March 15, 1966 T. J. RYS ETAL 3,240,888

ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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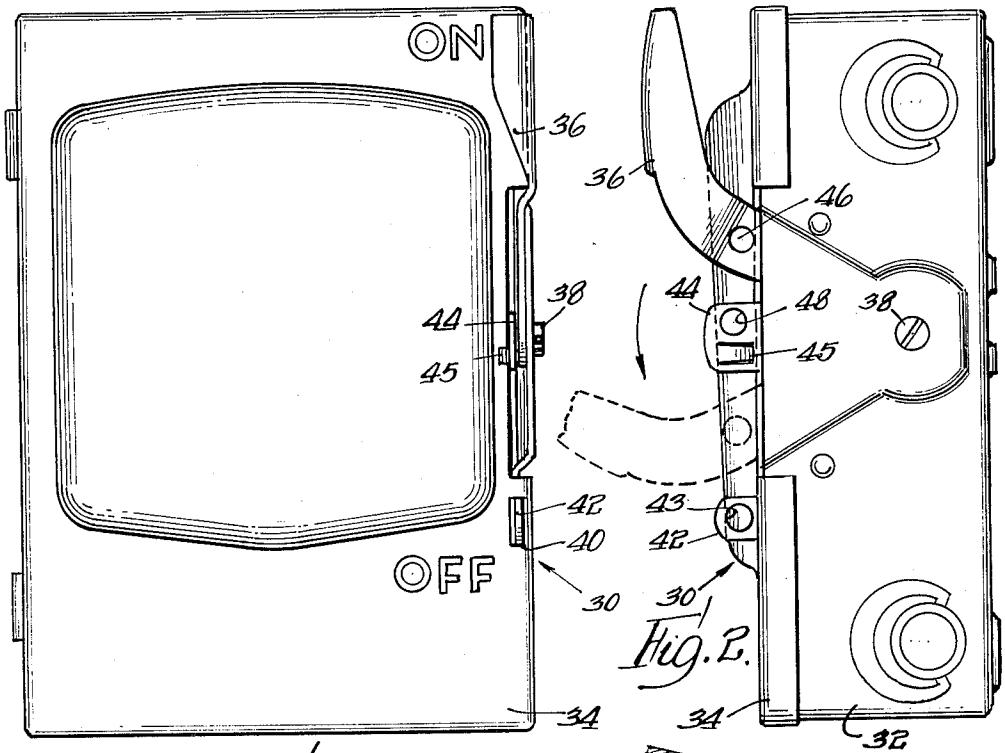


Fig. 1.

Fig. 2.

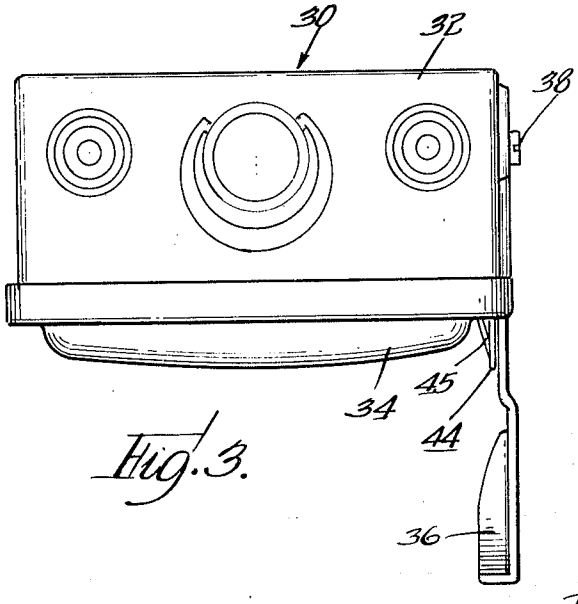


Fig. 3.

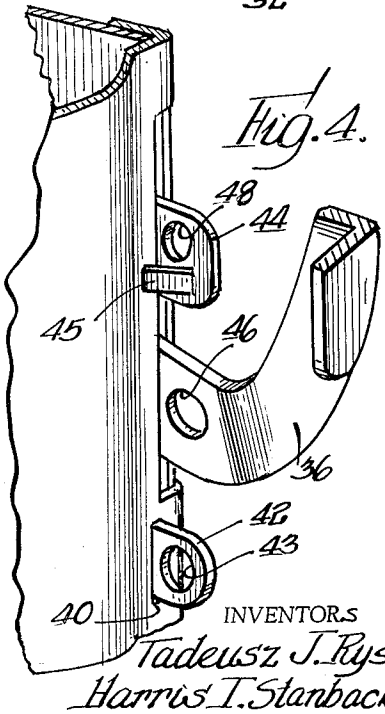


Fig. 4.

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ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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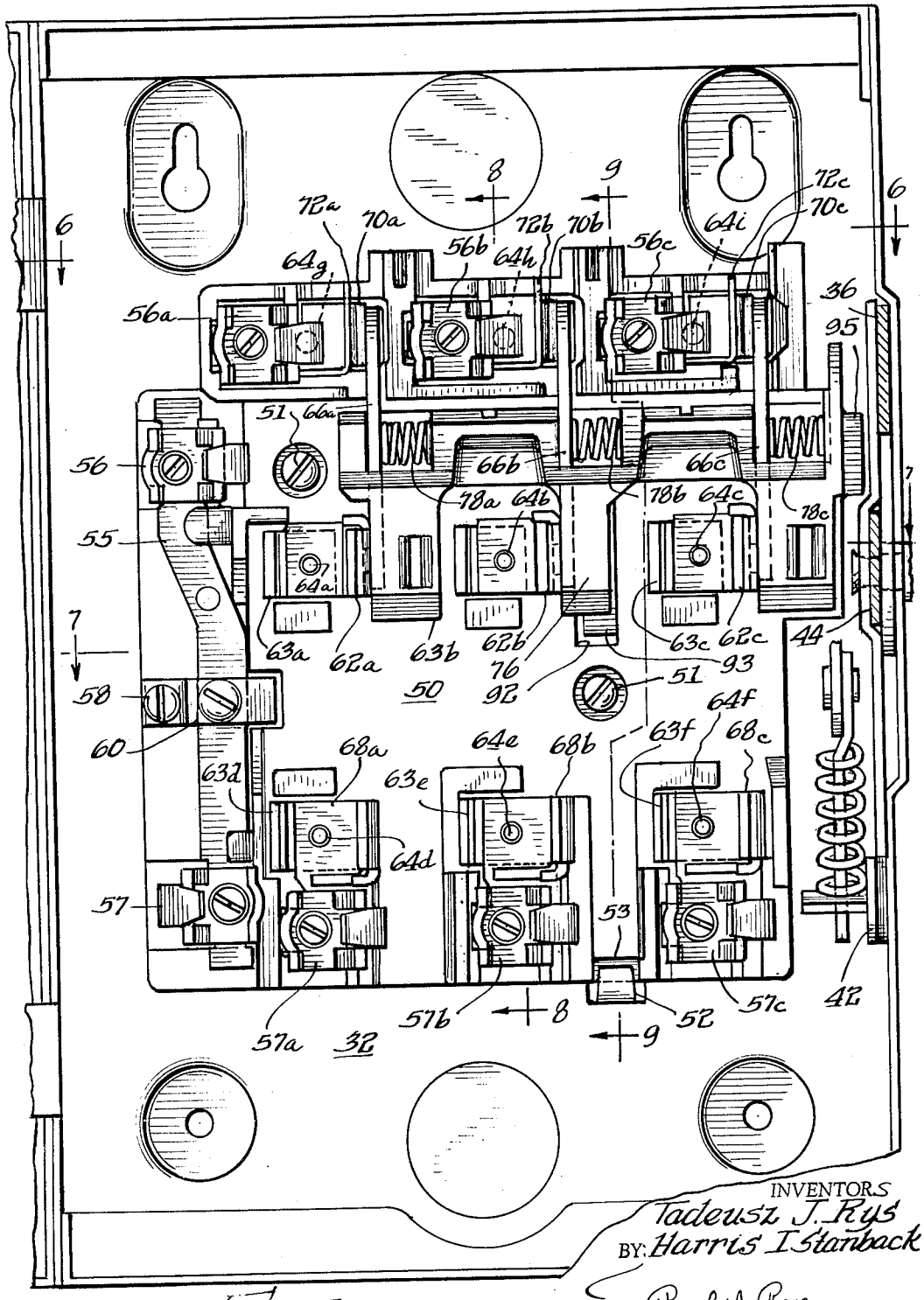


