

June 23, 1942.

J. K. LIVINGSTON

2,287,382

BARRIER ALARM

Filed Aug. 4, 1941

2 Sheets-Sheet 1

Fig. 1.

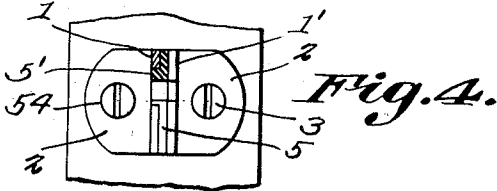
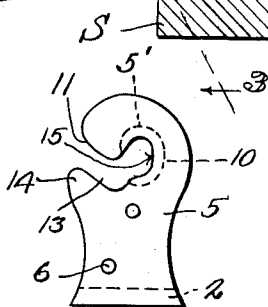
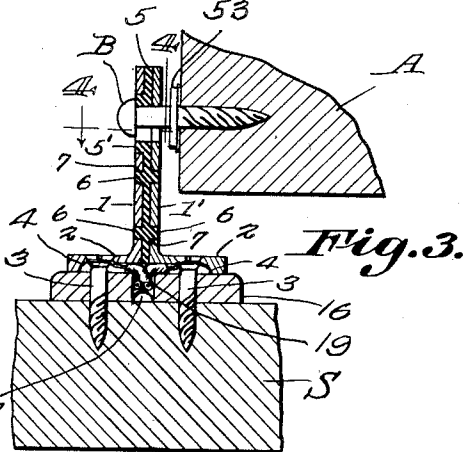
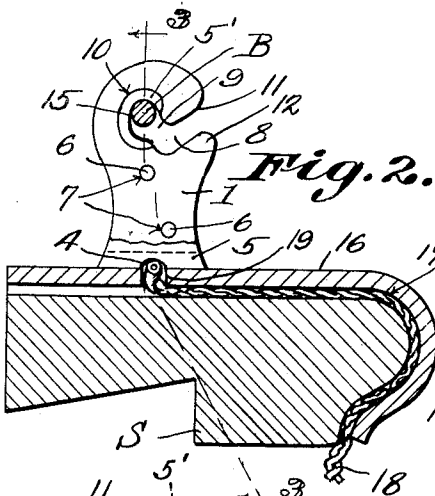
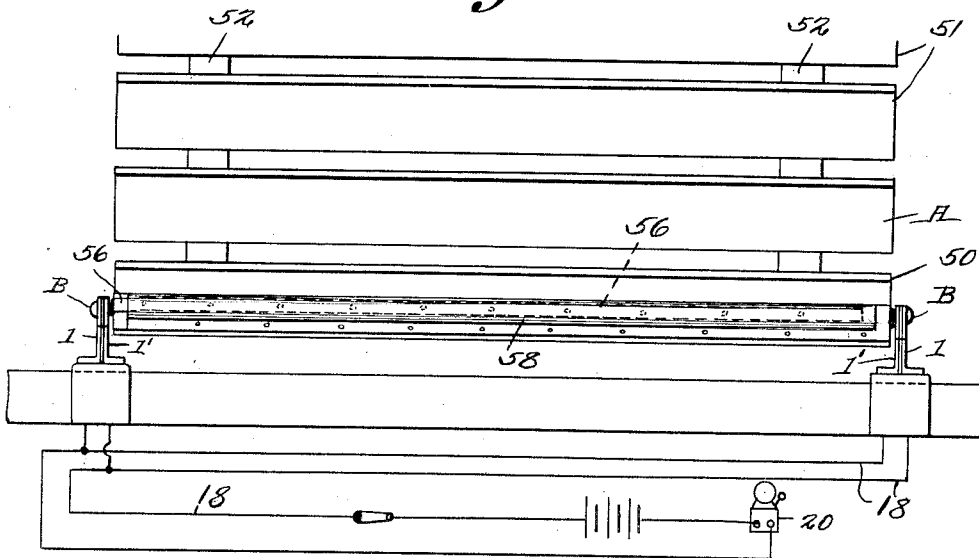


Fig. 5.

