June 21, 1932. F. J. BRIDGEMAN 1,863,965

MECHANICAL SYSTEM FOR GAS AND SMOKE PROTECTION

Filed May 27, 1931 3 Sheets-Sheet 1

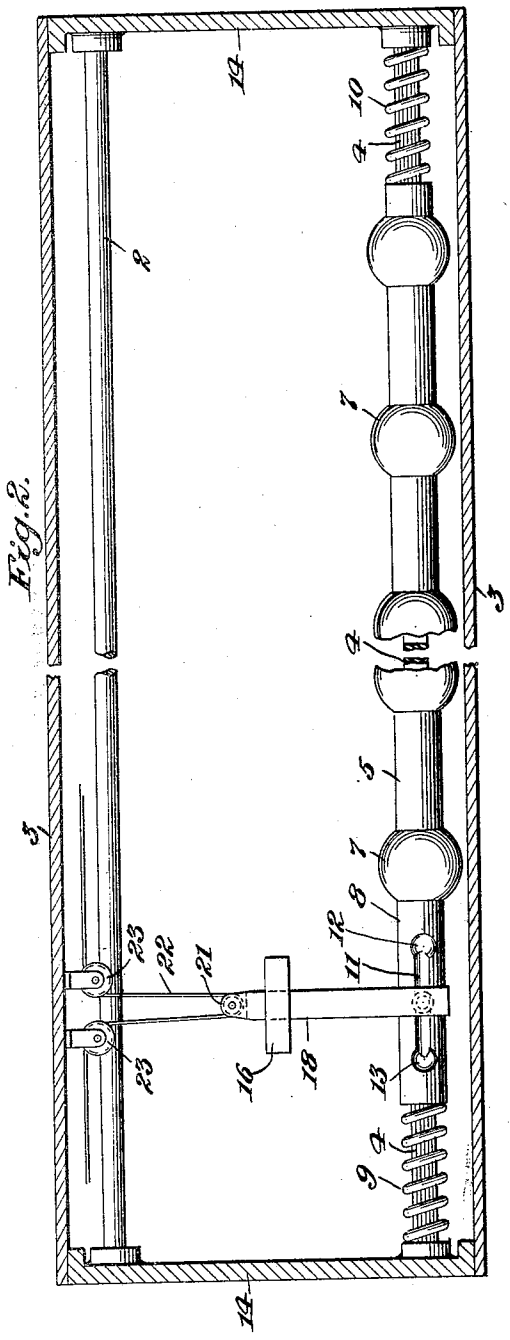


Fig. 2.

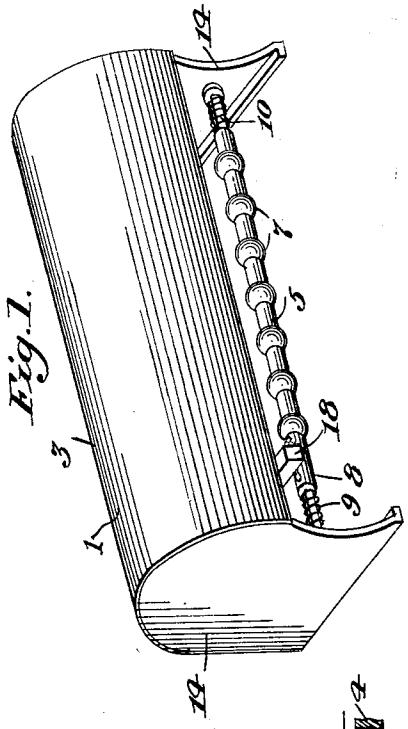


Fig. 1.

