Oct. 30, 1934. G. L. CARLISLE 1,979,097

LOCK SWITCH

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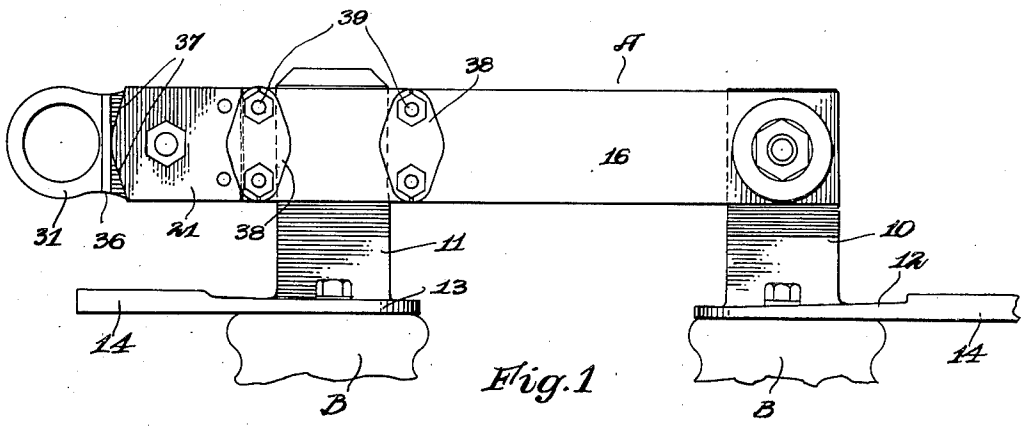


