United States Patent [19]

Gray

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[54] **COMBINATION STOP AND ALARM**

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[52] **U.S. Cl.** **116/13,** 116/86, 116/112

[51] **Int. Cl.** **G08b 15/00**

[58] **Field of Search** 116/12, 13, 82, 85, 86, 116/100, 112; 340/404, 283, 405, 406; 222/394

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Primary Examiner—Louis J. Capozi

[57] **ABSTRACT**

A security device in the form of a combination alarm and door or window stop is constituted by a container of pressurized gas combined with a sound generator and suitable mounting means so that the device may be secured at one end to the movable surface of a door or window and be supported at its other end on a fixed surface so that if an unauthorized opening is attempted the sound generator will move slightly to release the pressurized gas from the container so as to cause an alarm sound to be generated and at the same time movement between the movable surface and the fixed surface is prevented. The mounting means is such that the device can be inactivated by moving it to an out of the way position. The application discloses both permanently installed and portable versions.

15 Claims, 9 Drawing Figures

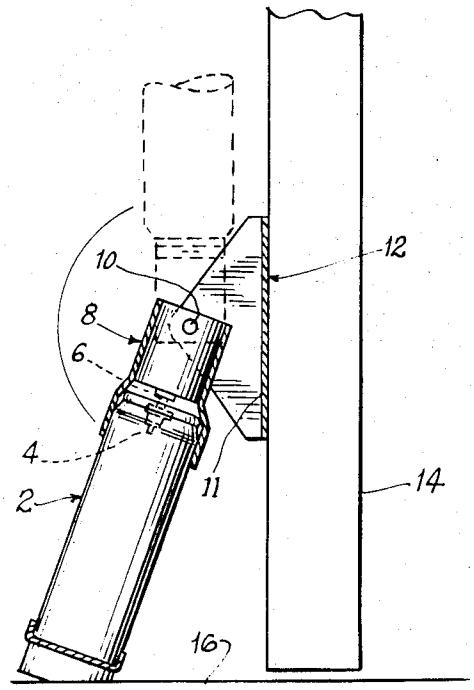


FIG. 1

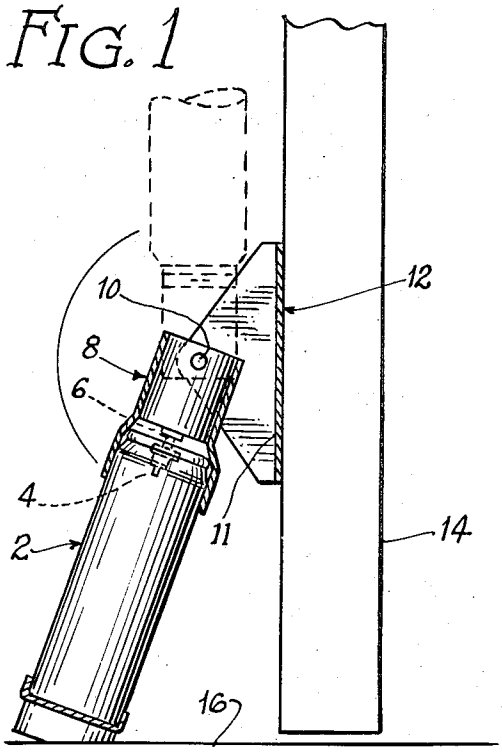


FIG. 2

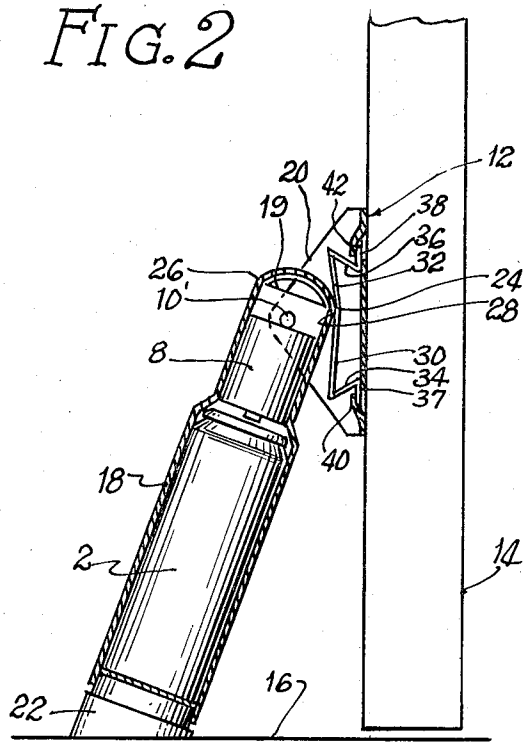


FIG. 3

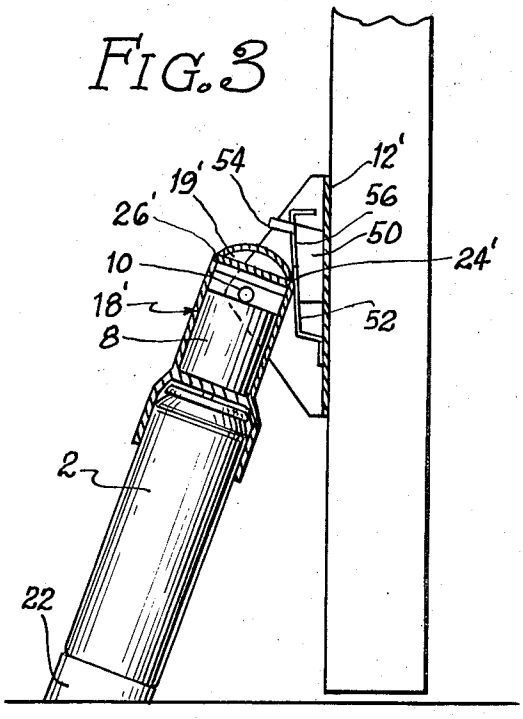


FIG. 4

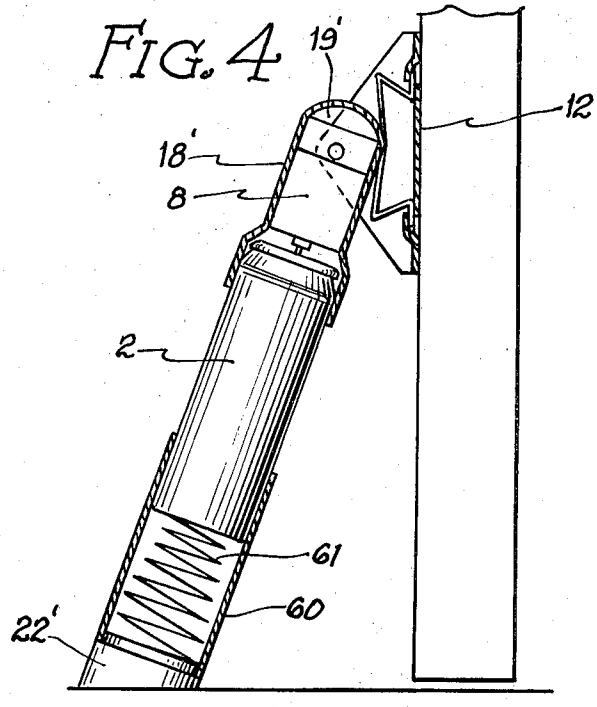


FIG. 5

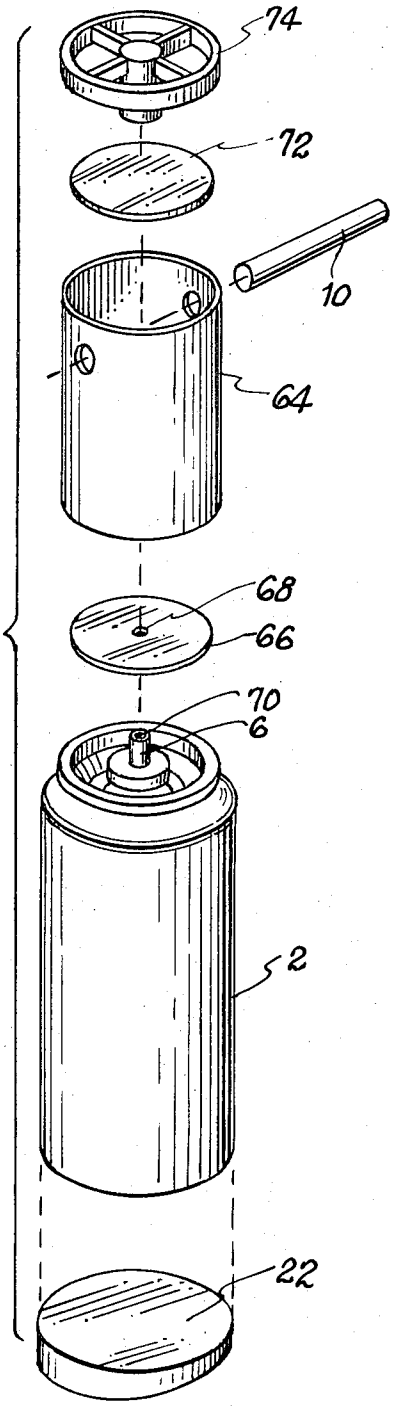


FIG. 6

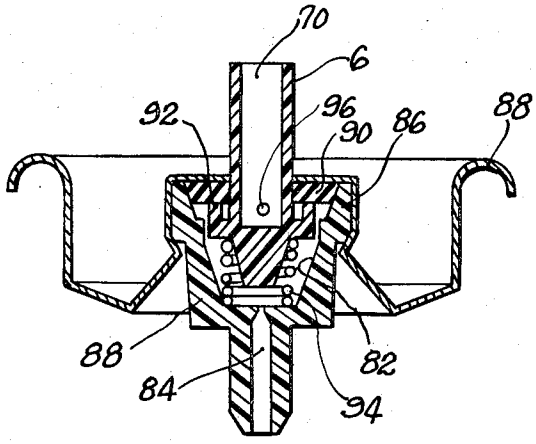


FIG. 7

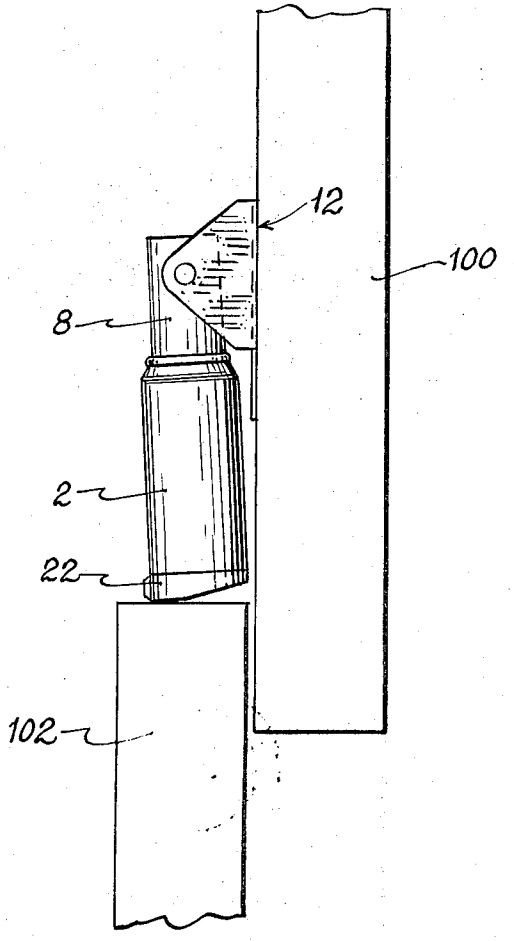


FIG. 8

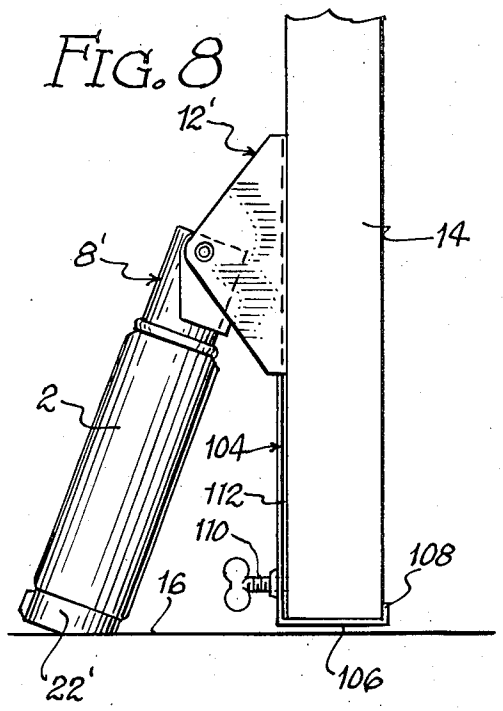
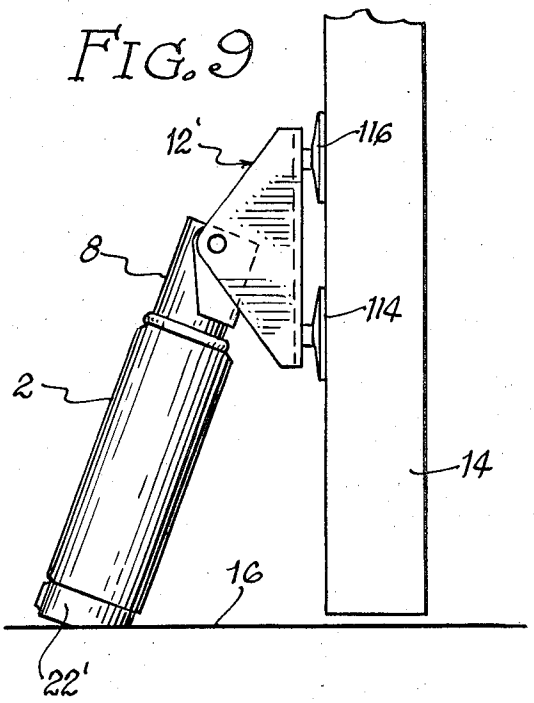


