

J. BIJUR.
ELECTRIC REGULATOR.
APPLICATION FILED AUG. 13, 1914.

1,304,522.

Patented May 20, 1919.
2 SHEETS—SHEET 1.

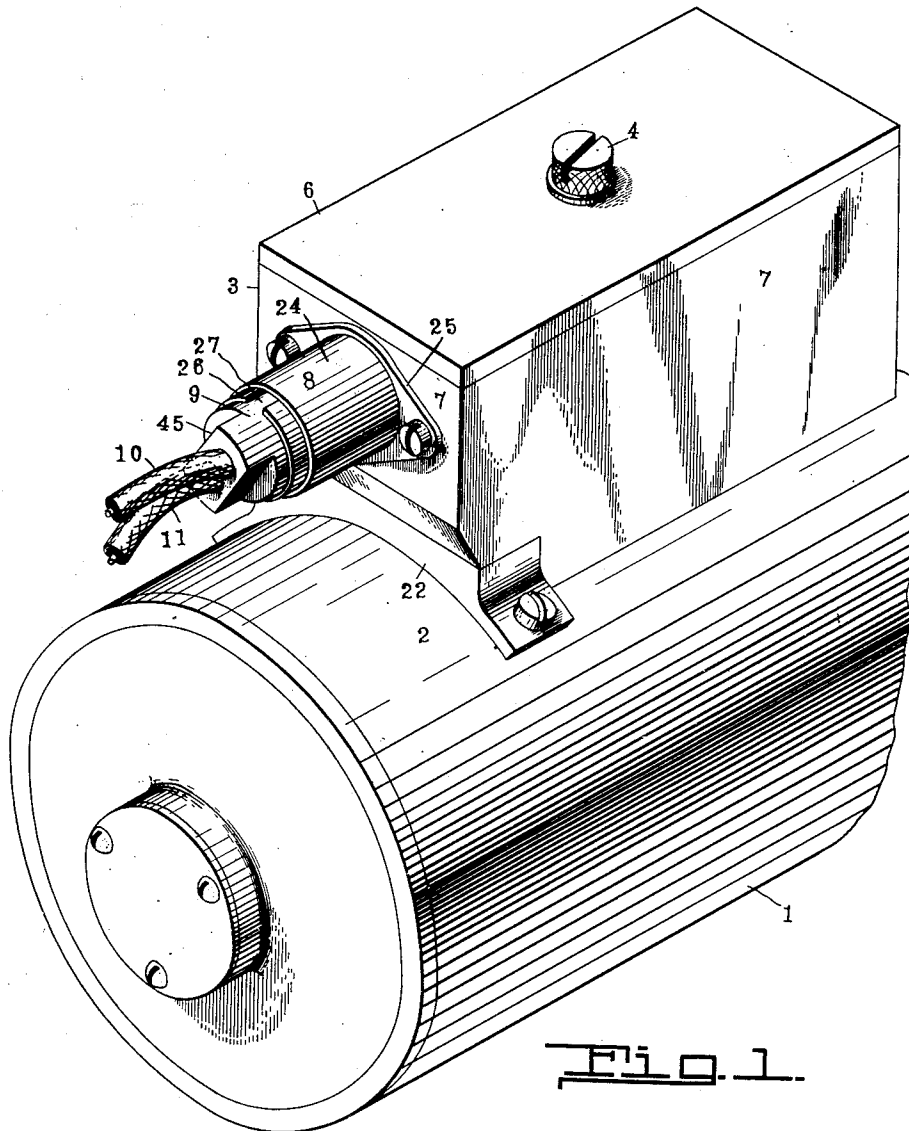


Fig. 1.

