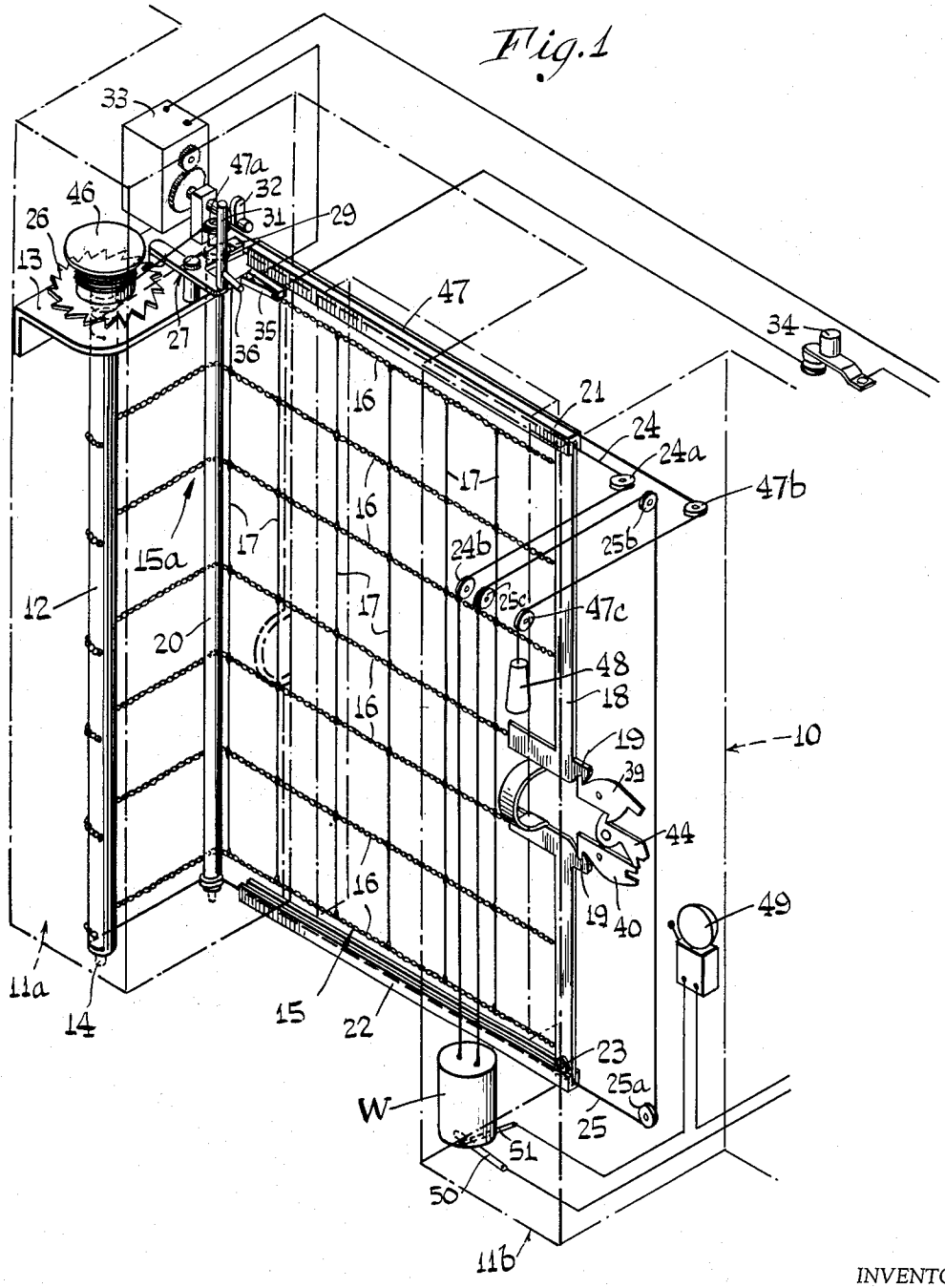
May 29, 1956 M. LUCAS 2,747,661

PROTECTIVE DEVICE

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Fig. 1



INVENTOR

Michael Lucas

BY Johnson and Kline

ATTORNEYS

May 29, 1956 M. LUCAS 2,747,661

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Fig. 3

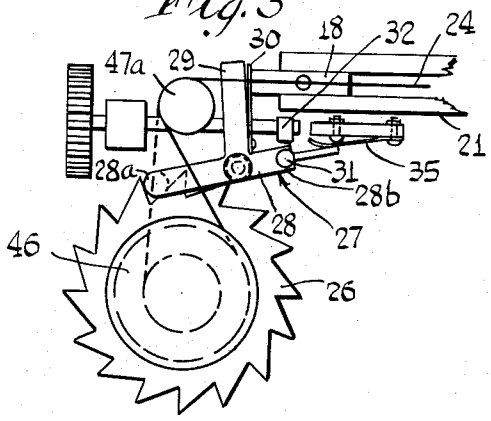


Fig. 4

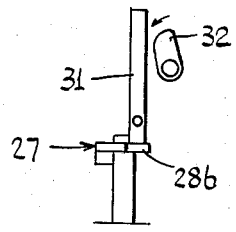


Fig. 2

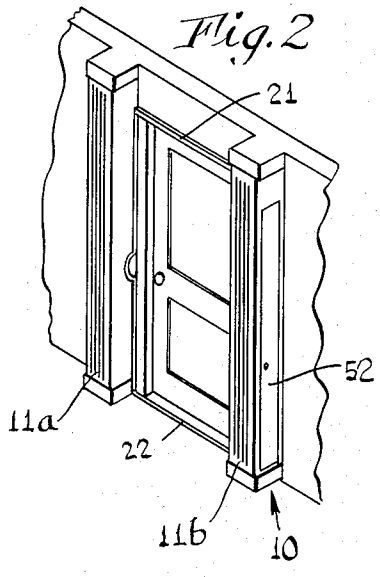
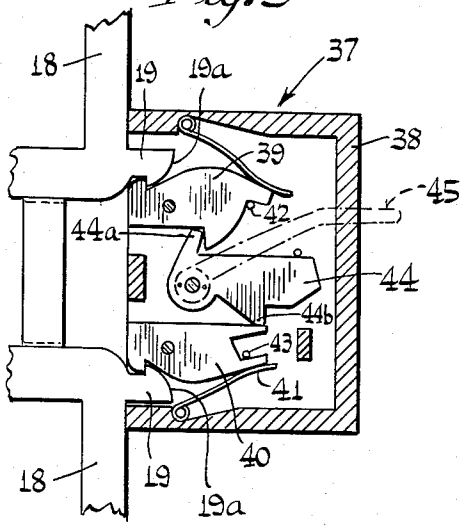


Fig. 5



INVENTOR
Michael Lucas

BY Johnson and Kline
ATTORNEYS

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2,747,661

PROTECTIVE DEVICE

Michael Lucas, Bridgeport, Conn.

Application September 20, 1954, Serial No. 457,182

16 Claims. (Cl. 160—10)

This invention relates to a protective device or a burglar trap of the type particularly useful for banks, liquir stores, pawn shops, loan companies, public buildings and the like, to prevent the entrance of any unauthorized person or to prevent the escape of any person attempting to steal anything within a building or the like on which my device is used.

An object of this invention is to provide a protective device of the flexible wall type adapted to be extended to form an obstruction across an opening to prevent passage therethrough and which takes up minimum space and is arranged to be concealed within the frame structure surrounding the opening or the like when in the inoperative position.

Another object is to provide a camouflaged novel anti-burglar device in a natural and conventional-looking frame structure that surrounds the opening.

Another object of this invention is to provide a means whereby the protective device may be quickly and easily reset with a minimum of effort.

Another object of this invention is to provide an automatic self-locking means for the protective device when it is in extended or operative position.

Another object of this invention is to provide a signaling device and control therefor operatively associated with the flexible wall means to cause a signal to be actuated only after the said wall is extended and locked or in the operative position.