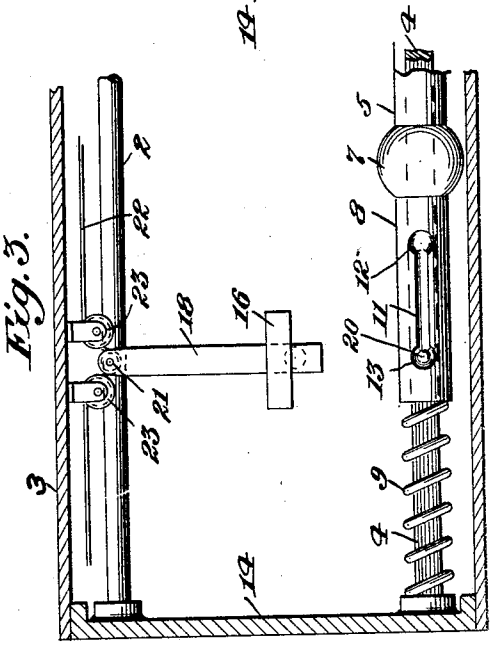


Fig. 3.

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MECHANICAL SYSTEM FOR GAS AND SMOKE PROTECTION

Filed May 27, 1931 3 Sheets-Sheet 2

Fig. 4.

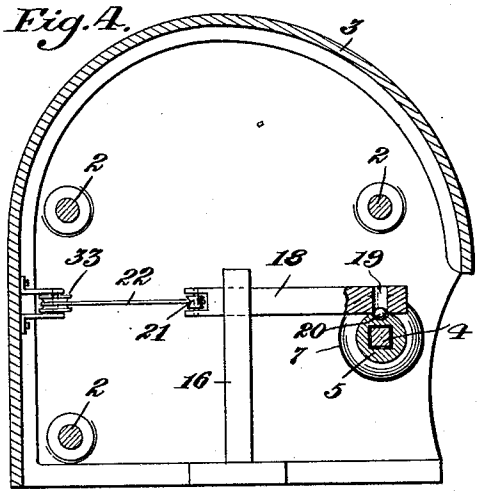


Fig. 5.

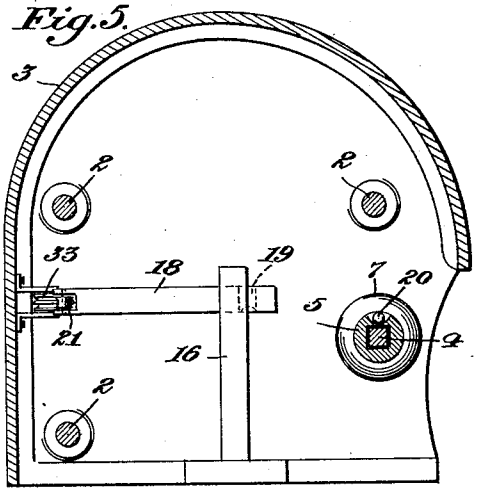


Fig. 6.

