April 16, 1968 R. C. O'REILLY 3,378,081

REMOTE CONTROL APPARATUS SUITABLE FOR ACTUATING FIRE EXTINGUISHERS

Filed April 18, 1966 3 Sheets-Sheet 1

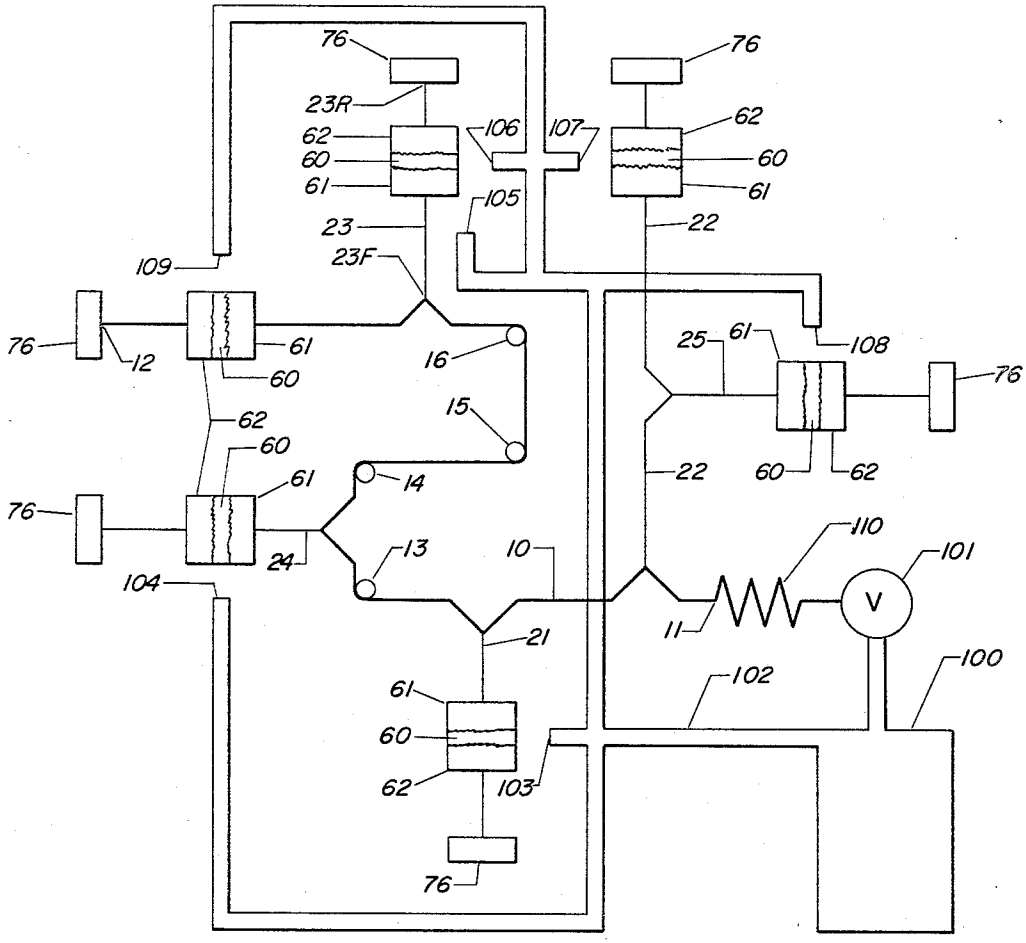


Fig. 1

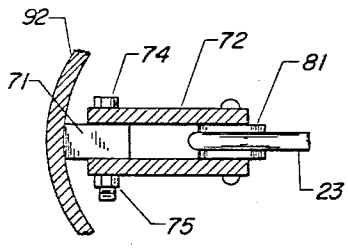


Fig. 3

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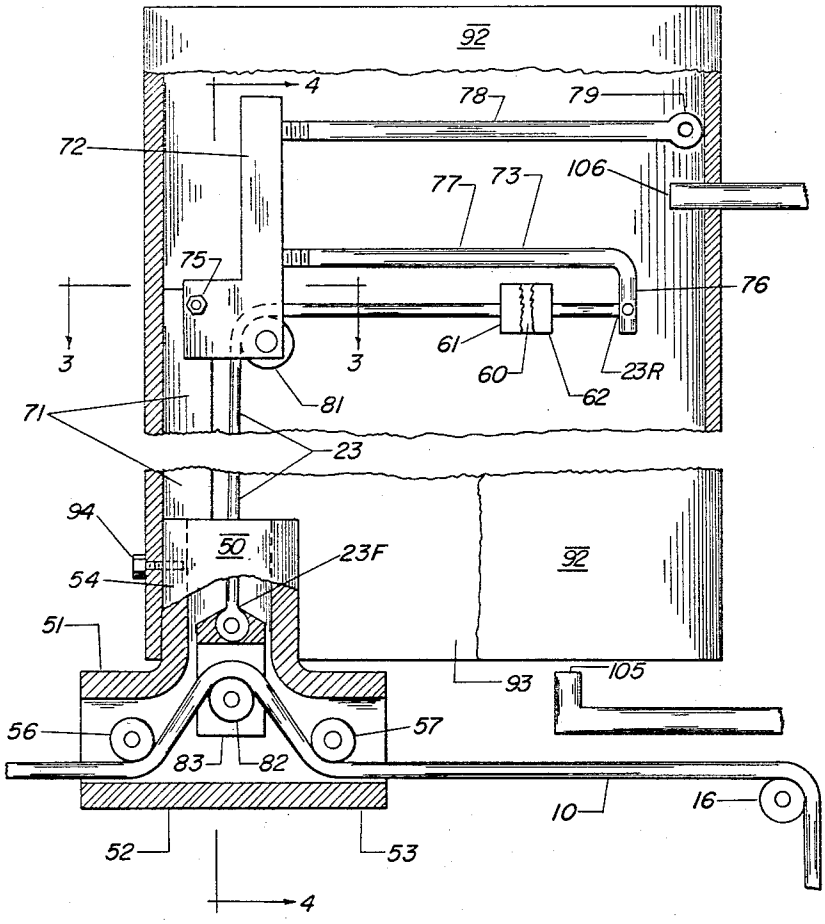
BY George R Kimmel