FIG. 9



COMBINATION STOP AND ALARM

BACKGROUND OF THE INVENTION

This invention relates generally to security devices. More specifically, it relates to a device functioning as a combination door or window stop and alarm.

Various means have been proposed to provide alarms in the event of an unauthorized attempt to enter a room in a home, office or other commercial establishment. Some of these attempts have included the use of containers of pressurized gas actuating sound generators and connected by cables or similar devices to a door or window so as to be actuated when the door or window is opened. Such devices are typified by those shown in the U.S. Pats. to Leve et al. No. 3,451,369 and Gantt U.S. Pat. No. 3,690,286.

It has also been proposed heretofore to provide a combination doorstop and alarm wherein movement of a door depresses a bar carrying a pin engaging an actuator on an alarm bell. The U.S. Pat. to Zukor No. 1,453,058 shows a device of this character.

It is believed, however, that a novel and more useful security device is obtained by the provision of a combination of a door or window stop and alarm which utilizes a container of pressurized gas and a sound generator to serve both the role of the stop and the alarm.

Therefore, it is an object of this invention to provide a novel security device in which the elements providing an alarm also function to prevent the unauthorized opening of a door or window.

It is another object of this invention to provide a novel security device which is relatively compact and light enough so as to be portable and yet is sufficiently strong so as to prevent unauthorized entering to a room.

It is a still further object of this invention to provide a novel security device which is economical so that cost is not a deterent to its use at all possible places of entry.

Another object of this invention is to provide a novel security device which may be used with a wide variety of door and window arrangements to provide both a stop and an alarm.

BRIEF SUMMARY OF THE INVENTION

The foregoing and other objects are achieved by the provision of a container of pressurized gas having a sound generator mounted on its discharge end and movable toward a valve actuator on that discharge end so as to release gas from the container to actuate the sound generator upon movement thereof. Mounting means are provided for attaching one end of the device to a movable surface such as a door or window so that it can extend between that movable surface and a fixed surface to cause actuation of the sound generator upon movement of the door or window and to simultaneously limit or prevent opening of the door or window.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of an embodiment of the invention illustrating how it may be attached to a door;

FIG. 2 is a side view of a further embodiment of the invention;

FIG. 3 is a side view of still another embodiment of the invention;

FIG. 4 is a side view of a still further embodiment of the invention;

FIG. 5 is an exploded view of an embodiment of the invention illustrating the essential components of the sound generator;

FIG. 6 is a sectional view of the valve and valve actuator forming a part of a container holding pressurized gas;

FIG. 7 is a side view of an embodiment of the invention mounted on a window so as to prevent unauthorized opening thereof;

FIG. 8 is a side view of one portable embodiment of the invention; and

FIG. 9 is a side view of still another portable embodiment of the invention.

DETAILED DESCRIPTION

Referring first to FIG. 1, an embodiment of the invention includes a container 2 for holding a quantity of a pressurized gas. Such a container may be constituted by a conventional container holding a pressurized gas. Such containers are readily available from commercial sources and are used to hold aerosols to dispense shaving cream, food, cosmetics and the like. The gas, of course, could be air or Freon or any other suitable pressurized gas.

