June 19, 1923.

1,459,051

J. GALAMB

STARTING SWITCH

Filed Oct. 18, 1920

2 Sheets-Sheet 1

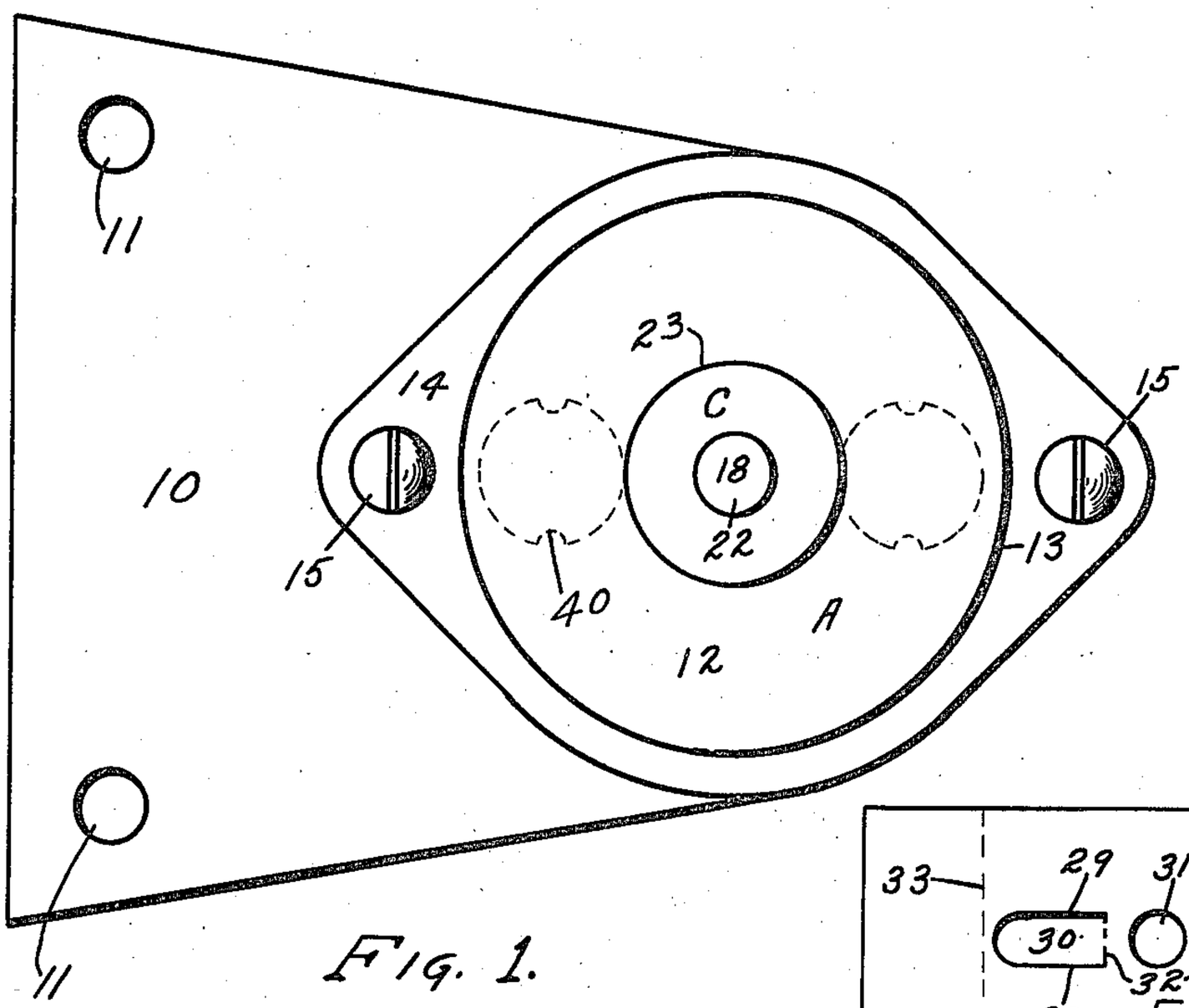
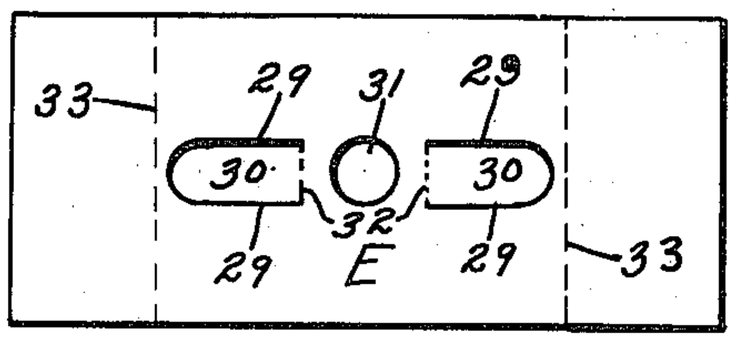


