N. WILKINSON.

CONTROL SYSTEM.

APPLICATION FILED SEPT. 13, 1909.

1,121,544. Patented Dec. 15, 1914.

Fig. 1.

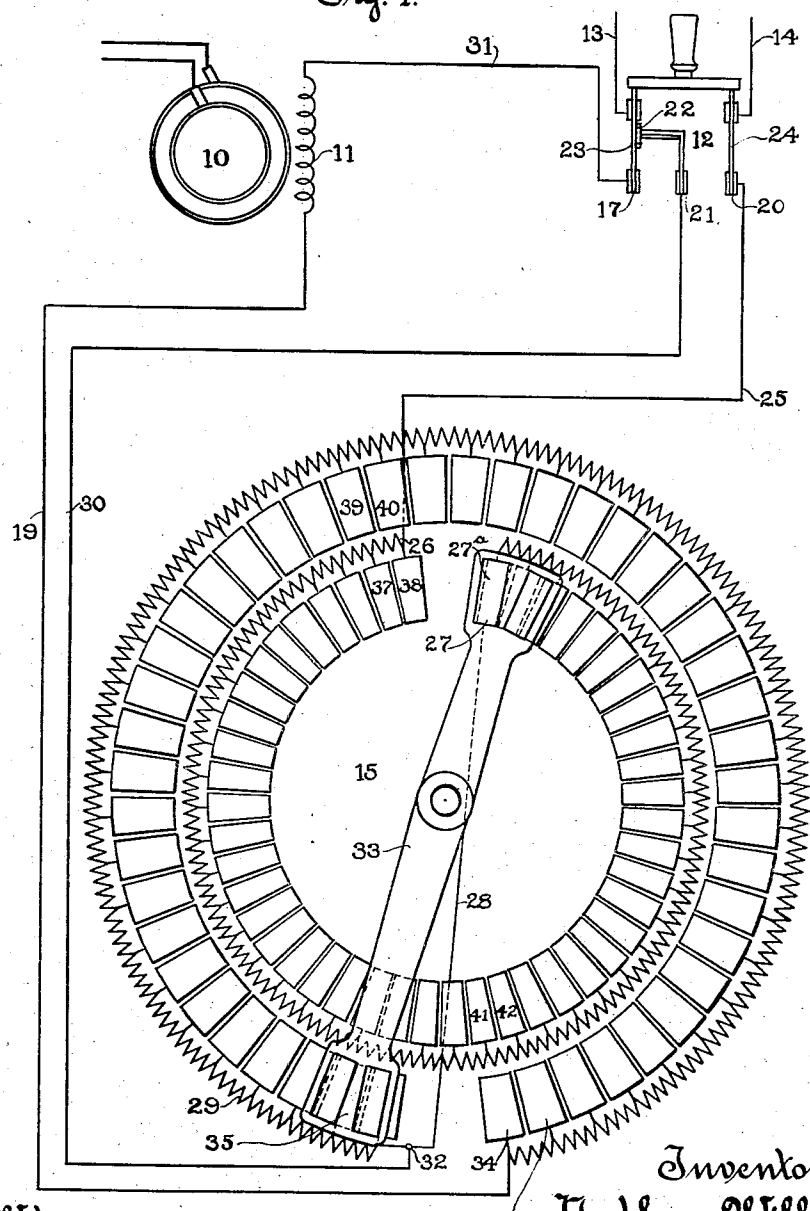
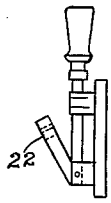


Fig. 2.



Witnesses

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CONTROL SYSTEM.

1,121,544. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed September 13, 1909. Serial No. 517,491.

To all whom it may concern:

Be it known that I, NATHAN WILKINSON, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Control Systems, of which the following is a full, clear, and exact specification.

My invention relates to systems of control for electric circuits, and more specifically to rheostats or variable resistances to be used in such circuits.

The object of my invention is to provide a method and means for using the resistance of a rheostat as a discharge resistance.

My invention further consists in certain novel details of construction and arrangements of parts to be described in the following specification and to be particularly pointed out in the claims.

In the accompanying sheet of drawings, Figure 1 is a diagram embodying my invention; and, Fig. 2 is side view of the switch illustrated in said diagram.

Referring to the figures, I have shown the rotor 10 of an alternator the field 11 of which is connected through a switch 12 to an exciter circuit, the mains of which are shown at 13 and 14. The field winding 11 is also in circuit with a rheostat 15 which is used for varying the exciting current when the switch 12 is closed, and used as a field discharge resistance when the exciter circuit is broken. The terminals of the field winding are respectively connected to binding posts 17 and 20 of the switch 12. The switch is also provided with another binding post 21 which has a stationary contact 22. This contact 22 is elevated to such an extent that when the switch 12 is opened, one blade 23 of the switch makes connection with the contact member 22 forming a field discharge circuit through the rheostat resistance.