Provided at the top of the container 2 is a normally closed valve 4, the purpose of which is to maintain the pressurized gas in the container until the valve is actuated to an open position. A valve actuator in the form of a plunger 6 engages the valve stem, and, as will be described hereinafter, is normally urged upwardly by a spring. The plunger 6 engages a bottom of a sound generator 8, the upper end of which is attached by a pivot pin 10 to a generally U-shaped mounting bracket 12. The bight portion 11 of the bracket 12 is attached by any suitable means to the lower surface of a door 14 so that in an operative or first position the assembled sound generator 8 and container 2 extend downwardly at a slight angle to the surface of the door with the bottom of the container engaging the floor 16. The floor, of course, constitutes a fixed surface while the door provides a surface which is movable with respect thereto.

By virtue of the pivoted connection between the sound generator and the bracket 12 the security device may be rotated about its pivot in a clockwise direction as shown in the drawing so as to assume an inoperative or second position as shown by the dotted line illustration in FIG. 1.

The operation of the device is such that when it is desired to prevent opening of the door 14 the device is pivoted to its first position wherein the bottom of the container 2 engages the floor 16 as shown in the drawing. In the event that there is an unauthorized attempt to open the door, the device pivots slightly about the point of engagement of the container 2 with the floor 16. The sound generator 8 moves downwardly causing the plunger actuator 6 to move downwardly so as to open the valve 4 whereby the pressurized gas stored in the container may enter the sound generator thereby providing an audible alarm. At the same time, the sound generator 8 and the container 2 in combination constitute a relatively rigid column between the pivot 10 and the floor to function as a doorstop so as to limit the movement of the door 14 to a very small amount.

The sound generator itself may be formed of plastic or metal, it being important, of course, that whatever material is used have sufficient mechanical strength to withstand the force being applied by someone attempting to open the door. As is well known, gas containers are formed of metal so that these two elements in combination provide a stop of substantial mechanical strength.

When it is desired to inactivate the stop/alarm device, it is merely rotated as shown in the drawing from its first position to its second position as shown in dotted lines.

In the embodiment illustrated in FIG. **2**, in order to provide increased mechanical strength a cover **18** encompasses the sound generator **8** and the container **2**. Openings **19** in the cover provide for the escape of sound and gas from the container. In this embodiment, the device is pivotally mounted on the bracket **12** by means of a pivot pin **10'** extending through matching openings in the cover and the legs **20** of the bracket (only one of which is shown). The pivot pin extends across the top of the sound generator so as to push the sound generator downwardly against the force of the biasing spring (not shown in this drawing) when the door is attempted to be opened. A wedge-shaped base pad **22** is fitted into the bottom of the cover retaining the container **2** inside and providing by virtue of its base a more extensive engagement with the floor or other fixed surface.

In order to retain the device in position in either its first or second positions, the cover is provided with a rounded top having a pair of relatively sharp edges **24** and **26.** These edges engage the juncture **28** of a pair of leaf spring segments **30** and **32.** The leaf spring segments **30** and **32** are part of a leaf spring wherein the segments **30** and **32** stand off from the bight portion of the bracket **12** by means of portions **34** and **36.** The entire leaf spring assembly itself is mounted on the bracket by tabs **36** and **38** engaged under elements **40** and **42** struck outwardly from the bight portion. The spring segment **32** is formed so as to exert a bias in a counterclockwise direction while the spring segment **30** extends a bias in the clockwise direction so that the juncture **28** is biased outwardly from the bight portion of the bracket **12.** When the device is in its first position the edge is pushed outwardly by virtue of its engagement with the juncture **28** to its second position, and the leaf spring moves inwardly to permit that rotation until the edge **26** is engaged in the juncture **28** at which time the device is then locked in the dotted line position shown in FIG. **1.**

In FIG. **3,** the cover **18'**, as may be seen, extends over only a portion of the unit and as with the cover **18** of FIG. **2** is provided with openings **19'** so as to permit sound and spent gas to escape from the sound generator.

In the embodiment of FIG. **3,** in order to eliminate the possibility that an intruder could force something under the door or window and raise the stop/alarm out of its operative position a locking wedge **50** is provided. The locking wedge is slideably mounted between the bight portion of the bracket **12'** and a leaf spring **52** secured at one end to that bight portion and extending outwardly and biased so as to exert a force against the edge **24'** or **26'** depending upon the position of the stop/alarm. The wedge **50** is provided with a tab **54** movable in a slot **56** provided in the leaf spring **52** and thus may move upwardly or downwardly as shown in the drawing. Thus, when the stop/alarm is moved to its downward or engaged position, the wedge **50** moves downwardly by force of gravity to occupy the space between the point of engagement of the wedge **50** with the bight portion of the U-shaped bracket so that if an attempt is made to rotate the stop/alarm about the pivot point **10** its movement will be prevented because the leaf spring would be unable to yield because of the wedge behind it.