WITNESSES

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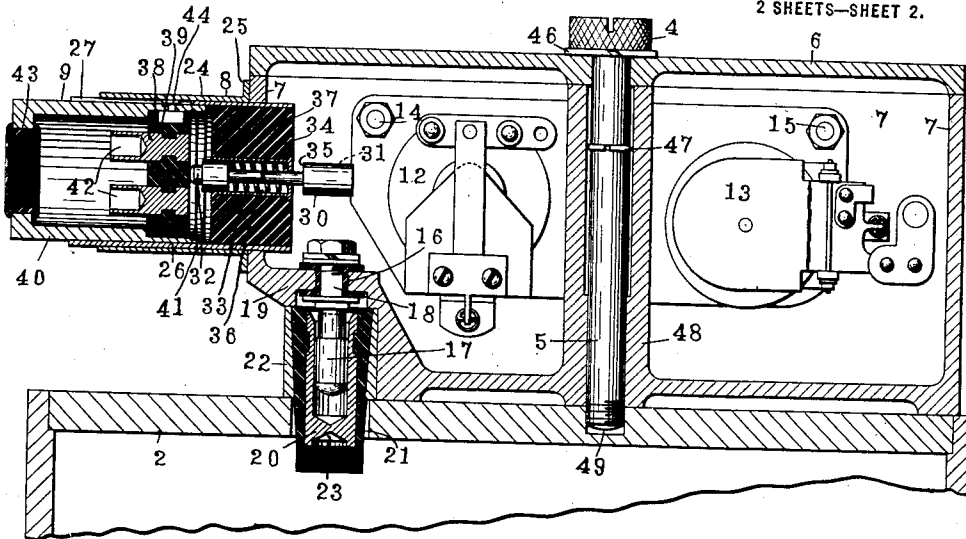


Fig. 2.

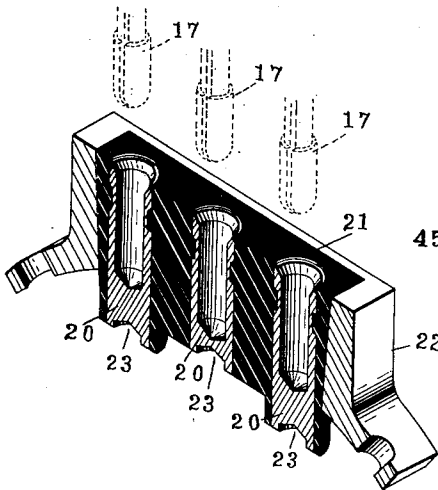


Fig. 3.

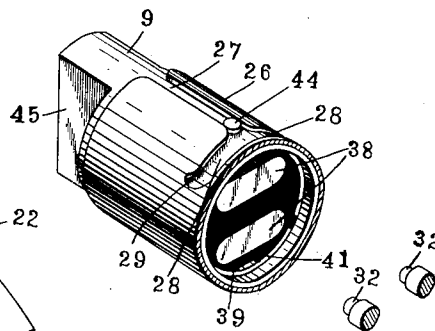


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH BIJUR, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO BIJUR
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ELECTRIC REGULATOR.

1,304,522.

Specification of Letters Patent.

Patented May 20, 1919.

Application filed August 13, 1914. Serial No. 856,575.

To all whom it may concern:

Be it known that I, JOSEPH BIJUR, a citizen of the United States, and residing at 122 East Sixtieth street, in the county of New York and State of New York, have invented a new and Improved Electric Regulator, of which the following specification is a full disclosure.

This invention relates to electric regulation, and with regard to certain more specific features, to the mechanical features of a regulator adapted for use with a variable-speed dynamo.

One of the objects of the invention is to provide a regulator of inexpensive and compact construction.

Another object is to provide a regulator mounting that can be installed and removed with a minimum of time and trouble by persons wholly unfamiliar with the character of the regulator or the wiring diagram of the system.

Another object is to provide a light-weight and durable casing that may be removably mounted directly on the dynamo itself and simultaneously connected electrically therewith, with the assurance that the circuits will not be improperly completed.

Another object is to provide a simple and inexpensive mechanism so constructed as to serve as a reversing switch.

Another object is to provide improved mechanism whereby a regulator may be replaced bodily without disturbing the remainder of the apparatus.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts, and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings, like char-

acters of reference denote corresponding parts throughout all the views, of which:—

Figure 1 is a view in perspective of a dynamo-electric generator with a regulator box attached;

Fig. 2 is a longitudinal vertical section of the box of Fig. 1 together with its associated parts and the adjacent portions of the dynamo;

Fig. 3 is a section in perspective of a generator terminal post; and

Fig. 4 is a perspective view of a reversing plug together with portions of the regulator-box outlet with which it coöperates.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1, there is illustrated at 1 a dynamo which may be driven, for example, from an automobile engine in order to generate current for the lighting and ignition of the automobile, although it will be obvious that the advantageous features of the invention are not restricted to a dynamo employed in this way. Since the dynamo is driven at a speed varying from zero to a maximum, it is necessary to provide some mechanism for controlling the connections between the dynamo and its external circuit and to prevent the dynamo output from exceeding predetermined values as the speed increases. The mechanism for effecting these results forms no part *per se* of the present invention, it being noted that this regulator may be of any type suitable to the requirements of the particular installation.