Fig. 1

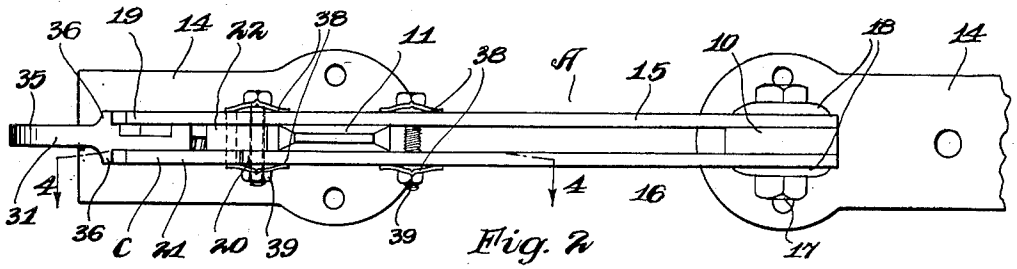


Fig. 2

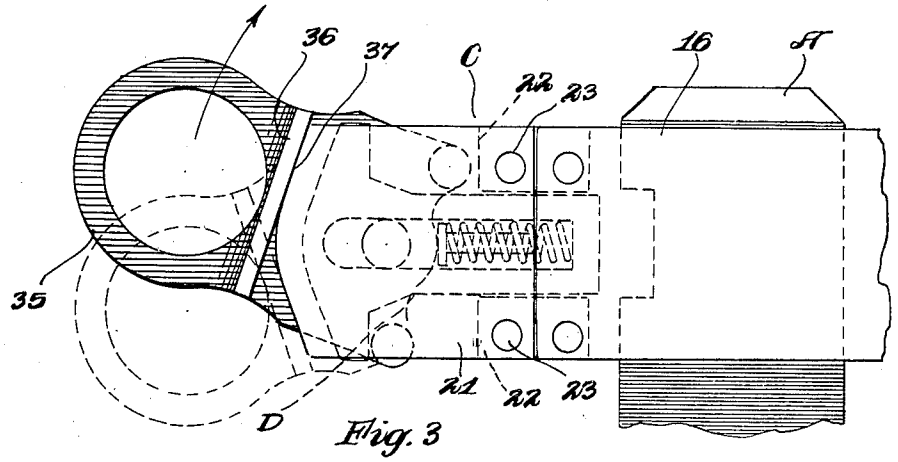


Fig. 3

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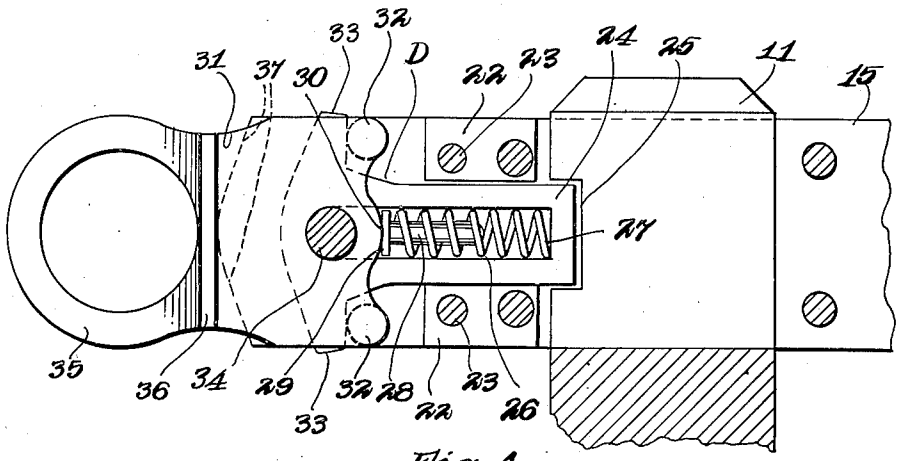


Fig. 4

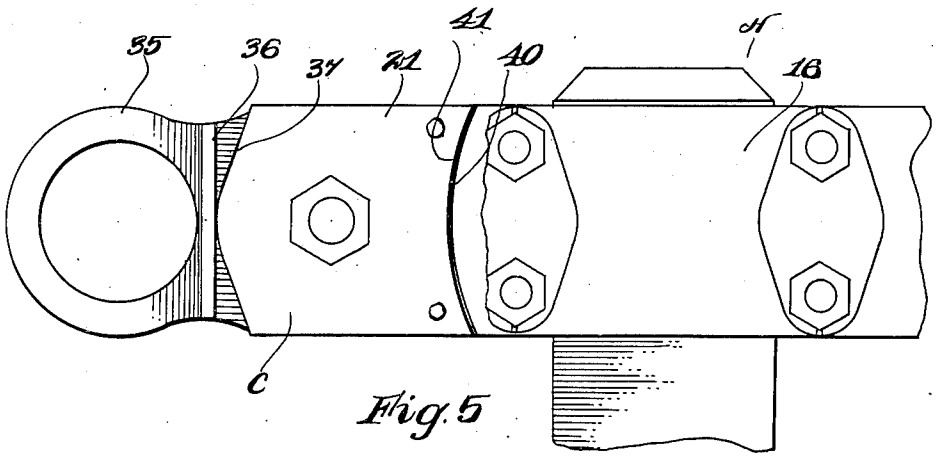


Fig. 5

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UNITED STATES PATENT OFFICE

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LOCK SWITCH

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Application May 31, 1930, Serial No. 458,434

9 Claims. (Cl. 200—169)

This invention is an electric lock switch for heavy duty disconnects where it is desirable to provide a suitable locking means for holding the switch locked in operative position and a releasing means which permits the switch to be easily operated for opening and closing of electrical circuits.

In switches designed for heavy duty to act as electrical disconnects it is desirable to provide a structure capable of giving good contact and to prevent injury to the releasing means when the switch is pulled open or forced into closed position. My invention accomplishes the result of providing a sturdy structure, capable of withstanding the wear and tear in the operation of switches of this nature and having particular means to protect the releasing means of the lock of the switch.

A further development of the present invention is to provide a switch structure wherein the locking mechanism is carried in a head portion secured to the end of one of the blades of the switch, while the other blade is adapted to co-operate and form the floating blade for easy engagement of the switch over the connecting terminal. The invention includes a formation and structure adapted to cause the floating blade to carry in line with the head which carries the locking and releasing means and to prevent lagging of the floating blade in the opening and closing of the same.