When it is desired to move the stop alarm to its raised position, the wedge is moved upwardly by the use of the tab **54** so as to clear the space between the edge **24'** and the bight portion of the bracket. With the spring **52** now freed for deflection the stop/alarm may be rotated clockwise to its out of the way position. Thus, in its operative position with the wedge in its most downward position any effort to slide something under a door or window to rotate the stop/alarm out of position would be rendered impossible.

Very frequently a householder wishes to open a door a slight distance in order to see who is on the other side of that door before opening it completely. This can be achieved with the embodiment of the invention illustrated in FIG. **4.** In this embodiment, a tube **60** is slideably mounted on the bottom of the container **2** and carries the wedge-shaped base **22'** at its bottom to engage the fixed surface or floor. The tube **60** engages the sides of the container **2** with a slight friction fit so as to offer a moderate resistance to movement. Additional resistance to motion between the tube **60** and container **2** may be provided by a coil spring **61** mounted between the bottom of container **2** and the bottom of tube **60** and normally urging the container outwardly.

It is contemplated that the longitudinal dimensions are such that a user wishing to see who is on the other side of the door and yet at the same time not open it completely may, after the door has been unlocked, open the door slightly causing the container **2** to move downwardly in the tube **60** a distance of perhaps two to three inches permitting the door to open slightly but to go no further for the bottom of the container would then be resting on the top of the wedge support **22'**. If the person on the other side of the door were to attempt to force the door further, he would be prevented from doing so by the stopping action of the device and any further movement of the door would be effective to release the gas causing the alarm to sound. If the user wishes to admit the person through the door after having an opportunity to see that person, the stop/alarm can be rotated out of the way as previously described and at the same time the tube **60** can be reset in its extended position by pulling it outwardly against the slight frictional force by which it engages the sides of the container.

FIG. **5** of the drawing illustrates a stop/alarm in accordance with the invention wherein the various parts have been exploded in order to illustrate an embodiment of a sound generator. The embodiment thus illustrated includes a sound chamber housing **65** provided with a bottom **66** having an opening **68** therein to permit passage of gas from the container **2** into the sound chamber. The bottom **66** rests on the valve plunger **6** with the opening **68** in communication with a passage **70** in the plunger **6** so that when the plunger is depressed by downward movement of the sound generator gas passing through the passage **70** may enter the

sound generator through the opening **68.** A sound reed **72** is supported inside the housing **64** in such a fashion so as to permit it to move or vibrate when gas from the container **2** impinges thereon. It is retained in position by a retaining ring **74** spaced slightly above it when assembled. The arrangement is such that when gas from the container **2** enters the sound generator the reed **72** is vibrated and generates a sound to provide the audible alarm.

FIG. **6** illustrates a valve which may be used in an embodiment of the invention. The valve is constituted by a housing **80** provided with a chamber **82** housing the valve structure. A passage **84** connects the chamber **82** to the interior of the container **2** while the valve is held in position by a shoulder portion **86** to which the top **88** of the container is crimped.

The actual valve mechanism is constituted by a deformable gasket **90** encompassing the vlave stem or actuator **6.** A sealing flange **92** is formed on the actuator **6** and is normally maintained in sealing engagement with the gasket **90** by a coil spring **94** engaging between a shoulder formed in the bottom of the chamber **92** and the flange. One or more openings **96** are provided in the bottom of the passage **70.**

As may be seen, the openings **96** are normally not in communication with the remainder of the chamber **82** because the sealing flange **92** engages the gasket **90.** However, when the actuator **6** is depressed against the force of the spring **94,** a passage is provided when the flange **92** moves away from the gasket **90** so as to permit communication with the interior of the container through the passage **84,** chamber **82** and the space between the flange **92** and gasket **90** to the openings **96** with the passage **70.** In this manner, the pressurized gas stored in the container is released to the interior of the sound generator **8.**

It has been previously stated that a stop/alarm in accordance with the invention may be used with either doors or windows, it being important only that the bracket **12** be attached to a movable surface while the bottom of the device is supported on a relatively fixed surface. FIG. **7** illustrates how a stop/alarm in accordance with the invention may be mounted on double-hung windows to provide a stop and an alarm. In this figure, the upper sash of a window is indicated by reference numeral **100** while the lower sash in indicated by reference numeral **102.** As may be seen, the bracket **12** is secured to the upper sash **100** while the wedge base **22** rests on the upper surface of the bottom sash **102.** If any unauthorized relative movement between the upper sash and lower sash is attempted, as before, the sound actuator will move relative to the container **2** so as to sound the alarm and after the limited relative movement further movement will be prevented.

