slat. The clips 11, one of which is positioned on each end of each slat 10, are each provided with a downwardly depending portion 12 having an opening 13 therein for mounting the slats 10 on their receiving members. Each of the slats 10 is carried by two metallic blocks 14, one at each end of the slat, which have pins 15 projecting outwardly therefrom and through the openings 13 in the clips 11. Blocks 14, at each end of the slats, are slidably supported in channels 16, which form the side frames of the blind and are snugly fitted in the window reveal 6 exteriorly of the window, and, as shown, these channels are joined together at their upper ends by a channel member 17 forming the housing for the blind tilting mechanism and the raising mechanism, hereinafter to be described.

The blind 5 shown in Fig. 3 may be suspended in the window reveal 6 in any desired manner, as by means of attaching chains or cables 18 between the channel 17 and the blocks 14 of the top slat 10, or limit stops may be set in the guide channels 16 for confining the vertical movement of the blocks 14 supporting the top slat. The remaining blocks 14 in each channel 16 are connected together by short pieces of chain or cable 19, which hold the blocks in vertically spaced relation one to the other when the blind is in lowered or operative position. In order that the blind will always be urged toward its lower or operating position, and to insure its remaining in that position, the lowermost block 14 or 14a of each set is made considerably heavier than the remaining blocks which also act to place the chains or cables 18—19 under tension.

The slats 10 are all held at the same angle of inclination by vertically extending wires 20—21 which are arranged at the ends of the slats and have their upper ends attached to the under surface of the uppermost slat of the blind and their lower ends attached to the upper surface of the lowermost slat thereof. Wires 20—21 project through registering openings 22 in the intermediate slats and clips and either frictionally engage the edges of said openings or are secured thereto in any suitable manner. The uppermost slat of the blind 5 also has a pair of wires 23 attached to its rear or inner edge one at each end thereof. These wires pass over the pulleys 24 and are connected to counterweights 25 which are sufficiently heavy to exert a continuous pull on the top slat and thus on the remaining slats of the blind due to the connection through the wires 20—21, and therefore to urge the slats toward their fully closed position. In order that the slats 10 may be set at any desired angle of inclination, the pulley 24 is keyed to a shaft 26 having a worm gear (not shown) on its opposite end which meshes with a worm 27 on the outer end of a shaft 28. Shaft 28 carries bevel pinion 29 which meshes with a

similar pinion 30 on the upper end of a vertical shaft 31 which is rotated from the inside of the room or building to vary the angle of inclination of the slats 10 through the stub shaft 32 and co-acting bevel pinions 33—34. Shaft 32 may be mounted in any desired position and may be flush with the wall of the room or terminate in a recess formed in the wall. Its inner end is provided preferably with a means for receiving a suitable key or crank (none shown) with which the shaft may be readily rotated. Thus, by rotating the stub shaft 32, the shafts 31, 28 and 26, which are geared thereto, are likewise rotated, turning the pulley 24 and lengthening or shortening the wire 23 between the pulley and the upper slat 10 of the blind and thereby tilting the slats to any desired degree of inclination. The lower end of the shaft 31 is supported on an angle bracket 35 secured to the window frame.

Since the counterweight 25 always tends to close the slats 10 by providing a pull upon their inner edges, it is apparent that any adjustment or tilting of the slats works against this pull of the counterweight and, consequently, a stable slat or louvre is provided which is relatively free from fluttering and whipping from the movement of the wind. In exceptionally wide blinds, the slats may be further strengthened against fluttering and whipping by securing a wire 36 (Fig. 6) to the inner or rear edge of each of the slats of the blind. Wire 36 may be attached to the slats by small clips 37 which slip over and frictionally engage the edges of the slats, or by other suitable means.

In order to raise the blind and nest the slats 10 at the upper portion of the window reveal 6, a cable 40 is secured to the bottom block 14 or 14a on each side of the blind; these extend upwardly and are threaded through an opening 41 in each of blocks 14 on each side of the blind and pass over suitable pulleys 42 and extend into the room adjacent the side of the window. By pulling on the cables 40, the blind may be readily raised to its inoperative position and held in such position by suitable clamps (none shown) which engage the cables 40 in substantially the same way as the ordinary Venetian blind is held in its upper or raised position. By releasing the clamps, the blind will be lowered to its operative position due to the weight of the blocks 14 or 14a attached to the bottom slat.

