

[54] **EMERGENCY STOP SWITCH MEANS
FOR A MOBILIZED SLEDGE OR THE
LIKE**

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200/61.85

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[56] **References Cited**

UNITED STATES PATENTS

3,626,919 12/1971 MacMillan180/82

1,881,251 10/1932 Tobener180/82 UX
3,487,183 12/1969 Schulman123/198 DC

FOREIGN PATENTS OR APPLICATIONS

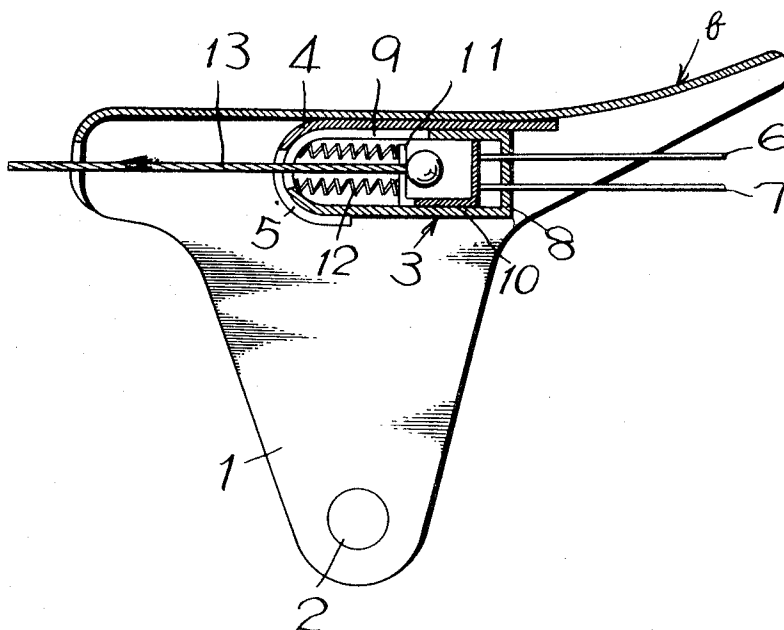
544,530 6/1922 France200/61.87

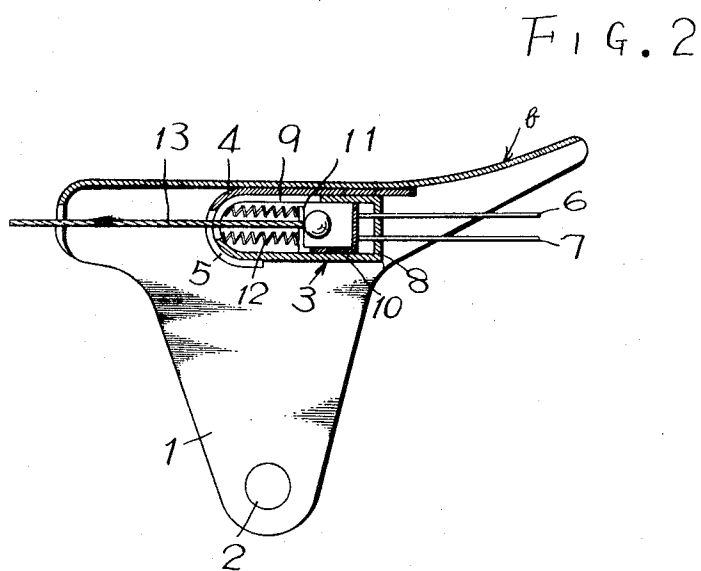
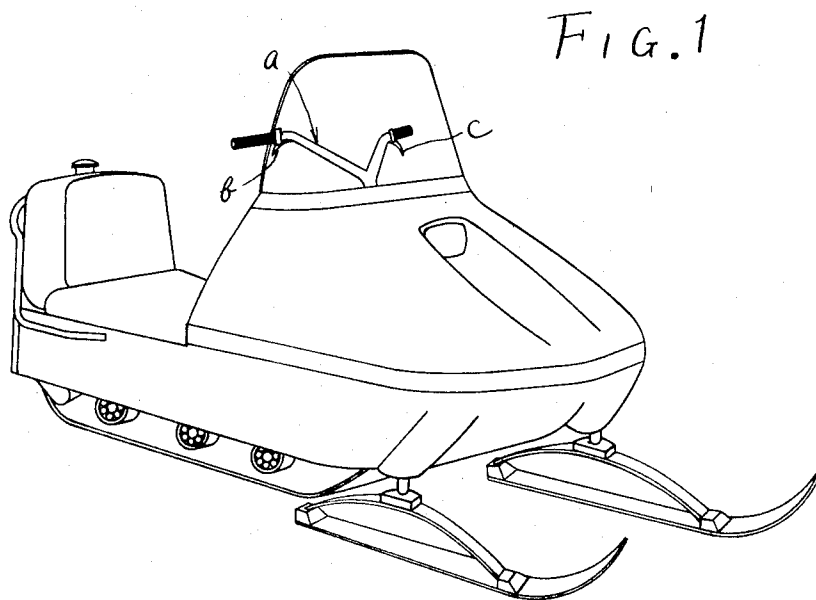
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[57] **ABSTRACT**