These features, together with other details and objects will be more clearly and fully set forth in the specification and claims.

In the drawings forming part of this specification:

Figure 1 is a side elevation of my switch.

Figure 2 is a plan view of the same.

Figure 3 is an enlarged detail portion of my switch showing the operation of the lock and releasing means.

Figure 4 is an enlarged sectional view on the line 4—4 of Figure 2.

Figure 5 illustrates another form of my switch.

In the drawings my heavy duty electric disconnect switch A is provided with the terminals 10 and 11 which extend upward from the base portions 12 and 13, respectively. The base portions 12 and 13 may be supported on suitable insulators B, only a portion of which is illustrated. The base portions 12 and 13 are formed with connecting ends 14 so as to connect the switch into the circuit desired.

The switch A is provided with blades 15 and 16 which are pivotally connected at 17 to the terminal 10 and are held by suitable spring washers 18 to cause the blades to frictionally contact with the terminal 10. The free end 19 of the blade 15 extends beyond the end 20 of the blade 16 and is adapted to support the locking and releasing head C for the switch A. The head C of my switch is rigidly supported to the free end 19 of the blade 15 and is provided with a side plate 21 which is rigidly attached to the spacing blocks 22 by the rivets 23 to rigidly secure the end 19 and the side plate 21 to the spacing blocks 22 and provide a casing in which the lock mechanism D is housed. The lock mechanism D of my switch A is provided with a locking tongue 24 which slides freely between the blocks 22 and the free end of which engages in the notch 25 formed in the terminal 11 of my switch. The locking tongue 24 is provided with a central longitudinal recess 26 in which a coil spring 27 is positioned and an operating pin 28 having a head 29. The pin 28 extends into the coils of the spring 27 and the head 29 is adapted to bear against the cam shoulder 30 of the releasing member 31. The member 31 is formed with pins 32 spaced on either side of the cam end 30 and which are adapted to engage with the shoulder ends 33 of the tongue 24. The shoulder ends 33 are of a flat nature and extend on either side of the tongue 24. The releasing members 31 together with the locking tongue 24 are pivotally connected by the supporting bolt 34 and when the parts are in operative position, as illustrated in Figure 4, when the releasing member 31 is moved up or down the tongue 24 is disengaged from locking position in the notch 24, as illustrated in Figure 3 in full and dotted lines. The operation of the releasing member 31 causes either of the pins 32 to engage against the shoulder ends 33 and pull the free end of the locking tongue 24 out of the notch 25 of the terminal member 11, thus releasing the switch blade so that the switch A may be disconnected from the terminal 11 or connected thereto.

The releasing member 31 is formed with a large engaging eye 35 on the outer end of the same and is provided with transverse shoulder members 36 which project on either side of the releasing member 31, as illustrated more clearly in Figure 2. The free end 19 of the blade 15 and the outer end of the plate 21 are formed with angularly disposed edges 37 which extend in line with each other and which are adapted to form stops against which the shoulder members 36 are adapted to engage in the rotation of the releasing member 31 in the disconnecting of the switch A when force is exerted to the operating eye 35, as illustrated in Figure 3. Thus when the switch

A is unlocked or forced into locking position, one of the pins 32 will engage with one of the shoulders 33 to pull the locking tongue 24 out of locking position, and any undue force instead of being carried by either of the pins 32 or the shoulder ends 33, is directed through the stops 36 to the shoulder edges 37 formed on the head C, and in this manner the releasing means of the lock D is protected against injury by any undue force being exerted in the locking or unlocking of the switch A.

Thus should the operator of the switch A jerk or extend undue force against the releasing member 31, the shoulders 36 will engage against the stop edges 37 so as to carry more than the necessary strain for operating the lock D, and thereby prevent injury to the lock parts and further providing a very effective and durable lock structure for the switch A.