Mounted upon the casing 2 of the dynamo 1 is a box 3 whose external elements comprise, in the present instance, simply the head 4 of a screw 5, a cover 6, the sides 7, and the outlet 8 into which may be inserted the plug 9 carrying the conductors 10, 11 leading to the storage-battery or other portions of the external circuit, (not shown). It will thus be seen that the exterior of the box is such as to afford no opportunity for the entrance of moisture or dirt, or for the accidental connection of any of the circuits improperly.

The electrical portions 12, 13 of the regulator may be mounted upon the rear vertical wall 7 of the box by means of bolts of

which two are visible at 14, 15. Inasmuch as the electrical elements of the regulator form no part of the present invention, *per se* these elements have been indicated simply as an automatic switch 12, and a voltage-controlled vibrator 13 adapted to control the dynamo by varying the field-current thereof; resistances (not shown) or other devices may be provided if desired.

Between the electrical portions 12, 13 there are provided suitable conductors (not shown), and other conductors (not shown) pass from these electrical elements 12, 13 to the dynamo outlet 16, and to the external-circuit outlet 8. A preferred form of dynamo outlet for a three-wire connection with the dynamo (+armature, +field, and -) is illustrated in Figs. 2 and 3 as comprising three spring-pins 17 passing through insulating bushings 18 in a shouldered portion 19 of the regulator box. These pins 17 are adapted to fit respectively into the sockets 20 mounted in the hard-rubber or other insulating support 21, which in turn is fitted into the member 22 adapted to be fastened on a suitable portion of the dynamo frame, the sockets and insulating support passing through the dynamo casing 2. Electrical connection between these sockets 20 and the proper elements of the dynamo is effected by means of conducting wires (not shown), which may be soldered into the recessed portions 23 of the sockets.

The other outlet for the box 2, providing electrical connection between the regulator and the external circuit, comprises preferably a cylindrical member 24 flanged as at 25 in order that it may be secured to the regulator box, and having fixed within it an inner cylinder 26 provided with a two-way bayonet slot 27 whose oppositely disposed lateral extensions are reentrant as at 29. Within this inner cylinder 26 are secured the requisite number of conducting pins 30 (in the present instance two) with recessed portions 31 at their inner ends for the reception of soldered contacting wires, the outer ends of these pins terminating in knobs 32; and for a purpose hereinafter explained, these pins are spring-pressed outwardly, as by means of the coiled springs 33, fitted as indicated in Fig. 2, around a reduced shank 34 of the pins, and arranged so as to force the knobs 32 toward the left in Fig. 2, that is, in an outward direction, this outward movement of the pins being limited by the contacting of the right-hand enlarged portions 35 of the pins against adjacent portions of the tube 36 fitted in the hard-rubber insulator 37. Coöperating with these pins 30 are a like number of conducting plates 38 arranged practically flush with the surface of a hard-rubber or other insulating member 39 adapted to be held within the cylindrical tube 40, as by the spring-ring retaining de-

vice 41. The conducting plates 38 are parts of terminals whose opposite ends are recessed as at 42 for the reception of soldered leads 10, 11 passing through the insulating bushing 43 to the external circuit of the apparatus. The external-circuit plug 9, comprising these terminals, the insulation in which they are mounted, and the cylindrical tube 40, may be pushed toward the right (Fig. 2) into the external-circuit outlet 8 of the regulator box, this movement being guided by the projecting pin 44 on the plug registering with the longitudinal portion of the bayonet slot 27. When the plug 9 is pushed into the receptacle 8 in this way, the limit of its travel is not reached until the pins 30 have been forced toward the right (Fig. 2) in opposition to the action of the coiled springs 33. Thus far, however, no electrical connection has been completed, since, as indicated in Fig. 2, (the knobs 32 of the outlet pins 30 bear against the insulation 39 of the plug and not against the plates 38. In order to effect an operative connection, it is necessary to turn the plug in one direction or the other to an extent determined by the length of the transverse portions 28 of the bayonet slot, this twisting of the plug being facilitated by the shouldered portion 45 of the tube 40, and it is not until the plug has been turned some distance from its neutral position indicated in Fig. 2, that connection is made between the outlet terminals 32 and the plug terminals 38. As the plug is turned to the limit of its angular travel, the pin enters the reentrant portion 29 of the bayonet slot, in which position the pin and plug are held by the pressure exerted by the coiled springs 33, so that in practice there is no danger of the plug becoming loose or the contact pressure between outlet terminals and plug terminals varying from an amount predetermined from the strength of the coiled springs 33. As will be obvious from Fig. 4, the relative connections between outlet terminals and plug terminals depends upon the angular position of the plug from neutral, so that the device constitutes what may be termed a reversing plug. The reversing feature of the plug is useful in many types of regulators where a periodic change of polarity at vibrators has been found to reduce the pitting at the contacts, although it will be obvious that the reversing may be for any purpose whatever, and in fact if no reversing is desirable the apparatus may be modified by omitting one of the transverse portions 28 of the bayonet slot 27.