An emergency stop switch means to be used for a mobilized sledge or the like in which said means includes a throttle lever for operating a carburetter and mounted on a handle portion, said throttle lever being provided with a contact point wherein it is short-circuited to stop the rotation of an engine in the manner that in an emergency said contact point is closed merely by releasing said lever thereby to stop the rotation of an engine.

4 Claims, 4 Drawing Figures





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FIG. 3

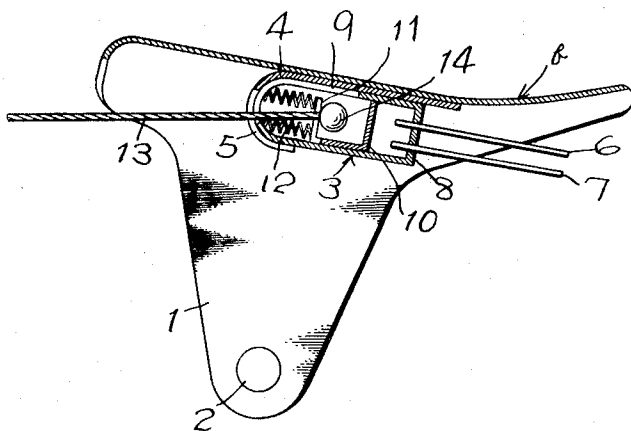
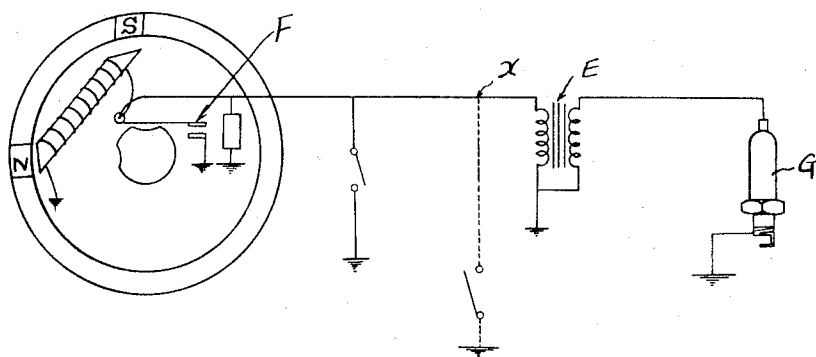


FIG. 4



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EMERGENCY STOP SWITCH MEANS FOR A MOBILIZED SLEDGE OR THE LIKE

The present invention relates to an emergency stop switch means to be used for a mobilized sledge car or the like which runs on the cold district or snowfield.

Generally it requires a mobilized sledge car or the like to provide a mechanism that can stop it promptly in an emergency so as to prevent any accidents that otherwise may take place. For this purpose it is customary to provide an emergency stop switch means in which an electrical circuit is designed to earth thereby to bring the rotation of an engine to a halt. However, the conventional type of such an emergency stop switch means is mounted on an instrument board so that in order to manually operate the same, it is necessary to turn it on with one hand while grasping the handle with the other hand. Thus the result is that the operation of such a switch means is carried out without reliability; and especially in case of emergency an operator is often pressed to confusedly manipulate the switch means with uncertainty so that he cannot halt the rotation of an engine until at last the sledge car or the like tumbles over and falls.

Further there is a difficulty to overcome that an operator is always forced to operate the sledge car or the like with a throttle lever pulled by hand and with a carburettor fully opened while he is not aware of the fact that the inner wire for operating the carburettor has been frozen together with the outer wire thereof under the influence of the severely cold weather. In addition, there is another difficulty that the afore-mentioned inner wire has been disconnected for some reasons unknown to him and frozen up in this disconnected relation before he is aware of it so that even if he releases the grasp of the throttle lever, he cannot move the inner wire so as to close the carburettor, consequently causing the sledge car or the like to run at full speed and collide against the impediment objects.

In order to eliminate all the above-mentioned difficulties the present invention aims at provision of the mobilized sledge car or the like in the manner of enabling an operator to easily switch on and stop the rotation of an engine. More particularly, this invention intends to provide such a mechanism that an emergency stop switch means can automatically act to halt the rotation of an engine even in the case that a carburettor would not be closed by releasing a throttle lever in an emergency because the inner wire immediately connected with this lever thereby to operate the carburettor has been frozen up in a stationary state together with the outer wire of said inner wire as has just been referred to.