In the operation of the switch A the blades 15 and 16 are held by suitable spring washer members 38 and bolts 39 to provide the resiliency for the blades in the engagement of the terminal 11, the blade 16 acting as the floating blade to compensate for the engagement with the terminal 11, while the blade 15 extends in a manner to support the operating head C. The sturdy structure of this form of lock provides an electrical disconnect switch adapted to heavy duty and one which cannot be easily put out of order even if abused in the locking and unlocking of the same. The blades operate to provide full contacts to the terminals and thus the switch is efficient in operation.

In Figure 5 I have illustrated another form of my lock A where the free end of the blade 16 is arcuated at 40 and adapted to fit into the arcuated edge 41 of the plate 21. This structure provides a means of causing the blade 16 to follow with the head C in the movement of the same and overcomes the lagging of the floating blade 16 in the operation of locking and unlocking of the switch A. This provides a simple and effective means of carrying the blade 16 in alinement with the blade 15 in the operation of the switch. In the operation of the switch A it is apparent that the locking mechanism D must be of a compact nature to be contained within the head C between the end 19 and the plate 21. The plate 21 extends virtually in line with the blade 16 and in making a lock with releasing means in a compact state and of this nature, some of the parts are small and without the protecting shoulders 36 which engage against the stop edges 37 the shoulder ends 33 might easily be broken off in the operation of the release 31. I have overcome this difficulty and provide a very desirable structure of heavy duty disconnect electrical switches.

In accordance with the patent statutes I have described the principles of operation of my electric disconnect switch with the locking mechanism and protective features therefor, and while I have endeavored to illustrate the best embodiment thereof I desire to have it understood that obvious variations and adaptations may be accomplished within the scope of the following claims without departing from the purpose and intent of the invention.

I claim:

1. In a locking switch, a pair of parallelly disposed switch blades, one of said blades being longer than the other, a locking head carried by said long blade, shoulders carried by said locking head each of which acts to limit the operating movement thereof in both the operation of opening and closing said switch.

2. An electric disconnect switch for heavy duty including, a pair of stationary switch terminals, a pair of blades pivotally connected to one of said terminals, lock releasing means rigidly carried in its entirety by one of said blades of said switch, means for holding the other of said blades in parallel floating relationship to said first blade, and means for limiting the movement of said releasing means to prevent straining thereof.

3. In combination, a pair of switch terminals, a pair of switch blades pivotally supported on one end to one of said terminals, one of said blades being shorter than the other, means for supporting said shorter blade floating in relation to the other of said blades and to resiliently engage the other of said terminals, locking means carried entirely by the longer of said blades and means for engaging the free end of said floating blade to prevent lagging of the same in opening and closing of said switch.

4. In combination, a pair of stationary switch terminals, a pair of switch blades pivoted upon one of said switch terminals, a switch locking head secured to one of said blades, and means for floatingly supporting the other of said blades to said one blade to hold said other blade in parallel alinement with said one blade.

5. An electric heavy duty disconnect switch including, a pair of stationary switch terminals, long and short switch blades pivotally connected to one of said terminals, means for floatingly supporting said short switch blade, and a locking head carried by said long switch blade.

6. In combination, a pair of stationary switch terminals, a pair of blades, means for holding said blades in a manner to engage said terminals under spring tension, a locking head carried by one of said blades, and a recess in said head into which the free end of the other of said blades is adapted to fit to cause said last blade to be operated in unison with the other blade against lagging in the opening or closing of said switch.

7. An electric disconnect switch including, a pair of stationary switch terminals, a long and short switch blade extending in parallel relation to each other, an operating end carried by said long switch blade, means for contacting said blades over said switch terminals resiliently, and means for holding said blades in alinement to prevent lagging in operation of opening and closing said switch.

8. An electric switch having a pair of stationary switch terminals, switch blades, an operating head carried by one of said blades, a notch formed in said head adapted to receive the end of the other of said blades, said other blade having an end shaped similarly to said notch to fit therein and to hold said other blade in alinement with said one blade in operation when opened and closed by said locking and release means.

9. A heavy duty electric switch including, switch blades, terminals for receiving said blades, said blades varying in length, locking means carried by the free end of the longer blade, and means for causing the shorter blade to follow in line with the longer blade in the opening and closing of said switch.

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