

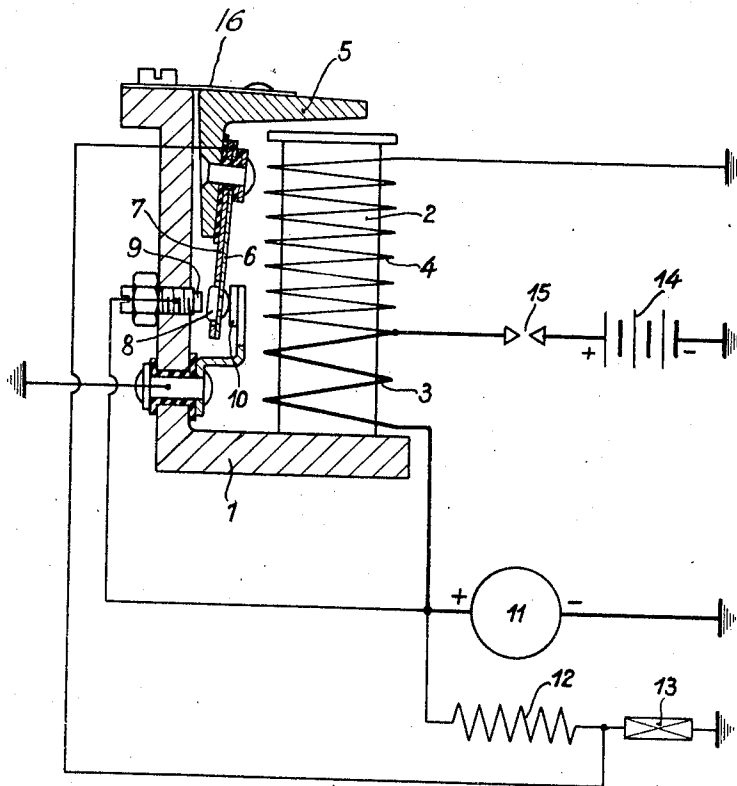
Aug. 19, 1941.

F. MENZEL

2,253,483

ELECTROMAGNETIC VIBRATORY GOVERNOR FOR DYNAMOS

Filed July 20, 1938



Inventor
Friedrich Menzel
by Roy F. Steward
his attorney

UNITED STATES PATENT OFFICE

2,253,483

ELECTROMAGNETIC VIBRATORY GOVERNOR FOR DYNAMOS

Friedrich Menzel, Stuttgart, Germany, assignor to
Robert Bosch Gesellschaft mit beschränkter
Haftung, Stuttgart, Germany

Application July 20, 1938, Serial No. 220,349
In Germany July 29, 1937

2 Claims. (Cl. 200—87)

This invention relates to electromagnetic vibratory regulators for dynamos driven at variable speed especially on vehicles, the regulators being provided with a contact spring actuated by an armature and swinging between two fixed contacts. There are two steps of regulation, one for the lower range of speed and the other for the higher range of speed.

The object of the invention is to provide a construction whereby it will be impossible for shocks and jolts, arising during the operation of the motor and affecting the armature and the contact spring, to affect the operation of the regulator in an unfavorable manner.

According to this invention, the contact spring, which bears with preliminary tension against a stop finger which is moved with it, is arranged in such a manner, that, on swinging, it impinges rigidly against the contact for the lower range of speed and resiliently against the contact for the higher range of speed. By this arrangement it is impossible for the contact spring to be thrown back and open the contact prematurely when a shock coincides with the attraction movement of the armature and pushes against the contact for the higher range of speed, whereby the regulated voltage would rise and injure the lamps or other current-consuming devices supplied by the dynamo.

The invention is more particularly described with reference to the accompanying drawing, which shows an example of construction in longitudinal section together with a circuit diagram.