In other words, the mechanical arrangements of the present invention are such that a throttle lever is mounted on a handle portion so as to control the rotatory speed of an engine and on this throttle lever is mounted an emergency stop switch means in the manner of enabling an operator to drive a mobilized sledge car or the like with high safety on the cold district or snowfield, always making it secure that even if the inner wire has been frozen before he is aware of it, the emergency stop switch means is ready to automatically work in an emergency to bring the rotation of an engine to a halt. Thus the emergency stop switch means in accordance with the present invention is to automatically work and stop the rotation of an engine merely by releasing the grasp of the throttle lever mounted on a

handle portion, that is, by removing the load acting on this throttle lever.

Accordingly, it is one of the main objectives of this invention to provide an emergency stop switch means having a very simple and durable structure that can be manufactured economically on a large scale and employed to thereby obviate any operational accidents that otherwise may occur to a mobilized sledge car or the like running on the cold district or snowfield. It is another objective of the invention to provide such a mechanical structure that an emergency stop switch means is mounted on a handle portion or in a suitable position where an operator is able to manipulate the same in a carefree manner thereby preventing the operational jeopardies of a mobilized sledge car or the like. It is another objective of the invention to provide a mechanical structure on the handle in the manner of being moveable in communication with said lever in order to operate the carburettor thereby preventing the mobilized sledge car or the like from encountering any operational accidents. Further it is another objective of the invention to provide such an emergency stop switch means that when the inner wire connected with said throttle lever has been frozen up before an operator is aware of it, an electrical circuit is automatically earthed merely by releasing the grasp of said throttle lever so as to stop the rotation of an engine thereby preventing the mobilized sledge car or the like from any operational accidents.

The detailed description of this invention is as set forth in the following explanation made with reference to the accompanying drawings, the novel features of the invention being as defined in what is claimed.

Accounting for the accompanying drawings in which; FIG. 1 is a perspective view showing an example of a mobilized sledge car or the like in which an emergency stop switch means in accordance with the present invention is mounted on a handle portion,

FIG. 2 is a vertical cross-section showing a throttle lever portion (emergency stop switch means) which is an elemental part of the invention,

FIG. 3 is a schematic view illustrating how the throttle lever is when grasped by hand, and

FIG. 4 is a schematic diagram of the electrical circuit adaptable for the emergency stop switch means embodying the present invention.

Setting forth to greater detail an electric switch means for emergency stop to be provided on a mobilized sledge car or the like with reference to the accompanying drawings, reference character *a* designates a handle means of the sledge car. Said handle means *a* has a throttle lever *b* at one side and a brake lever *c* at the other side respectively movably pivoted through a bracket secured to the handle means *a*. Said throttle lever *b* is constructed in such a manner that, as is clearly shown as an example by reference numeral 1 in FIG. 2, it is formed with a reversely U-typed metallic plate having their ends cut to form a protruded piece in mutually opposed position of the middle portion. The foremost end of said protruded piece has perforated holes 2 formed in aligned relation with each other thereby to allow both the throttle lever and the brake lever to be moveably pivoted to the bracket as have been mentioned above.

On the reverse of the upper portion of said throttle lever body 1 there are fixedly mounted holding pawls 4 for holding an electric switch means 3 which will be

subsequently described. Said holding pawls 4 are provided with narrow grooves 5. The electric switch means 3 comprises a pair of lead wires 6 and 7 secured to one side of a chamber 8 and each terminal of which is slightly protruded into the inside of said chamber 8. Each opposed wall of said chamber 8 is provided with a groove 9 in the position opposed to said narrow grooves 5 formed in the holding pawls 4. In the inside of the chamber 8 there is slidably mounted a metallic contact element 10 bent in a channel shape. In the position opposite to the chamber wall corresponding to the groove 9 of the chamber 8 there is formed a narrow groove 11. Between said metallic contact element 10 and the chamber 8 is provided a pushing spring 12 which normally presses this element 10 against the terminals of the lead wires 6 and 7. By the way, the pushing spring 12 is replaceable with a pulling spring or any other resilient elements that can normally keep the metallic contact element 10 in abutment against the terminals.

By the above-mentioned arrangement the switch means 3 is held on said holding pawls 4 thereby to be secured to the slot lever body 1. Reference numeral 13 designates the inner wire of an outer wire. To the foremost end of this inner wire 13 is secured a ball 14 disposed in the space of the channel-shaped metallic contact element 10. Said foremost end of the inner wire 13 extends in a fixed direction through said narrow grooves 5, 9 and 11, and connected to a lever (not shown) which operates a carburetter (not shown).