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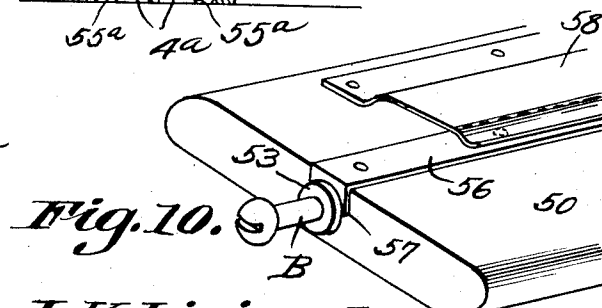
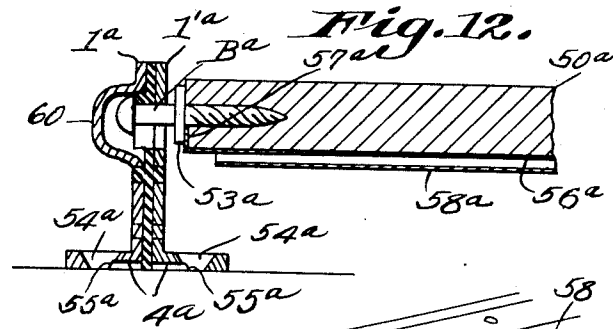
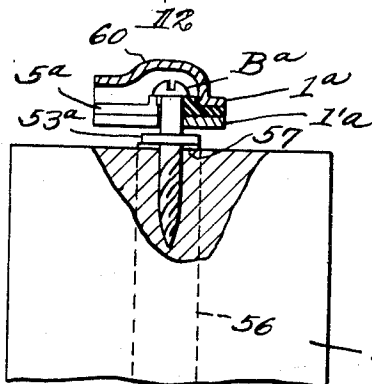
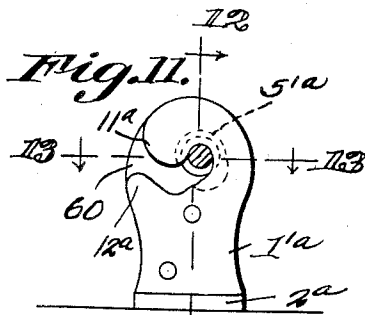
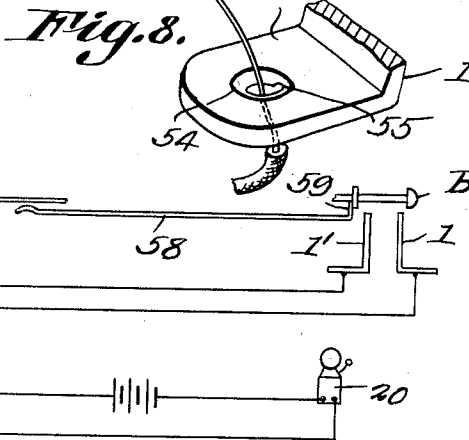
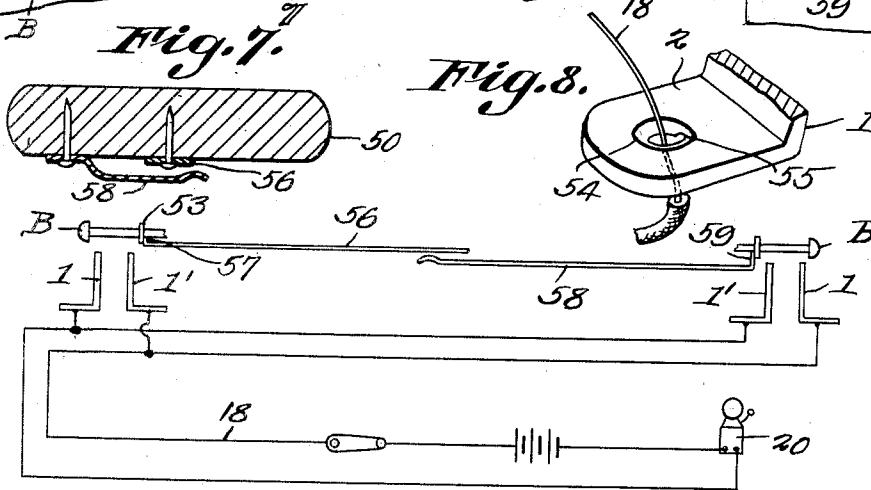
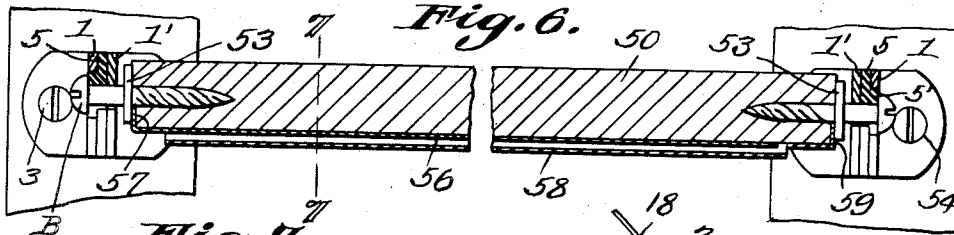
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BARRIER ALARM

Filed Aug. 4, 1941

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,287,382

BARRIER ALARM

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Application August 4, 1941, Serial No. 405,390

6 Claims. (Cl. 177—314)

This invention relates to a signal apparatus designed primarily for use with flexible barriers such as Venetian blinds or the like and adapted to operate when an attempt is made to open the blind or other barrier.