FIG. 5.

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ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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Fig. 6.

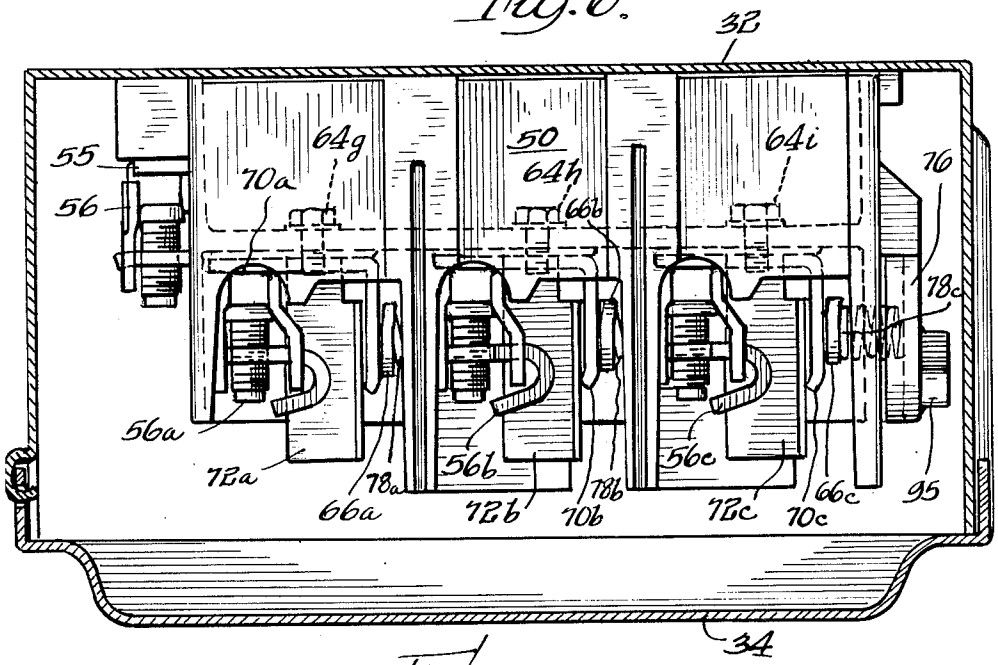


Fig. 7.

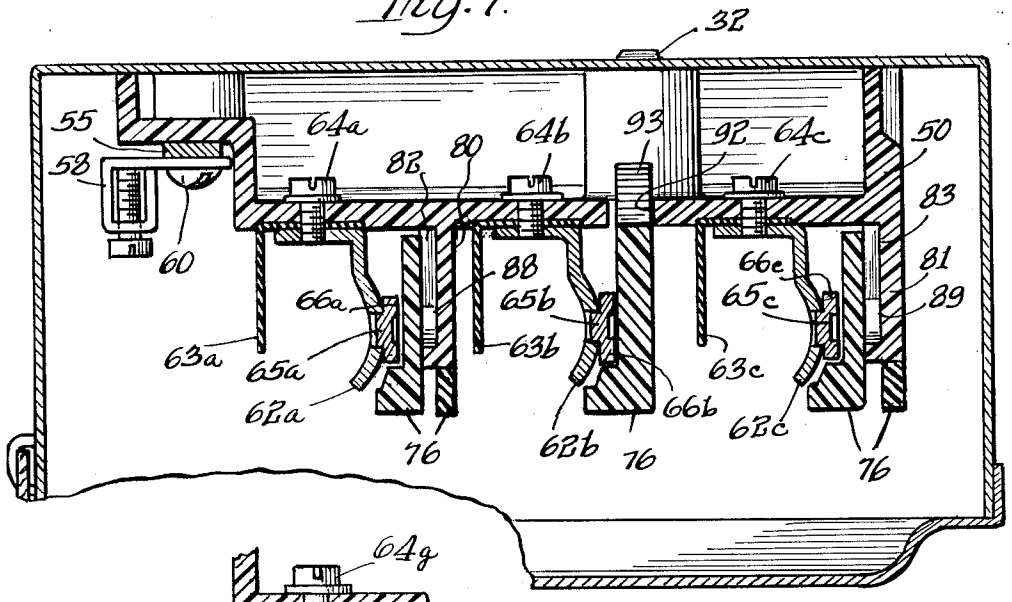
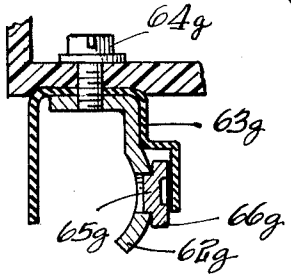


Fig. 7a.



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ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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Fig. 8.