The objects are accomplished in the present preferred form of the invention by having a novel flexible wall or net adapted to be wound about a spindle and is normally urged to an unwound position, said wall being held against the action of said urging means by releasable holding means. The wall is concealed within a hollow frame surrounding a building door opening or the like and is released by remote control means by an attendant of the building upon the appearance of a burglar or suspicious person. Upon release, the flexible wall unwinds to an extended position across a building opening and locks in place, thereby obstructing the opening or the like for preventing the entrance or escape of a burglar or suspicious person and upon completion of its movement actuates a signal indicating that the trap has been sprung. The signal is energized until the device is reset by a simple and novel rewind mechanism.

A feature of this invention resides in the compact, simple, inexpensive, durable, and novel construction of the flexible wall portion which consists of a lattice of chain and/or wire construction.

Another feature of this invention resides in the provision of an inexpensive, positive and novel arrangement for rewinding the flexible wall portion after the trap has been sprung which is prepared for operation by the unwinding of the wall.

A still further feature resides in the fact that the signal is not actuated until after the wall has closed the opening so that the would-be thief or burglar is not forewarned before the trap is closed.

Still another feature of this invention resides in the provision of a novel self-locking construction for the flexible wall when in the extended position.

Other features and advantages will be apparent from the specification and claims when considered with the drawings in which:

Figure 1 is a perspective view of the protective device of the present invention with the frame shown in dot-and-dash lines.

Fig. 2 is a perspective of an opening with the protective device in retracted position.

Fig. 3 is a detail view of the spindle holding means.

Fig. 4 is a fragmentary detail of the release means.

Fig. 5 is a detail of the lock means.

As herein illustrated, my invention is shown as applied to a door opening of a building. However, my invention can likewise be applied to other enclosures and to window openings or other accessible building openings by which unauthorized persons may seek ingress or egress.

As shown in Figs. 1 and 2, a hollow door frame **10** extends around about a building opening by which unauthorized access of undesirable persons may be had. This frame structure, as shown in Fig. 2, has the general appearance of a usual and conventional doorway and has projecting side columns **11***a*, **11***b* for housing the novel anti-burglar device of the present invention, thereby rendering the anti-burglar device free from suspecion and observation.

The hollow frame member **11***a* has a spindle **12** rotatably mounted therein in suitable upper and lower bearings **13** and **14** respectively, the upper bearing comprising of an angle plate which also carries operating mechanisms to be described. The spindle has one end of a flexible wall or net **15** connected thereto so that it can be wound and unwound upon the spindle.

While the flexible wall or net may be made of all chain, all wire, or all metal bands or strips, or a combination of the same, in the preferred illustrated form of the invention as shown in Fig. 1 the flexible wall **15** comprises a series of spaced and substantially parallel chain members **16** or the like interlaced with wire members **17** so that the whole forms a metal net or gate that is flexible, tough, compact, and easily wound or unwound about the spindle. It is of sufficient strength and cannot be easily broken, and of the required compactness so as to fit a restricted volume or hollow portion of the casual or conventional-looking door frame. As shown in Fig. 1, the other end of the lattice wall or net is secured to a leading bar **18** which carries a latch mechanism **19** to be described.

In order to guide the lead bar as it moves across the opening between the opposed hollow frame members **11***a*, **11***b*, upper and lower guide means **21**, **22** of channel construction are provided which engage the ends of the leading bar and guide the same across the door opening as the flexible wall or net is extended, wheeled rollers **23** facilitating movement of the bar in the channels. If desired, a roller or guide bar **20** may be provided for guiding the intermediate portion **15***a* of the flexible wall or net across the building opening as it is wound and unwound about the spindle **12**.