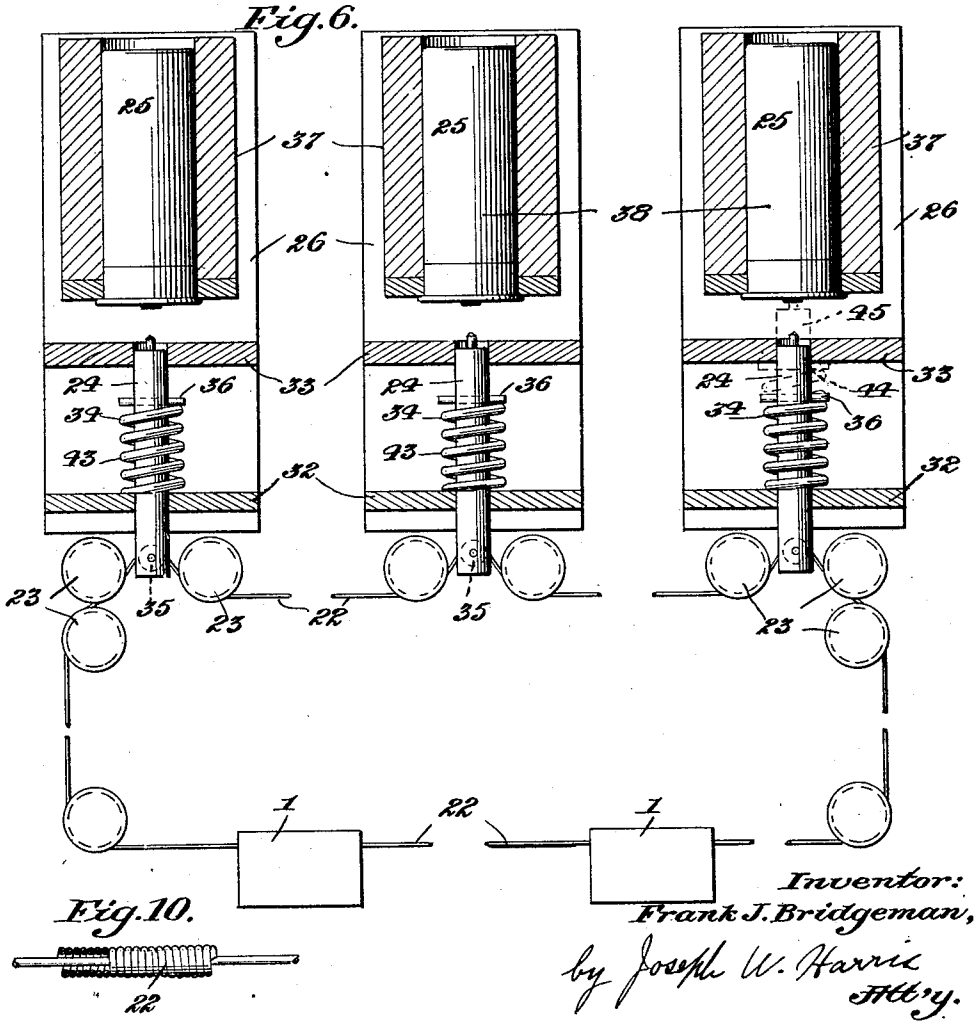


Fig. 10.

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MECHANICAL SYSTEM FOR GAS AND SMOKE PROTECTION

Filed May 27, 1931 3 Sheets-Sheet 3

Fig. 8.

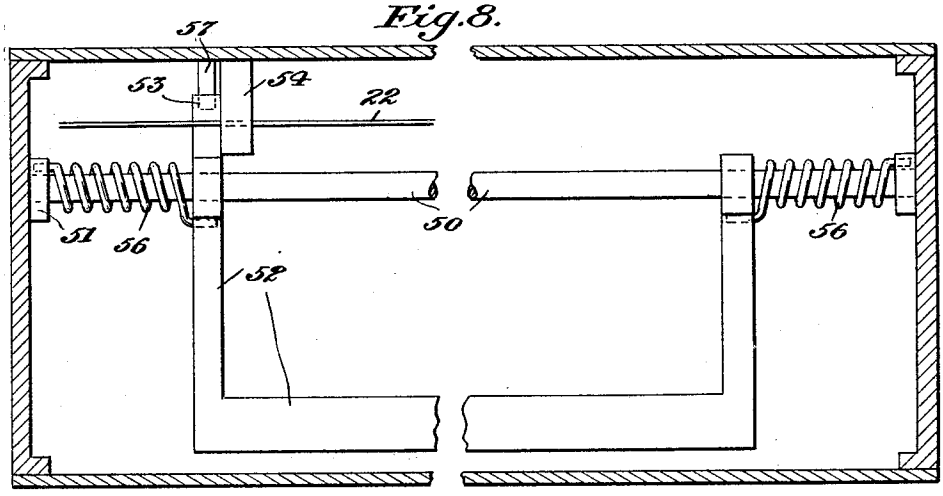


Fig. 9.