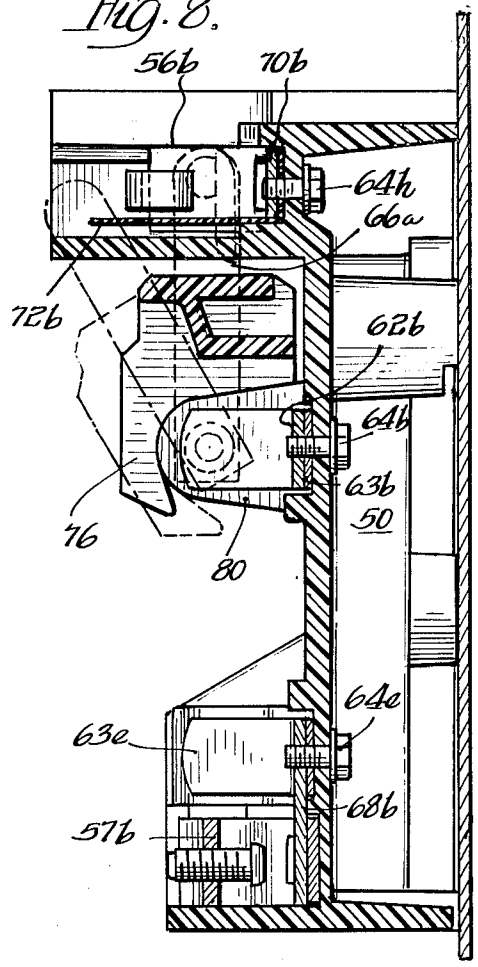
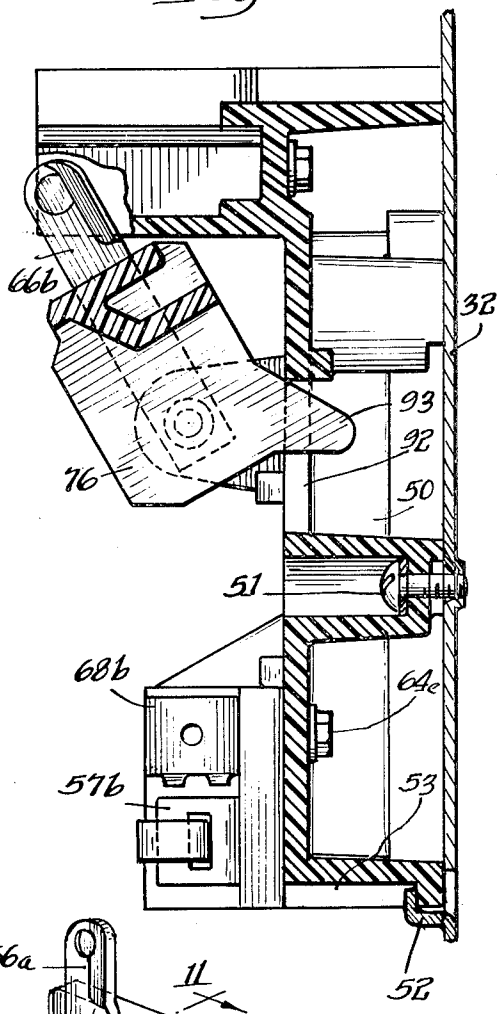


Fig. 9.



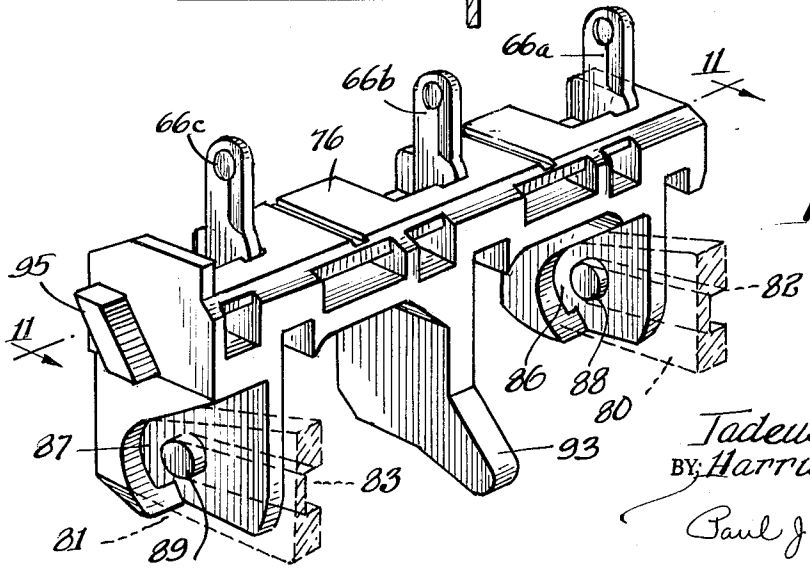


Fig. 10.

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Fig. 11.

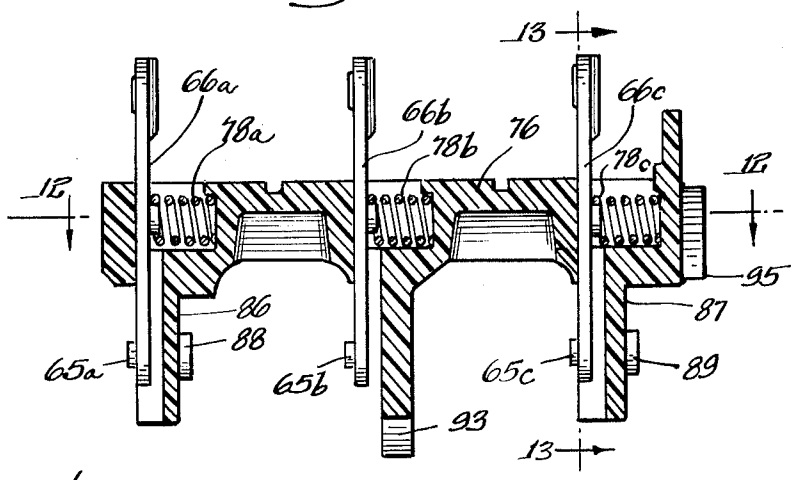


Fig. 12.

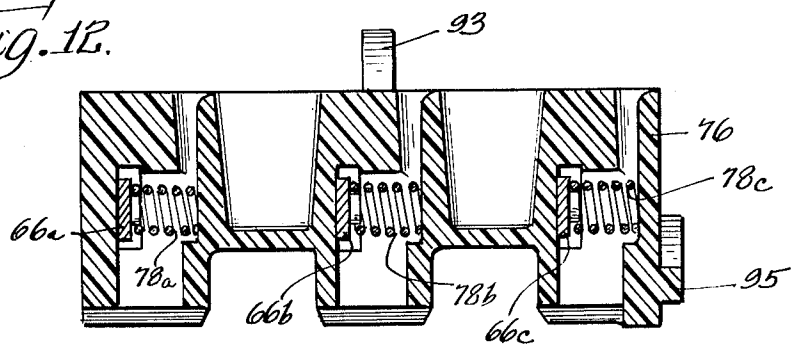


Fig. 13.

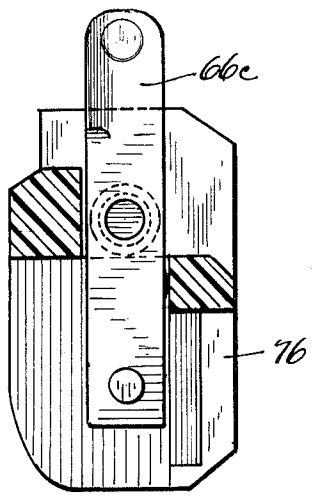
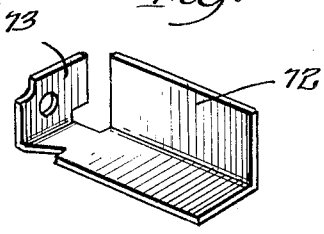


Fig. 14.