As is shown by reference character X in the wiring diagram of FIG. 4, each terminal of the lead wires 6 and 7 is connected to the contact point F of the ignition coil E in an electrical circuit which works as the ignition device of an engine, so that when said metallic contact element 10 abuts against these terminals, an electric current will be earthed so as not to cause a spark plug G to set off whereby the rotation of an engine is brought to a halt.

While the electric switch means for emergency stop embodying the present invention is constructed in the above-mentioned manner, the mechanical functions and operational effect of the invention are as defined in the following description.

Firstly, the throttle lever *b* is moved on that pivoting point as its center which is formed by said perforated holes 2 as is shown in FIG. 3 so that the inner wire 13 is pulled to open a carburetter thereby giving the initial motion to an engine. In this case, the ball 14 fixed on the foremost end of the inner wire 13 is brought into contact with the metallic contact element 10 to move the same in the opposed direction to the terminals of the lead wires 6 and 7 against the resiliency of the pushing spring 12.

From this it is readily understood that the faster the engine is rotated by further moving the throttle lever *b* the greater resiliency the pushing spring 12 is given. Thus if a sledge car or the like still keeps on running in this state while an operator is not aware of this spring condition, the inner wire 13 will sure be frozen together with the outer wire thereof under the influence of the cold weather. Thus when he happens in such a case to notice obstacles in front of him, he cannot slow up the rotatory speed of the engine so as to drive the sledge car quite clear of these obstacles even if he releases the hand-grasping of the throttle lever 13 with the intention of operating a carburetter because the throttle lever

and the carburetter are both connected through the inner wire frozen up to be motionless as has been mentioned. Thus the result is that the throttle lever cannot work at all and the engine still continues to rotate at as high speed as ever.

However, the throttle lever *b* being substantially released, the pressure force of the ball 14 against the metallic contact element 10 is set free whereby the pushing spring 12 that had been compressed before the throttle lever *b* was released gets so repulsive that it presses the contact element 10 against the terminals of the lead wires 6 and 7 as is shown in FIG. 2 and connect these terminals with each other. In other words, the electrical circuit shown in FIG. 4 is earthed so that the spark plug G is not ignited to thereby stop the rotation of the engine, and bring the sledge car to a halt.

Accordingly, the present invention is concerned with the provision of such an electric switch means for emergency stop only as can be operated merely by releasing the hand-grasping power of the throttle lever *b* when an operator comes across obstacles in front of him while running the sledge car with the throttle lever *b* in hand or when he cannot slow up the rotatory speed of the engine by operating the throttle lever because the inner wire has been frozen together with the outer wire thereof or broken before he is aware of them.

The emergency stop switch means in accordance with the present invention is substantially provided in the throttle lever *b* mounted on a handle means as has been mentioned, so that an operator can easily operate this thereby to stop the rotation of an engine and bring the sledge car to a halt at his seated posture which it is necessary to take the trouble of changing when he intends to operate the conventional type of emergency stop switch means.

Accordingly, the emergency stop switch means of the present invention provides many advantages that, in addition to being very easily operable, it is excessively simple in structure and produceable economically on a large scale thereby making it possible to secure many operational effects and mechanical merits that cannot be obtained by the conventional type of switches.

Although the present invention has been described with reference to preferred embodiments, it is also to be understood that it is not to be so limited since changes and modifications may be made therein which are within the fully intended scope and spirit of this invention as hereinafter claimed.

What is claimed is:

1. In a vehicle having an engine, a carburetor, an ignition circuit for electrically operating said engine, a hand operated throttle means and means interconnecting said throttle means and said carburetor, the combination comprising:

holder means disposed within said throttle means; a pair of electrical contacts mounted within said holder means and insulated therefrom, said contacts being electrically connected to said ignition circuit whereby shorting therebetween disables said ignition circuit; slidable contacting means positioned slidably within said holder means and holding said interconnecting means; and resilient means positioned within said holder means for normally causing said contacting means to short said pair of electrical contacts when no hand pressure is exerted on said throttle means, said hand

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pressure exerted on said throttle means causing said contacting means to act against said resilient means and move away from said shorting position and causing said interconnecting means to operate said carburetor.

2. The combination of claim 1, wherein said resilient means is a spring.

3. The combination of claim 2, wherein said holder

means is a "U" shaped structure, and said slidable contacting means is a box-like structure disposed within said "U" shaped structure.

4. The combination of claim 3, wherein said interconnecting means is a wire having an enlarged portion at one end thereof, said enlarged end being held by said box-like structure.

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