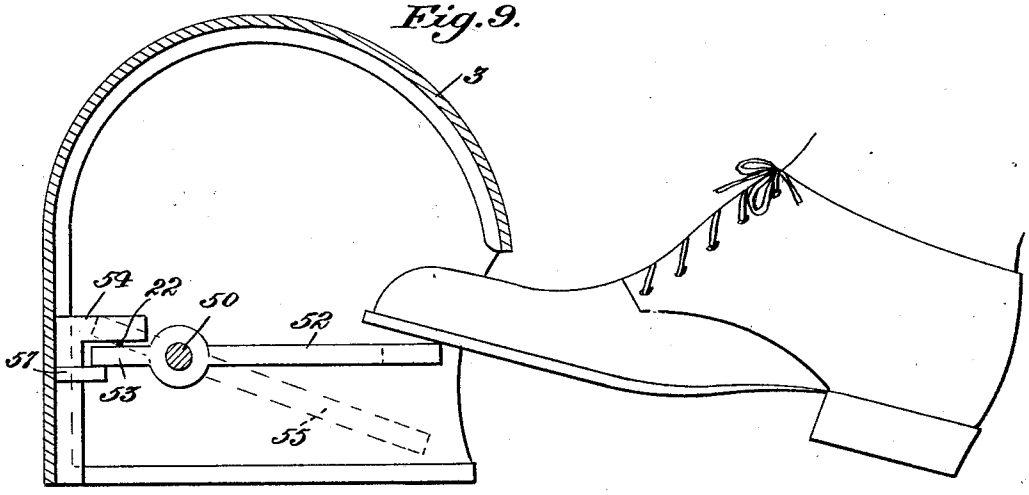
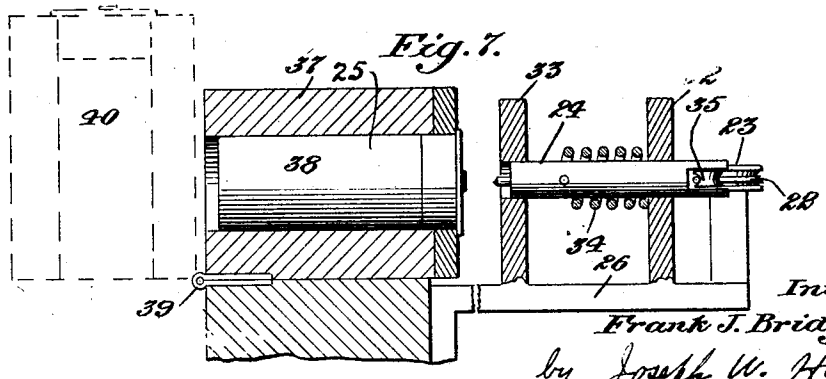


Fig. 7.



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UNITED STATES PATENT OFFICE

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MECHANICAL SYSTEM FOR GAS AND SMOKE PROTECTION

Application filed May 27, 1931. Serial No. 540,456.

This invention relates to mechanically operated gas and smoke discharge systems for daylight hold-up robberies, of the kind that may be installed in banks, ticket offices, pay windows, stores, etc., and are self-contained in that no electric supply circuits are used to actuate the gas and smoke discharge guns.

An object of the invention is to provide a gas and smoke discharge system to be used in the event of a daylight hold-up robbery, which operates entirely by mechanical power, for example by the stored up energy of a spring, said energy being liberated by the movement of a foot-control device conveniently located near the pay window, or the like.

A further object is to provide a gas gun, or smoke gun, or several of them, suitably connected with a tension wire circuit, the circuit to include one or more foot controls, any one of which when actuated will release the tension wire and discharge all of the gas and smoke guns connected in the tension wire circuit.

A further object is to provide a foot control constructed to release a tension wire when actuated by a foot movement.

Other objects of the invention will be apparent to those skilled in the art upon reading the specification.

