

ment is arranged for full speed operation on 600 volts instead of for half speed.

**FOUR - MOTOR EQUIPMENTS.**—From the fact that the motors are connected permanently two in series, it is obvious that in order to obtain series—parallel control on 1200 volts, it is necessary to have four motors. Practically all 1200 volt equipments are arranged in this way. In one or two special cases, two motor equipments have been used on single cars, with the two motors connected permanently in series, and governed by ordinary rheostatic control. Such equipments, however, are undesirable and are on a par with single motor equipments for 600 volt operation.

**DYNAMOTOR COMPRESSOR.**—To reduce the weight and complication of high voltage direct current railway equipments, a dynamotor compressor has been developed which combines the functions of the dynamotor and the compressor motor in one machine. The dynamotor part of the equipment runs continuously whether on 1200 or 600 volts, and the compressor is connected to, or disconnected from, it by means of a clutch, regulated by the air pressure governor.

**SIMPLIFIED EQUIPMENTS.**—While the dynamotor compressor offers many advantages over the use of a separate dynamotor and compressor motor, the presence of the dynamotor element introduces a feature which on small cars, or small roads, it is sometimes desired to eliminate. By using properly designed lighting details instead of the usual 600 volt material, the lighting circuits may be operated directly from the 1200 volt trolley with entire safety. The control circuits of type HL control also require such a small amount of current, that instead of being operated directly from the line, so that each train line wire is subjected to full trolley voltage, they are operated from a shunt circuit on a resistance, in such a manner that only one wire of the main line is subjected to the full trolley potential while all others operate at a much lower voltage. This arrangement can be readily adopted for operation at 1200 volts, and by using 1200 volt lighting material and a 1200 volt control resistance in this way, the necessity for a dynamotor is entirely avoided. Equipments of this sort may be arranged for operation on 600 volts, either at full speed, or at half speed, in the same general way as equipments using a dynamotor, or dynamotor compressor, and they afford an exceptionally simple and reliable 1200 volt outfit, especially adapted for operating small, or moderate sizes cars, either singly, or in trains of two or three cars.

**CONCLUSION.**—Summarizing briefly the various points which I have dwelt upon, the principal tendency in the control of railway motors, is towards the use of apparatus, which will give more reliable operation, lower maintenance, and a greater mileage between inspection periods, than the present drum type controller. Bound together with this tendency, is that toward the employment of apparatus which removes the heavy current circuits from the car platform, and permits multiple unit operation. Special efforts are being made to secure economical operation, and the use of field control and the 1200 volt system are two of the tendencies toward accomplishing this end. Fortunately, all of these objects may be secured simultaneously by the use of power operated control apparatus, of which type HL, is the most successful example.

## ACCIDENT CLAIMS.

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The importance of the claims department in the operating affairs of electric railways, both city and interurban, has long been recognized in the industry. One reason of this, and possibly the principal reason, is that it either influences or is influenced by almost every other department that goes to make the organization of a railway company. For this reason,