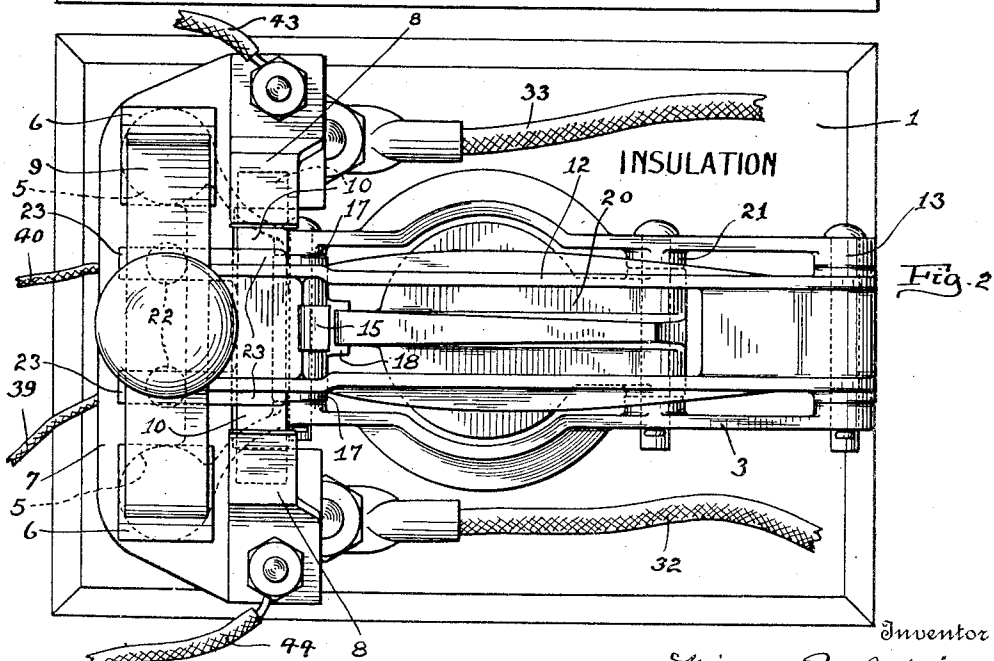


1,313,019.



Witness

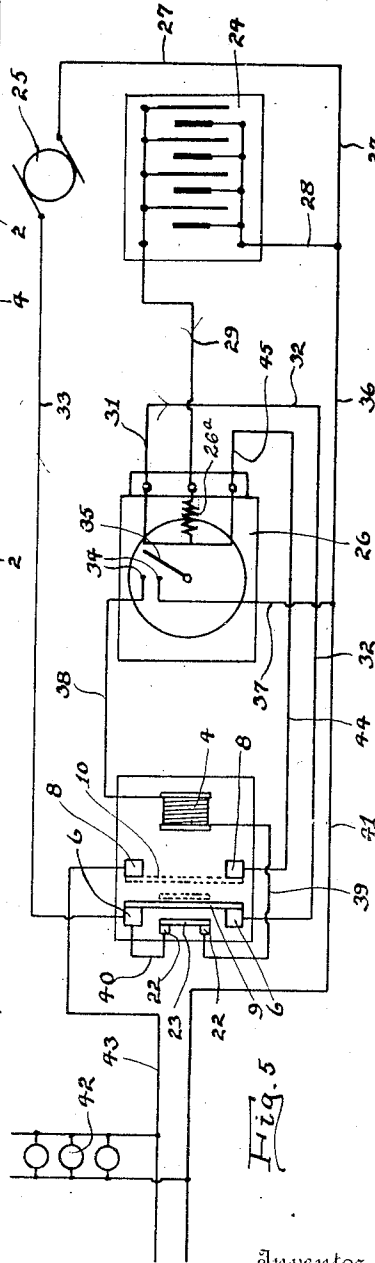
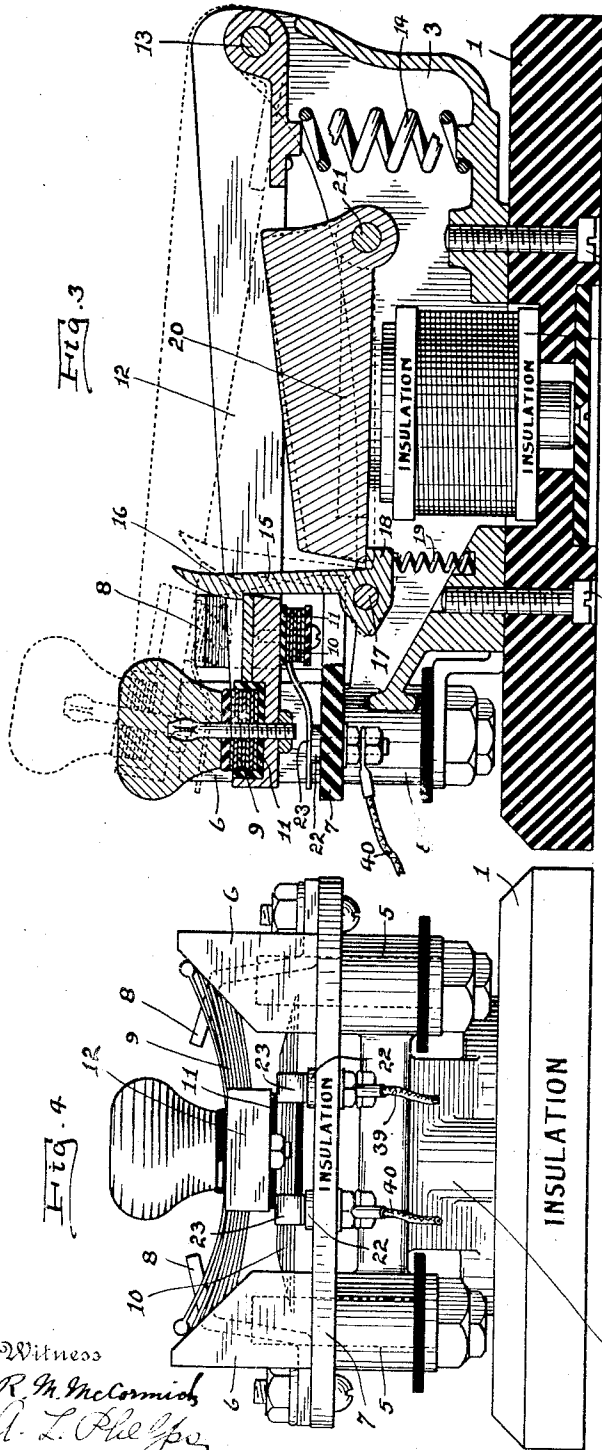
Witness
R. M. McCormick
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Inventor
William R. Schmitz