The structure is primarily an improvement upon that which is disclosed in the application filed by Jay K. Livingston on June 9, 1941, Serial Number 397,335.

It has been found in practice that movement by air currents of the barrier disclosed in the application referred to, has resulted in the unnecessary operation of the alarm and consequently it has been undesirable to use the invention under certain conditions.

The present invention has for an object the provision of circuit closers which will make electrical contacts only when a deliberate effort is made to unfasten the barrier from its holding means, the normal relative movement of the parts due to air currents being without effect on the apparatus.

Another object is to provide a structure which, when applied to a window sill or other structure, will conceal and protect the lead wires so that they cannot be reached and cut by an intruder.

A further object is to provide hangers or keepers in the form of contacts which can be securely mounted on a window sill or the like without boring or otherwise mutilating the exposed surface thereof.

A further object of the invention is to provide a means whereby a warning signal will be given, even though a person should hold up the bottom member of a Venetian blind, cut the blind apart in an elevated part, and attempt to gain entrance.

A still further object is to improve upon the construction of the hangers or keepers by rendering them more efficient without complicating their structure or increasing their cost.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts herein-after more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:

Figure 1 is an elevation of the lower portion of a Venetian blind equipped with the present

improvements, the electric circuit being shown in diagram.

Figure 2 is an enlarged section through a sill showing one of the keepers or hangers in position, a portion being broken away.

Figure 3 is a section on line 3—3, Figure 2.

Figure 4 is a section on line 4—4, Figure 3.

Figure 5 is an elevation of the insulating member.

Figure 6 is a horizontal section taken through the bottom member of the barrier.

Figure 7 is a section on the line 7—7 of Figure 6.

Figure 8 is a fragmental perspective showing a portion of one of the keepers.

Figure 9 is a circuit diagram.

Figure 10 is a fragmental perspective showing a portion of the bottom member of the barrier.

Figure 11 is an elevation showing a modification.

Figure 12 is a section on the line 12—12 of Figure 11.

Figure 13 is a section on the line 13—13 of Figure 11, parts being broken away.

In the drawings, the letter A designates a portion of a barrier, such as a Venetian blind or the like, comprising a bottom member 50 and slats 51, joined together by flexible connectors 52. Mounted in the ends of the bottom member 50 are retainers or studs B which can be in the form of screws having flanges 53. The studs B are of metal constituting a good conductor of electricity. It is the practice to insert the studs B into slotted keepers for holding the lower end portion of the barrier in closed position.

Each of the keepers, in the present structure, includes side or contact members 1 and 1', each formed of a metal constituting a conductor of electricity, and each member has a laterally extended base or foot 2, provided with a countersunk hole 54 (Fig. 8), for the reception of attaching screws 3 or the like. The hole 54 has a small offset or notch 55. Grooves 4 are formed in the concealed surface of each foot 2, the grooves being closed at their outer ends and registering at their inner ends.

The two members 1 and 1' are fitted snugly against opposite sides of an intermediate member 5 of insulating material, or are insulated otherwise. The member 5 has integral studs 6, which are seated tightly in small apertures 7 in members 1—1', thus holding the members against sliding displacement relatively to each

other. Any equivalent of the studs 6 may be employed for the end in view.

The member 1 has an obliquely disposed slot 8 extending therinto from one edge, and inclined along a line converging toward the foot 2 of the member. The inner end of the slot 8 is abruptly upcurved at 9, and communicates with a substantially elliptical opening or enlargement 10, the slot and its enlarged inner end thus defining a rounded nose 11, inclined downwardly and inwardly toward a rounded nose 12, which is extended upwardly and outwardly.

The insulating member 5 is of the same outline as the corresponding portions of the member 1, with few exceptions. A slot 13 in the insulating member 5 is of the same size and pitch as slot 8 of the member 1, and the nose 14 is of the same size and shape as nose 12, the opening or enlargement 15 at the inner end of the slot being smaller than the opening 10, so that the insulating member 5 is thus extended partly across the opening 10. The insulating member 5 has a side rib 5', fitted against the edge of the opening 10, from one side of the upcurved slot 9, to the other. The opening 15 is sufficiently large to hold one of the studs B normally centered in the upper portion thereof, as shown in Figure 2.