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ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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Fig. 16

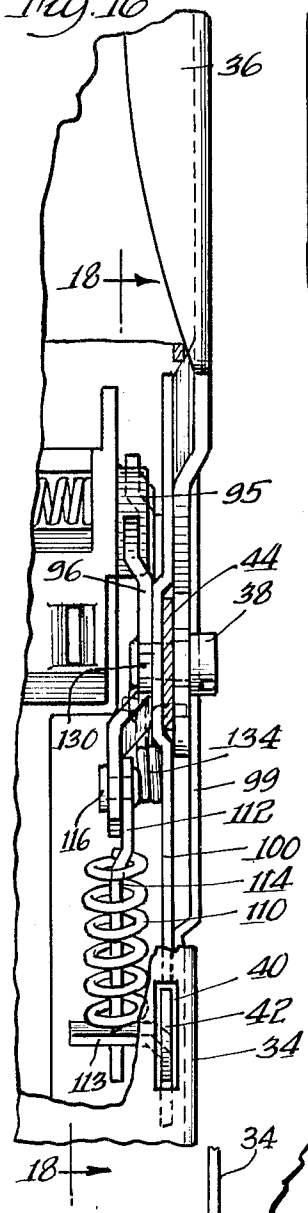
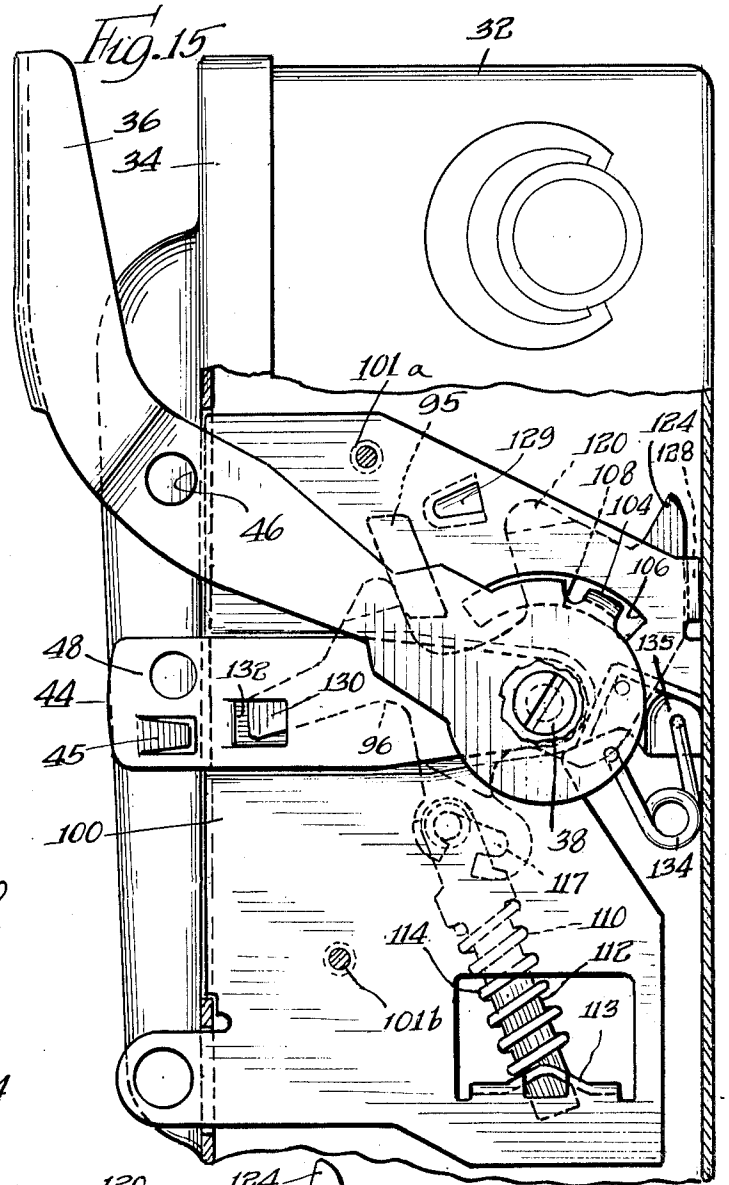


Fig. 15



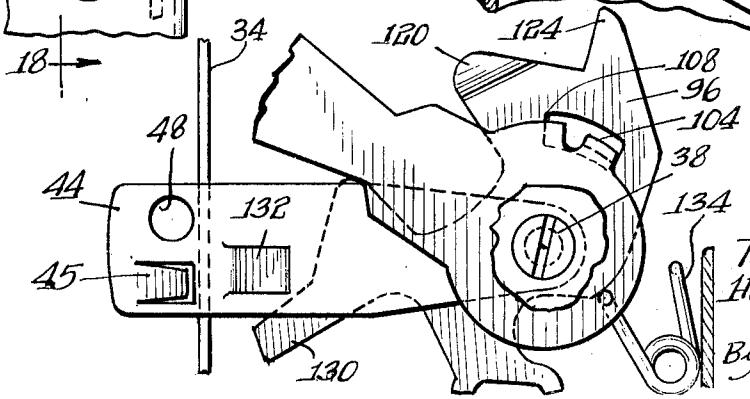


Fig. 17.

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ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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Fig. 18.

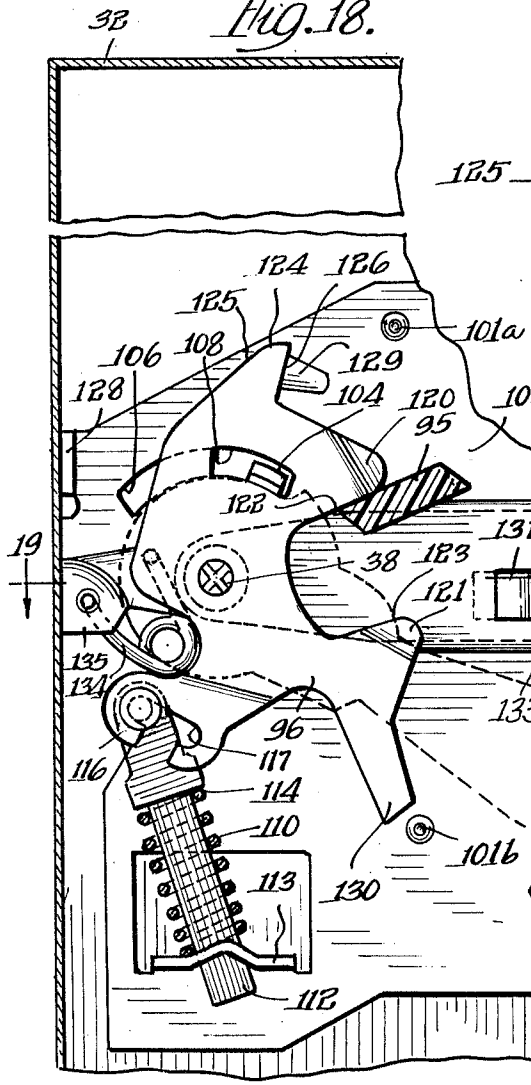


Fig. 20.

