E. WEISSBERG.

HIGH TENSION SWITCH.

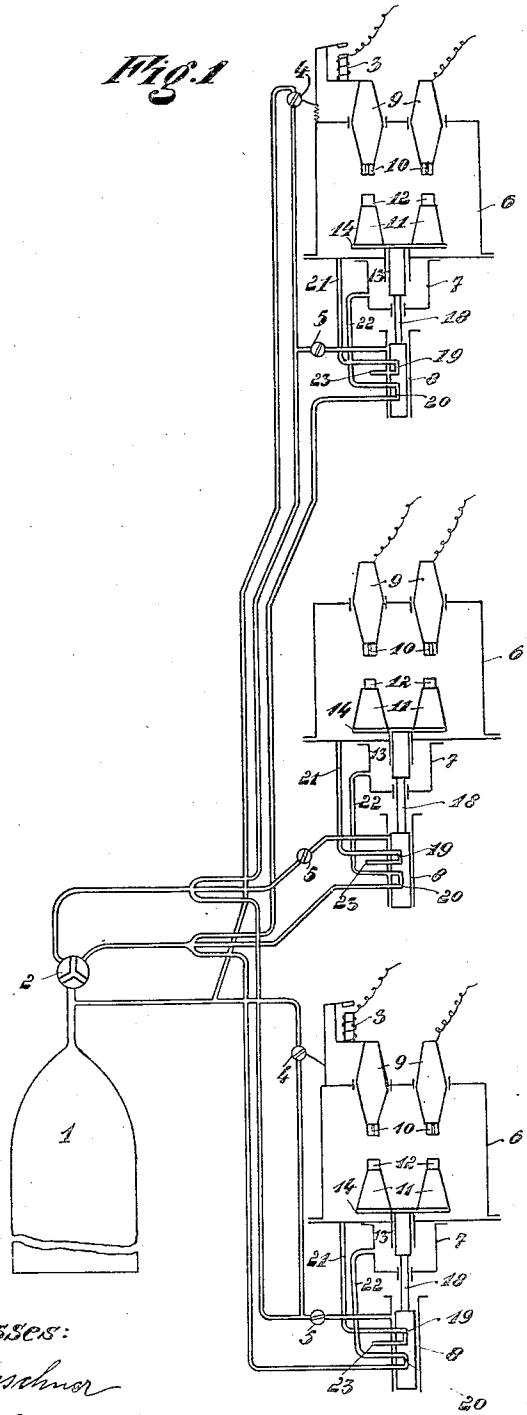
APPLICATION FILED JUNE 10, 1914.

1,225,901.

Patented May 15, 1917.

3 SHEETS—SHEET 1.

Fig. 1



Witnesses:

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Inventor:

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3 SHEETS—SHEET 2.