In the accompanying drawings—

Fig. 1 is a view in perspective of one type of foot control, showing a movable sleeve which when moved to the right or the left will release a member which in turn releases the tension wire;

Fig. 2 is a broken inside view of the foot control, with the cover removed, showing the device in the undischarged position and the tension wire under tension and drawn taut;

Fig. 3 is a similar broken view showing the movable sleeve after having been moved to the right, and the tension wire released;

Figs. 4 and 5 are inside sectional views from one end of the foot control, Fig. 4 showing the device in the undischarged position, and Fig. 5 in the discharged position;

Fig. 6 is a view of a circuit showing three gas or smoke guns, suitably located in a bank or ticket office or the like, and a tension wire circuit connecting the guns, and also connected with two foot controls; the gas or smoke gun at the right also shows in dotted lines the position of the trigger after the tension wire has been released;

Fig. 7 is a longitudinal sectional view, with some parts in elevation, through the longitudinal center of a gas or smoke gun, and also shows the cartridge holder in dotted lines in the turned-up position for reloading;

Fig. 8 is an inside view with the cover removed, of a modified type of foot-control, in which the tension wire is cut by the pressure of the foot upon a foot lever;

Fig. 9 is an inside end view of the foot control shown in Fig. 8, and also showing in dotted lines the position of the foot lever after having been pressed and the tension wire cut; and

Fig. 10 is a view, partly in section of one type of tension wire, called a Bourdon wire.

In the foot control 1, shown in Figs. 1, 2, and 3, the end pieces 14, are united by bracing rods 2, and covered by the shield 3. Extending between, and securely supported by the ends 14 is a square rod 4 upon which is slidably mounted a tubular element 5, provided with a square hole, Figs. 4 and 5; the tube 5 is also provided with foot engageable knobs 7, and a shank portion 8 at one end; the tube 5 is maintained centrally located on the rod 4 by springs 9, 10, one at each end. The shank portion 8 is provided with a groove 11, and two wells 12, 13, Figs. 2 and 3, one at each end of the groove.

Suitably supported by the structure is an upright 16, Figs. 2, 3, 4, and 5, provided with a square hole, and in which is slidably mounted a square rod 18, the front end of which is drilled, as at 19, Figs. 4 and 5, in which a steel ball 20, Fig. 4, may drop; at the back end of rod 18 is a pulley 21, over which a Bourdon tension wire 22, Fig. 2, passes. The groove 11 in shank 8, Figs. 2 and 3, is deep enough to receive the lower half of the steel ball 20, Fig. 4, the upper half of the ball being engaged by the walls of the hole 19, in the square rod 18, Fig. 4. The rod 18 is so positioned in the hole in upright 16 that the lower surface of rod 18 rests firmly but

slidably upon the surface of the shank 8, Figs. 2 and 4, whereby when the steel ball 20 is engaged by both the groove 11 and the hole 19, the rod 18 is firmly held against forward or backward movement, Fig. 4.

The tension wire, for example, a Bourdon wire 22, Fig. 10, passes over the pulley 21 on the back end of rod 18, and is threaded around suitably mounted pulleys 23, 23, Figs. 2, 3, and passes to other foot controls, Fig. 6, and also to spring controlled firing pins 24 for gas and smoke guns 25, 25, Figs. 6 and 7, the guns being mounted on bases 26, the wire 22 being mounted on pulleys 23 where necessary, the wire 22, guns 25, and foot control 1 being suitably distributed about the place to be protected. Suitably located upon the circuit of the tension wire 22 are the gas and smoke guns 25, 25, provided with their spring controlled triggers 24, which latter are mounted in supports 32, 33, and provided with springs 34 located between support 32 and pin 36; in one end of each trigger 24 is mounted a pulley 35, over which passes the tension wire 22. Mounted in operative relation to the triggers are the gas and smoke guns 25, the guns consisting of barrels 37 to receive the gas or smoke cartridges 38, the barrels 37 being mounted, for example on a hinge 39 in order that the barrel may be tilted as shown at 40 in dotted lines in Fig. 7, so that an exploded cartridge may be removed and a new one inserted. The cartridges 38 may be gas cartridges, or smoke cartridges, or combination gas and smoke cartridges.