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REMOTE CONTROL APPARATUS SUITABLE FOR ACTUATING FIRE EXTINGUISHERS

Filed April 18, 1966 3 Sheets-Sheet 2



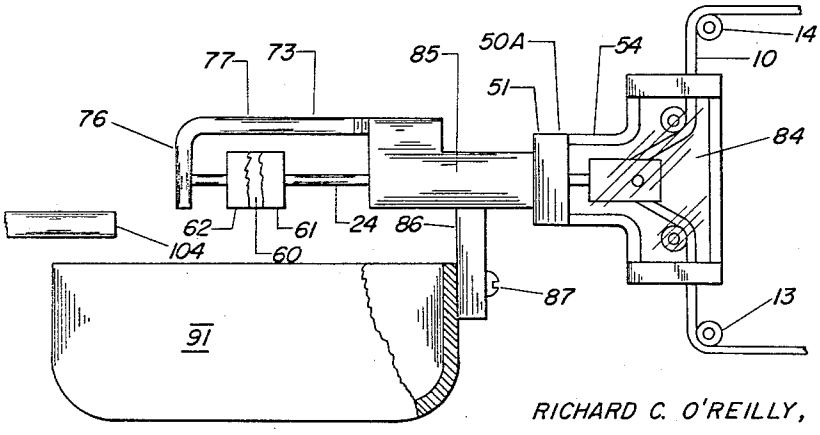


Fig. 2

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REMOTE CONTROL APPARATUS SUITABLE FOR ACTUATING FIRE EXTINGUISHERS

Filed April 18, 1966 3 Sheets-Sheet 3

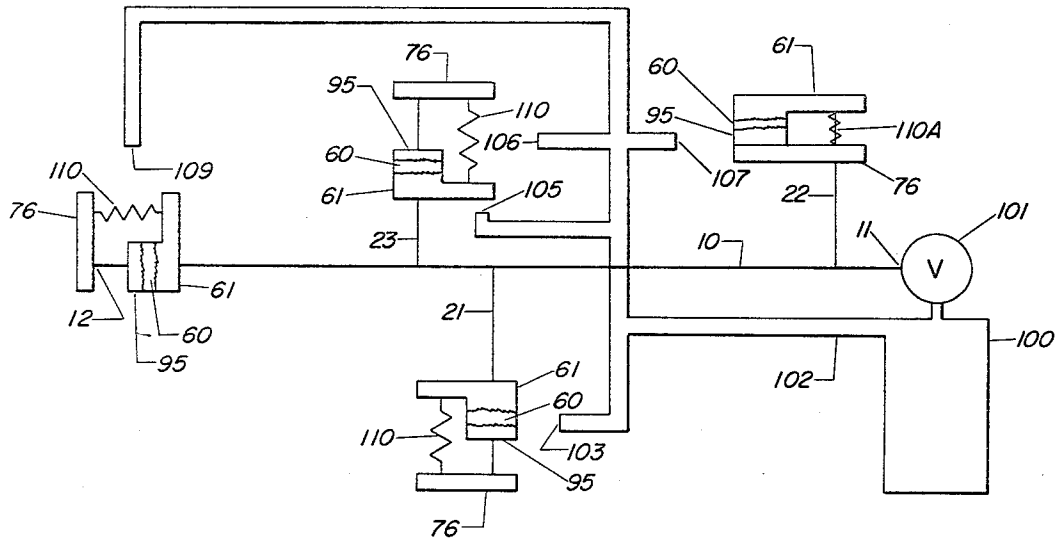


Fig. 5

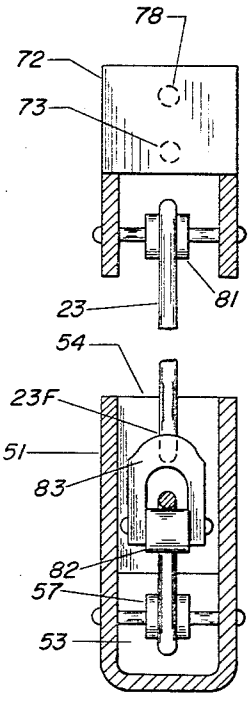


Fig. 4

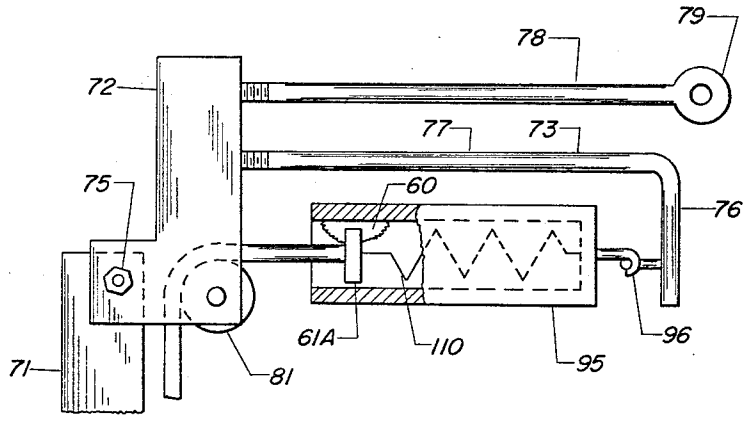


Fig. 6

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3,378,081

REMOTE CONTROL APPARATUS SUITABLE FOR ACTUATING FIRE EXTINGUISHERS

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7 Claims. (Cl. 169—19)

This invention relates to an apparatus for the mechanical remote control of an actuatable stationary device. In particular, this invention provides an apparatus by which a fire extinguisher or other actuatable stationary device may be mechanically controlled from any one of a plurality of remotely positioned stations.

There are many situations wherein it is desired to mechanically control an actuatable stationary device from any one of a plurality of remotely positioned stations. Oftentimes it is appropriate that the actuatable stationary device be automatically mechanically triggered in response to a given stimulus acting through a stimulatable means located at each of the remote stations, said stimulatable means might typically be of the thermally-sensitive, light-sensitive, mechanically-sensitive, electro-sensitive, or hydro-sensitive types.

Mechanical remote control apparatuses are admirably suited to the actuation of fire extinguisher devices. In many installations, as for example in restaurant kitchens, the fire extinguisher device includes an outlet conduit system that is appropriately branched and that terminates at a plurality of potentially hazardous locations to provide simultaneous delivery of a flowable fire extinguishing agent at each of the potential fire hazards. For example, in restaurant kitchens the fire extinguisher branched outlet might have terminii at a vat of heated flammable grease, e.g. a deep fat fryer, at the open burner cooking stove, and at the lower mouth of each chimney duct positioned over each of several cooking grills and stoves. The stationarily positioned fire extinguisher is mechanically actuated by means of a lengthy taut continuous cable operationally attached to the fire extinguisher; a plurality of strategically positioned rotatable guiding wheels, called "cornering boxes" in the art, are employed to bring the path of the elongated taut cable adjacently near every potentially hazardous location. For certain applications the taut cable is so associated with the fire extinguisher that an increase in cable tension, e.g. a "pull," will actuate the extinguisher while in other applications the cable is so associated with the fire extinguisher that a decrease in cable tension, e.g. a "release," will actuate the device.