Fig. 2

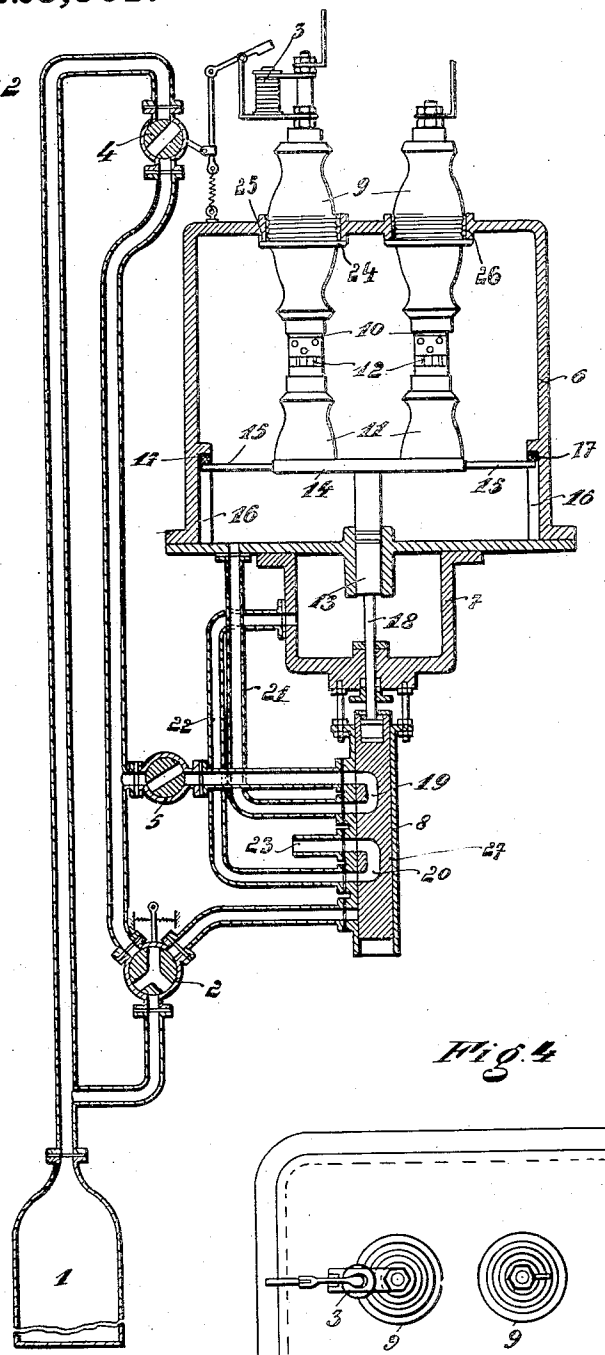


Fig. 3

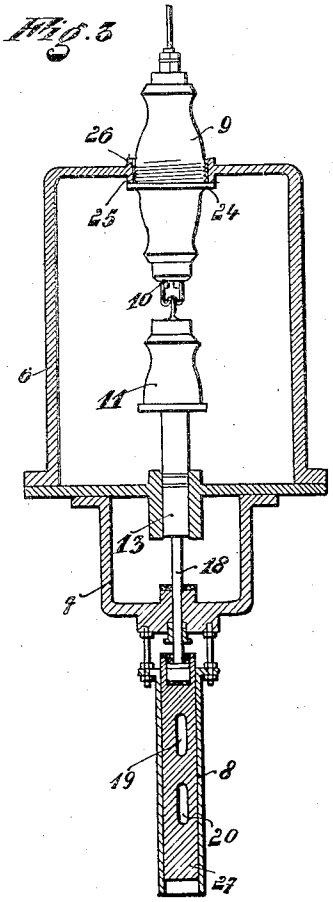


Fig. 4

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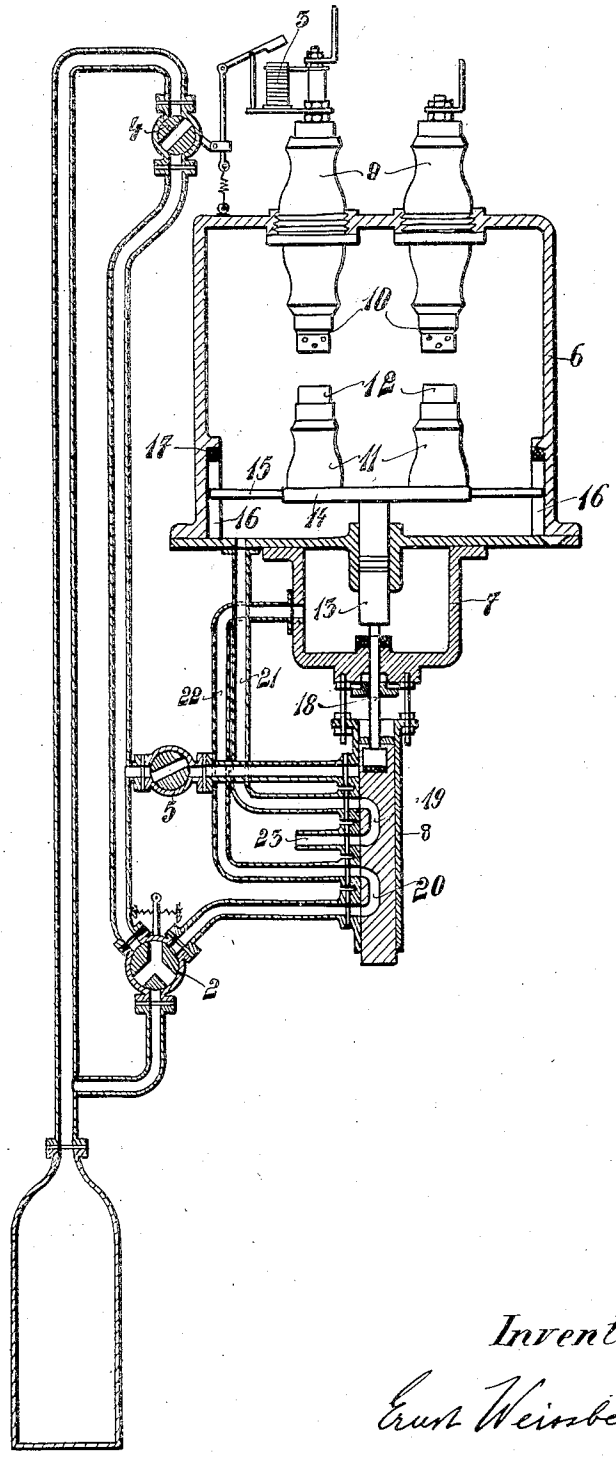
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1,225,901.

Patented May 15, 1917.

3 SHEETS—SHEET 3.

Fig. 5



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Inventor:
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UNITED STATES PATENT OFFICE.

ERNST WEISSBERG, OF CASSEL, GERMANY.

HIGH-TENSION SWITCH.

1,225,901. Specification of Letters Patent. Patented May 15, 1917.

Application filed June 10, 1914. Serial No. 844,234.

To all whom it may concern:

Be it known that I, ERNST WEISSBERG, a subject of the Czar of Russia, and residing at Cassel, Germany, have invented certain new and useful Improvements in High-Tension Switches, of which the following is a specification.

This invention has reference to certain new and useful improvements in switches or cut-outs for electrical high tension service, and relates more particularly to a cut-out with means for extinguishing the arc set up on breaking the circuit, and the invention essentially consists of a device or system in which a high pressure medium, such as gas, is used for extinguishing the switch arc and in which this same pressure medium is used to operate the cut-out parts for opening or closing the circuit. The high pressure gases, just previous to the operation of the switch, are admitted into the chamber containing the switches or respectively to an auxiliary pressure chamber, by means of a manually or mechanically operable controller, which in construction resembles a steam engine slide valve.

In order to make my invention more readily understood, I will now describe it in detail with reference to the accompanying drawings, which by way of example show a preferred form of construction, and in which—

Figure 1 represents a diagrammatical view of a three pole high tension switch, in which cutting in or out is effected by means of a valve or a magnet. Figs. 2 and 3 show on an enlarged scale sectional views, partly in elevation, of a single pole switch with the movable switch-member in the uppermost position. Fig. 4 represents a top view of the switch casing. Fig. 5 represents like Fig. 2 a sectional view of a single pole switch with the movable switch-member in the lowest position.

The entire system is fed from the tank 1 containing suitable gases under high pressure, and is operated by means of the three-way valve 2.