FIG. 1.



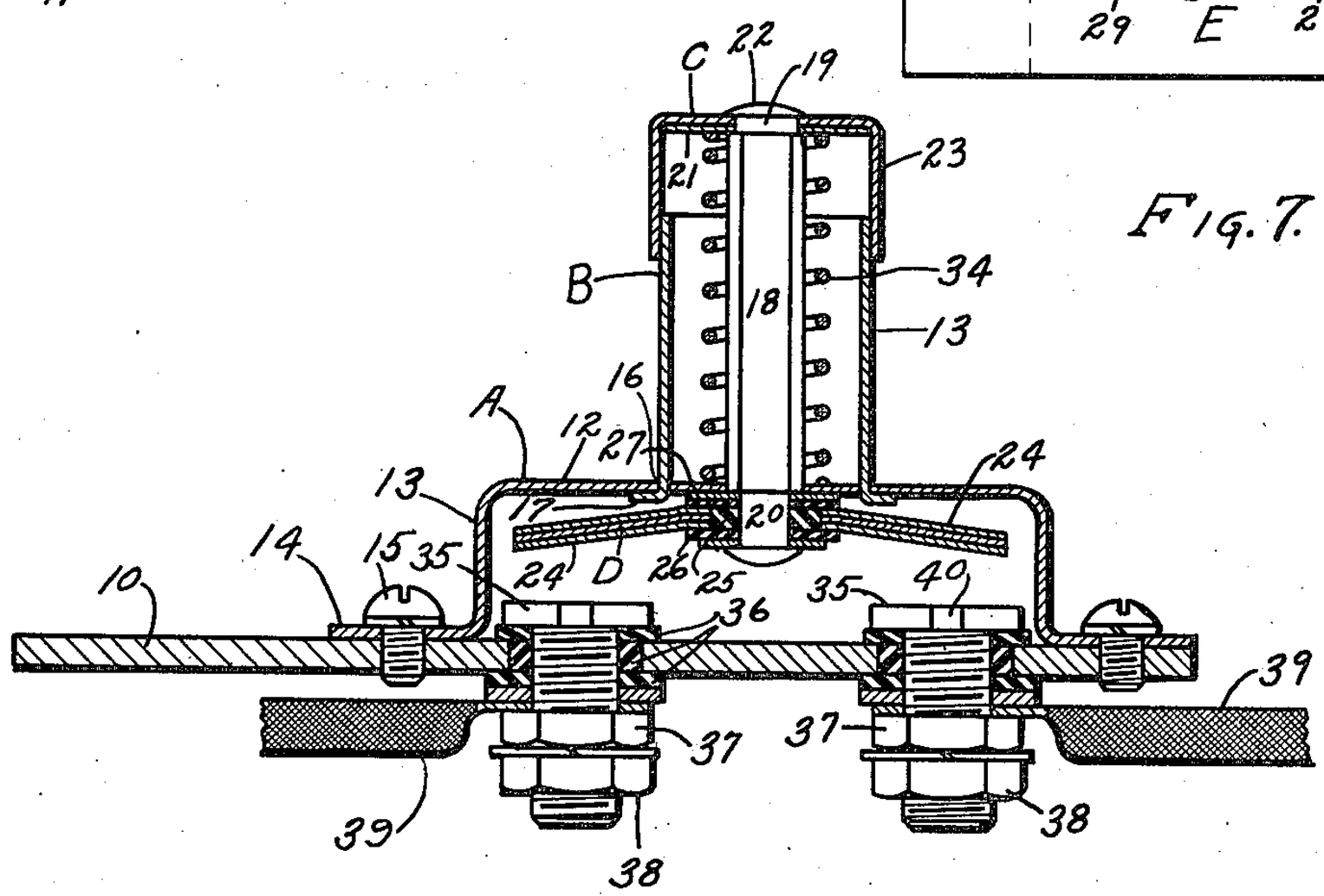


FIG. 2.

