"voltage. I adopt a few coils ou armature rather than many, for while " the spark at brushes is larger, the increased simplicity of all parts " more than compensates."

WESTINGHOUSE A., C. ARC DYNAMO.

This dynamo, recently put upon the market, embodies several movel features. The frame of the 60-light are machine is cast off the same patterns as the ordinary 750-light Westinghouse incandescence dynamo; and the only difference in the field windings is that the iron cores project through the coils to a greater extent than in the incandescent machine, the coils being shorter. The principal feature of the machine is the armature winding, which is almost entirely enveloped by the laminated iron discs forming the core, and is connected to two collecting collars as in the Westinghouse incandescence machines. The speed is 600 revolutions per minute, the periodicity peing 50 cycles.

The lamp has two laminated wire cores, somewhat similar to the core of the Westinghouse annexter, hung on a swinging arm, one of which plunges into the coarse wire geries coil and the other into the fine wire shut coil.⁵ One carbon rod only is used, and the carbon itself is about $24^{\prime\prime}$ wile by $1^{\prime\prime}$ thick. The lamp runs for 42hours with one set of carbons. The P. D. at lamp terminals is 50 volt and the current 10 anperes. For lamps for inside use a converter isuttached to the high-pressure street wires which transforms the ourrent to 50 volts and 10 amperes, so that 50 volts is the maximum pressure entering a building. With the 60-light machine the lamps when required for street lighting only, may be run in series without the use of these converters. In the 125-light machine the current is 30 amperes and the total E. M. F. 2100 volts, and with this size, converters are used for all the lamps, whether for street or interior lighting, which raise the voltage from 17 volts per lamp to 50 and reduce the current from 30 to 10 anperes. These are made to carry one, three, or five lights each.

The machines are started upon short circuit, and when fully excited a switch is opened and the lamps thereby thrown into circuit. With a sensitive ampere meter attached, the total change in the current when the lamps were thus placed in circuit, on a recent visit of the anthor's to me of the Westinghouse stations was less than two amperes, and this was only temporary. Provision is made by attachments on the dynamo and on the wires in the station to prevent the opening of the circuit. LOW TENSION INCANDESCENCE DYNAMOS.

THE EDISON DYNAMO (PIG. 5).

The type of low tension machines which has found most favour on this continent is the Edison us modified and improved by Dr. Hopkinson, and further perfected awhich Edison Machine Works. Betweenthe machines made, by the Edison Co. in America and the Edison-Hopkinson machine made by Mather & Platt of Manchester there is this difference : that the field cores of the Edison machine are made cylindrical and the armsture core is still built up of iron discs bolted together ; while the Edison Hopkinson machine has field cores, the section of which is a square between two half circles, and the armsture discs are held together by mits at each end of the core screwed on the shaft, thus giving the core a greater sectional area.

Take the Edison machines known as Nos. 10, 12 and 16 to illustrate the general construction of Edison dynamos, and their relative proportions and weights. The No. 10 unachine is made for an E. M. F. of 125 volts and a current of 200 amperes, but is hardly ever run at more than 200 amperes and 110 volts except for central station work. The total weight of this, the heat running of all the Edison dynamos, is 3570 lbs. The two east-iron field blocks weigh 600 lbs. The field cures which, as in all Edison auschines, are of wrought-iron, are each $10_{4}^{\prime\prime\prime}$ diameter by $16_{4}^{\prime\prime\prime}$ long, and are connected by a massive wrought-iron keeper $10_{4}^{\prime\prime\prime}$ wide by $8^{\prime\prime\prime}$ deep by $26_{4}^{\prime\prime\prime}$ long. The field cures are wound with 220 lbs. of copper wire-110 bas on each limb. The wrought iron in the armature weighs 220 lbs., the dimensions of the armature shell before winding is $83^{\prime\prime}$ diameter by $16\frac{1}{4}^{\prime\prime}$ long, and the winding is a modified Stemeas, taking 60 lbs. soft weight of copper wire. The diameter of the completed armature outside the bands is $9\frac{1}{12}^{\prime\prime\prime\prime}$ and the bore of the fields being $9\frac{1}{12}^{\prime\prime\prime\prime}$, there is a clearance of $\frac{1}{4}^{\prime\prime\prime}$ all round. The speed of the machine is 1300 revo-