In order that the blind will lower automatically and act as a curtain, in the event of fire, each of the cables 40 is provided with a fusible link 44 which is adapted to melt at a relatively low temperature (Fig. 1). When the links 44 are destroyed by the heat from fire, the weighted blocks 14a pull the blind to its lowered or operating position in the window opening 6 and the slats are then automatically closed to provide a curtain and prevent the flame from entering the building, if the fire is outside of the building, or confine it in the room, if the fire is within the building. To automatically close the slats 10, the portion 35a of the bracket 35 which supports the vertical shaft 31, is also made of a metal having a relatively low fusing point so that when the portion 35a of the bracket is destroyed, the shaft 31 will drop and pull the pinion 30 away from the pinion 29 on the horizontal shaft 28, which is journaled at one end in a bearing 45 of substantially inverted U-shape open at the bottom (Fig. 4). Shaft 28 is held in the bearing 45 by the shaft 31. Consequently, as the vertical shaft 31 drops, the support for the end of the horizontal shaft

28 is removed and shaft 28 drops out of the bearing 45 and pulls the worm 27 out of mesh with the worm gear on the shaft 26, leaving the shaft 26 free to be turned by the counterweight 25 and, thus, close the slats 10. With a blind of this particular structure, it is apparent that if the fire should be inside the building, the automatic closing of the blind shuts off the draft normally entering through the window and confines the flames to the room, whereas, if the fire is outside or in an adjacent building, the closing of the blinds keeps the flames from spreading to the building protected by the blinds.

The blind 5 may be locked in its lower or operating position by a set screw 46 which is threaded through the central boss 47 of a spider 48 and is adapted to engage or be received in an opening 49 drilled in the block 14a. The spider 48 may be secured to the window jamb or any other suitable member and the inner end of the screw 46 which is provided with means for receiving a key or other suitable turning device to move it into and out of the opening 49, may be concealed in a suitable recess within the room. When the blind is thus locked in its lowered position, it acts as a shield and not only prevents persons from accidentally falling from the window but also reduces the hazard of an unlawful entrance into the building through the window protected by the blind as by thieves and other undesirable persons.

In Figs. 8 to 10, I have shown a slight modification of the blind illustrated in Fig. 1. In this exemplification of my invention, the blocks 14, which carry the clip supporting pins 15 of the slats 10, are connected together on each side of the blind by a series of metallic one-way acting strap hinges 50 which are adapted to fold inwardly as the blind is raised and to project between the slats when they are nested at the top of the window opening.

Fig. 11 illustrates a blind or curtain which is always in operating position and which is incapable of being raised or lowered. In this construction, the depending portions 12 of the clips 11 for each slat 10 are journaled on pins 51 which project outwardly, in vertically spaced relation, from side frame members 52. The side frames 52 are connected together at their upper ends by an inverted channel member 53 and at their lower ends by a channel member 54 which is supported on the sill of the window. The slats or louvres 10 are all maintained at the same angle of inclination by wires 20—21 as heretofore described and in order to constantly urge the slats 10 toward their closed position, a cable 56 is attached to the rear edge of the uppermost slat of the blind which passes around a pulley 57, mounted in the channel 53 and has a counterweight 58 secured to the end thereof. To vary the angle of inclination of the slats 10, a clip 59 is secured to one end of the lower or bottom slat, designated as 10b. The lower edge of the clip 59 is in the form of a gear segment 60 and is in mesh with a relatively wide pinion 61 journaled on a stud shaft 62.

Pinion 61 is also engaged by a rack bar 63 having a slot 64 therein for slidably and eccentrically mounting the bar on a pin 65 projecting outwardly from the window frame. The inner end of the rack bar 63 projects inwardly into the room and is provided with a hand grip 66 for moving it back and forth. As the rack bar 63 is moved back and forth, the pinion 61 and gear segment 60 are turned, varying the angle of inclination of the bottom slat 10b and hence the remaining slats

due to their connection to each other and to the bottom slat 10b by the wires 20—21. The rack bar 63 and the handle 66 therefor have the weight concentrated toward the inner or handle end and the rack bar which, consequently, has a tendency to turn in a clockwise direction is held in operating relation to the pinion 61 by a fusible metal stop 67 which engages the top of the rack bar. In the event of fire, the fusible bar 67 is melted, releasing the rack bar which, due to the weight distribution and the eccentric mounting, turns in a clockwise direction and moves out of engagement with the pinion 61, and permits the counterweight 58 to pull the slats to their closed position.