At each potentially hazardous location, a thermally-sensitive stimulatable means is operationally connected to the elongate taut cable, said plurality of thermally-sensitive stimulatable elements being normally positioned in series along the elongate taut cable. Normally the heat stimulatable means employed is a pair of relatively heat stable metallic elements joined together with a relatively heat-sensitive fusible alloy, e.g. a so-called "fuse link" fusible into a liquid at about 285–360° F. In response to a heat stimulus, e.g. a fire, at any one station, the "fuse link" melts and depending upon the positioning of spring means operationally associated with the elongate taut cable and the relatively heat stable metallic elements of the stimulatable means, the cable is either appropriately "pulled" or "released" to actuate the fire extinguisher device, and fire extinguishing agent is stimultaneously delivered at all potentially hazardous locations.

The thermally-sensitive stimulatable means, e.g. "fuse link," must be placed at the various potentially hazardous locations according to the rigorous standards established by the National Board of Fire Underwriters. For example, the standards of the National Board of Fire Underwriters require that the fuse link to be used in conjunction with the overhead chimney ducts of a cooking grill or stove be located at least five to eighteen inches above the lower mouth of said chimney duct. In order to comply with this rigorous standard, it is usually necessary for the installer to cut through the duct sidewall at the required distance from the mouth, which is a troublesome and time-consuming operation. Many times, the appropriately required distance for the fuse link from the chimney duct mouth is located above the kitchen ceiling, perhaps within a very limited or even a non-existing working space, which requires a very difficult, laborious, and time-consuming installation. Further, with many of the thermally-sensitive stimulatable means appropriate to "pull" type actuation of the elongate taut cable, installation is apt to be especially difficult because of the limited means available for operationally associating them within and of the necessity for having to space them in clusters along the elongate taut cable.

It is accordingly the general object of the present invention to provide an exceedingly versatile and simple means for mechanically controlling an actuatable device from any one of a plurality of remotely positioned stations.

It is another object of the present invention to provide a mechanical remote control apparatus especially adaptable to a fire extinguisher device, said remote control apparatus comprising a plurality of remotely positioned stations each station having a thermally-sensitive stimulatable means, any one of which will remotely trigger the fire extinguisher device.

It is another object to overcome the disadvantages and deficiencies of the prior art with regard to the positioning of the stimulatable means a prescribed distance from the lower mouth of a chimney duct, auxiliary objects being to eliminate the necessity for physically cutting into the duct sidewall and/or for having to install the stimulatable means above the ceiling level.

It is yet another object of the present invention to adopt the "pull" type mechanical remote control system for more general application and use than has been heretofore employed, thus overcoming many of the disadvantages associated with this type mechanical actuation.

With the above and other objects in view, which will become apparent as the description proceeds, the invention comprises the novel form, combination, and arrangement of parts as hereinafter more fully described, reference being had to the accompanying drawings wherein like numbers refer to like parts in the several views and in which:

FIGURE 1 schematically illustrates one form of the apparatus for mechanical remote control of an actuatable stationary device, as for example a fire extinguisher device.

FIGURE 2 is an elevational view partially in section of typically representative portions of the FIGURE 1 embodiment of the present invention.

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 2.

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 2.

FIGURE 5 schematically illustrates another form of the apparatus for remote control of an actuatable stationary device, as for example a fire extinguisher device.

FIGURE 6 is an elevational view partially in section of a portion of the FIGURE 5 embodiment of the present invention.

As can be seen in the FIGURE 1 schematic view, the remote control apparatus of the present invention comprises an actuatable stationarily positioned device, as for example a fire extinguisher device 100; a taut primary cable line 10, a forward end 11 of which is attached to

the control mechanism **101** of device **100**, and the second end **12** being statically fixed a finite distance remote of device **100**; a plurality of taut secondary branch cables **21–24**, each being operably associated with primary cable line **10**, there being a substantially uniform degree of tension along the primary cable line and each secondary cable line commencing at a fixed point **76**; and stimulatable means **60** along each taut secondary branch cable for altering the tension of the secondary branch cable to mechanically remotely control the actuation of an actuatable stationarily positioned device, as for example the fire extinguisher device **100**.