The switch in the construction shown essentially consists of three parts: the switch box proper 6, the auxiliary pressure chamber 7, and the controller 8. In the top of the switch box 6 are suitably secured the insulators 9. They are provided with contact springs 10 into which take the knives 12 arranged on the lower insulators 11. These latter are secured to a cross member 14 which is supported on the plunger 13 and is provided with lateral extensions 15, which latter engage in run-ways 16, provided with elastic buffers 17, in the chamber wall. The insulators 9 preferably are provided with a circumferential flange 24, which is intended to contact with the lower edge 25 of the thread portion 26 in the chamber top, within which the insulators are cemented.

The plunger 13 extends down into the auxiliary pressure chamber 7, and the plunger rod 18 is secured to the top of the controller body, which, according to this invention, is constructed in the form of a slide 27 with U-shaped passages 19, 20. Suitably disposed tubing interconnects the several parts, as shown in the drawings.

The controller 8 serves to regulate the admission and emission respectively of the pressure medium, into and out of the chambers 6 and 7, the passages 19, 20 in the slide 27 alternately registering with the respective tubes communicating with the chambers 6 and 7, which latter are under pressure always only for a relatively short time, *i. e.* during the actual switch operation.

Upon compressed gas being admitted to the switch box 6 through the conduit 21, the insulators 11 will be forced downwardly, if the pressure is high enough to overcome the friction in the contact springs 10, when the main current will be interrupted. The adjustment of this frictional resistance may be such that the operation of the switch takes place only at a predetermined pressure, which would assure the extinction of the ensuing arc.

The circuit being broken, as it is represented in Fig. 5, the switch box 6 is connected by the passages 21 and 19 with the opening 23, and in the switch box there is the normal pressure of air. The auxiliary pressure chamber 7 is connected by the passages 22 and 20 with the valve 2. If the latter is turned so that compressed gas may enter into the auxiliary pressure chamber 7 from the tank, the plunger 13 will be forced upward, whereby the cross member 14, which is connected to the plunger, will move upward with the insulators 11 and the knives 12 and form a bridge between the contact springs 10.

Then the controller 27, connected to the plunger 13 by the plunger rod 18, also moves

upwardly, until it assumes the position which is represented in Fig. 2. Now the auxiliary pressure chamber 7 is set in communication with the opening 23 by the passages 22 and 20, so that its compressed air may escape. If there is now an excess voltage, the magnet 3 moves the keeper and the valve 4 is turned so far, that the compressed air may leave the tank 1, pass through valve 4, and then through a movable valve 5, and the conduits 19 and 21 into the switch box 6. The construction and operation of valve 5 is such that it always permits of gas entering the U-passage 19, the valve never closing completely, but presenting a passage of varying diameter; whereby, depending upon the momentary extent of this passage, a more or less pronounced throttling action is obtained. When the pressure in the switch box has reached a certain height, which is necessary to overcome the frictional resistance of the knives 12, the plunger 13 with its connected parts will again move downward, whereby the knives 12 and 10 are disconnected and the switch breaks the circuit.

The circuit may also be broken by turning the valve 2 by one sixth of a turn.

What I claim is:—

1. A high tension switch mechanism, comprising a gas tight chamber, a switch therein, a second gas tight chamber in axial alinement with the first said chamber, a plunger extending into both said chambers and supporting the movable part of said switch, and controllable means for carrying a pressure medium to and away from the opposite faces of said plunger, for the purpose of alternately opening and closing it, said pressure medium being also adapted to extinguish the arc set up on operation of the switch.

2. In a high tension switch mechanism, in combination, a gas tight switch box, a switch or switches therein, a pressure chamber in axial alinement with said box, a plunger operably extending into said box and said chamber, said switch adapted to be operated by said plunger, a tank containing a gaseous pressure medium, conduits connecting said tank with said switch box and said pressure chamber, means for controlling respectively the admission and emission of the pressure medium to and from said switch box and said pressure chamber, said pressure medium being adapted to operate said plunger and to also extinguish the switch arc, and said controlling means being secured to, and operated with, the said plunger.

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

ERNST WEISSBERG.

Witnesses:
WILLY GERSCHNER,
JEAN KERKMANN.