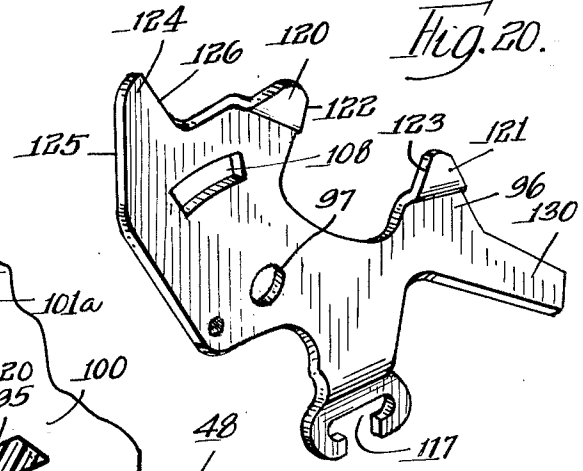


Fig. 21.

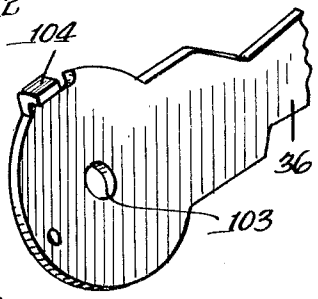
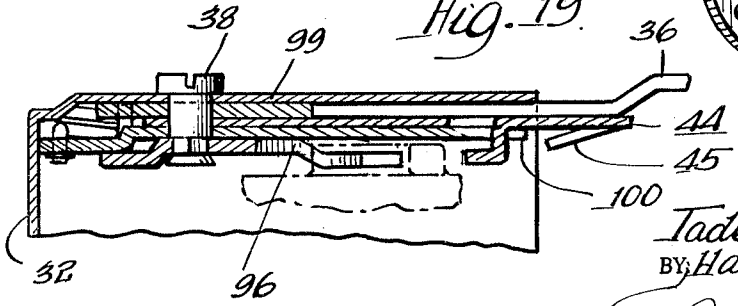


Fig. 19.



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ELECTRICAL SWITCH WITH INTERLOCKING MECHANISM

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Filed Dec. 5, 1962, Ser. No. 242,423
7 Claims. (Cl. 200—50)

This invention relates generally to electrical switches, and more particularly to enclosed or safety switches.

An object of the invention is to provide an improved safety switch.

Another object is to provide an improved safety switch of the single throw, single make and break type.

A further object is to provide an improved multipole safety switch.

Yet another object is to provide an improved multipole safety switch in which a pivotally mounted blade carrier carries a plurality of pivotally mounted blades respectively adapted to engage a plurality of stationary contacts and also carries a corresponding plurality of biasing springs, each biasing spring being operatively associated with one of the blades intermediately of the ends of the blade to retain one end portion of the blade in its pivotal mounting and to establish pressure between the other end portion of the blade and its respective stationary contact when the blade and contact are engaged, and the biasing springs also being operatively associated with the blade carrier to aid in retaining the blade carrier in its pivotal mounting.

Still another object is to provide an improved multipole safety switch of the fusible type.

A still further object is to provide an improved multipole fusible safety switch including a base, a plurality of pairs of axially aligned fuse holders mounted on the base, a plurality of stationary contact members mounted on the base and respectively spaced generally axially from the pairs of fuse holders, a blade carrier pivotally mounted on the base, a plurality of switch blades carried by the blade carrier and having first end portions respectively engageable with the stationary contact members and second end portions respectively pivotally mounted on the fuse holders of each pair closer to the stationary contact members, and a plurality of biasing springs carried by the blade carrier and respectively operatively associated with the switch blades between the end portions thereof to establish pressure between the first end portions thereof and the stationary contact members when the first end portions of the switch blades are in engagement with the stationary contact members and to retain the second end portions of the switch blades in pivotal engagement with the fuse holders of each pair closer to the stationary contact members, the biasing springs also being operatively associated with the blade carrier to aid in retaining the blade carrier in pivotal engagement with the base.

Another object is to provide an improved multipole fusible safety switch in which a minimum number of electrical joints is provided between the fuse holder of each fusible pole and the corresponding electrical connector for a power supply line.

Still another object is to provide a safety switch having an improved arrangement for a spring latch which forms a part of an interlock means for the cover and the switch operating handle.

A still further object is to provide a safety switch having an improved quick-make, quick-break operating mechanism including an operating cam operatively associated with a pivotally mounted movable contact blade carrier and forming a part of a defeatable interlock means for an

operating handle and cover which normally prevents opening of the cover when the switch is in "on" position.

Yet another object is to provide a multipole safety switch having an operating handle pivotally mounted on a pin forming a part of a defeatable interlock means for an operating handle and cover, the pin having an operating cam fixed on an inner end thereof and operatively associated with a pivotally mounted contact blade carrier and cooperable with a spring latch for the cover to normally prevent opening thereof when the switch is in "on" position.

Other objects and advantages will appear when the following specification is considered along with the accompanying drawings in which:

FIGURE 1 is a front elevational view of a fusible safety switch constructed in accordance with the invention;

FIGURE 2 is a side elevational view of the switch of FIGURE 1;

FIGURE 3 is a top view of the switch of FIGURE 1;

FIGURE 4 is a fragmentary perspective view of the switch of FIGURE 1 showing particularly the latch for the front cover;

FIGURE 5 is a front elevational view of the switch of FIGURE 1 with the cover and certain other portions removed, and certain other parts broken away or in section, the switch blades being shown in "on" position;

FIGURE 6 is a view taken substantially along section line **6—6** of FIGURE 5;

FIGURE 7 is a view taken substantially along section line **7—7** of FIGURE 5;

FIGURE 7*a* is a fragmentary sectional view showing a modified form of the fuse clips of FIGURE 7;

FIGURE 8 is a view taken substantially along section line **8—8** of FIGURE 5;

FIGURE 9 is a view taken substantially along section line **9—9** of FIGURE 5 but showing the switch blades in "off" position;

FIGURE 10 is a perspective view of the blade carrier of the switch of FIGURE 1;

FIGURE 11 is a sectional view taken substantially along the line **11—11** of FIGURE 10;

FIGURE 12 is a sectional view of the blade carrier of FIGURE **10** taken substantially as indicated by line **12—12** of FIGURE 11;

FIGURE 13 is a sectional view of the blade carrier of FIGURE 10 taken substantially as indicated by line **13—13** of FIGURE 11;

FIGURE 14 is a perspective view of one of the arc shields of the switch of FIGURE 1;

FIGURE 15 is a fragmentary view similar to FIGURE 2 but with portions of the box and cover broken away, the operating mechanism of the switch being shown in "on" position;

FIGURE 16 is a fragmentary front elevational view of the operating mechanism of the switch, portions of the cover and the latch therefor being broken away;

FIGURE 17 is a view of portions of the operating mechanism shown in FIGURE 15, but illustrating a different position thereof for defeating the switch and cover interlock means;

FIGURE 18 is a view taken substantially along section line **18—18** of FIGURE 16, but showing the operating mechanism of the switch in "off" position;

FIGURE 19 is a view taken substantially along section line **19—19** of FIGURE 18;

FIGURE 20 is a perspective view of the operating cam of the switch operating mechanism; and

FIGURE 21 is a fragmentary perspective view of a portion of the handle of the switch operating mechanism.