While the apparatus schematically illustrated in FIGURE 1 can be employed for remotely mechanically controlling several types of actuatable stationarily-positioned devices, as for example clapper-type bells, slidable doors and windows, throttle controls, plungers, etc., the apparatus has especially desirable features when employed in conjunction with fire extinguishers. For example, the fire extinguisher device **100** of FIGURE 1 has a conduit system **102** terminating at seven potentially hazardous locations **103–109**, the fire extinguisher being adapted to simultaneously deliver a suitable flowable fire extinguishing agent (gaseous, liquid, or puverized solid) at all potentially hazardous locations. There is a control mechanism, e.g. valve **101**, to initiate such simultaneous delivery of flowable fire extinguishing agent. Although the control mechanism for an actuatable device, e.g. **100**, could conceivably be of the variable control type, in the fire prevention trades the degree of actuation must necessarily be complete rather than partial in order that all the available fire extinguishing agent may be delivered to the hazardous locations as quickly as possible. For this reason, valve **101** is of the "on-off" type and may be maintained "off" by virtue of the tension of taut primary cable **10**, and to indicate that tension maintains valve **101** in the "off" condition, a helical spring **110** in elongated tension is shown positioned between primary cable first end **11** and control valve **101**. Thus, the FIGURE 1 schematic view illustrates the "release" type application wherein a decrease in tension along the primary cable **10** is necessary to actuate fire extinguisher **100**.

Primary cable **10** need not necessarily be linearly disposed but may indeed assume any desired path depending upon any obstructions that may be present at the site and depending further upon the desired points for intersection with the various secondary branch cables **21–24**. The desired path for primary cable **10** can be controlled by the use of so-called "cornering boxes" at strategic locations, said "cornering boxes" include a revolvable wheel component to guide the path of primary cable **10**. For illustrative purposes, four such cornering wheels **13–17** are schematically shown in FIGURE 1.

The stimulatable means **60** along the various taut secondary branch cables provides a means to decrease the tension along a secondary branch cable and thus concurrently decreasing the tension along primary cable **10**, with which each secondary branch cable is operably associated, so as to actuate the stationarily-positioned actuatable device, as for example the fire extinguisher **100** which is normally kept "off" by virtue of the taut primary cable **10**. While for other applications the stimulatable means could be of various kinds including light-sensitive, electro-sensitive, and pressure-sensitive forms, in the fire prevention trade the stimulatable means is ordinarily of the thermally-sensitive variety. Accordingly, stimulatable means **60** may be as a suitable normally solid alloy that will fuse at a given temperature, for example at 285°–360° F., alloy **60** being as a solder-like connection between metallic links **61** and **62** of each secondary branch cable. Thus, if a fire should develop in the proximity of thermally-sensitive alloy **60**, so as to cause stimulatable means **60** to fuse, the integral connection **60** between relatively heat stable metallic links **61** and **62** is broken causing a release of tension along that particular secondary branch cable, said tension release continuing through primary cable **10** to control valve **101**, resulting in actuation of fire extinguisher **100** and simultaneous delivery of fire extinguishing agent to terminal outlets **103–108**. While normally the stimulatable means, e.g. **60**, is normally positioned along a secondary branch cable, one or more stimulatable means can be similarly disposed at any desired location along primary cable **10**, as for example adjacent to conduit terminus **109**.

As can be seen in FIGURE 2, conduit terminus **104** may be positioned over a vat **91** containing a flammable liquid, as for example a restaurant deep fat fryer filled with heated cooking oil while conduit terminii **105** and **106** may be positioned respectively at the mouth and at a given distance above the mouth of a tubular chimney duct **92** vertically positioned over a restaurant cooking grill. Primary cable **10** passes adjacently near vat **91** and chimney duct **92** and is guided to said proximal locations with revolvable cornering wheels **13**, **14**, and **16** schematically shown in FIGURES 1 and 2.

The fusible stimulatable means **60** is maintained a finite distance into chimney duct **92** with an adapter assembly **50**. Adapter **50** comprises a hollow junction box **51** for enclosing the means for operationally associating the forward portion **23F** of secondary branch cable **23** with primary cable **10**. Hollow junction box **51** is preferably of inverted T-shaped configuration having transverse arms **52** and **53** and revolvably attached to junction box **51** are revolvable wheels **56** and **57** that serve to guide primary cable **10** which passes longitudinally through transverse arms **52** and **53**. Junction box **51** is maintained at the mouth **93** of chimney duct **92** with suitable attachment means, as for example with a threaded screw **94** passing through the wall of duct **92** and engaged with a threaded lateral perforation of junction box upright stem **54**. If primary cable **10** is itself encased within a rigid conduit system as is often the situation, then the rigid conduit would normally be sufficient to maintain junction box **51** adjacent to duct mouth **93**, without the use of a separate fastener, e.g. **94**.