The wall is normally urged to closed position by means of a concealed cable **24** secured to the upper portion of the bar **18** and extends across the opening and is threaded over pulleys **24***a* and **24***b* and secured at its other end to a suspended weight W capable of moving the wall to the extended position. Another cable **25** is likewise concealed and secured to the lower portion of the bar **18** and extends across the opening and is threaded through the pulleys **25***a*, **25***b* and **25***c* having the other end thereof attached to the weight W. The pulley arrangements, concealed in the projecting frame portion

11*b*, provide equal distribution of the pulling force on the bar resulting in smooth and easy operation of the bar by the weighted means upon the release of the holding means.

In order to hold the flexible wall in wound position against the action of the weight W, a holding means is provided which includes a ratchet **26** fixed to the spindle and rotates therewith. Cooperating with the ratchet is a T-shaped member **27** which is pivoted at the junction of the crossbar **28** and stem **29** to the bearing plate **13** with one end of the crossbar **28***a* engaging the ratchet **26** to form a pawl which prevents rotation of the spindle and unwinding of the flexible wall therefrom. The stem **29** of the T is positioned to be engaged by the lead bar **18** as the flexible wall is wound on the spindle and moves the end of the crossbar **28***a* into holding position when the wall is completely wound thereon. If desired the stem **29** of the T may be provided with a buffer spring **30** to prevent damage to the pawl by the action of the lead bar in moving to retracted position. The other end of the crossbar **28***b* has an actuator or projection **31** fixed thereto to be engaged by releasing means to move the pawl out of engagement with the teeth of the ratchet.

In the illustrated form of the invention, the releasing means comprises a releasing cam **32** operatively connected to an electrical motor **33** to be driven thereby. The motor is connected in a circuit controlled by a remotely disposed button **34** concealed within the building and which is located in a strategic position and easily accessible to an attendant or employee in the building.

The motor circuit which is connected to a suitable source of electrical energy, not shown, includes a second switch **35** in series with said button and motor. This second switch **35** is a normally open switch located adjacent an extension pin **36** carried by the end of the crossarm **28***b* and is closed thereby when the pawl is moved to holding position thus setting up the release circuit to be controlled by the push button when the flexible wall is in the retracted position.

When it is desired to release the flexible wall **15** for movement by the weight W, the push button **34** is closed. This energizes the motor **33** to rotate the cam **32** and moves the pawl out of contact with the ratchet leaving the spindle free to rotate. Movement of the pawl to release position automatically opens the motor circuit at the switch **35**.

The locking mechanism **37** for my trap consists of a pair of spaced latching members **19** having spaced undercut cammed surfaces **19***a* thereon and carried by the leading bar **18**. Aligned therewith and located in the opposed frame member **11***b* is a lock housing **38** containing a pair of spaced upper and lower locking cams **39** and **40** respectively, pivotally mounted in said housing and which mate with the latching members **19** in the lock position. Spring means **41** engage each locking cam, and urge them into locked relation with the latching members **19**. Stop pins **42** and **43** limit the movement of the locking cams in the direction of the force exerted by the spring. This arrangement allows the latching cams **19***a* carried by the leading bar **18** to ride over and automatically interlock with the locking cams, **39** and **40** respectively, for securing the net in the extended position.

To prevent the locking cams **39** and **40** from being released by pull on the lead bar, a manually controlled blocking member **44** connected to a release lever **45** is provided. The blocking member **44** has an upper **44***a* and a lower **44***b* cam surface abutting the locking cams. This blocking member prevents the opening of the gate by a pull on the leading bar. Pressing the release lever **45** will pivot the blocking member **44** so that the upper **44***a* and lower **44***b* camming surfaces will cam against said lock cams **39** and **40** respectively and pivot the same against the force of the spring **41**, thereby enabling the latch members **19** to be disengaged therefrom. The release lever **45** is concealed and operated either by hand or key so the unauthorized person caught in the trap cannot release the net when it is in the extended position.