With reference to the drawings, and particularly to

FIGURES 1–4, a fusible safety switch **30** constructed in accordance with the invention includes an open-front metal box **32** closable by a cover **34** hinged to the left-hand side thereof as viewed in FIGURE 1. An operating handle **36** for the switch is mounted for pivotal movement between "on" and "off" positions on a pin **38** which has a slotted head, and, as hereinafter described, forms part of a defeatable interlock means for the switch operating handle **36** and the cover **34**. For compactness and to permit mounting of a plurality of switches **30** in closely spaced side-by-side relationship, the operating handle **36** is formed and arranged to be generally within the broad outline of the box **32** and cover **34**. The cover **34** is provided with flange portions which overlap the front edges of the box **32**, but is cut away adjacent the handle **36** and is provided with an aperture **40** for the reception of an ear **42**, to be hereinafter more fully described, having a hole **43** therein for the reception of a padlock hasp to lock the cover **34** closed. A latch member **44**, also to be more fully described hereinafter, is provided for latching cover **34** closed when a padlock is not used in the ear **42**. The latch member **44** has a tongue **45** engageable with the outside of the cover **34** to retain it in closed position. The tongue **45** normally prevents opening and closing of the cover **34** when the handle **36** is in "on" position; but when the handle **36** is in "off" position, and also when the defeatable interlock means is operated by the turning of the pin **38** with a screwdriver when the handle **36** is in "on" position, the outer end of the latch member **44** may be resiliently deformed as more fully described hereinafter to release the cover **34** from the tongue **45**.

A hole **46** is provided in a handle **36** and a hole **48** is provided in the latch member **44**, a padlock hasp inserted in either of the holes **46** and **48** serving to prevent operation of the handle **36** from one extreme position to the other and thus effectively locking the switch blades, to be later described, in open or closed position.

In FIGURES 5–9, a molded insulating base **50** is shown secured to the back of the box **32** in any suitable manner. The fastening means shown includes a pair of screws **51** (FIGURES 5 and 9) threaded into the back of the box and a hook **52** formed on the back of the box and adapted to be received in a recess **53** to retain the base. The base **50** serves as a mounting for a four-pole solid-neutral switch including three fusible poles having cooperable contacts and one solid-neutral pole. The solid-neutral pole includes a solid-neutral strap **55**, an electrical connector **56** for the neutral wire of a four-wire, three-phase source of electrical power, an electrical connector **57** for the neutral wire of a four-wire three-phase load, and an electrical connector **58** for the connection to ground. A single screw **60** secures the strap **55** and the connector **58** to the base, and the connectors **56** and **57** are held in suitable recesses in the base by opposite ends of the strap **55**. For three-wire ungrounded systems, the solid-neutral strap **55** and its associated connectors may be eliminated.

Each of the three fusible poles includes an upper and a lower composite fuse holder, the upper one having a switch blade pivotally mounted thereon and the lower one having a load terminal associated therewith. Further, each composite fuse holder includes a relatively rigid conductive portion and a resilient clamping portion. Thus, as shown best in FIGURE 7, upper fuse holders including relatively rigid conductive portions **62***a*, **62***b*, and **62***c* and resilient clamping portions **63***a*, **63***b*, and **63***c* are secured to the base **50** by means of screws **64***a*, **64***b*, and **64***c* which are threaded into the relatively rigid portions **62***a*, **62***b*, and **62***c*, respectively. The resilient clamping portions and the relatively rigid portions are substantially L-shaped, but the relatively rigid portions are curved to form pockets for ferrules of cartridge fuses and are additionally provided with holes forming pivotal bearing surfaces for switch blades **66***a*, **66***b*, and **66***c*, respectively, which have protuberances **65***a*, **65***b*, and **65***c* projecting into the bearing holes.

In FIGURE 7*a*, a modified form of the resilient clamping portion of a composite fuse holder is shown. Thus, if desired, the L-shaped resilient clamping portions **63***a*, **63***b*, and **63***c* may be replaced by resilient clamping portions such as a generally U-shaped clamping portion **63***g*, which is similar to the L-shaped clamping portions **63***a*, **63***b*, and **63***c*, but has an additional leg extending over a switch blade **66***g* to aid in retaining a protuberance **65***g* thereof in a bearing hole in a relatively rigid conductive portion **62***g* of a composite fuse holder.

As shown in FIGURES 5, 8, and 9, the lower fuse holders including resilient clamping portions **63***d*, **63***e*, and **63***f* and relatively rigid conductive portions **68***a*, **68***b*, and **68***c* are secured to the base **50** by means of screws **64***d*, **64***e*, and **64***f* which are threaded into the relatively rigid portions **68***a*, **68***b*, and **68***c*, respectively. The relatively rigid portions **68***a*, **68***b*, and **68***c* of the lower fuse holders differ from the relatively rigid portions **62***a*, **62***b*, and **62***c* of the upper fuse holders in that they do not have switch blades associated therewith, and they are provided with extensions parallel to the base **50** for securing electrical connectors **57***a*, **57***b*, and **57***c* respectively thereto, as best shown in FIGURE 8. The electrical connectors **57***a*, **57***b*, and **57***c* respectively form the load terminals of the three fusible poles.

Electrical connectors **56***a*, **56***b*, and **56***c* forming the line terminals of the three fusible poles are secured to the base **50** by extensions of generally L-shaped stationary contact members **70***a*, **70***b*, and **70***c*, respectively, which in turn are secured to the base **50** by means of screws **64***g*, **64***h*, and **64***i*. The line terminals or electrical connectors **56**, **56***a*, **56***b*, and **56***c* and the load terminals or connectors **57**, **57***a*, **57***b*, and **57***c* are preferably of the type shown and described in copending application, Serial No. 106,106, filed on April 27, 1961, now Patent No. 3,133,781, issued May 19, 1964, and assigned to the assignee of the present invention. The contact areas of the upstanding leg portions of the generally L-shaped stationary contact members **70***a*, **70***b*, and **70***c* engageable by the switch blades **66***a*, **66***b*, and **66***c* are shielded from the line terminals **56***a*, **56***b*, and **56***c* by insulating members **72***a*, **72***b*, and **72***c* respectively, which are identical to insulating member **72** shown in FIGURE 14, a small apertured portion **73** of each insulating member being secured between the base **50** and a leg portion of a stationary contact member **70** extending parallel to the base **50**.