There is a vertically upright elongate spacer means for adapter assembly **50**, to position stimulatable means **60** a finite distance into duct **92** from primary cable **10**; normally in the restaurant trades it is desired to space fusible link **60** some 5–18 inches from the duct mouth **93**. The spacer means may conveniently comprise three components including an elongate bar **71**, an L-shaped lug **72**, and an adjustable bracket **73**. Elongate bar **71** is the primary component of the spacer means, the lower end of bar **71** being attached as by welding to the stem **54** of junction box **51**; bar **71** may be of any convenient length and the length is chosen to be substantially equivalent to the spacing required for stimulatable means **60** above duct mouth **93**. As is further amplified in FIGURES 3 and 4, the lower portion of L-shaped lug **72** is of clevis-like configuration and is pivotably attached to the upper end of bar **71** as with threaded bolt **74** passing through non-threaded perforations of bar **71** and lug **72**, threaded nut **75** engaging bolt **74** and bearing against lug **72** to affix the normally pivotal relationship between **72** and **71**. Bracket **73** is of an L-shaped configuration including a longer threaded arm **77** and a shorter downwardly extending arm **76** to which the rearward end **23R** of secondary cable **23** is attached. Longer arm **77** of bracket **73** is threadedly engaged with lug **72** to provide an adjustable length feature for bracket **73** thus allowing the adapter **50** to fit within a range of duct sizes and providing locational control for stimulatable means **60**. There is a support bar or strut **78** having a headed end **79** that is threadedly engaged with lug **72**, said support bar **78** being substantially parallel with bracket longer arm **77**. By virtue of its threaded end, support bar **78** is of adjustable length, and is therefore adaptable to the cross-

sectional width of duct 92. The headed end 79 of bar 78 is adapted to bear against the wall of duct 92 and thus vertically stabilize the upper portion of adapter 50.

Between fusible link 60 and primary cable 10, secondary branch cable 23 is given a 90 degree turn by virtue or removable wheel 81 positioned within L-shaped lug 72. The forward portion 23F of secondary cable 23 is attached to a carrier 83 for a revolvable pulley wheel 82, said revolvable pulley wheel 82 being positioned within junction box 51. Primary cable 10 travels around pulley wheel 82 and there is sufficient tension upon secondary cable 23 that there is a definite offset of cable 10 between revolvable wheels 56 and 57 in the direction toward stimulatable device 60. This primary cable offset has a U-shaped configuration in FIGURE 2 and is schematically shown as a V in FIGURE 1. If there should be a fire in duct 92, fusible link 60 would melt, releasing the tension in secondary cable 23, and moving the pulley 82 operational connection with cable 10 downwardly, releasing the tension in cable 10 and actuating the fire extinguisher 100 to deliver fire extinguishing agent through conduit openings 104–106.

Because of the offset of primary cable 10 within box 51 the release of tension in secondary cable 23 causes a given distance movement toward cable 10, and cable 10 moves twice this given distance toward stationary fire extinguisher 100. Thus, the cable 10 has twice the degree of sensitivity of secondary branch cable 23. With appropriate pulley means between secondary branch cable 23 and primary cable 10, this double mechanical advantage could be increased to whatever multiple desired provided that undue frictional forces are not so introduced. In FIGURE 1, it can be seen that there is a tertiary branch cable 25 operationally connected to secondary branch cable 22 in identical offset fashion to the operable connections between secondary cables 23 and 24 and primary cable 10. In this situation, there is a four-times or four-fold mechanical advantage along primary cable 10 with respect to tertiary cable 25.

With regard to the open vat 91 of FIGURE 2, the adapter assembly 50A has the same junction box 51 which encloses an operable connection between secondary cable 24 and primary cable 10, identical to that operable connection between secondary cable 23 and primary cable 10. The junction box 51 of adapter 50A includes a transparent outer panel 84 through which an inspector might check to see if the proper offset type connection between secondary cable 24 and primary cable 10 has been made and maintained.

The spacer means of adapter assembly 50A for stimulatable means 60 comprises two components including bracket 73 and a tubular component 85. The tubular component 85 is attached as by welding to the stem 54 of junction box 51 and is of analogous function to elongate bar 71. In fact a tubular member could be adapted as a substitute for bar 71 in the event it should be desired to enclose or surround cable 23 as might have been done with cable 24. Bracket 73 is attached to the end of tubular component 85 as by welding. The length of spacer means 73 and 85 is predominantly governed by the length of the tube 85 and accordingly the threads of bracket 73 would not be ordinarily employed. However, there is no reason why bracket 73 could not be threadedly engaged with tube 85 or a laterally extending fitting thereof. Adapter assembly 50A can be attached to vat 91 as with a lateral flange component 86, said flange 86 being attached to vat 91 with suitable fastener means, as with a screw 87 as shown.