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1,313,019.

Patented Aug. 12, 1919.
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

WILLIAM R. SCHMITZ, OF COLUMBUS, OHIO.

ELECTRIC SWITCH.

1,313,019.

Specification of Letters Patent.

Patented Aug. 12, 1919.

Application filed February 19, 1917. Serial No. 149,437.

To all whom it may concern:

Be it known that I, WILLIAM R. SCHMITZ, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to electric switches designed for use particularly in connection with generator storage battery sets.

The main object of my invention resides in the combination with a generator, meter, and storage battery, of an electromagnetically controlled switch whose structure is such that when the switch arm is in one position, a circuit will be formed from the generator through the battery and when in the other position, the generator will be thrown off the battery and the lighting or lead circuit will be completed. Coupled with the above, is the electromagnetic control whereby the switch arm will be automatically operated to throw the generator off the battery after this battery has been given a predetermined charge. By the use of a structure such as this, the operator need only close the switch whenever the battery needs charging and then rely upon the switch itself to automatically open at the proper time, thus enabling him to otherwise utilize his time.

The preferred embodiment of my invention is shown in the accompanying sheets of drawings, in which similar characters of reference designate corresponding parts, and in which:

Figure 1 is a view in side elevation of my improved type of electromagnetic switch,

Fig. 2 is a top plan view of the structure shown in Fig. 1,

Fig. 3 is a longitudinal vertical section of the structure shown in Figs. 1 and 2,

Fig. 4 is an end elevation of the structure shown in Figs. 1 and 2, and,

Fig. 5 is a wiring diagram showing the use to which my invention is put.

Usually, these switches are mounted upon a slab of insulation 1, which are suitably drilled to receive the screws 2 by means of which the switch casting 3 is secured thereto.

This casting forms the housing for a coil 4 and also carries a pair of formations 5 at its forward end, into which the contacts 6 are secured. Between the formations 5 and the contacts 6 there is located a strip of insulation 7, which insulation is made to support a second pair of contacts 8. The

former are designed to be bridged by means of a bridge piece 9 and the latter by means of a bridge piece 10 insulated from each other by means of the insulation 11 and both mounted upon the switch arm 12, which latter is pivotally mounted at its rear end as shown at 13 to the casting 3. A coiled spring 14 normally urges this switch arm to the position shown in broken lines in Fig. 3. When the switch arm is in the full line position shown in Fig. 3, the bridge piece 9 bridges the gap between the two contacts 6, and the bridge piece 10 is out of electrical contact with its contacts 8. However, upon release of the switch arm, the bridge piece 9 is out of contact with the contact 6 and the bridge piece 10 is in electrical engagement with the contacts 8. A dog shown at 15 is provided with a lip 16, which engages the switch arm, as is shown, to lock it in its lowermost position, the dog being pivoted about the shaft shown at 17 as being rigidly carried by the casting 3. This dog is further provided with a rearwardly projecting foot portion 18, with which the coiled spring 19 coöperates in urging it forwardly. The foot portion 18 coöperates with the armature 20 which is pivotally mounted to the base casting as is shown at 21, so that when the coil 4 is energized, the armature 20 is attracted and being in engagement with the foot portion 18, the dog is tripped and the arm 12 is released and forced upwardly by the action of the spring 14.