The switch blades **66***a*, **66***b*, and **66***c*, while being pivotally mounted on the relatively rigid portions **62***a*, **62***b*, and **62***c*, respectively, of the upper fuse holders, are also mounted in a molded insulating blade actuator or carrier **76** forming an important part of this invention. The blade carrier **76** is formed with appropriate slots for respectively receiving the switch blades, as can best be seen in FIGURES 11–13, and also with appropriate pockets for respectively receiving compression springs **78***a*, **78***b*, and **78***c*, the spring pockets intercepting the blade slots so that one end of each spring is seated on a blade. The blade carrier **76** is pivotally mounted on the base **50**, and more specifically on a pair of upstanding post portions **80** and **81** having recesses or slots **82** and **83** in respective corresponding sides thereof. The carrier is provided with recesses **86** and **87** for laterally receiving post portions **80** and **81**, respectively, and with cylindrical projections **88** and **89** which are adapted to be laterally received in the recesses or slots **82** and **83**, respectively. The arrangement may be visualized best from FIGURE 10 in which the post portions **80** and **81** are shown in phantom. In assembling, the carrier without switch blades is placed on the post portions but offset from its final assembled position thereon so that the projections **88** and **89** will clear the post portions.

Thereafter, the carrier is shifted laterally of the post portions to place the projections **88** and **89**, respectively, in the slots **82** and **83**, and engagement of the projections with the closed ends of the slots then prevents removal of the carrier directly axially of the post portions. The switch blades **66***a*, **66***b*, and **66***c* are then inserted in the blade carrier and projecting portions **65***a*, **65***b*, and **65***c* inserted in the bearing holes of the rigid portions **62***a*, **62***b*, and **62***c* of the upper fuse clips, the switch blades and associated springs **78***a*, **78***b*, and **78***c* then preventing shifting of the carrier back laterally of the post portions and thus maintaining the projections **88** and **89** in the slots **82** and **83**.

The base **50** is provided with a slot **92** (FIGURE 9) through which a projection **93** on the blade carrier **76** extends to limit pivotal movement of the carrier in a switch opening direction by engagement with the base **50** at the end of the slot, as shown in FIGURE 9.

A lug **95** is provided on one end of the blade carrier **76** for cooperation with an operating cam **96** shown in FIGURES 15–20, the cam being best shown in FIGURE 20 and the cooperative relationship between the lug **95** and the cam being illustrated in FIGURES 15, 16, and 18. The cam **96** is provided with a hole **97** (FIGURE 20) for receiving the inner end of the pin **38** on which it is fixedly mounted for rotation therewith as a unit. The pin **38** is supported by bearing holes formed in an outwardly offset portion **99** of the right-hand side of the box **32** and in a formed plate **100** which overlaps the offset portion **99** and is riveted to the inside of the right-hand side of the box by a pair of rivets **101***a* and **101***b*. The ear **42** previously described is an integral part of the plate **100**.

The handle **36** is pivotally mounted on the pin **38** between offset portion **99** of the box and plate **100**, a hole **103** (FIGURE 21) being provided for this purpose, and an inwardly projecting lug **104** is provided radially of the hole **103** on the flat inner end of the handle, the plate **100** having an arcuate slot **106** through which the lug **104** projects into a slot **108** in the cam **96**.

A quick-make and quick-break action between the switch blades **66***a*, **66***b*, and **66***c* and the stationary contact members **70***a*, **70***b*, and **70***c*, respectively, is provided by an over-center compression spring **110** operatively connected to the cam **96**. The spring **110** is retained on an actuator **112** which extends therethrough and is reciprocally mounted in a bracket **113** formed integrally with the plate **100**, the spring being compressed between the bracket **113** and a shouldered portion **114** on the actuator. The actuator **112** includes a pin **116** having an enlarged head portion, the pin **116** being received in a generally T-shaped slot **117** formed in the cam **96**.

The cam **96** is provided with a pair of inwardly offset blade carrier actuating portions **120** and **121** having respective cam surfaces **122** and **123** alternatively engageable with the lug **95** on opposite sides thereof. The pivotal movement of the cam **96** in opposite directions is limited by a stop engaging projection **124** thereon having a surface **125** engageable with a flange **128** on the formed plate **100** and a surface **126** engageable with a stop **129** formed on the plate **100**. A locking tongue **130** on the cam **96** is cooperable with a tongue **132** formed on the latch member **44**, as best shown in FIGURE 15. The latch member **44** is pivotally mounted on the pin **38** but is prevented from rotating by engagement of the tongue **132** in a notch **133** (FIGURE 18) provided in the plate **100**.

When the switch is in "on" position, the locking tongue **130** is normally aligned with the tongue **132** and substantially prevents bending of the outer end of the latch member **44**, and the tongue **45** on the latch member interferes with opening and closing of the cover **34**. Further, this interlock may not be defeated by merely moving the handle **36** part way toward "off" position of the switch without disengaging the blades **66***a*, **66***b*, and **66***c* from the stationary contact members **70***a*, **70***b*, and **70***c*, for when the handle **36** is moved far enough for the lug **104** thereon to rotate the locking tongue **130** out of alignment with the tongue **132**, the handle **36** itself then prevents bending of the outer end of the latch member **44** and maintains the tongue **45** in interfering relationship with the cover **34**. However, the interlock can be defeated by turning the pin **38** sufficiently to rotate the locking tongue **130** out of alignment with the tongue **132**, as shown in FIGURE 17, thus allowing the outer end portion of the latch member **44** to be bent sufficiently to move the tongue **45** out of interfering relationship with the cover **34** so that the cover can be opened by authorized persons while the switch is in "on" position. It is unlikely that unauthorized persons will know that the pin **38** may be turned to defeat the interlock.

A torsion spring **134** is provided to bias the handle **36** toward its extreme positions. One end of the spring **134** is anchored in a bracket portion **135** of the formed plate **100** and the other end is connected to the handle **36**. The spring is pre-stressed so that it tends to unwind. Thus, in FIGURE 15, the spring tends to rotate the handle **36** clockwise toward "off" position, and in FIGURE 18, where it is viewed from the opposite side, the spring tends to rotate the handle **36** clockwise toward "on" position.

The slot **108** in the cam **96** has a longer arcuate length than the lug **104** on the handle **36** to provide a lost-motion connection enabling the over-center spring **110** to operate the cam **96** with a snap action without any restraint by the handle once the line of action of the spring has shifted across the pivotal axis of the cam. The snap movement of the cam is enhanced by the lost-motion connection between the pin **116** and the generally T-shaped slot **117**, a shifting of the pin across the head of the T having an impact effect on the cam as the line of action of the spring **110** is shifted across the pivotal axis of the cam. Further, the cam surfaces **122** and **123** are spaced farther apart than the width of the lug **95** on the blade carrier **76** to provide a lost-motion connection enabling the cam to enter its snap movement before sufficient opening movement of the blade carrier **76** occurs to cause disengagement of the switch blades **66***a*, **66***b*, and **66***c* from the stationary contact members **70***a*, **70***b*, and **70***c*.