From the foregoing description, it is apparent that I have designed a metallic blind which not only catches and deflects the sun's rays, together with the attendant heat, before such rays penetrate into the room, but which also acts as a shield to prevent persons from passing into or out of the window, and as a curtain, in the case of fire, to shut off the draft if the fire is in the building equipped with the blind while preventing the fire from entering the building, if the fire is outside or in an adjacent building.

To further reduce the heat conductivity of the metallic blind, I prefer to coat the backs of the slats with a paint or enamel having an asbestos base or some other similar material which is highly resistant to heat conduction, or I may back each slat with a thin fibre, Bakelite or pressed asbestos sheet, or other suitable heat resisting membrane. When Bakelite or asbestos sheets are used, they are preferably held in place on the slats by sliding the edges of the sheets into the rolled edges 10a of the slats 10 which, as above pointed out, also act to materially stiffen the slats. The sheets may be further secured to the slats by a suitable binder, such as cement or glue.

Blinds of this general character may also be used to advantage on the inside walls of factory plants and buildings where through ventilation is desirable but where precautions must be taken against fire and theft since the blinds are so arranged as to automatically close in the case of fire, and if constructed of stainless steel are exceedingly hard to cut and open. Blinds of this character are also adaptable for doors and for installations in the walls of buildings in tropical countries or warm countries since the blinds protect against heat, storm, fire and thieves.

Having thus described my invention, what I desire to secure by Letters Patent is:

1. An all metal exterior window blind and fire shutter comprising a series of stainless steel slats, a vertically slidable block pivotally connected to each end of each said slat, means for holding the blocks on each side of said slats in vertical spaced relation, means for adjusting and holding the slats at any desired angle of inclination relative to said blocks, means for subjecting said slats to a continuous closing force, means for raising and lowering said blocks, fusible means associated with said slat adjusting and holding means, and fusible means associated with said block raising and lowering means.

2. An all metal exterior window blind and fire shutter comprising, a series of stainless steel slats, a pair of vertically slidable metallic supporting blocks for each slat and to which each slat is pivoted, the blocks of each side of said slats being connected together independently of said slats, cables attached to said slats for holding said slats at the same angle of inclination, means for adjusting the inclination of said slats, means for

raising and lowering said blocks to nest and space said slats, means responsive to the application of heat for releasing said blocks from said raising and lowering means, means responsive to the application of heat for releasing said inclination adjusting means, and means for closing said slats upon the release of said adjusting means.

3. The invention set forth in claim 2 in which a counterweight is attached to one of the slats for continuously applying a closing force to the slats.

4. The invention as claimed in claim 2, in which the supporting blocks for the slats are connected together by chains to hold the slats in vertically spaced relation to each other.

5. The invention as claimed in claim 2 in which the supporting blocks for the slats are hinged together and a cable having a fusible element therein is provided for raising and lowering the blocks.

6. The invention as claimed in claim 2 in which each of said metallic blocks has a projecting pin and said slats are provided on each end with an apertured clip for receiving said pins.

7. The invention as claimed in claim 2 in which the slats are held at the desired angle of inclination in opposition to the continuous closing pull of a counterweight and a fusible metal element adapted to be destroyed on the application of heat is associated with the slat holding means and when destroyed releases the holding means and permits the counterweight to close the slats.

8. An all metal exterior window blind and fire shutter comprising a pair of channels mounted in a window reveal, a series of spaced slats, a block at each end of each slat and pivotally connected to and supporting the same, the blocks being disposed in said channels for raising and lowering movement therein and being interconnected, a pair of wires passing through each end of each slat the lower ends of which are connected to the upper surface of the lowermost slat and the upper ends of which are connected to the under surface of the uppermost slat, a counterweight secured by wires to the rear edge of said uppermost slat and urging said slats always into closed position, said wires passing over pulleys mounted adjacent said uppermost slat, means for rotating said pulleys at will in either direction, means for raising and lowering said blocks, means for pivotally adjusting said slats to a desired inclination and fire-responsive means for lowering said blocks and closing said slats independently of the previous condition thereof.

9. Structure as defined by claim 8 wherein a worm drive is provided to actuate the pulleys and wherein the fire-responsive means includes a fusible support which, when fused, renders the worm drive inoperative.

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