A novel reset mechanism is provided for rewinding the wall on the spindle when the lock is released. This reset mechanism comprises a flanged drum **46** on the upper part of the spindle to rotate therewith. A rewind cable **47** has one end secured to said drum **46** and is arranged to be wound on said drum in a reverse direction to the winding of the flexible wall portion or net **15**. In the illustrated form the reset cable is wound clockwise about the drum while the wall is wound counterclockwise. Therefore, it will be seen that as the wall portion **15** is unwound from said spindle, the reset cable is wound about said drum and prepared for a reset. The reset cable is threaded over pulleys **47***a*, **47***b*, and **47***c* to facilitate the reset operation. The other end of the cable has secured thereto a weighted handle **48** whereby the cable can be pulled to rotate the spindle during the resetting of the trap.

In accordance with the present invention an indicating signal is provided to give notice that the trap has been sprung. While this signal may be either a flashing light and the like or an audible signal, in the illustrated embodiment an audible buzzer **49** is used as the signal which may be located either on the building or in a nearby police station or both.

The buzzer circuit contains a buzzer **49** and a switch or pair of open contacts **50** and **51** which are positioned below the weight W and are closed by the weight only when it has reached its limit of travel after the trap is closed and locked. Thus the signal is energized only after the gate or net has closed so that a burglar or suspicious character is not forewarned of the springing of the trap, so that the unauthorized person within the building immediately becomes trapped therein and can be subsequently captured without loss of property. If the trap is sprung before the would-be burglar or suspicious character is within the building, his plans fail and the attempted burglary is thwarted without loss.

The operation of the burglar trap is as follows:

With the trap set and upon the approach of entrance of a burglar or suspicious character, the building attendant or employee presses a hidden button **34** which actuates the motor **33**. The motor rotates the cam **32** against the actuator **31** thereby pivoting the pawl **28***a* carried by the crossbar **28** out of engagement with the ratchet **26**. As soon as the pawl **28***a* is released from the ratchet **26**, the weight W is free to fall, and pulls as it does, the leading bar **18** across the doorway unwinding the flexible wall or net **15**. Upon release of the pawl, the actuator **31** moves the extension pin **36** fixed thereon away from the biased closed switch **35**, enabling the said switch to open the circuit and cut off the motor.

As the wall or net is unwinding clockwise, the reset cable **47** is winding counterclockwise about the drum **46** fixed to the spindle **12** and rotating therewith. When the leading bar **18** reaches the opposite frame member, the latch members **19** ride over the locking cams **39** and **40** due to the momentum of the bar and automatically interlocks therewith. The weight W, then at the end of its travel, closes the contacts **50** and **51** actuating the buzzer **49**. At this point, if the burgular is within the building, he is trapped therein, and if not, he is prevented from entering and carrying out his plans.

After the burglar has been apprehended or discouraged, the trap is reset. A hidden access door **52** in the hollow frame **11***b* member enables the building attendant to have access to the reset cable **47** and lock means **37**. The trap is reset by opening the access door **52** and pressing the release lever **45** to disengage the lock cams **39** and **40**. The operator then pulls on the handle **43** of the reset cable **47** which was wound counterclockwise about the drum as the net was unwound to the extended position. Pulling the handle effects the unwinding of the reset cable **47** which will cause the spindle **12** to ro-

tate and rewind thereon the net or flexible wall **15**. Rewinding the net returns the weight W to its original position and causes the buzzer contacts **50** and **51**, or switch, to be opened thereby de-energizing the signal circuit.

As the leading bar **18** approaches its limit in the retracted position, it cams against the stem **29** of the T-member pivoting the crossbar **28** so that the pawl **28***a* automaticaly engages the ratchet **26** to counteract or hold the weight W against release. A buffer spring **30** fixed to the stem **29** of the T-member cushions the impact of the leading bar **18** against the T **27** during resetting. Pivoting the crossbar **28** of the T-member **27** also permits the pin extension **36** fixed to the actuator **32** to bias the switch **35** closed to set up the control circuit and the device is immediately ready for another operation.

Although the trap was described for use during business hours, it will be understood that the said device may be used after business hours to discourage night burglars and would-be trespassers. At the close of the business day, the building attendant, or owner may disconnect the buzzer and actuate the trap before leaving the building. Thus with the net extended, it would function as a further deterrent to a would-be night prowler or trespasser. The device may likewise be equally useful during strikes, riots, and the like to protect an owner's property.