FIG. 7.

WITNESS:
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June 19, 1923.

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2 Sheets-Sheet 2

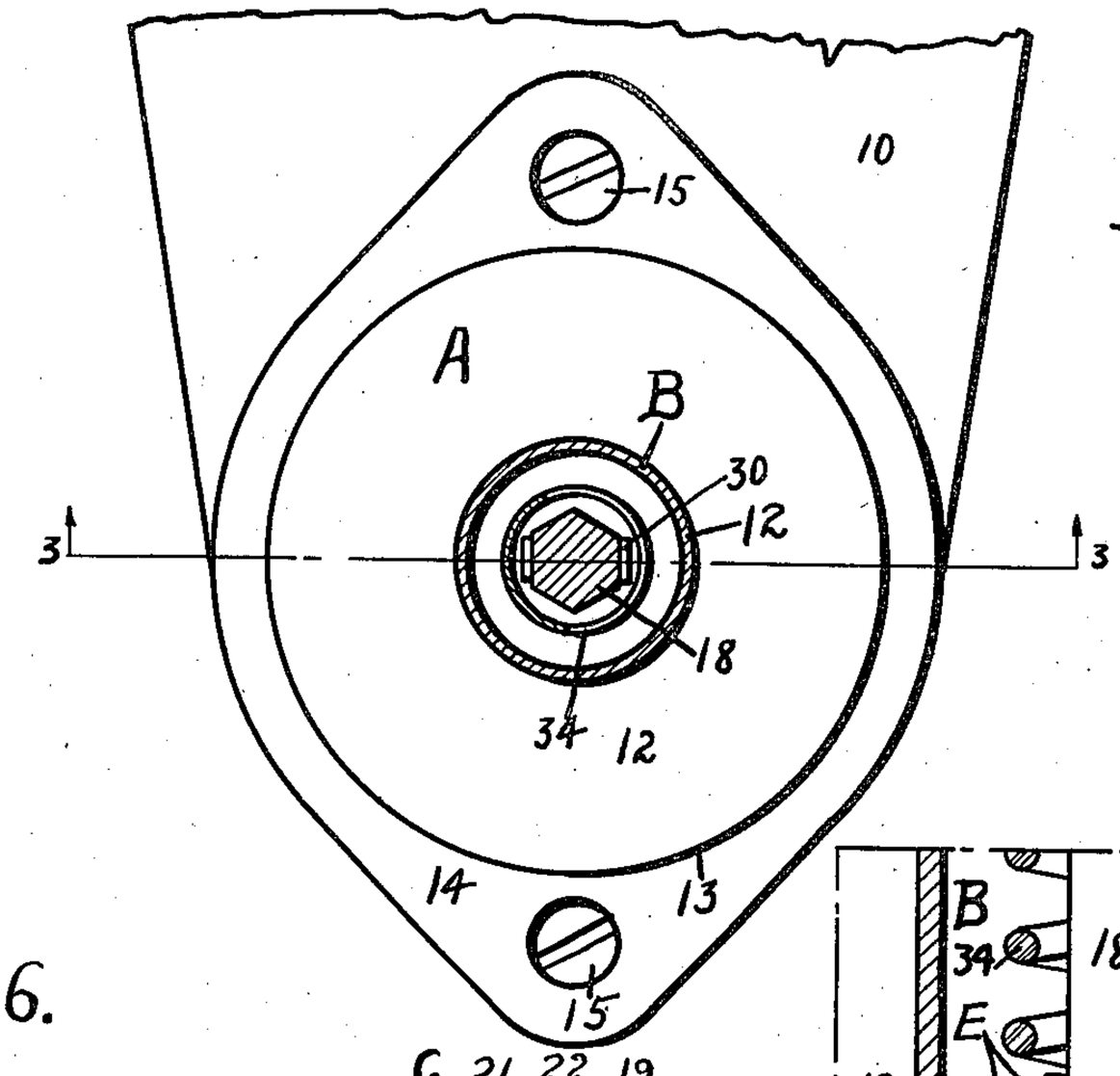


Fig. 4.