The operation of the system is as follows:— The foot controls 1 are suitably located under pay windows, ticket counters, desks, and other desirable places, and the gas and smoke guns 25 located in suitable positions so that the discharged gas and smoke will flood the atmosphere of the room and asphyxiate and effectively disable a bandit attempting a hold-up robbery. The tension wire 22 is arranged to be held taut by the springs 34 on triggers 24, there being no slack when any or all of the rods 18 are released and the triggers 24 in the discharged position shown in dotted lines at 45 in Fig. 6. When any or all of rods 18 are pulled back so that the steel balls 20 engage both the grooves 11 in shank 8, and holes 19 in rod 18, as shown in Figs. 2 and 4, the springs 34 on triggers 24 are compressed and receive stored up energy as shown at 43, Fig. 6, and the wire 22 is placed under tension, from ten to forty pounds, as may be desired. Upon a movement of the tube 5 in either direction by the foot engaging the knobs 7, the shank 8 will be moved and the steel ball 20 will drop into one of the wells 12, 13, according to the direction of movement of the tube 5, the dropping of the ball 20 into one of the wells 12, 13, permits the release of the rod 18, and thereby permits the springs 34 to drive forward the triggers 24 and strike and explode all of the cartridges 38, as shown in dotted lines at 45 in the right hand end gun in Fig. 6, thereby liberating the gas and smoke. The system may be re-established by drawing back the bars 18 and inserting balls 20 in holes 19, so as to engage both the walls of the hole 19 and groove 11 of shank 8.

In the modification of the foot control shown in Figs. 8 and 9, a shaft 50 is supported by the brackets 51, and on shaft 50 is mounted a foot operated lever 52, the rear end 53 of which has a sharpened edge; supported from the body of the foot control is an arm 54 which is also provided with a sharpened edge, the pair of sharpened edges on 53 and 54 cooperating to function as cutting pliers and constituting a releasing means when the foot lever 52 is pressed as shown in the dotted line at 55; a spring 56 on shaft 50 engages the lever 52 and retains the same in gentle but firm contact against the stop 57. When in normal use, the stretched Bourdon tension wire 22 will be threaded as shown in Figs. 8 and 9, between the cutting edges of 53 and 54; and to the several gas and smoke guns 25, 25, as described above; upon an attempted hold-up robbery the bank clerk will press the foot lever 52 as shown in Fig. 9, cutting the tension wire 22 and thereby release the triggers 24 and discharge the gas and smoke guns 25, 25. A new tension wire 22 should be installed to replace the cut wire and again place the system in operative condition. Also, new cartridges should be inserted in the gas guns.

The system is entirely mechanical throughout, and is operated by the stored up energy in the springs 34 shown in the gas guns; the energy could also be stored in additional springs located elsewhere in tension wire system, either in the foot control or in a separate box, but such additional springs would tend to make the system more complex.

I claim:—

1. A mechanical system for gas and smoke protection against daylight hold-ups as described, comprising a tension wire circuit distributed about the place to be protected, guns distributed about the place to be protected, said guns associated with said tension wire, manually operated mechanical controls distributed about the place to be protected, said controls associated with said tension wire, means to place said tension wire under tension and maintain said wire taut, said controls adapted to mechanically release the tension in said wire and cause the discharge of said guns.

2. A mechanical system for gas and smoke protection against daylight hold-ups as described, comprising a tension wire circuit distributed about the place to be protected, said tension wire adapted to be placed under tension, guns distributed about the place to be

protected, said guns associated with said tension wire, springs associated with said guns, said springs adapted to receive stored up energy from said tension wire when said wire is placed under tension, a manually operated control, said control associated with said tension wire, said control adapted to mechanically release the tension in said tension wire and liberate the energy in said springs and cause the discharge of said guns.