The side member 1' is of the same shape and size as the intermediate member 5, but is not provided with the lateral rib 5'.

In practice, the keepers are positioned where they can be engaged by the studs B, when the barrier A is closed. In the drawings, each keeper has been shown fastened to a sill S by the screws 3, which pass through a hook-shaped base 16, adapted to rest upon and engage around the inner edge portion of the sill. The sill S is a frame member defining part of an opening in an otherwise enclosed structure. The base 16 has a groove 17 in its bottom or concealed surface, in which are housed insulated wires 18, extended through an opening 19 in the base and along the grooves 4 to the respective attaching screws 3. The wires 18 are given a turn or two around the screws 3, under the heads thereof, and are bound against the feet 2 of the members 1 and 1'. The wires 18 are received in the offsets 55 of the holes 54, and will neither interfere with the threading of the screws to place, nor be cut off by the threads. The wires 18 form two sides of an electric circuit including an alarm 20, but as the members 1 and 1' of each pair are out of electrical contact, the circuit is normally open.

When the barrier A is closed, the studs B are inserted into the slots 8 and 13 by moving them downwardly and thence upwardly until they become seated against the insulating members 5 at the upper ends of the openings 15. It will be noted that the rib 5' is elongated vertically consequently, the stud B can have a slight vertical movement due to wind pressure, and the signal circuit will not be closed. If, however, an attempt is made to withdraw the stud B through the mouth of the slot 8 of Fig. 2, the stud will come into contact with metal parts, the circuit will be closed, and a signal will be given. When an attempt is made to detach the studs B from the keepers, it is necessary to move each of them along a tortuous path leading downwardly into the portion 9 of its slot 8, and thence upwardly, and such movement is practically impossible without one or the other of the studs engaging the two contact members 1 and 1' of one keeper simultaneously at some point. Obviously this

will instantly close the circuit to the alarm, and notice will be given that someone is trying to raise the barrier A.

Instead of mounting the keepers on the bases 16, they can of course be attached directly to the sill S or other supporting structure, and the arrangement is so obvious that illustration thereof is not deemed necessary. The wires 18, under these conditions could be extended through the sill to the grooves 4, so as to be concealed.

It may be that someone will attempt to hold up the bottom member 50 of the barrier A, for example by putting a block or wedge under it, the circuit which includes the wires 18 and the signal 20 remaining open under such circumstances, and the person desiring to enter might attempt to cut off the flexible connectors or tapes 52, thus severing the barrier A horizontally, and entrance being made easy. A mechanism is provided whereby such an unauthorized procedure will be made impossible.

A conducting switch strip 56 is secured to the lower surface of the bottom member 50, and has rectangularly disposed end tongues 57 (Fig. 10), bound against the ends of the part 50 by the flanges 53 on the studs B. The switch strip 56 thus is in electrical contact with the studs B.

A resilient switch member 58 extends lengthwise of the blind part 50 and is secured thereto. The switch member 58 has an offset part 59, extending under the switch strip 56 and spaced therefrom. The switch member 58 and the switch strip 56 form part of a normally open circuit, including the studs B, the contact members 1 and 1', the screws 3, the conductors 18 and the signal 20. If anyone attempts to hold up the bottom member 50 of the barrier A, by inserting a wedge or the like under it, the offset part 59 of the switch member 58 will come into contact with the switch strip 56, and the circuit through the conductors 18 will be closed, as hereinbefore explained, the signal 20 being sounded. The possibility of cutting the barrier A apart crosswise and gaining an entrance in that way therefore will be avoided.

Referring to the modification shown in Figs. 11, 12 and 13, parts hereinbefore described have been designated by characters already used, with the suffix "a". The member 1a of the keeper has an offset housing 60, enclosing the head of the stud Ba. The housing 60 is open at one side, and the circuit is closed when the head of the stud comes into contact with the lower part of the housing, in a way which will be understood readily from Fig. 12.

In any of its forms, the device is simple in construction, but will be found thoroughly advantageous for the ends in view.

What is claimed is:

1. In a signal mechanism, a frame member defining part of an opening in an otherwise enclosed structure, a vertically movable barrier extended across the opening, a retainer carried by the barrier, an electric signal circuit including an alarm, and a keeper fixedly mounted on the frame member, said keeper comprising spaced contact members connected to the respective sides of the circuit, and an insulating member between the contact members, said contact and insulating members having registering tortuous slots opening through one edge of the keeper and leading to openings in the members of the keeper and shaped for the reception of the retainer, the opening in the insulating member being smaller than the opening in one of the contact

members and being positioned and proportioned to define an insulating rib extending inwardly beyond the walls of the openings in the contact members, the retainer and the keeper forming a combined circuit closer and hold-down, the retainer being so located on the barrier as to enter the slots.