Thus it will be seen that my burglar trap is simple, efficient and positive in its operation, and sturdy, inexpensive, and compact in its manufacture. It is completely concealed and unobstructive in the stowed position and capable of protecting life and property from injury due to burglars, trespassers, rioters and the like.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion of open lattice construction and having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means including a weight and a cable connected to said wall portion and normally urging said wall portion to unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said aperture, means locking said wall in unwound position, and switch means actuated by said weight upon completion of the movement of the wall portion to operate a signal only after the wall portion is in unwound position.

2. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion of open lattice construction and having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means including a weight and a cable connected to said wall portion and normally urging said wall portion to unwound position extending over the aperture, pawl and ratchet means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said aperture, means locking said wall in unwound position, switch means actuated by said weight upon completion of the movement of the wall portion to operate a signal only after the wall portion is in unwound position, and means to rewind said wall portion about said spindle to reset the device for reuse.

3. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion of open lattice construction and having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means including a weight and a cable connected to said wall portion and normaly urging said wall portion to unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said aperture, means locking said wall in unwound position, and an alarm means including a pair of contacts disposed in the path of movement of the weight to be engaged thereby and actuate the alarm circuit only upon completion of movement of the wall portion to closed position.

4. A protective device adapted to close an aperture in a building or the like comprising a rotatably mounted spindle adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means separate from said wall portion and normally urging said wall portion to unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom to a position over the aperture, a cable connected to the leading bar, a weight secured to said cable to unwind said wall portion upon actuation of said release means, and a second cable means connected to said spindle to rewind said wall portion about said spindle to reset said device, said second cable being reversably wound on said spindle by the rotation of the spindle as the wall portion is unwound therefrom, whereby said second cable is automatically conditioned for a reset operation.

5. A protective device adapted to close an aperture in a building or the like comprising a rotatably mounted spindle adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means separate from said wall portion and normally urging said wall portion to unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom to a position over the aperture, a cable connected to the leading bar, a weight secured to the leading bar by said cable to unwind said wall portion upon actuation of said release means, switch means actuated by said weight to operate a signal only after the wall portion is unwound and positioned over the aperture, second cable means to rewind said wall portion about said spindle to reset said device, said second cable being reversably wound on said spindle by the rotation of the spindle as the wall portion is unwound therefrom, whereby said second cable is automatically conditioned for a reset operation, manually operable means for actuating the second cable to reset position, said switch means rendering the signal means inoperative as the weight is moved by the wall portion as it moves to reset position.

6. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means separate from said wall portion and normally urging said wall portion to an unwound position extending over the aperture, means including a ratchet and pawl device connected to said spindle for holding said spindle against rotation with the wall portion wound thereon, remote control means releasing said ratchet and pawl device to permit unwinding said wall portion therefrom and close said aperture, and means locking said wall in unwound position.

7. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound

and unwound upon said spindle, means separate from said wall portion and normally urging said wall portion to an unwound position extending over the aperture, means including a pawl and ratchet device for holding said spindle against rotation with the wall portion wound thereon, remote control means including an electric motor driven cam for engaging and releasing said pawl to permit unwinding said wall portion therefrom and close said aperture, and means locking said wall in unwound position.

8. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means normally urging said wall portion to an unwound position extending over the aperture, means comprising a ratchet connected to said spindle and a T-shaped pawl member pivoted at the junction of the stem and crossbar of the T with one end of the bar cooperating with the ratchet to hold said spindle, said leading bar engaging the stem of the T in retracted position to cause the end of the bar to move into holding position with the ratchet and hold said spindle against rotation with the wall portion wound thereon, means operable to move the other end of the bar of the T and move the pawl to release said ratchet to permit unwinding said wall portion therefrom and close said aperture, and means locking said wall in unwound position.

9. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means normally urging said wall portion to an unwound position extending over the aperture, means comprising a ratchet connected to said spindle and a T-shaped pawl member pivoted at the junction of the stem and cross bar of the T with one end of the bar cooperating with the ratchet to hold said spindle, said leading bar engaging the stem of the T in retracted position to cause the end of the bar to move into holding position with the ratchet and hold said spindle against rotation with the wall portion wound thereon, a projection on the other end of the bar, means including a remote control circuit having an electric motor driven cam operable to engage said projection and move the other end of the bar of the T and move the pawl to release said ratchet to permit unwinding said wall portion therefrom and close said aperture, and means locking said wall in unwound position.

10. The invention as defined in claim 9 wherein a normally open switch means in included in the remote control circuit and wherein means is provided on the pawl member to close the switch upon the pawl being moved into holding position and to set up the circuit for remote operation of the release means.

11. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion comprising a plurality of spaced parallel chain members having one end connected to the spindle and the other end connected to a lead bar and spaced transverse wire connectors tying said chains together, said wall portion being adapted to be wound and unwound upon said spindle, means normally urging said wall portion to an unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said aperture, means locking said wall in unwound position, and means for energizing a signal only after the said wall is unwound and locked.

12. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a guide bar mounted adjacent the spindle, a flexible wall portion comprising a plurality of spaced parallel chain members passing around the guide bar and having one end connected to the spindle and the other end connected to a lead bar and spaced transverse wire connectors tying said chains together, said wall portion being adapted to be wound and unwound upon said spindle, means normally urging said wall portion to an unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said aperture, means locking said wall in unwound position, and means for energizing a signal only after the said wall is unwound and locked.

13. A protective device adapted to close an aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means normally urging said wall portion to an unwound position extending over the aperture, means comprising a ratchet connected to said spindle and a T-shaped pawl member pivoted at the junction of the stem and crossbar of the T with one end of the bar cooperating with the ratchet to hold said spindle, said stem of the T having a resilient buffer means thereon and said leading bar engaging the buffer means on the stem of the T in retracted position to cushion the contact and cause the end of the bar to move into holding position with the ratchet and hold said spindle against rotation with the wall portion wound thereon, means operable to move the other end of the bar of the T and move the pawl to release said ratchet to permit unwinding said wall portion therefrom and close said aperture, and means locking said wall in unwound position.

14. A protective device adapted to close in aperture in a building or the like comprising a spindle mounted adjacent the aperture, a flexible wall portion having a leading bar, said wall portion being adapted to be wound and unwound upon said spindle, means normally urging said wall portion to an unwound position extending over the aperture, means holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said aperture, and means locking said wall in unwound position, said locking means comprising a latching member carried by the leading bar, a pair of opposed pivotally mounted locking cam means mounted adjacent the aperture opposite the spindle for receiving the latching member carried by the leading bar when the wall is extended across the aperture and releasing means, said releasing means including a blocking member engaging said locking cams, and a lever actuating said blocking cam to pivot said locking cams to release said latch.

15. In a building having an opening therein, hollow opposed frame members extending around said opening, a burglar device concealed in said frame members comprising a spindle mounted adjacent the opening, a flexible wall portion, said wall portion being adapted to be wound and unwound upon said spindle, weighted means normally urging said wall portion to an unwound position extending over the opening, means mounted in the frame member holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said opening, means in the frame member locking said wall in unwound position, and switch means actuated by said weighted means upon completion of the movement of the wall portion to operate a signal only after the wall portion is in the unwound position.

16. In a building having an opening therein, hollow opposed frame members extending around said opening with projecting portions at each side thereof, a burglar device concealed in said frame members comprising a spindle mounted in one projecting portion adjacent the opening, a flexible wall portion, of open lattice construc-

tion, said wall portion being adapted to be wound and unwound upon said spindle, weighted means normally urging said wall portion to an unwound position extending across the opening, means adjacent the spindle and holding said spindle against rotation with the wall portion wound thereon, means releasing said spindle to permit unwinding said wall portion therefrom and close said opening, and means in the other projecting portion locking said wall in unwound position, said other projecting portion having a locked access opening whereby said last named means may be exposed and released.

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