Fig. 5.

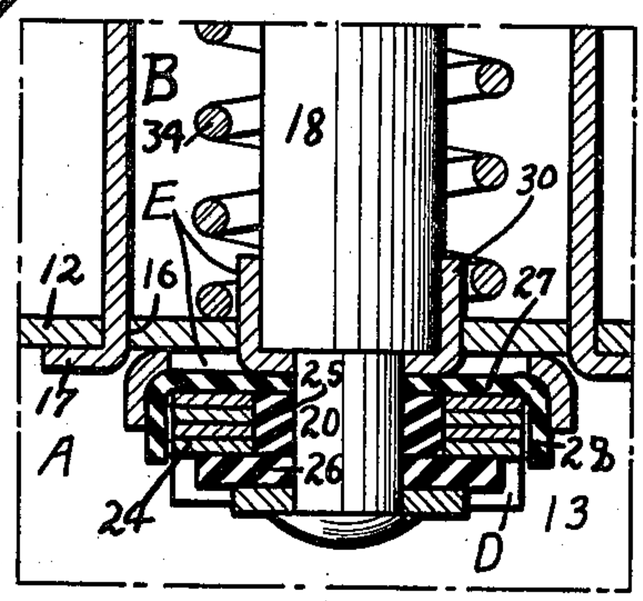
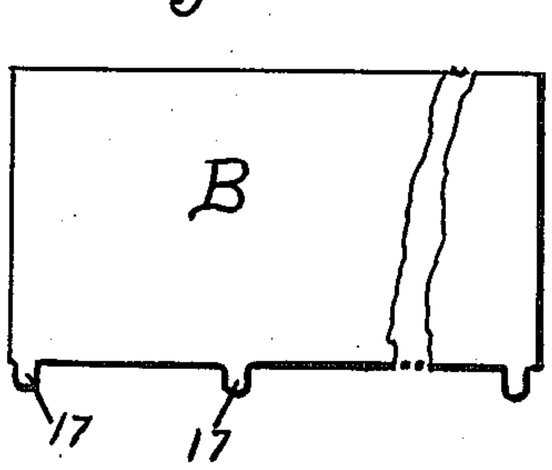


Fig. 6.