The vibrating governor has a magnet frame 1 with a magnet 2, which carries a current coil 3 and a voltage coil 4. On the upwardly pointing leg of the magnet frame 1 is suspended, by means of a leaf spring 16, a right angle-shaped armature 5, to the downwardly directed leg of which are secured, so as to be insulated, a contact spring 6 and a substantially rigid stop finger 7 of equal length. The contact spring 6 bears with preliminary tension against the stop finger 7 and carries a double contact 8, which on one side passes through a recess provided in the stop finger 7. The contact 8 cooperates with two opposed fixed contacts 9 and 10, 9 being connected to the frame of the magnet and 10 insulated therefrom. As may be seen from the drawing, the stop finger 7 bears on that side of the contact spring 6 which faces the contact 9.

In the circuit diagram 11 denotes a continuous current dynamo, 12 the excitation winding thereof, 13 denotes a series resistance, 14 a bat-

tery and 15 denotes an automatic charging switch between the dynamo 11 and the battery 14.

In the inoperative position of the governor, the contact 8 present on the contact spring 6 bears on the contact 10, whereby the resistance 13 in the excitation circuit of the dynamo 11 is short circuited. If the armature 5 is attracted by the magnet 2 at a certain voltage of the dynamo 11, the contact spring 6 is immediately lifted from the contact 8 and thus the resistance 13 is connected in series with the excitation winding 12. If, on increasing voltage, the armature 5 is attracted more strongly, then the contact spring 6 strikes with its contact 8 against the contact 9, whereby the excitation winding 12 is short circuited. As a result of its preliminary tension, the contact spring 6 damps the impact and in doing this it may be raised from the contact finger 7. When the armature 5 swings back, the stop finger 7 takes the contact spring 6 with it and opens the contact 8, 9. If the armature 5 thereby goes into its inoperative position, then the stop finger 7 causes the contact spring 6 to strike rigidly against the contact 10.

The vibrating governor controls the voltage of the dynamo in known manner by periodic opening and closing of the contacts 8, 10 or 8, 9.

Shocks or jolts arising in operation during travel may take effect as impacts on the armature. In the event of an impact coinciding with the attraction movement of the armature 5, the damping caused by the contact spring 6 prevents the armature, when the contact 8 impinges on the contact 9, from being thrown back by the latter, and thus the contact 8, 9 is opened, whereby the controlled voltage would rise. The arrangement devised here permits the armature 5 to move further, after the closing of the contact 8, 9, in the direction which it has taken. The additional resilient force exerted hereby by the contact spring 6 supports the return of the armature 5.

On the other hand, if the impact coincides with the dropping movement of the armature, then owing to the rebounding of the armature from the contact 10, the contact 8, 10 is prematurely opened, so that the controlled voltage becomes somewhat smaller. The influence of the lower contact, by the opening of which the resistance is switched into the excitation winding, is, however, not as considerable as that of the upper contact, by the closing of which the excitation winding is short circuited. On the other hand, owing to the fact that when the armature is attracted out of the inoperative position, the

contact bar 8, 10 is opened, a peak in the control voltage which would otherwise arise, is avoided.

The remaining construction of the governor can be chosen in any desired manner.

I declare that what I claim is:

1. An electromagnetic vibratory regulator for dynamos driven at variable speed comprising an armature, a contact spring actuated by said armature, two fixed contacts between which said contact spring is adapted to swing, one of said contacts being for the lower range of speed of the dynamo and the other of said contacts being for the higher range of the speed of said dynamo, and a substantially rigid stop finger rigidly mounted upon and actuated by said armature together with said contact spring, said contact spring being substantially coextensive with and bearing against said stop finger with preliminary tension whereby, on swinging, the said contact spring impinges rigidly on the contact for the lower range of speed and resiliently on the contact for the higher range of speed.

2. An electromagnetic vibratory regulator for dynamos driven at variable speed comprising a magnet frame, an armature, a spring pivotally securing said armature to said frame, a contact spring and a substantially rigid stop finger, both mounted on said armature, said contact spring bearing against said stop finger with preliminary tension, and two fixed contacts between which said contact spring is adapted to swing, one of said contacts being for the lower range of speed of the dynamo and the other for the higher range of speed of said dynamo, said contact spring and said stop finger being substantially coextensive and arranged in such a manner that, on swinging, the said contact spring impinges rigidly on the contact for the lower range of speed and resiliently on the contact for the higher range of speed.

FRIEDRICH MENZEL.