In the simplified schematic of FIGURE 5, there is the same fire extinguisher device 100 having valve 101 and conduit system 102 including terminal outlets 103, 105, 106, 107, and 109. The first end 11 of primary cable 10 is attached to valve 101 and second end 12 of primary cable 10 is statically positioned a finite distance from fire extinguisher 100. Primary cable 10 is taut between its ends 11 and 12. Valve 101 is of the type wherein an increase in tension or "pull" along primary cable 10 is required to actuate fire extinguisher 100 and therefore, the various stimulatable means 60 must, when stimulated, exert an affirmative pull upon cable 10. For this reason, the helical spring 110 of elongated tension is positioned in parallelism with fusible link 60 and attached between forward plate 61 and the rearward terminus 76 of each secondary branch cable so that when fusible link 60 melts there is an affirmative pull upon the secondary cable and thence along the primary cable to actuate the fire extinguisher. The same type of pull mechanism can be used on primary cable 10 adjacent to second end 12. As illustrated along secondary cable 22, the helical cable 110A parallel to fuse link 60 can be in normally compressed form if the proper mechanical reversals are made.

As can best be seen in the FIGURE 6 view which is a detail view similar to FIGURE 2, the "pull" type device includes the same components at the upper end of adapter 50 except for the position of heat-sensitive fusible link 60. There is a tubular container 95 having a hook 96 at one end for attachment to shorter arm 76 of L-shaped bracket 72. A helical spring 110 in elongated tension is disposed along the axis of tube 95, one end of spring 110 being attached to tube 95 adjacent to hook 96. The second end of spring 110 carries a disc-like link 61A and disc 61A is attached to tube 94 with fusible link 60. Thus, when fusible link 60 melts, spring 110 within tube 95 moves rightwardly and pulls cable 23 and thence cable 10 to actuate fire extinguisher device 100. Unlike the "release" type mechanism shown in FIGURE 1, there is no need for the offset at the junction between every secondary cable and the primary cable 10, a sharp connection being adequate.

While the pulley-type offset operable connection between the primary and secondary cables is preferred, especially for the "release" type application, various types of operable connections between the primary and secondary cables may be employed without departing from the spirit of the present invention.

In the FIGURE 1 type embodiment, the permissible tension alteration in the various secondary cables is a decrease in tension, and there is a like type of tension alteration, e.g. a decrease, along primary cable 10. In the FIGURE 5 type embodiment, there is a permissible increase in tension along the various secondary cables, and there is a like type of tension alteration, e.g. an increase, along primary cable 10.

From the foregoing, the construction and operation of the mechanical remote control apparatus will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invetnion to the exact construction shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

I claim:

1. An apparatus for remotely mechanically controlling the actuation of an actuatable stationary device, said mechanical remote control apparatus comprising:

(A) A taut primary cable line, a first end being operably attached to the control mechanism of said actuatable stationary device and the second end being statically fixed a finite distance from the said actuatable stationary device,

(B) A plurality of taut secondary branch cables, the forward terminal portion of said secondary branch cables being operationally connected with the primary cable line so that each branch cable exerts a constant degree of tension between the first and second ends of the primary cable line, said constant degree of tension being exerted continuously between the rearward end of each secondary branch cable and the respective ends of the primary cable line

so that an alteration in the branch line tension will be transmitted to the primary cable first end, and

(C) Stimulatable means attached to each secondary branch line cable nearer to the secondary branch cable rearward end for altering the tension along a branch cable in response to an appropriate stimulus exerted to a rearward end station of the secondary branch cable, the distance between the rearward end and the forward terminal portion of the secondary cable being maintained in tension with a spacer means, the resultant alteration in tension for a given secondary branch cable providing a like tension alteration along the primary cable line to control the actuation of the stationary actuatable device.

2. The apparatus of claim 1 wherein the stationary actuatable device is a fire extinguisher adapted to deliver a fluidized fire extinguishing agent to a location adjacent to the stimulatable means through a conduit associated with the fire extinguisher; wherein an increase in tension along the primary cable line is required to actuate the fire extinguisher; and wherein the means to increase the tension along each secondary branch cable comprises an energized spring maintained in its energized state with a thermally-sensitive link, said spring normally tending to pull both the secondary branch cable and the associated primary cable whereby a heat stimulus sufficient to fuse the link will cause a pull to be exerted along the primary cable to actuate the fire extinguisher device.