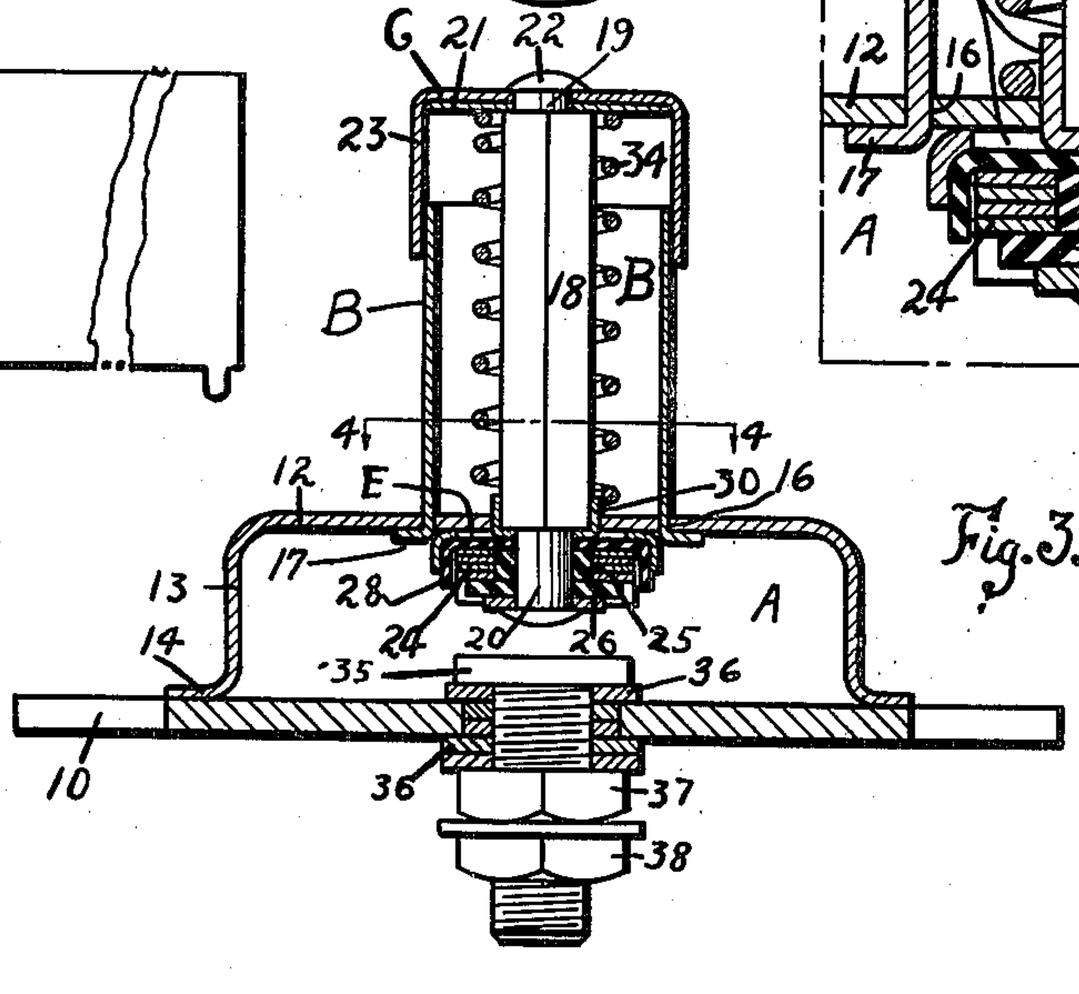


Fig. 3.

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Patented June 19, 1923. 1,459,051

UNITED STATES PATENT OFFICE.

JOSEPH GALAMB, OF DETROIT, MICHIGAN, ASSIGNOR TO FORD MOTOR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF DELAWARE.

STARTING SWITCH.

Application filed October 18, 1920. Serial No. 417,595.

To all whom it may concern:

Be it known that I, JOSEPH GALAMB, a citizen of the United States, residing in the city of Detroit, county of Wayne and State of Michigan, have invented new and useful Improvements in a Starting Switch, of which the following is a specification.

The object of my invention is to provide an improved starting switch of simple, durable, and inexpensive construction.

A further object of my invention is to provide a switch having a moving or actuating member which will withstand a great deal of abuse, and which is arranged to protect the electrical portions of the switch from such abuse.

A further object of my invention is to provide an improved switch casing and cover especially adapted for use with a switch such as is set in the floor of an automobile for connecting the starter motor with the battery.

A further object of my invention is to provide, in combination with such switch, a combined base and supporting bracket of novel construction.

With these and other objects in view, my invention consists in the arrangement, combination and construction of the various parts of my improved device, as described in the specification, claimed in my claims, and shown in the accompanying drawings in which:

Figure 1 is a top or plan view of my improved switch.

Figure 2 is a vertical central sectional view therethrough.

Figure 3 is a similar view taken at right angles to the plane of Figure 2.

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 3.

Figure 5 is an enlarged sectional view showing a slightly different form of my improved device.

Figure 6 is a plan view of a blank from which the enclosing casing for the switch handle is made; and

Figure 7 is a plan view of the blank from which one of the members, which carries the switch proper, is formed.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate, generally, a base member which is of substantially triangular shape. One corner of the base member is designed to support a cover member "A", and the remaining corners have openings 11 therein, designed to receive bolts or other fastening means whereby the switch may be mounted on any suitable portion of an automobile frame. The cover member "A" comprises a central horizontal web 12, a downwardly extending flange 13; and a horizontal flange 14 at the bottom of the flange 13. The flange 14 has a pair of openings therein designed to receive screws 15 whereby the cover may be screwed to the base. Adjacent to the center of the web 12 is an opening of somewhat irregular outline. In position spaced from this opening and from each other, are a plurality of openings 16.

The switch rod casing is formed from a substantially oblong blank "B" having a plurality of ears 17 thereon at one edge. This blank is rolled to substantially cylindrical shape with its axis so arranged that the ears will all be upon its lower end. Openings 16 are so arranged that they exactly correspond with the ears 17 whereby, when the casing "B" is mounted on the cover "A" then that these ears may enter the openings and be bent over against the under side of the web 12 to thereby secure the casing "B" to the cover "A"; to hold the former from movement relative to the latter.