2. In a signal mechanism, a frame member defining part of an opening in an otherwise enclosed structure, an electric signal circuit including a keeper and an alarm, said keeper being mounted on the frame member and comprising spaced contact members connected to the respective sides of the circuit, and an insulating member between the contact members, said members having registering tortuous slots opening through one edge of the keeper and leading to openings in the members of the keeper, the opening in the insulating member being smaller than the opening in one of the contact members and being positioned and proportioned to define an insulating rib extending inwardly beyond the walls of the openings in the contact members, a movable barrier extended across the first-specified opening, and a retainer so located on the barrier as to be insertible into the tortuous slot in the keeper for normal engagement with the insulating rib, the retainer and the keeper constituting a circuit closer when the retainer touches the contact members along the tortuous slot.

3. In a signal mechanism, a frame member defining part of an opening in an otherwise enclosed structure, an electric signal circuit including a keeper and an alarm, said keeper comprising spaced contact members connected to the respective sides of the circuit, and an insulating member between the contact members, said members having registering tortuous slots opening through one edge of the keeper and leading to openings in the members of the keeper, the opening in the insulating member being smaller than the opening in one of the contact members and being positioned and proportioned to define an insulating rib extending inwardly beyond the walls of the openings in the contact members, a foot on each contact member for attachment to the frame member, each foot having a wire receiving groove in the surface which engages the frame member, a movable barrier extended across the first-specified opening, and a member on the barrier and so located thereon as to be insertible into the tortuous slot in the keeper for normal engagement with the insulating rib, said member and the keeper constituting a circuit closer when said member touches the contact members along the tortuous slot.

4. In a signal mechanism, a frame member defining part of an opening in an otherwise enclosed structure, a vertically movable barrier extended across the opening, a retainer carried by the barrier, an electric signal circuit including an alarm, and a keeper, fixedly mounted on the frame member, said keeper comprising spaced contact members connected to the respective sides of the circuit, and an insulating member between the contact members, said contact and insulating members having registering tortuous slots opening through one edge of the keeper

and leading to openings in the members of the keeper and shaped for the reception of the retainer, the keeper and the retainer forming a circuit closer and hold-down, the opening in the insulating member being smaller than the opening in one of the contact members and being positioned and proportioned to define an insulating rib extending inwardly beyond the walls of the openings in the contact members, a base strip engageable with the frame member, a foot on each contact member and attached to the strip, each foot and the base strip having a wire-receiving groove, said grooves being in communication and concealed when the keeper is set up for use.

5. In a signal mechanism, a frame member defining part of an opening in an otherwise enclosed structure, an electric signal circuit including a keeper and an alarm, said keeper comprising spaced contact members connected to the respective sides of the circuit, and an insulating member between the contact members, said members having registering tortuous slots opening through one edge of the keeper and leading to openings in the members of the keeper, the opening in the insulating member being smaller than the opening in one of the contact members and being positioned and proportioned to define an insulating rib extending inwardly beyond the walls of the openings in the contact members, a base strip engageable with the frame member, a foot on each contact member and attached to the strip each foot and the base strip, having a wire-receiving groove, said grooves being in communication and concealed when the keeper is set up for use, a movable barrier extended across the first-specified opening, and a retainer on the barrier and so located thereon as to be insertible into the tortuous slot in the keeper for normal engagement with the insulating rib, the retainer and the keeper constituting a circuit closer when the retainer touches the contact members along the tortuous slot.

6. Signal mechanism comprising a vertically movable barrier extended across an opening in an otherwise enclosed structure and including a bottom member, duplicate devices each including a laterally extended retainer carried by the bottom member, and a fixedly mounted keeper structure comprising members located closely enough together to be bridged by the retainer: a first normally open electrical circuit including the members of each keeper, a signal in the circuit, insulation carried by one member of each keeper and engaging one retainer to maintain the circuit open, the insulation being so limited in area that, when an effort is made to detach the retainer from the keeper members, the retainers will ride downwardly off the insulation, bridge the keeper members of at least one of said duplicate devices, and close the circuit, a second circuit including the retainers, the signal, and a portion of the first circuit, and a normally open switch in the second circuit and located on the bottom of the bottom member and exposed for closing when an attempt is made to raise the bottom member.

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