3. The apparatus of claim 1 wherein the stationary actuatable device is a fire extinguisher adapted to deliver a fluidized fire extinguishing agent to a location adjacent to the stimulatable means through a conduit associated with the fire extinguisher; wherein a decrease in tension along the primary cable line is required to actuate the fire extinguisher; and wherein the means to decrease the tension along each secondary branch cable comprises a thermally-sensitive link maintaining the secondary branch cable under tension whereby a heat stimulus sufficient to fuse the link will cause a release in tension along the secondary branch cable and along the primary cable so as to actuate the fire extinguisher.

4. The apparatus of claim 3 wherein the stimulatable means is located a finite distance from the lower mouth of a chimney duct, said stimulatable means comprising a thermally-sensitive fusible link; wherein the primary cable passes across the lower mouth of the chimney duct; and wherein an adapter assembly extends upwardly into said chimney duct, said adapter assembly comprising:

(A) An inverted T-shaped hollow junction box attached to the chimney duct, the junction box having transverse arms positioned across the lower mouth of the chimney duct, a pair of aligned parallel revolvable wheels positioned within respective transverse arms of the junction box, the primary cable line slidably passing internally through the junction box along the transverse arms thereof against the aligned parallel wheels, and

(B) Spacer means including a vertically upright component and a bracket member, the lower end of the upright component being attached to the vertical stem of the junction box, said upright component extending a finite distance upwardly into the chimney duct, a secondary cable branch being disposed along the upright component, the forward terminal portion of the secondary cable branch including a pulley member, said pulley member being revolvably engaged with the primary cable between the revolvable parallel wheels of the junction box, said primary cable between the revolvable parallel wheels of the junction box being offset a given distance toward the upright component, the bracket member being attached to the upper end of the upright member, said bracket member supporting one end of the stimulatable fusible link, the fusible link being attached to the rearward end of the secondary branch cable, whereby a heat stimulus sufficient to melt the fusible link will release the tension along the secondary branch cable causing it to travel downwardly toward the primary cable to the degree of the primary cable offset, the tension decrease being transmitted to the primary cable line to actuate the fire extinguisher device.

5. The apparatus of claim 4 wherein the bracket comprises two members, the first member being pivotably attached to the upright component of the spacer means; and the second member being threadedly engaged to said first member to permit modification of the fusible link position with respect to the upright component; and wherein there is an adjustable strut member adapted to transversely span the chimney duct so as to vertically support the adapter assembly.

6. The apparatus of claim 2 wherein the stimulatable means is located a finite distance from the lower mouth of a chimney duct, said stimulatable means comprising a thermally-sensitive fusible link; wherein the primary cable passes across the lower mouth of the chimney duct; and wherein an adapter assembly extends upwardly into said chimney duct, said adapter assembly comprising:

(A) An inverted T-shaped hollow junction box attached to the chimney duct, the junction box having transverse arms positioned across the lower mouth of the chimney duct, a pair of aligned parallel revolvable wheels positioned within respective transverse arms of the junction box, the primary cable line slidably passing internally through the junction box along the transverse arms thereof against the aligned parallel wheels, and

(B) Spacer means including a vertically upright component and a bracket member, the lower end of the upright component being attached to the vertical stem of the junction box, said upright component extending a finite distance upwardly into the chimney duct, a secondary cable branch being disposed along the upright component, the forward terminal portion of the secondary cable branch being operably associated with the primary cable line between the revolvable parallel wheels of the junction box, the bracket member being attached to the upper end of the upright member, said bracket member supporting one end of a helical spring, said helical spring being maintained in elongated tension by a fusible link which is attached to a tubular housing for the spring, the second end of said elongated spring being attached to the rearward end of the secondary branch cable to cause a constant degree of tension along the secondary cable line through the primary cable line to the fire extinguisher device, the degree of tension on all secondary branch cables being substantially equal, whereby a heat stimulus sufficient to melt the link will allow the elongated spring to shorten causing a marked increase in tension along the secondary branch cable and along the associated primary cable line to actuate the fire extinguisher.

7. The apparatus of claim 6 wherein the bracket comprises two members, the first member being pivotably attached to the upright component of the spacer means; and the second member being threadedly engaged to said first member to permit modification of the fusible link position with respect to the upright component, and wherein there is an adjustable strut member adapted to transversely span the chimney duct so as to vertically support the adapter assembly.

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