Mounted for reciprocation within the central opening in the cover "A", is a switch rod 18 which may or may not be of irregular cross section, complementary to the cross section of the central opening in the cover member, to thereby keep the rod 18 from rotation. In the form of switch illustrated in Figure 5 the switch rod is substantially round, whereas, in the remaining figures it is shown as being of hexagonal shape. The switch rod 18 has contracted portions 19 and 20 at either end thereof, and a cap "C" is provided with a central opening adapted to receive the contracted portion 19. A washer 21 is also preferably provided within the cap "C" and around the contracted portion 19, so that the latter may be riveted over the cap "C" at 22 to hold the latter from movement relative to the rod 18. A downwardly extending flange 23 at the edge of the cap "C" receives the free end of the casing "B" whereby the flange forms a

guide for the upper end of the switch rod and also prevents foreign matter from entering the casing "B".

Mounted on the contracted portion 20 of the switch rod 18 are a plurality of laminations 24 which are composed of resilient metal and form a bar switch member "D". A sleeve or washer 25 and washers 26 and 27 mounted on the contracted portion 20 insulate the bar switch member "D" from the switch rod 18. The upper washer 27 has its ends 28 bent over the edges of the laminations 24 to also insulate these edges. Mounted above washer 27 is a locking member "E" which is formed from a rectangular blank such as is illustrated in Figure 7. This blank has U shaped cuts 29 formed therein, adjacent to either end to thereby form a pair of tongues 30. A central opening 31 is provided to receive the contracted portion 20 of the switch rod. Tongues 30 are bent upwardly along the switch rod on the dotted lines 32, and the remaining portions of the ends are bent downwardly along the sides of the laminations 24 and the flanges 28 of the washer 28 on the dotted lines 33. The tongues 30, where they extend upwardly through the central opening in the cover "A", are received in corresponding coacting portions of the opening so that such portions of the opening will co-act with the tongues 30 to hold the member "E" from rotation relative to the cover. The downwardly extending ends of the member "E" will also engage the laminations of bar switch member "D" to prevent the rotation of the latter so that the switch rod may be reciprocated without causing or allowing the bar switch member to rotate relative to the casing. Mounted within the casing "B" and encircling the switch rod 18 is a coiled spring 34 which engages the cap C and the cover "A" to push the operating rod to the upper limit of its movement and to normally hold it in this position.

Extending through the base 10 are a pair of contact members 35 which, in the form here shown, are composed of flat-headed bolts extended through opening in the base but insulated therefrom by insulated washers 36. A nut 37 and lock nut 38 are screwed onto the bolt 35 to hold the bolt in the base and at the same time to form a binding post for feed wires 39. Notches 40 are provided in the heads of the contacts 35, so that they may be held from movement, when desired, against the turning of the nuts 37 and 38.

The practical operation of my improved device has been brought out from time to time in the course of this specification but it will be understood that my switch is especially adapted for use as, what is termed, "a starter switch for automobiles," although its use is not confined to that purpose. Where the switch is so used the base 10 is screwed to a portion of the frame of the automobile below the floor boards thereof, but then the switch member or operating rod must extend upwardly through the floor boards of the machine to position where the operator may press it with his foot to close the switch.

In the construction of such switches in the past a large amount of difficulty has been experienced due to the amount of vibration of the parts, the fact that the operating rod must be extended for some distance from the switch itself, the great strain on a switch mounting and the switch due to the fact that it is operated by the foot of the driver, and due to the large amount of dirt and other foreign material which naturally accumulates around the floor boards of an automobile.

With my improved switch it will be seen that when a base member is secured to the frame of a machine then that the operator may press his foot against the cap "C" without doing any damage to the switch or contacts, as the pressure which he can apply to the parts is limited by the cap "C" or the contact of the operating rod with the base and the resiliency of the bar switch member. The switch itself is also protected from dirt by the fact that the cover member "A" is formed from one piece of material, and by the fact that the enclosure of the operating rod makes it substantially impossible for foreign matter to get into the switch proper.