To provide means whereby the circuit through the coil will be in condition to be closed when the switch arm is moved to a charging position, I have provided a third set of contacts which are shown at 22, these contacts coöperating with the spring arms 23. These spring arms, as shown, are supported and attached to the bridge piece 10 so that when the switch arm is closed, a shunt circuit may be completed through this coil.

From the foregoing description, it will, therefore, be apparent that when the switch arm is moved to the full line position shown in Fig. 3, the contact 6 will be bridged and the contacts 22 will also be bridged. When the coil 4 is energized, the contact 15 is tripped and the switch arm moves to its upper position, in which the contacts 8 are bridged.

In Fig. 5, I have designated the storage battery by the reference numeral 24, the generator by the numeral 25 and an ampere

hour meter by the numeral 26. The various contacts mentioned in the foregoing part of this specification, have been designated correspondingly in the diagrammatic view, so that when the switch arm is moved to its lower position, or the one in which the battery 24 is being charged, the switch piece 9 bridges the contacts 6. In this condition, current leaves the generator 25 through the wire 27 and enters the battery 24 through the wire 28. After leaving the battery by the wire 29, it enters the meter 26, and through its workings which have been shown diagrammatically and designated 26^a and leaves the same by a wire 31, thereafter passing through the wire 32 into the contact 6, bridge piece 9 by said contact 6 and returns to the generator through the wire 33. The ampere hour meter is provided with a pair of contacts 34 which are designed to be closed by means of the indicator arm 35, so that when this indicator arm comes back to a full charge position, these contacts will be bridged. When this occurs, a portion of the current from the generator 25 will be shunted through the wires 36 and 37 across the contacts 34 by means of the arm 35, then entering the coil 4 through the wire 38 and inasmuch as the contacts 22 are bridged by the contact piece 23, this coil will be energized. The coil 4 and one of the contacts 22 are connected by means of the wire 39 and the other contact 22 is connected to the contact 6 by means of the wire 40, so that this shunted current then returns to the generator 25 through the wire 33. Thus, it will appear that when the indicator arm 35 of the meter reaches its full charge position, the magnet 4 will be energized to cause the tripping of the switch arm.

When the arm 12 is thus moved to the dotted line position as shown in Fig. 3, the generator 25 is cut off of the battery, because the bridge piece 9 moves out of engagement with the contacts 6. In this event, current may discharge from the battery through the wire 28, wires 36 and 41 through the exterior load 42, wire 43, contact 8, bridge piece 10, which now bridges these contacts 8, wire 44 into the meter in a reverse direction through the wire 45 and

again through its workings 26^a and out through the wire 29 back into the battery. It will, therefore, appear that the charging and discharging circuits are complete in accordance with this diagram. 55

From the foregoing description, it will be apparent that I have provided a switch of considerable utility and one wherein the closing of the single switch arm 12 alters the circuits to such an extent that the generator is placed in a charging position and at the same time, a circuit is formed so that when the full charge has been given, the arm 12 will be automatically tripped. 60 65

What I claim, is:

1. The combination with a generator, meter and a storage battery, of an electro-magnetic switch structure comprising a plurality of contacts and a magnetically controlled arm operable to bridge the contacts, said arm being so arranged that when the same occupies one position a circuit will be completed through the generator, meter and battery, and when said arm occupies a second position said generator will be thrown out of circuit and a load circuit completed through said battery and meter, and means operating in conjunction with said meter for automatically moving said arm to said second position after the battery has received its charge. 70 75 80

2. A switch for a storage battery generator set comprising a plurality of switches formed by a plurality of sets of contacts and a single arm, and a coil governing said arm, one set of contacts connecting the battery to the work circuit, another set connecting the generator to the battery, and a third set governing the closure of a circuit through said coil, said arm being arranged so that when in one position it bridges the contacts connecting the battery and work circuits, and when in the other position to bridge the other two mentioned sets of contacts. 85 90 95

In testimony whereof I affix my signature in presence of two witnesses.

WM. R. SCHMITZ.

Witnesses:

WALTER E. L. BOCK,
A. L. PHELPS.