The lost-motion connections between the handle **36** and cam **96** and between the cam **96** and blade carrier **76** also enable the cam **96** to be turned by the screw **38** to defeat the interlock between the cover **34** and handle **36**.

Various modifications may be made in the structure disclosed without departing from the spirit and scope of the invention.

We claim:

1. A safety switch comprising an open-front box having a rear wall and a pair of opposed first and second side walls, an openable cover pivotally mounted on said first side wall and normally closing the open front of said box, a stationary contact member mounted in said box, a blade actuator movably mounted in said box, a switch blade mounted in said box and movable by said blade actuator between an open position in which it is electrically disconnected from said stationary contact member and a closed position in which it is electrically connected to said stationary contact member, an operating handle pivotally mounted on said second side wall for movement between OFF and ON positions corresponding respectively to said open and closed positions of said switch blade, a releasable latch member mounted on said second side wall and disposed between said handle and said first side wall, said latch member projecting forwardly beyond a front surface of said cover when said cover is in closed position and having a latching portion

normally overlapping said front surface of said cover to latch said cover in closed position, the outer end portion of said latch member being movable in a direction away from said first side wall when said handle is in said OFF position and said switch blade is in said open position to move said latching portion out of latching relationship with said cover, an operating cam pivotally mounted on said second side wall, first lost motion connection means operatively connecting said handle and cam, second lost motion connection means operatively connecting said cam and blade actuator, a pair of spaced stop means in said box respectively engageable by said cam and respectively limiting pivotal movement thereof in opposite directions, an over-center cam-biasing spring, and means operatively connecting said cam-biasing spring and said cam, said cam-biasing spring selectively biasing said cam in opposite directions into engagement respectively with said stop means, said cam and latch member having portions which interlock and prevent movement of said outer end portion of said latch member in a direction away from said first side wall and movement of said latching portion out of latching relationship with said cover when said switch blade is in said closed position and said handle is in said ON position and said cam is biased into engagement with the corresponding one of said stop means by said cam-biasing spring, and said cam being pivotable against the force of said spring out of interlocking relationship with said latch member to a predetermined position between said stop means without shifting the line of action of said cam-biasing spring over the pivotal axis of said cam, thereby to permit said outer end portion of said latch member to be moved in a direction away from said first side wall and said latching portion to be moved out of latching relationship with said cover and said cover to be opened while said switch blade is in said closed position and said handle is in said ON position.

2. A safety switch as claimed in claim 1, wherein when said handle is in said ON position and said switch blade is in said closed position, said handle may be moved to a predetermined intermediate position to move said cam to said predetermined position thereof between said stop means and out of interlocking relationship with said latch member without shifting the line of action of said cam-biasing spring over the pivotal axis of said cam, said handle when in said intermediate position having a portion preventing movement of said outer end portion of said latch member in a direction away from said first side wall and movement of said latching portion out of latching relationship with said cover, whereby said latching portion may be moved out of latching relationship with said cover and said cover may be opened while said switch blade is in said closed position solely by prior pivotal movement of said cam to said predetermined position thereof independently of said handle.

3. A safety switch as claimed in claim 1, including an over-center handle-biasing spring and means operatively connecting said handle-biasing spring to said handle, said handle-biasing spring being movable with said handle to shift the line of action thereof over the pivotal axis of said handle as said handle is moved between said ON and OFF positions, whereby said handle-biasing spring selectively biases said handle in opposite directions.

4. A safety switch as claimed in claim 1, wherein said operating handle is positioned on the side of said second side wall closer to said first side wall.

5. A safety switch comprising an open-front box having a rear wall and a pair of opposed first and second side walls, an openable cover pivotally mounted on said first side wall and normally closing the open front of said box, a stationary contact member mounted in said box, a blade actuator pivotally mounted in said box, a switch blade pivotally mounted in said box and movable by said blade actuator between an open position in which it is electrically disconnected from said stationary contact member and a closed position in which it is electrically connected to said stationary contact member, a pin pivotably mounted in said second side wall, an operating handle pivotally mounted on said pin for movement between OFF and ON positions corresponding respectively to said open and closed positions of said switch blade, a releasable latch member mounted on said second side wall and disposed on the side of said handle closer to said first side wall, said latch member projecting forwardly beyond a front surface of said cover when said cover is in closed position and having a latching portion normally overlapping said front surface of said cover to latch said cover in closed position, the outer end portion of said latch member being movable in a direction away from said first side wall when said handle is in said OFF position and said switch blade is in said open position to move said latching portion out of latching relationship with said cover, an operating cam disposed on the side of said latch member closer to said first side wall and fixedly mounted on said pin for pivotal movement therewith, first lost motion connection means operatively connecting said handle and cam, second lost motion connection means operatively connecting said cam and blade actuator, a pair of spaced stop means respectively engageable by said cam and respectively limiting pivotal movement thereof in opposite direction, an over-center cam-biasing spring, and means operatively connecting said cam-biasing spring and said cam, said cam-biasing spring selectively biasing said cam in opposite directions into engagement respectively with said stop means, said cam and latch member having portions which interlock and prevent movement of said outer end portion of said latch member in a direction away from said first side wall and movement of said latching portion out of latching relationship with said cover when said switch blade is in said closed position and said handle is in said ON position and said cam is biased into engagement with the corresponding one of said stop means by said cam-biasing spring, and said pin being pivotable against the force of said cam-biasing spring to turn said cam out of interlocking relationship with said latch member to a predetermined position between said stop means without shifting the line of action of said cam-biasing spring over the pivotal axis of said cam and pin, thereby to permit said outer end portion of said latch member to be moved in a direction away from said first side wall and said latching portion to be moved out of latching relationship with said cover and said cover to be opened while said switch blade is in said closed position and said handle is in said ON position.

6. A safety switch as claimed in claim 5, wherein when said handle is in said ON position and said switch blade is in said closed position, said handle may be moved to a predetermined intermediate position to move said cam to said predetermined position thereof between said stop means and out of interlocking relationship with said latch member without shifting the line of action of said cam-biasing spring over the pivotal axis of said cam and pin, said handle when in said intermediate position having a portion preventing movement of said outer end portion of said latch member in a direction away from said first side wall and movement of said latching portion out of latching relationship with said cover, whereby said latching portion may be moved out of latching relationship with said cover and said cover may be opened while said switch blade is in said closed position solely by prior pivotal movement of said pin independently of said handle to move said cam to said predetermined position thereof.

7. A safety switch as claimed in claim 5, wherein said latch member is loosely mounted on said pin and prevented from turning with said pin.

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