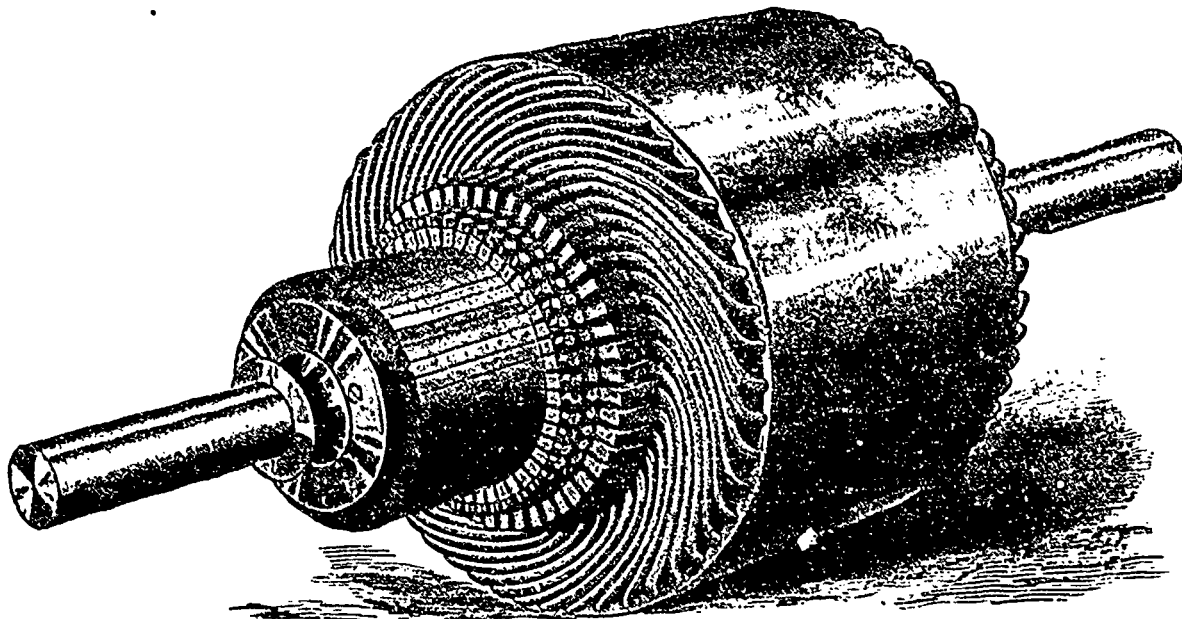


remarkable points. It is very simply constructed and most substantially built, both as to electrical and mechanical details. Up to this time a machine has never been seen in this country which utilized all the magnetic forces as fully and undergoes so little loss of power as does the Wenstrom. It is impossible to utilize all such magnetic forces without the aid of two very essential points, which are the principal features of this machine. In all the best dynamos, as at present constructed, the manner

on to the bracket so that they can be adjusted or taken off the motor entirely without removing the brackets. But one motor is used to a car, excepting in special cases where special grades, or work, renders two motors necessary, as it is an impossibility to construct two motors identical in power, speed and other details, the result being that where two are applied to the car axles, one does the greater share of the work; therefore, while one is running light, the other is overworked and overloaded; there are also twice as many parts to wear out and keep in repair. Owing to the low revolutions of the motor, it will give a maximum speed of 15 miles per hour (by one reduction and without use of a countershaft), and by use of patent hydraulic noiseless wood en toothed gear, the armature is allowed at all times to run at full speed regardless of the



THE WENSTROM ARMATURE, SHOWING SMOOTH EXTERNAL SURFACE AND WIRES LACED THROUGH HOLES NEAR PERIPHERY

of wiring the armature is such that it is impossible to bring the armature surface sufficiently close to the field poles to obviate the magnetic resistance, which it is very desirable to do. In all machines at present on the market, the old forms of field magnets have been strictly adhered to, and the currents produced by them generate magnetism in such a way that a large and valuable portion of it is generally lost. This, as will be readily perceived, it is very desirable to utilize, as, if it could be retained, more magnetism could be generated with less power. In the Wenstrom machine the desired end is attained by the peculiar construction of the field magnets and the cast iron shell, which while accomplishing the result demanded of it, also renders the dynamo more substantial and rigid in all its bearings. By this form the magnetic forces which are generally lost in other makes of machines are retained, while in the armature the two great obstacles are overcome by lessening the distance between the armature and the field, and by reducing the magnetic resistance to the core. The machine runs evenly and smoothly at extremely low speed. A careful examination of it will convince any one that it is the very best compared with other machines. In point of speed none can equal the Wenstrom, as it produces more current at low speed than any other can give at high speed. This machine has overcome some of the principal defects of other makes in speed, efficiency, weight and electrical and mechanical details, and no machine of equal capacity at present known could be manufactured as cheaply or run better."

THE "WENSTROM" SLOW SPEED RAILWAY MOTOR is a four pole machine cast in one piece, being very simple in construction. The field coils are wound on bobbins which slide on to the main poles at either end of the motor. The construction of the armature is similar to that of the dynamo and generator, but its advantages are even more apparent for this work. There being no wire on surface of the armature, it is possible to run it within 1-16 inch of the field poles. The boxes are so arranged as to take up any wear, and by the same device the armature can be adjusted to 1-100 part of an inch. The difficulty of taking out the armature is obviated by making the pinion seat conical, so that the pinion can readily be taken off and armature slid out, taking but a few moments time, without any danger of injury to armature wires, which will be appreciated by persons who have had this difficulty to overcome. The Wenstrom motor complete weighs about 2,000 lbs., and it is claimed will develop 35 H. P., although the manufacturers have seen fit to rate it at 25 H. P. Its speed is only 400 revolutions per minute, which allows it to be geared to the car axle *direct*, without the annoyance and expense of the intermediate countershaft. Brush holders are arranged to slide

speed of the car, and cannot be tied up or overloaded. By means of this hydraulic gear the speed of the car may be varied, without relation to speed of armature, which may be kept running all day. This also avoids the jerking in starting and stoppage of cars.

Further particulars will be cheerfully supplied by the Canadian manufacturing agents, THE BALL ELECTRIC LIGHT CO., LTD., Toronto.

TORONTO WATER SUPPLY.

THE Toronto water supply continues to demand a great deal of attention, and the daily papers are constantly referring either to the quantity or quality of the supply or the management or



FIG. 4.—WENSTROM SLOW SPEED STREET CAR MOTOR.

mismanagement of the water works department of the civic government.

Public opinion, or the opinion of the public, seems favorably disposed to the idea of a supply running down hill instead of being pumped up, and no doubt if it can be got it will be a great improvement. Pure water and plenty of it should be supplied, and every householder should be made to pay for his share of