The construction of the base forms a combined base and supporting bracket, and makes it substantially impossible to break the switch by pressure or a blow thereon, such as is normally likely to occur. The arrangement of the device "E" is such that the bar switch member may be used thereby securing the advantages due to the simplicity of its construction, and also the possibility that the switch member may rotate out of position to contact with the contacts 35 is entirely eliminated.

Some changes may be made in the arrangement and construction of the various parts of my improved device without departing from the spirit of the invention therein, and it is my intention to cover by my claims such changes as may be reasonably included within the scope thereof.

I claim as my invention:

1. In a switch comprising a base with spaced contacts thereon and a cover with a central aperture therein, said aperture having an irregular outline, a switch member having a head adapted to span said contacts and a shank loosely received in said aperture, and a member having portions turned down around the head and up around the shank whereby said portions may pass through and co-act with the irregular portions of the aperture thereby pre-

venting rotary movement of the head relative to the base.

2. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base, said cover having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted portions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a bar switch member mounted on the second contracted portion of the rod, insulating members mounted between the bar and the rod, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating.

3. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base, said cover having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted portions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a bar switch member mounted on the second contracted portion of the rod, insulating members mounted between the bar and the rod, a pair of spaced contacts on the base in position to co-act with said bar member, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating relative to said contact members.

4. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base, said cover having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted portions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a spring encircling the rod between the cap and cover adapted to yieldingly hold the rod at one limit of its movement, a bar switch member mounted on the second contracted portion of the rod, insulating members mounted between the bar and the rod, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating.

5. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base, said cover having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted portions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a spring encircling the rod between the cap and cover adapted to yieldingly hold the rod at one limit of its movement, a bar switch member mounted on the second contracted portion of the rod, insulating members mounted between the bar and the rod, a pair of spaced

contacts on the base in position to co-act with said bar member, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating relative to said contact members.

6. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base, said cover having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted portions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a bar switch member mounted on the second contracted portion of the rod, said bar member being composed of laminations of resilient material, insulating members mounted between the bar and the rod, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating.

7. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base, said covering having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted portions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a bar switch member mounted on the second contracted portion of the rod, said bar member being composed of laminations of resilient material, insulating members mounted between the bar and the rod, a pair of spaced contacts on the base in position to co-act with said bar member, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating relative to said contact members.

8. In a switch, a cover having an opening therethrough, a switch rod slidably mounted in said opening, a switch member secured to the rod within the casing, and a locking device having portions turned down to engage the switch member and portions turned up to engage said cover to thereby prevent the switch member from rotating relative to the casing while permitting reciprocating motion of the switch member and rod.

9. In a switch, a cover having an opening therethrough, a switch rod slidably mounted in said opening, a switch member secured to the rod within the casing, a locking device having portions turned down to engage the switch members and portions turned up to engage said cover to thereby prevent the switch member from rotating relative to the casing while permitting reciprocating motion of the switch member and rod, and means for insulating the switch member from the rod and cover.

10. In a switch, a cover having an opening therethrough, a switch rod slidably mounted in said opening, a switch member secured to the rod within the casing, said member comprising laminations of resilient material, and a locking device having portions turned down to engage the switch member and portions turned up to engage said cover to thereby prevent the switch member from rotating relative to the casing while permitting reciprocating motion of the switch member and rod.

11. In a device of the class described, a base comprising a substantially triangular plate, a circular cover secured to said base adjacent to one corner thereof, whereby a switch chamber may be formed on one side of the base and the remaining portion of the base may form a bracket which may be secured to a support to form a mounting for the switch, said cover having a central opening therein of irregular outline and a plurality of spaced openings adjacent to said first described opening, a cylindrical casing mounted on said cover member with one end surrounding the first described opening, said casing being formed of a blank rolled to cylindrical form and having ears at one end adapted to enter the second described openings in the cover whereby said ears may be bent over to secure the casing to the cover, a switch rod received in said casing and extending through the first described opening in the cover, said rod having contracted por-

tions at either end thereof, a cap having a flange thereon secured to one of said contracted portions with the flange slidably receiving the free end of the casing, a bar switch member mounted on the second contracted portion of the rod, insulating members mounted between the bar and the rod, and means mounted on the insulating members and rod adapted to co-act with the irregularities of the outline of the first described opening to hold the switch bar from rotating.

JOSEPH GALAMB.

Witness:
EDWARD L. DAVIS.