When the regulator box is to be applied to a dynamo, it is simply necessary to fit the spring-pins 17 into the corresponding sockets 20, and then to tighten the retaining screw 5, which is illustrated in Fig. 2 as comprising a head 4 provided with a lock washer 13.

46, and a spring-ring device 47 to prevent the accidental loss of the screw from the box, the screw passing loosely through the cover 6 and through an annular projection 48 within the box to a threaded engagement with the dynamo casing 2 at the socket 49. The socket 49 is provided rather than a hole extending entirely through the dynamo casing, for the reason that a hole in the casing might be mistaken for an oil hole, with results detrimental to the dynamo, or dirt or other extraneous matter might find its way into the dynamo casing during the time that the regulator box was not in place. In fact, by the present construction there is no opening whatever in the dynamo casing through which dirt or oil may find its way. In fitting the regulator box to the dynamo, it will be noted that no mistake can be made in the electrical connections, because the screw 5 will fit into the socket 49 only when the spring-pins 17 are inserted in the sockets 20 in the proper relative order. There are no other electrical connections that need to be made at this time, since the spring-pins are permanently connected within the regulator box to the electrical elements of the regulator, and the socket members 20 are permanently connected within the dynamo casing to the proper elements of the dynamo.

In connecting the regulator box to the external circuit, the two mains from said circuit may be soldered without regard to polarity into the sockets 42 of the plug terminals 38, and the plug 9 then inserted into the outlet 8 and turned in one direction or the other until the pin 44 registers in the respective reëntrant portion 29 of the bayonet slot. With the present arrangement therefore, no electrical skill whatever is needed in installing the device initially or in replacing a worn or defective regulator, or in detaching a regulator from one dynamo and applying it to another one. Extraneous matter is excluded from the dynamo, as above explained, whether the regulator box is in place or not, and the regulator itself when applied to the dynamo is entirely inclosed and protected from dust at all times.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adap-

tations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

Having thus revealed this invention, I claim as new and desire to secure the following combination of elements, or equivalents thereof, by Letters Patent of the United States:—

1. Apparatus of the character described, comprising in combination, an inclosed generator, electro-magnetic control apparatus therefor, a box inclosing said apparatus, a plurality of coöperating plug and socket electrical connectors connecting said apparatus to said generator, and mechanically retaining said box against turning with respect to the casing of said generator, and means for positively retaining said box against removal from said generator.

2. Apparatus of the character described, comprising in combination, a generator, electro-magnetic control apparatus therefor, a box inclosing said apparatus, a plurality of plugs, a plurality of coöperating sockets, said pluralities being attached one to said generator and the other to said box, to furnish a quick-detachable electrical and mechanical connection between said generator and said box.

3. Apparatus of the character described, comprising in combination, a generator having an inclosing casing for preventing the entry of foreign matter to the windings thereof, electro-magnetic control apparatus for said generator, a box completely inclosing said apparatus and a multi-contact quick detachable plug and socket connector electrically connecting said apparatus to said generator, and mechanically connecting said box to said generator.

4. Apparatus of the character described, comprising in combination, a generator, electro-magnetic control apparatus for said generator, a box within which said control apparatus is secured, a detachable electrical connection between said generator and said apparatus, constituting also a mechanical connection between said box and said generator, a cover for said box, and means adapted to maintain said cover on said box and said box on said generator.

In witness whereof, I hereunto subscribe my name, as attested by the two subscribing witnesses.

JOSEPH BIJUR.

Witnesses:

JACOB SHAPIRO,
DELOS G. HAYNES.