FIG. **8** illustrates a first portable embodiment of a stop/alarm in accordance with the invention. In this embodiment a generally L-shaped clamp **104** is attached to the bracket **12'** and extends downwardly. A horizontal portion **106** is dimensioned to extend under a door **14** in the space between the door and the floor **16.** The clamp is provided with a finger **108** extending upwardly from the portion **106.** A thumb screw **110** is threaded through an opening in the vertically extending portion **112** of the clamp **104** and as may be seen in the figure bears against the surface of the door.

In the event that a user is traveling and desires protection beyond that which may be provided in the usual motel or hotel room a stop/alarm in accordance with the invention may be secured in position at any time the room is occupied. This is accomplished by loosening the thumb screw **110** so as to permit the clamp **104** to be positioned on the door as shown. The thumb screw **110** is then tightened in order to securely clamp the bracket to the door. The clamp **104** may be made of spring material biased so as to exert a holding force at **108** when it is attached to a door.

In FIG. **9** a pair of suction cups **114** and **116** are mounted on the bracket **12'** and the stop/alarm assembly may be secured to the surface of a door **14** by the use of such cups.

A number of embodiments and variations in design have been shown and described. Obviously, it is possible to provide still other variations in design and applications beyond those indicated. It is intended by the claims to cover all such variations as fall within their scope.

What is claimed as new and desired to be secured by Letters Patent is:

1. A security device for attachment to doors or windows to prevent the opening thereof and to sound an alarm in the event unauthorized opening is attempted comprising: a container of pressurized gas having a discharge end; a normally closed valve at said discharge end; a valve actuator extending from said valve; a gas actuated sound generator movably mounted on said discharge end and engageable with said valve actuator; mounting means for securing said sound generator to one surface; and support means for supporting said container in a first position on another surface so that said sound generator and said container extend along a common axis between the two surfaces whereby upon movement of one surface relative to the other said sound generator moves said valve actuator to release pressurized gas from said container to actuate said sound generator and at the same time the device limits the relative movement of the two surfaces.

2. A security device as set forth in claim **1** wherein said container and sound generator are pivotally attached to said mounting means whereby said sound generator and said container may be pivoted away from one of the surfaces to a second position where said support member clears said one surface.

3. A security device as set forth in claim **2** including a spring member on said mounting means engaging said sound generator to maintain the device in either its first or second positions.

4. A security device as set forth in claim **3** wherein said spring member comprises a leaf spring secured to said mounting means and having portions biased toward engagement with said sound generator.

5. A security device as set forth in claim **4** wherein said portions of said leaf spring are constituted by a first portion biased in clockwise direction and a second portion biased in counterclockwise direction, said first and second portions being joined and wherein said sound generator is provided with an edge and said edge engaging said leaf spring where said first and second portions are joined.

6. A security device as set forth in claim **1,** including means for temporarily attaching said mounting means to said one surface.

7. A security device as set forth in claim **6** wherein said temporary attaching means is constituted by a

clamp extending downwardly from said mounting means.

8. A security device as set forth in claim 6 wherein said temporary attaching means comprises suction cups for engaging said one surface.

9. A security device as set forth in claim 2 including locking means for maintaining the device in its first position.

10. A security device as set forth in claim 9 wherein said locking means comprises a wedge slideably mounted on said mounting means.

11. A security device as set forth in claim 4 including a locking wedge slideably mounted between said leaf spring and said mounting means and movable to a position between said sound generator and said mounting means to prevent movement of the device from its first position.

12. A security device as set forth in claim 1 including generally wedge-shaped base on the bottom of said container to provide frictional engagement of said container with a relatively fixed surface.

13. A security device as set forth in claim 1 including a cover extending over said sound generator and said container.

14. A security device as set forth in claim 13 wherein said cover extends completely over said sound generator and said container.

15. A security device as set forth in claim 13 including a tube engaging the bottom of said container and extending beyond said bottom for engagement with a surface.

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