3. A mechanical system for gas and smoke protection against daylight hold-ups as described, comprising a tension wire circuit distributed about the place to be protected, guns distributed about the place to be protected, said guns associated with said tension wire, springs associated with said guns, said springs adapted to receive stored up energy from said tension wire, manually operated mechanical controls distributed about the place to be protected, said controls associated with said tension wire, means to place said tension wire under tension and maintain said wire taut and store up energy in said springs, said controls adapted to mechanically release the tension in said wire and liberate said stored up energy in said springs and cause the discharge of said guns.

4. A mechanical system for gas and smoke protection against daylight hold-ups as described, comprising a tension wire circuit distributed about the place to be protected, said tension wire adapted to be placed under tension, guns distributed about the place to be protected, said guns associated with said tension wire, springs associated with said guns, said springs adapted to receive stored up energy when said tension wire placed under tension, foot controls, said foot controls distributed about the place to be protected, said foot controls associated with said tension wire circuit, and means associated with said foot controls to mechanically release the tension in said tension wire and thereby liberate the stored up energy in said springs and cause the discharge of said guns.

5. A mechanical system for gas and smoke protection against daylight hold-ups as described, comprising a tension wire circuit distributed about the place to be protected, said tension wire adapted to be placed under tension, guns distributed about the place to be protected, said guns including triggers, said triggers associated with said tension wire, said triggers provided with springs, said springs adapted to receive stored up energy when said tension wire is placed under tension, a foot control, a releasable retractable bar in said control, said bar associated with said tension wire, a foot operated movable member in said control, means to detachably engage said bar and said member with each other, said bar when retracted adapted to impart tension to said tension wire and store up energy in said spring and maintain said tension wire taut while said bar is engaged with said member, and said member upon movement adapted to be disengaged from said bar and thereby mechanically release the tension in said tension wire and liberate the stored up energy in said spring and discharge said guns.

6. A mechanical system for gas and smoke protection against daylight hold-ups as described, comprising a tension wire circuit distributed about the place to be protected, guns distributed about the place to be protected, said guns associated with said tension wire, a manually operable mechanical foot control, a foot actuated movable element in said control, a retractable bar in said control, said bar associated with said tension wire, means to detachably engage said bar and element with each other, said bar when retracted adapted to place said tension wire under tension and to maintain said wire under tension while said bar and element are engaged, and said control adapted to release the tension in said tension wire and cause the discharge of said guns when said element is moved and said bar disengaged therefrom.

7. In a mechanical system for gas and smoke protection against daylight hold-ups as described, a tension wire circuit distributed about the place to be protected, guns distributed about the place to be protected, said tension wire associated with said guns, each of said guns provided with a trigger, said triggers provided with springs, said springs adapted to receive stored up energy from said tension wire, said tension wire adapted to be placed under tension and be maintained taut, a foot control, said control mechanically associated with said tension wire, said control adapted to release the tension in said wire and liberate the energy in said spring and cause a discharge of said guns.

8. In a mechanical system for gas and smoke protection against daylight hold-ups as described, a tension wire circuit distributed about the place to be protected, guns distributed about the place to be protected, said tension wire associated with said guns, each of said guns provided with a trigger, said triggers provided with springs, said springs adapted to receive stored up energy from said tension wire, said tension wire adapted to be placed under tension and be maintained taut, a foot control, said control provided with a movable foot operated cutting element, said control provided with a fixed cutting element, said tension wire associated with said control and threaded between said cutting elements, said cutting elements adapted to cooperate and sever said tension wire when said movable element is pressed, and thereby release the tension in said wire and deliver the stored up energy in said spring and cause the discharge of said guns.

9. A manually operated mechanical ten-

sion wire system for gas or smoke guns for protection against daylight hold-ups, comprising a tension wire circuit, said circuit including a manual control, tension wire, and gas or smoke guns, said circuit arranged to discharge said guns upon the manual actuation of said control.

In testimony whereof I hereby affix my signature.

FRANK J. BRIDGEMAN.