As shown in Fig. 1 the switch 12 is closed and the exciting current for the field passes through the entire resistance of the rheostat, taking the following path: Current passes from one main 14 through one side of switch 12, conductor 25, a ring 26 of resistance connected up by means of contact segments, such as 37 and 38, to a contact 27 through conductor 28, an outer ring 29 of resistance, conductor 19, field 11, the other side of the switch and completing the circuit through main 13. When the switch is opened a large electro-motive force is developed in the field 11 and there is a large rush of current. But just at this point the blade 23 of the switch makes connection with contact 22 forming a circuit through a portion of the rheostat resistance which acts as a field discharge resistance. The discharge current passes from field 11 through conductor 31, contact 22, conductor 30, discharging through the outer ring 29 of resistance, completing the circuit through conductor 19 into field 11.

When all of the rheostat resistance is cut out of the field circuit, a movable contact member 35 bears upon stationary contact segments 34 and 36, and movable contact member 27^a bears upon stationary contacts 37 and 38. When the rheostat is in this position and the switch is opened, the discharge current takes the same path up to point 32 of the rheostat. Here the current divides, part of it going through the outer ring 29 of resistance as before, the other part passing through conductor 28, the inner ring 26 of resistance, a connector 33, joining the other branch at point 34 and passing through conductor 19 back into field 11. When only half of the rheostat resistance is in the field circuit, one movable contact 35 bears upon the stationary contacts 39 and 40, and the other movable contact 27 bears upon stationary contacts 41 and 42. When the switch is opened with the rheostat in this intermediate position, the field discharge current again divides in point 32, part of the current going through half of the outer ring 29 of resistance, the other part passing through conductor 28, through half of the inner ring of resistance, connector 33, and meeting the other branch, the circuit being completed through the remainder of the outer ring 29 of resistance and conductor 19. In some positions of the rheostat, therefore, the discharge current passes through a single branch of resistance while in other positions the current divides, passing through branches of the rheostat resistance which are in parallel. The field discharge resistance is varied by means of rotating the connector 33 of the rheostat.

The sides of all of the stationary segments and the outside edges of the movable contact members are preferably along radial lines, and in this way when there is relative movement between said stationary and movable

contacts, the full length of the edges of said movable contacts will meet the full length of the edges of said stationary contacts thus preventing injurious sparking.

I do not wish to limit the use of my rheostat to alternator fields for it can be used in connection with other apparatus.

There may be many modifications of the precise arrangement herein shown and described and I aim in my claims to cover all such modifications which do not involve a departure from the spirit and scope of my invention.

What I claim as new is:

1. In combination, a source of supply, a dynamo-electric machine having a field winding, a resistance capable of being divided into a number of portions and being adapted to be connected in circuit with said field winding, and means for connecting said winding to said source of supply through said resistance and for short-circuiting said winding through said resistance, said resistance having a portion which may be connected either in series or in parallel with another portion thereof.

2. In combination, a source of supply, a dynamo-electric machine having a field winding, a resistance capable of being divided into a number of portions and being adapted to be connected in circuit with said field winding and said source of supply, and a switch having terminal connections to said source, winding, and resistance, a portion of said resistance being always connected in series with said winding when the switch is in one position.

3. In combination, a source of current supply, a dynamo-electric machine having a field winding, a resistance, and a switch for connecting said field winding to said source of current supply through said resistance and for breaking said supply circuit while still maintaining the circuit through said field winding and said resistance.

4. In combination, a source of current supply, a dynamo-electric machine having a field winding, a resistance, and a switch having a plurality of contacts for connecting said winding to said source of supply through said resistance, said switch having another contact by means of which a circuit is completed through said winding and said resistance when said current supply circuit is broken.

5. In combination, a source of supply, a dynamo-electric machine having a field winding, a resistance provided with terminal connections and an intermediate connection, and capable of being divided into a number of portions, and switch means connected to said source, winding, and the three connection points of said resistance, a portion of said resistance being adapted to be connected in circuit with said field winding through the terminal connections of said resistance when the source of current supply is connected to the field winding, and said field winding being adapted to be short-circuited through a portion of said resistance when the connections to the source of current supply are open.

6. In combination, a dynamo-electric machine having a field winding, a source of supply therefor, a variable resistance device having an arm movable into a plurality of operative positions, and means for connecting said field winding to said source of current supply through said resistance and for breaking said supply circuit while still maintaining a circuit through said field winding and said resistance.

7. In combination, a source of supply, a dynamo-electric machine having a field winding, a variable resistance adapted to be connected in circuit with said source and said field winding in all of its operative positions, and switch means for connecting said winding to said source of supply through said resistance and for short-circuiting said winding through said resistance.

8. In combination, a source of supply, a dynamo-electric machine having a field winding, a rheostat adapted to be connected in the circuit of said field winding, and switch means capable of connecting said winding through said source through said rheostat or of connecting said winding through said rheostat while disconnected from said source, said rheostat being effective to complete the circuit with the latter connection while in any of its operative positions.

Milwaukee, Wis., Aug. 19, 1909.

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

NATHAN WILKINSON.

Witnesses:
CHAS. L. BYRON,
ROB. E. STOLL.